



Gas Measurement Instruments Ltd

Personal Surveyor 200

PS200 *Series*

**Auto Bump / Calibration
Station - Handbook**

Issue 4

04/11/2016

Part Number: 64192

GMI welcomes comments on all our publications. Your comments can be of great value in helping us to improve our customer publications. Please send any comments that you have to customerservice@gmiuk.com

Copyright © Gas Measurement Instruments Ltd 2011

LICENCE AGREEMENT

This Licence Agreement is your proof of licence. Please treat it as valuable property. Please note that this licence agreement supersedes the "statement of Copyright Restrictions".

IMPORTANT - READ CAREFULLY

This is a legal and binding contract between you (either an individual or an entity), the end user and Gas Measurement Instruments Limited (GMI). By opening sealed software packages or by installing, copying, or otherwise using this '**PS200 Settings**' Auto Bump / Cal Station application program ("SOFTWARE"), you agree to be bound by the terms of this agreement. If you do not agree to the terms of this agreement you should promptly return this disc package and accompanying items* (including written materials, binders or containers) to GMI.

CALIBRATION SOFTWARE LICENCE

1. GRANT OF LICENCE: The '**PS200 Settings**' Licence Agreement (Licence) permits concurrent use of the SOFTWARE on the number of computers for which this licence grants (that is: single user package licences one user; twenty user package licences twenty users). Additional SOFTWARE licences may be purchased for each additional concurrent user.

If you have acquired this SOFTWARE in a multiple licence pack, you may make the number of additional copies of the SOFTWARE authorised on the printed copy of the licence. You may also store or install a copy of the network SOFTWARE on a storage device, such as a network server, used only to install or run the SOFTWARE on your other computers over an internal network; however you must acquire and dedicate a licence for each separate computer on which the SOFTWARE is installed or run from the storage device. A licence for the software may not be shared or used concurrently on different computers.

This licence is granted for use on the GMI products and for use on one computer. If you require a second copy you must purchase that from GMI or its distributor. The documentation accompanying this software is essential for the correct and safe operation of the instruments.

This software is used on certified equipment which may be used in life critical applications. Only trained competent personnel should use this equipment and should be aware of the certification, calibration and Health and Safety issues associated with the product and its application.

2. COPYRIGHT: The SOFTWARE is owned by GMI and is protected by United Kingdom copyright laws and international treaty provisions. Therefore you must treat the SOFTWARE like any other copyrighted material (for example, a book or musical recording) except that you may either (a) make one copy of the SOFTWARE solely for backup or archival purposes, or (b) transfer the SOFTWARE to a single

hard disk provided you keep the original solely for backup and archival purposes. You may not copy the written materials accompanying the SOFTWARE.

3. OTHER RESTRICTIONS: You may not rent or lease the SOFTWARE, but you may transfer the SOFTWARE and accompanying written materials on a permanent basis to another individual. If you transfer the software, you must retain no copies and the recipient must agree to the terms of this agreement. You must not reverse engineer, decompile, or disassemble the SOFTWARE that is provided solely as executable programs (.EXE files) or dynamic link libraries (.DLL files). If the SOFTWARE is an update, any transfer must include the update and all prior versions.

30 DAY LIMITED WARRANTY

If the product was purchased in the UK, simply return the full product in resaleable condition* within 60 days of purchase to GMI, together with your original receipt or invoice, for a full refund. If this product was not purchased in the UK, you should return the full product* to the place of purchase within 30 days of purchase for a full refund.

LIMITED WARRANTY

The CD-ROM and Handbook that make up this software product are warranted by GMI to be free from defects in materials and workmanship for a period of 60 (sixty) days from the date you purchased this product. If you notify GMI within the warranty period of such defects in materials or workmanship, GMI will replace the defective CD-ROM or handbook. The sole remedy for breach of this warranty is limited to replacement of defective CD-ROM and handbook and / or refund of purchase price and does not include any other kinds of damage. Apart from the foregoing limited warranty, the software programs are provided "AS IS", without warranty of any kind, either expressed or implied. The entire risk as to the performance of the program is with the purchaser. GMI does not warrant that the operation of the programs will be uninterrupted or error free. GMI assumes no responsibility or liability of any kind for errors in the program or documentation or for the consequences of any such errors.

INCIDENTAL AND CONSEQUENTIAL DAMAGES CAUSED BY MALFUNCTION, DEFAULT, OR OTHERWISE WITH RESPECT TO BREACH OF THIS WARRANTY OR ANY OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE NOT THE RESPONSIBILITY OF GMI AND ARE HEREBY EXCLUDED BOTH FOR PROPERTY AND, TO THE EXTENT NOT UNCONSCIONABLE, FOR PERSONAL INJURY DAMAGE.

The remedies described above are the exclusive remedies extended to you by GMI for any default, malfunction or failure of the product to conform with this warranty or otherwise for the breach of this warranty or any other warranty, whether expressed or implied. Should you have any questions concerning this agreement please contact the GMI sales department on +44 (0)141 812 3211.

* If the product is not in resaleable condition, you will be charged a 20% restocking fee.

COPYRIGHT

This document is copyright of GMI and the information contained within is for use only with '**PS200 Settings**' Software. Reproduction, in whole or in part, including utilisation in machines capable of reproduction or retrieval without the written permission of GMI is prohibited. Reverse engineering is not permitted.

TRADEMARK INFORMATION

Windows XP™, Vista™ and 7™ are registered trademarks or trademarks of the Microsoft Corporation in the United States and / or other countries.

LIABILITY

Every care has been taken in the preparation of this document, however, GMI do not accept any responsibility for errors or omissions and their consequences. Information in this document is subject to change without prior notice.

This document does not constitute a specification or basis for a contract.

Your statutory rights under UK law are not affected.

TABLE OF CONTENTS

LICENCE AGREEMENT	i
IMPORTANT - READ CAREFULLY	i
CALIBRATION Software Licence	i
30 DAY LIMITED WARRANTY	ii
LIMITED WARRANTY	ii
COPYRIGHT	iii
TRADEMARK INFORMATION	iii
LIABILITY	iii
<hr/>	
INTRODUCTION	1-1
1.1 GENERAL DESCRIPTION	1-1
1.2 AUTO BUMP / CALIBRATION HARDWARE (6mm fittings)	1-4
1.3 AUTO BUMP / CALIBRATION HARDWARE (1/4 in. fittings)	1-5
1.4 ADDITIONAL ACCESSORIES	1-5

CONNECT CALIBRATION GAS & POWER SUPPLY	2-1
2.1 CONNECT CALIBRATION GAS	2-1
2.1.1 Compare Gas Cylinder Label with Software Configuration	2-2
2.1.2 Connect Gas Cylinder to Auto Bump / Cal Station	2-4
2.1.3 Connect Air / Exhaust Tubing to Auto Bump / Cal Station (if required)	2-6
2.2 CONNECT POWER SUPPLY	2-8

VIEW / RE-CONFIGURE SOFTWARE	3-1
3.1 VIEW / EDIT SOFTWARE CONFIGURATION	3-1
3.1.1 Quick Bump Test	3-5
3.1.2 Full Bump Test (Factory Default)	3-6
3.1.3 Calibration	3-10
3.1.4 Generate Settings File	3-14
3.2 TRANSFER UPDATED 'PS200 SETTINGS' SOFTWARE to AUTO BUMP / CAL STATION	3-15

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION	4-1
4.1 INSTALL INSTRUMENT in AUTO BUMP / CAL STATION	4-1
4.2 PERFORM BUMP / CALIBRATION	4-6

CONTENTS

4.3 REMOVE INSTRUMENT from AUTO BUMP / CAL STATION	4-11
4.4 AUTO BUMP / CAL STATION FAULT INDICATION	4-13
<hr/>	
VIEW / PRINT TEST RESULTS	5-1
5.1 INTRODUCTION	5-1
5.2 DOWNLOAD TEST RESULTS	5-2
5.3 VIEW / PRINT TEST RESULTS	5-4
Test Results:	5-6
Generated Certificates:	5-11
Certificate Content:	5-12
Include Company Logo:	5-13
Generated Certificate Files:	5-14
<hr/>	
FIT MOUNTING BRACKET	A-1
1.1 GENERAL DESCRIPTION	A-1
1.2 FIT MOUNTING BRACKET	A-2
1.3 ATTACH STATION to WORKBENCH / DAISY CHAIN OPTION	A-3
<hr/>	
INDEX	i

INTRODUCTION



Fig. 1-1 PS200 Series Auto Bump / Calibration Station

1.1 GENERAL DESCRIPTION

The GMI Personal Surveyor 200 (PS200) Series Auto Bump / Calibration Station provides the user with a quick, easy and reliable method of ensuring that PS200 series instruments are correctly calibrated where company policy dictates. Equipment does not have to be taken out of service for extended time periods while testing is undertaken.

The Auto Bump / Calibration Station can be used for:

- A 'Quick' Bump Test, approximately 15 seconds gas duration, to verify that the instrument alarms will activate when the alarm setpoints are reached.
- A 'Full' Bump Test (factory default), approximately 60 seconds gas duration, performs a full Bump Test of alarm setpoints and sensor response. This is followed up with an automatic calibration of failed gas ranges, if applicable.
- A Full Calibration of the instrument, approximately 60 seconds gas duration.

The unit can be free standing on a workbench, or alternatively, secured to the workbench individually or in daisy chain fashion using the mounting bracket and screws supplied with the unit. Refer to APPENDIX-A for fitting instructions.

Power is supplied to the rear of the unit via a 12V Universal Power Supply Unit (PSU) supplied with the unit. A 12V Vehicle Power Supply is available as an accessory.

Gas is connected to the clearly marked inlet adaptor at the rear of the unit. An integral pump automatically draws gas into the instrument for bump / calibration operation.

The user simply inserts the PS200 instrument to be tested into the Auto Bump / Calibration Station, then closes the cover initiating the automatic testing process.

The Auto Bump / Calibration Station uses a traffic light system to display progress / result and thus provides the user with a clear indication of whether the PS200 meets selected parameters.

- i.e.
- LED 1 (Green) = ON (power)
 - LED 2 (Orange) = TEST (in progress)
 - LED 3 (Green) = PASS
 - LED 4 (Red) = FAIL

Note: The 'PASS' or 'FAIL' LED's indicate the overall result. If any doubt exists about the obtained result, please contact GMI.

GMI '**PS200 Settings**' Software is a Windows™ based 'stand alone' application that allows the user to edit test parameters and view and / or print test results.

This software will run on any PC / Laptop with Windows XP™, Windows Vista™, or Windows 7™ (32bit or 64bit) software installed (Net Framework 2.0 or higher may also be required on early Windows XP™ operating systems).

Both the Auto Bump / Calibration Station and the USB memory stick are supplied from GMI with necessary '**PS200 Settings**' software installed. This pre-installed software is configured to factory default parameters as detailed in the following chapters. The software configuration parameters can be edited via PC or Laptop then the settings file transferred to the Auto Bump / Calibration Station using the USB memory stick supplied.

The software provides a full audit trail of tested instruments and the resulting data is retained in the station memory until downloaded to the USB memory stick, supplied by GMI, before being transferred to any compatible PC / Laptop for long term storage, review, and / or printing. The instrument 'Cal Due' date is also updated on successful completion of calibration. A Calibration Certificate can also be generated automatically after successful completion of instrument testing.

A permanent PC connection is provided via mini-USB socket at the rear of the Auto Bump / Calibration Station. An Ethernet socket is also provided at the rear of the unit to allow results to be gathered over a network. Both of these options require '**flexiCal Plus**' software package, available from GMI.

Note: PS200 Bump / Calibration Software is only one part of the requirement in terms of calibration and maintenance of a PS200 portable gas detector. Gases, delivery and trained personnel are all of equal or even greater importance.

The Auto Bump / Calibration Station can also be used to charge the instrument while power supply is connected. This is indicated as a flashing battery symbol  and 'CHARGING' on the instrument display. Charging will take up to 4 hours to complete. On completion, a full battery symbol  and 'CHARGING COMPLETE' is displayed.

The instrument will not be damaged if left in Auto Bump / Calibration Station after charging.

1.2 AUTO BUMP / CALIBRATION HARDWARE (6mm fittings)

- The Auto Bump / Calibration Station (GMI Part No. 64052) includes 12V output Universal Power Supply Unit (PSU), and USB Memory Stick with GMI '**PS200 Settings**' software pre-installed.
- A Test Gas Kit (GMI Part No. 64060) is available as an accessory and is supplied complete with Combi Test Gas Cylinder (containing a mixture of 2.5% CH₄, 500ppm CO, 50ppm H₂S, 18% O₂ and balance N₂), On Demand Gas Flow Regulator and Tubing.

1.3 AUTO BUMP / CALIBRATION HARDWARE (1/4 in. fittings)

- The Auto Bump / Calibration Station (GMI Part No. 64052Q) includes Adaptor Kit, 12V output Universal Power Supply Unit (PSU), and USB Memory Stick with GMI '**PS200 Settings**' software pre-installed.
- A Test Gas Kit (GMI Part No. 64060) is available as an accessory and is supplied complete with Combi Test Gas Cylinder (containing a mixture of 2.5% CH₄, 500ppm CO, 50ppm H₂S, 18% O₂ and balance N₂), On Demand Gas Flow Regulator and Tubing.

1.4 ADDITIONAL ACCESSORIES

- Combi Test Gas Cylinder (GMI Part No. 99146) containing a mixture of 2.5% CH₄, 500ppm CO, 50ppm H₂S, 18% O₂ and balance N₂. This cylinder is supplied in Test Gas Kit(s) above.
- On Demand Gas Flow Regulator (GMI Part No. 99118). This regulator is supplied in Test Gas Kit(s) above.
- 1.0 metre Tygon[®] tubing complete with 6mm adaptor (GMI Part No. 64265).
- Adaptor Kit (GMI Part No. 67305) 6mm to 1/4in. adaptor x 3.

CONNECT CALIBRATION GAS & POWER SUPPLY

2.1 CONNECT CALIBRATION GAS

Gas is supplied to the Auto Bump / Calibration Station from the Combi Test Gas Cylinder (GMI Part No. 99146) via an On Demand Flow Regulator (GMI Part No. 99118) and Tygon[®] tubing complete with adaptor (GMI Part No. 64265).



Fig. 2-1 Calibration Gas Setup

The above three items are available as a Test Gas Kit (GMI Part No. 64060).

2.1.1 Compare Gas Cylinder Label with Software Configuration

First of all, make sure that the cylinder is not older than the 'use by' date on the label illustrated in Fig. 2-2.

Make sure that the cylinder contains enough gas to complete the bump test / calibration. The pressure gauge on the Regulator Valve, after fitting, gives a clear indication of this.

When applying gas to the instrument via the Auto Bump / Cal Station, it is important that the gas concentrations listed on the cylinder label are consistent with the current software configuration downloaded from the USB memory stick to the Auto Bump / Cal Station.

As illustrated in Fig. 2-2, the cylinder gas concentrations can be easily found on the cylinder label.



Fig. 2-2 Gas Cylinder Label

CONNECT CALIBRATION GAS AND POWER SUPPLY

The concentrations, illustrated in Fig. 2-2, should be consistent with Auto Bump / Cal Station installed software configuration window, as illustrated in Fig. 2-3.

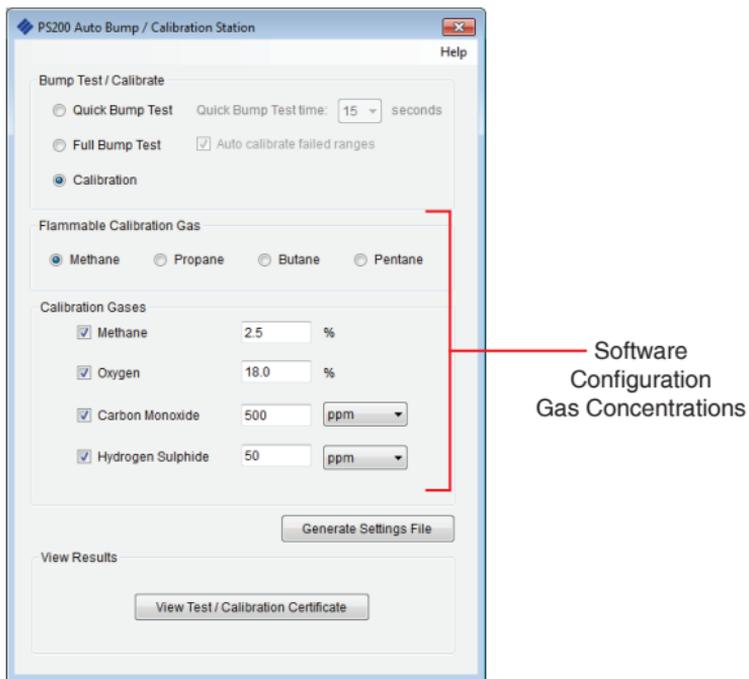


Fig. 2-3 Software Configuration

After comparing gas values between Cylinder Gas Label and Software Configuration, when consistent, proceed to next paragraph.

If inconsistent, refer to Chapter 3 to update software configuration then download updated configuration to Auto Bump / Calibration Station.

2.1.2 Connect Gas Cylinder to Auto Bump / Cal Station

Connect the On Demand Regulator Valve to the gas cylinder by screwing the valve firmly into the top of the cylinder, as illustrated in Fig. 2-4. Fitting is simplified by pressing the valve on to the cylinder with one hand and turning the cylinder with the other. Care must be taken not to over-tighten the valve.



Fig. 2-4 Attach Regulator Valve to Gas Cylinder

Connect the barbed adaptor, supplied with the station, to the other end of the tubing, then push the adaptor into the 'GAS' inlet adaptor fitting on the rear of the Auto Bump / Cal Station, as illustrated in Fig. 2-5.

Note: 6mm o/d tubing (not supplied), connects directly into the 'GAS' inlet adaptor fitting on the rear of the station.

CONNECT CALIBRATION GAS AND POWER SUPPLY

For 1/4 in. o/d tubing (not supplied), an adaptor kit (6mm to 1/4 in.) is available as an accessory and supplied as a pack of 3 (Part No. 64085). The adaptor is fitted, as illustrated in Fig. 2-6, before connecting tubing.



Fig. 2-5 Connect Gas Tubing Adaptor to Station



Fig. 2-6 Fit 6mm to 1/4 in. Adaptors (if required)

2.1.3 Connect Air / Exhaust Tubing to Auto Bump / Cal Station (if required)

If the Auto Bump / Calibration Station is located in a poorly ventilated area, it is recommended that tubing is connected to both 'AIR' inlet and 'EXHAUST' outlet adaptors on the rear face of the station using barbed adaptors supplied with the station.

GMI recommend the use of an 'AIR' in-line filter, also supplied with the station. The (in-line filter) barbed adaptor is a push fit in the 'AIR' inlet adaptor on the rear face of the station, as illustrated in Fig. 2-7.

Air inlet tubing, from the in-line filter, can be routed to the nearest window for the supply of fresh air.

Note: 6mm o/d tubing (not supplied), connects directly into the 'AIR' or 'Exhaust' adaptor fitting on the rear of the station.

For $\frac{1}{4}$ in. o/d tubing (not supplied), an adaptor kit (6mm to $\frac{1}{4}$ in.) is available as an accessory and supplied as a pack of 3 (Part No. 64085). The adaptor is fitted, as illustrated in Fig. 2-6, before connecting tubing.

Alternatively, compressed air can be used to supply inlet air. Note that if this option is adopted, the in-line filter cannot be used.

CONNECT CALIBRATION GAS AND POWER SUPPLY



Fig. 2-7 Connect Air Tubing Adaptor to Station

The 'EXHAUST' line, not illustrated, consists of a length of tubing and a barbed adaptor, supplied with the station. The barbed adaptor is a push fit in the 'EXHAUST' outlet adaptor on the rear face of the station.

Exhaust tubing can be routed to the nearest window.

Note that inlet and exhaust tubing must be distanced from each other at end of tubing.

To remove 'Gas', 'Air' and 'Exhaust' adaptors from Auto Bump / Calibration Station, depress each blue coloured collar, in turn, to release then withdraw adaptor and tubing.

2.2 CONNECT POWER SUPPLY

Power is supplied to the Auto Bump / Cal Station via a Universal AC Power Adaptor (12Vdc output) supplied with the station.

The plug adaptor is located in the 12Vdc socket on the rear face of the station, as illustrated in Fig. 2-8.



Fig. 2-8 Connect Power Supply to Station

Locate the Universal Power Adaptor in a mains supply wall socket then switch mains power ON.

The 'ON' LED, on the front face of the station, will illuminate green, as illustrated in Fig. 2-9.



Fig. 2-9 Station 'ON' Indication

VIEW / RE-CONFIGURE SOFTWARE

3.1 VIEW / EDIT SOFTWARE CONFIGURATION

The USB Memory Stick, supplied with the Auto Bump / Calibration Station, contains the 'PS200 Settings' software in factory default configuration.

To view the default configuration settings, insert the Memory Stick into an available USB port on your PC / Laptop.

Depending on operating system running on your PC / Laptop (i.e. Windows XP™, Windows Vista™ or Windows 7™), one of the following three screens is displayed:

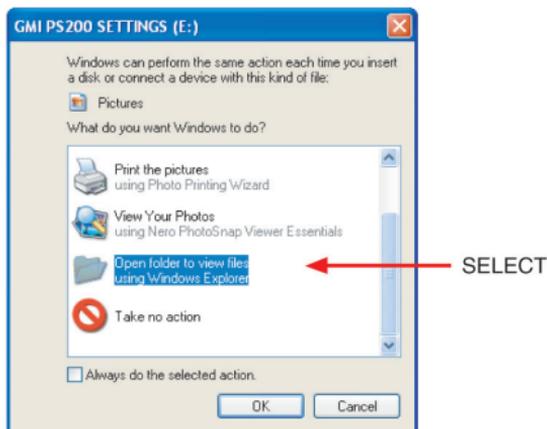


Fig. 3-1 Windows XP™

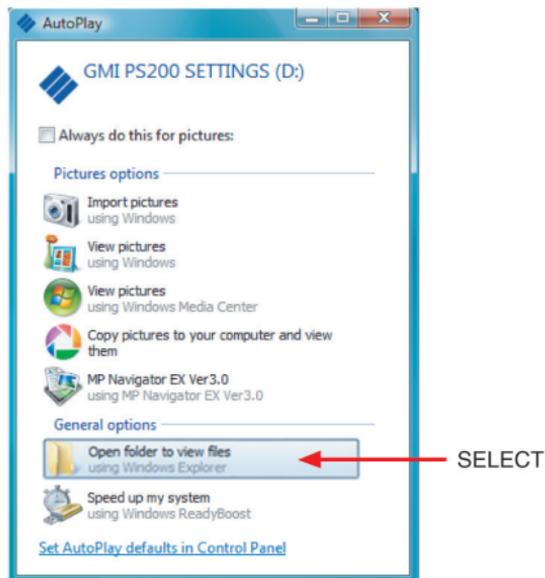


Fig. 3-2 Windows Vista™

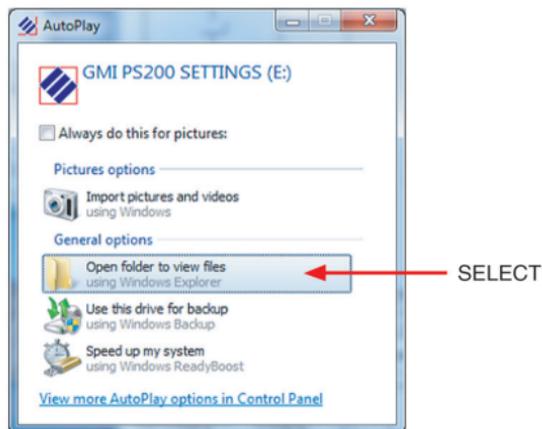


Fig. 3-3 Windows 7™

Select 'Open folder' to display the contents, as illustrated in Fig. 3-4.



Fig 3-4 USB Contents Folder

Note that a shortcut to both Handbook, and the Quick Operation Guide (as included in Auto Bump / Cal Station package), can be accessed from this window. Adobe Acrobat Reader must be installed in your PC / Laptop to view these files.

To view the factory default configuration settings, select **PS200 Settings.exe** file from the list of items in Fig. 3-4. The window, illustrated in Fig. 3-5, is displayed.

The screenshot shows a software window titled "PS200 Auto Bump / Calibration Station" with a "Help" button in the top right corner. The window is divided into several sections:

- Bump Test / Calibrate:** Contains three radio buttons: "Quick Bump Test", "Full Bump Test" (which is selected), and "Calibration". Next to "Quick Bump Test" is a text field for "Quick Bump Test time:" with a dropdown menu showing "15" and the word "seconds". A checked checkbox "Auto calibrate failed ranges" is located to the right of the "Full Bump Test" option.
- Flammable Calibration Gas:** Contains four radio buttons: "Methane" (selected), "Propane", "Butane", and "Pentane".
- Calibration Gases:** Contains four checked checkboxes with corresponding input fields and units:
 - Methane: 2.5 %
 - Oxygen: 18.0 %
 - Carbon Monoxide: 500 ppm
 - Hydrogen Sulphide: 50 ppm
- Buttons:** A "Generate Settings File" button is located below the calibration gases section. A "View Test / Calibration Certificate" button is located in a box at the bottom of the window.

Fig. 3-5 Configuration Window (Default Settings)

There are three available 'Bump Test / Calibrate' options:

- Quick Bump Test
- Full Bump Test (with option to calibrate failed ranges)
- Calibration

3.1.1 Quick Bump Test

A quick bump test provides the user with the option of verifying that the instrument alarms will activate when the alarm setpoints are reached. The default quick bump test time for applying gas is set at 15 seconds when using the GMI Test Gas Cylinder (Part No. 99146).

To select this option, position the cursor on the adjacent radio button then left click mouse button to confirm, as illustrated in Fig. 3-6.

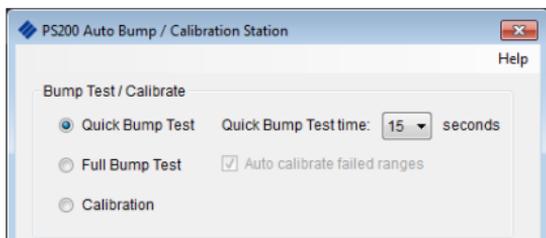


Fig. 3-6 Quick Bump Test Option

If, for any reason, the instrument alarm levels are edited, there may be a requirement to use a different gas cylinder and extend the gas delivery duration. If this is the case, a drop down list of test times (in seconds) is available.

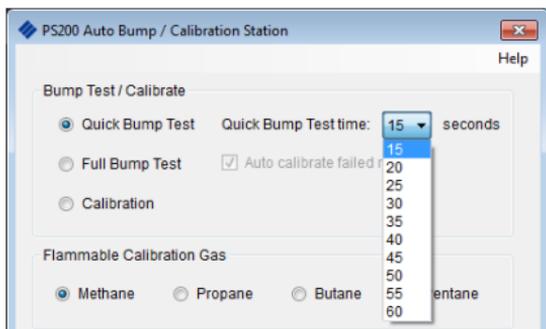


Fig. 3-7 Test Time

The test times can be set from 15 to 60 seconds, as illustrated in Fig. 3-7.

To edit test time, position cursor on value required then left click mouse button to confirm.

3.1.2 Full Bump Test (Factory Default)

This feature is the factory set default option and provides the user with the ability to perform a full bump test then, if selected as illustrated in Fig. 3-8, follow up with an automatic calibration of failed gas ranges, if applicable.

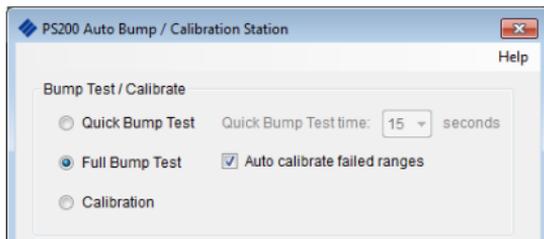


Fig. 3-8 Default Selection

When gas is applied, using the GMI Test Gas Cylinder (Part No. 99146), for a pre-set 60 seconds and when the instrument tolerance band listed below, is reached for each gas range, the Bump / Cal Station will record a 'Pass'.

The instrument default gas range tolerances are as follows:

LEL hydrocarbons: 45% to 62%

Oxygen (O₂): 18.5% to 17.5%

Carbon Monoxide (CO): 450ppm to 550ppm

Hydrogen Sulphide (H₂S): 45ppm to 55ppm

If, for any reason, the calibration gas type is changed or the instrument alarm levels are edited, there may be a requirement to use a different gas cylinder type and edit test gases.

Calibration Gas Type

To change calibration gas type, a selection of flammable calibration gases are available, as illustrated in Fig. 3-9.

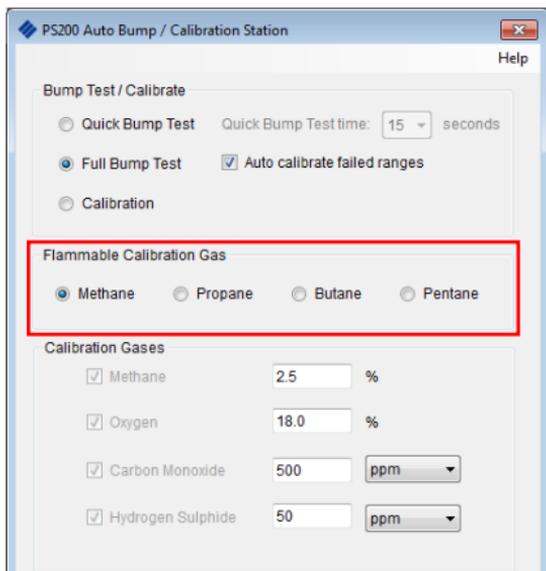


Fig. 3-9 Cal Gas Selection

Calibration gases available for selection are as follows:

Methane (Default); Propane; Butane; Pentane.

To select calibration gas, position the cursor on required radio button, then left click mouse button to confirm.

It is important that the calibration gas type reflects the instrument configuration.

Refer to PS200 series Configuration handbook CD-ROM (GMI Part No. 64193).

Calibration Gas Values

It is important that 'Testing Gases' values displayed in window, illustrated in Fig. 3-10, are consistent with values displayed on gas cylinder label.

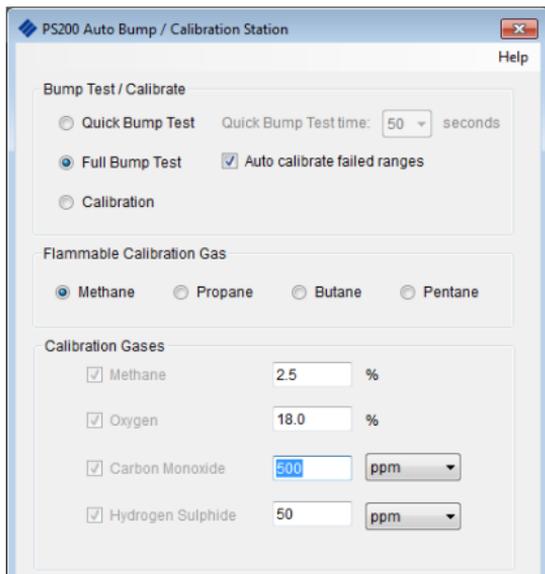


Fig. 3-10 Gas Values

To edit test gas value, use cursor to highlight current gas value (carbon monoxide in example) then type new value in window.

Gas Measurement Units

Gas measurement units for Carbon Monoxide (CO) and Hydrogen Sulphide (H₂S) can be displayed as either 'ppm' (default) or mg/m³. The unit type selected is reflected in Auto Bump / Cal Station stored data and printed Test / Calibration Certificate.

To change measurement units, a drop down list is available, as illustrated in Fig. 3-11.

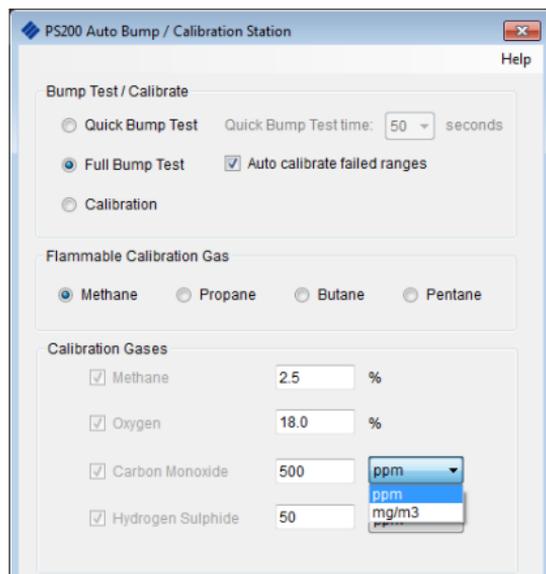


Fig. 3-11 Measurement Units

Units available for selection are as follows:

ppm (Default); mg/m³.

To select measurement type, position the cursor on required unit type in list, then left click mouse button to confirm. Selection should match instrument configuration.

3.1.3 Calibration

This feature provides the user with the option of performing a full calibration of the instrument.

Gas is applied, using the GMI Test Gas Cylinder (Part No. 99146) for a full 60 seconds and the Auto Bump / Cal Station will record a 'Pass' when the target values, as listed in 'Testing Gases' window illustrated in Fig. 3-12, are attained.

To select this option, position the cursor on the adjacent radio button then left click mouse button to confirm, as illustrated in Fig. 3-12.

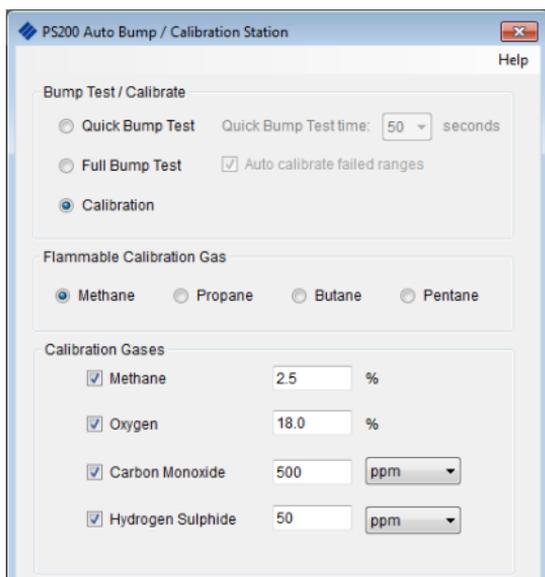


Fig. 3-12 Calibration Option

If, for any reason, the calibration gas type is changed or the instrument alarm levels are edited, there may be a requirement to use a different gas cylinder type and edit test gases.

Calibration Gas Type

To change calibration gas type, a selection of flammable calibration gases are available, as illustrated in Fig. 3-13.

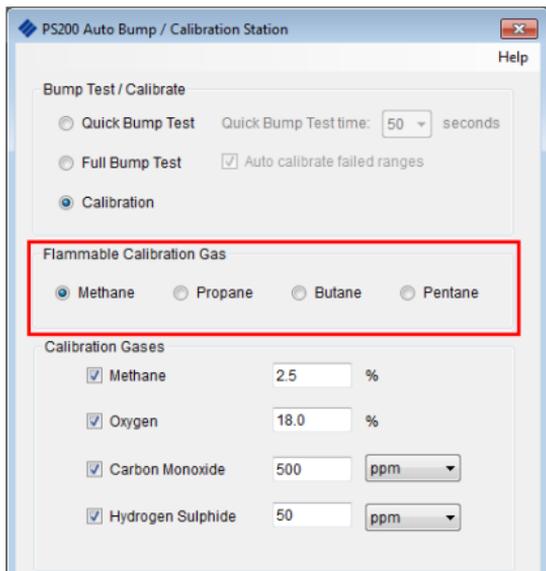


Fig. 3-13 Cal Gas Selection

Calibration gases available for selection are as follows:

Methane (Default); Propane; Butane; Pentane.

To select calibration gas, position the cursor on required radio button, then left click mouse button to confirm.

It is important that the calibration gas type reflects the instrument configuration.

Refer to PS200 series Configuration Handbook CD-ROM (GMI Part No. 64193).

Calibration Gas Values

It is important that 'Testing Gases' values displayed in window, illustrated in Fig. 3-14, are consistent with values displayed on gas cylinder label.

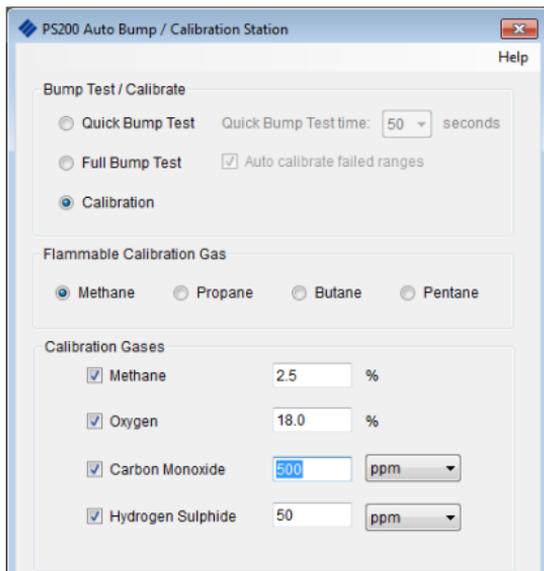


Fig. 3-14 Gas Values

To edit test gas value, use cursor to highlight current gas value (carbon monoxide in example) then type new value in window.

Gas Measurement Units

Gas measurement units for Carbon Monoxide (CO) and Hydrogen Sulphide (H₂S) can be displayed as either 'ppm' (default) or mg/m³. The unit type selected is reflected in Auto Bump / Cal Station stored data and printed Test / Calibration Certificate.

To change measurement units, a drop down list is available, as illustrated in Fig. 3-15.

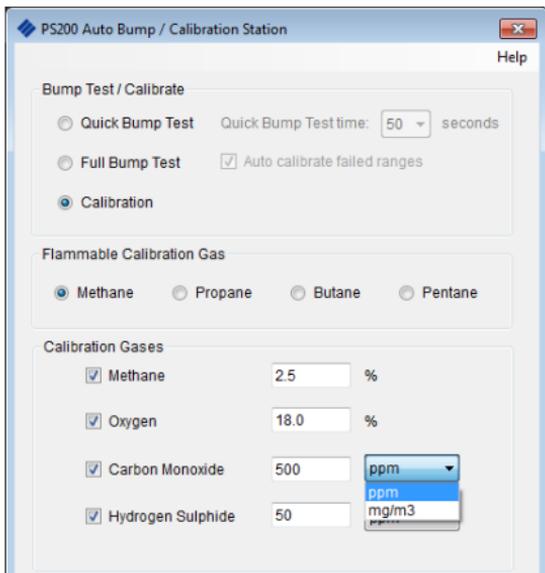


Fig. 3-15 Measurement Units

Units available for selection are as follows:

ppm (Default); mg/m³.

To select measurement type, position the cursor on required unit type in list, then left click mouse button to confirm. Selection should match instrument configuration.

3.1.4 Generate Settings File

The 'Generate Settings File' button, illustrated in Fig. 3-16, allows any configuration changes to be saved to USB Memory Stick, as updated settings file, then transferred to Auto Bump / Cal Station.

The screenshot shows a software window titled "PS200 Auto Bump / Calibration Station" with a "Help" button in the top right corner. The window is divided into several sections:

- Bump Test / Calibrate:** Contains three radio buttons: "Quick Bump Test", "Full Bump Test" (which is selected), and "Calibration". Next to "Quick Bump Test" is a text field "Quick Bump Test time:" with a dropdown menu showing "50" and the unit "seconds". A checkbox "Auto calibrate failed ranges" is checked.
- Flammable Calibration Gas:** Contains four radio buttons: "Methane" (selected), "Propane", "Butane", and "Pentane".
- Calibration Gases:** Contains four checked checkboxes with corresponding text fields and units:
 - Methane: 2.5 %
 - Oxygen: 18.0 %
 - Carbon Monoxide: 500 ppm
 - Hydrogen Sulphide: 50 ppm
- Buttons:** A blue "Generate Settings File" button is located below the calibration gases section. A "View Test / Calibration Certificate" button is located in a "View Results" section at the bottom.

Fig. 3-16 Configuration Window

Firstly, make sure that USB Memory Stick supplied with Auto Bump / Cal Station is inserted in an available USB port on your PC / Laptop.

To save changes, position cursor over 'Generate Settings File' button then left click mouse to save data to USB Memory Stick.

3.2 TRANSFER UPDATED 'PS200 SETTINGS' SOFTWARE to AUTO BUMP / CAL STATION

Make sure that 12V power supply is connected to the Auto Bump / Cal Station and switched ON, indicated by an illuminated 'ON' LED on the front of the station and that the station has completed start-up.

Remove USB Memory Stick from PC / Laptop then insert in USB port on front face of Auto Bump / Cal Station, illustrated in Fig. 3-17.



Fig. 3-17 Auto Bump / Cal Station USB Port

When USB is inserted in station, the updated settings file is automatically transferred to the Auto Bump / Cal Station, indicated by three flashing green LED's, as illustrated in Fig. 3-18.



Fig. 3-18 Transferring Data to Auto Bump / Cal Station

On completion of downloading updated settings file, the three LED's stop flashing. The Auto Bump / Cal Station has stored the new data and is now ready for use.

The memory stick can now be removed.

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

4.1 INSTALL INSTRUMENT in AUTO BUMP / CAL STATION

Before commencing with installation of instrument, make sure that gas is connected to the station and that the 12V power supply is connected to mains wall socket.

Switch ON at mains.

Power to the unit is indicated by an illuminated green LED on the front of the station, as illustrated in Fig. 4-1.



Fig. 4-1 Station 'ON' Indication

After 5 seconds all four LED's illuminate green, as illustrated in Fig. 4-2. This indicates that the station is loading operating software and preparing for testing.



Fig. 4-2 Station Loading Software

After a further 25 seconds three green LED's extinguish leaving only the 'ON' indication illuminated, as illustrated in Fig. 4-1. Next, three LED's coloured orange, orange and red illuminate briefly in sequence, indicating that GMI 'TEST' software has started.

Finally, the 'ON' indication is illuminated as illustrated in Fig. 4-1 and the Auto Bump / Cal Station is now ready for operation.

To release the front cover of the Auto Bump / Cal Station, press the cover latch downwards, as illustrated in Fig. 4-3, then open the cover fully.

Note that the front cover is designed to remain in the open position as long as necessary.



Fig. 4-3 Open Front Cover

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

Locate the instrument inlet connector over the gas supply nozzle in the station, as illustrated in Fig. 4-4.

Note 1: The instrument can be either switched ON or OFF when inserted into the Auto Bump / Cal Station.

Note 2: The Auto Bump / Cal Station is designed so that the instrument can be installed with or without rubber boot (accessory) fitted.



Fig. 4-4 Locate Instrument on Gas Supply Nozzle

Push the instrument rearwards until correctly seated in the station recess, as illustrated in Fig. 4-5.



Fig. 4-5 Instrument Correctly Seated

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

Close the front cover of the Auto Bump / Cal Station, as illustrated in Fig. 4-6, then, using both thumbs, press the lower edge corners of the cover firmly until the latch 'clicks' shut.



Fig. 4-6 Close Station Cover

The Bump / Calibration operation starts up automatically following the locking of the station cover latch.

4.2 PERFORM BUMP / CALIBRATION

The instrument Bump / Calibration operation starts up automatically following the locking of the station cover latch.



Fig. 4-7 Perform Bump / Calibration

Immediately after the cover latch clicks shut, the orange 'Test in Progress' LED illuminates, as illustrated in Fig. 4-8.



Fig. 4-8 Testing in Progress

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

Concurrently, the instrument automatically starts up and begins its warm-up routine, if installed in the 'OFF' condition. The instrument pump runs briefly before the Station pump 'overrides' this and automatically switches OFF the instrument pump.

The six green LED's on the instrument flash in one second intervals then, when the following instrument screen is displayed, the gas delivery commences.

Note that the confidence signal is disabled during bump testing / calibration.



Fig. 4-9 Instrument Warm-up

As the gas delivery progresses, the instrument display reflects the increase in each gas value (decrease in oxygen).

The gas delivery duration is dependent on test type, as follows:

Quick Bump Test: 15 seconds default (can be edited in configuration setup from 15 seconds to 60 seconds)

Full Bump Test: 60 seconds (fixed)

Calibration: 60 seconds (fixed)

When the alarm setpoints are reached, the instrument backlight illuminates red, as illustrated in Fig. 4-10, the six LED's on the instrument flash red in one second intervals and the instrument's audible alarm activate.



Fig. 4-10 Instrument in Alarm Condition

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

The gas values, illustrated in Fig. 4-10, alternate with HIHI / HI or LOLO / LO indication, as illustrated in Fig. 4-11.



Fig. 4-11 Instrument in Alarm Condition

The instrument's audible alarms are activated for a short period of time when each range reaches the instrument's configured alarm setpoint. These normally overlap.

The station pump continues to operate for approximately 30 seconds in order to induce air, via the 'AIR' inlet adaptor on the rear of the station, and purge the station / instrument of remaining gas.

During this process, a reduction in the gas values (increase in oxygen) on the instrument display will be clearly visible.

On completion, the gas values (except oxygen) return to zero, then the instrument initiates a countdown sequence and switches OFF.

A 'PASS' is indicated by a green LED, as illustrated in Fig. 4-12.



Fig. 4-12 PASS Indication

Alternatively, a 'FAIL' is indicated by a red LED, as illustrated in Fig. 4-13.



Fig. 4-13 FAIL Indication

Note: If the instrument fails, please ensure you are using the correct gas cylinder and the cylinder contains enough gas to perform a bump / calibration. The pressure gauge on the Regulator Valve gives a clear indication of this.

Next, the station pump switches OFF and the instrument can be safely removed from the Auto Bump / Cal Station.

The test result indication is displayed until the instrument is removed from the Auto Bump / Cal Station.

All test results are stored in the Auto Bump / Calibration Station memory and can be accessed as detailed in Chapter 5 of this handbook.

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

4.3 REMOVE INSTRUMENT from AUTO BUMP / CAL STATION

To release the front cover of the Auto Bump / Cal Station, press the cover latch downwards, as illustrated in Fig. 4-14, then open the cover fully.

Note that the front cover is designed to remain in the open position as long as necessary.



Fig. 4-14 Open Front Cover

CAUTION : Do not overextend angle of extraction as damage to the nozzle could result.

Grasp the instrument as shown, lean top of instrument away from station then carefully lift away from gas supply nozzle in the station, as illustrated in Fig. 4-15.



Fig. 4-15 Lift Instrument Clear of Gas Nozzle

Close the front cover of the Auto Bump / Cal Station then, using both thumbs, press the lower edge corners of the cover firmly until the latch 'clicks' shut.

INSTALL INSTRUMENT IN STATION & PERFORM BUMP / CALIBRATION

4.4 AUTO BUMP / CAL STATION FAULT INDICATION

Fault detection indication is via the LED's on the front face of the Auto Bump / Cal Station, as follows:

Test Error

A 'Test Error' is indicated by a orange flashing LED, as illustrated in Fig. 4-16.



Fig. 4-16 Test Error

If this fault occurs, it is recommended that the Memory Stick (Part No. 64184) is inserted into PC or Laptop and re-configured as detailed in Chapter 3.

On completion, the data should then be transferred to the Auto Bump / Cal Station.

VIEW / PRINT TEST RESULTS

5.1 INTRODUCTION

The test results of all instruments that have been Bump Tested / Calibrated in the Station are stored in the Station internal memory.

These results must be downloaded to a PC / Laptop for viewing or printing.

The Memory Stick (Part No. 64184), containing 'GMI Settings' software and supplied with the Auto Bump / Cal Station, must be used to download this data.



Fig. 5-1 Downloading Memory Stick

The memory stick can be used to download data from several GMI Auto Bump / Cal Stations, if required.

The data identifies the serial number of the Station used to download data from each instrument bump tested or calibrated.

5.2 DOWNLOAD TEST RESULTS

Make sure that the Auto Bump / Cal Station is connected to Mains power supply, switched ON and start-up is completed.

This is indicated by an illuminated green 'ON' LED, on the front face of the station, as illustrated in Fig. 5-2.



Fig. 5-2 Station 'ON' Indication

Insert USB memory stick (Part No. 64184) into the USB port on the front face of the Auto Bump / Cal Station, as illustrated in Fig. 5-3.



Fig. 5-3 Auto Bump / Cal Station USB Port

When the USB memory stick is inserted in Auto Bump / Cal Station, all stored test results are automatically transferred to the memory stick. During this process three green LED's flash in sequence from left to right, as illustrated in Fig. 5-4.



Fig. 5-4 Downloading Data

This is followed by all four green LED's illuminating, as illustrated in Fig. 5-5, indicating that download is complete.



Fig. 5-5 Download Complete

Next, LED's coloured orange, orange and red illuminate, as illustrated in Fig. 5-6. This indicates that the test data has been downloaded and GMI 'TEST' software has re-started.



Fig. 5-6 Test Software Re-started

Next, the three (orange, orange and red) LED's extinguish, leaving only the 'ON' LED illuminated, as illustrated in Fig. 5-7.



Fig. 5-7 'ON' Indication

The memory stick can now be removed and transferred to either PC or Laptop to view test results.

5.3 VIEW / PRINT TEST RESULTS

Insert USB memory stick (Part No. 64184) into the USB port on PC / Laptop.

Using Windows Explorer, locate 'GMI PS200 SETTINGS' program as illustrated in Fig. 5-8.

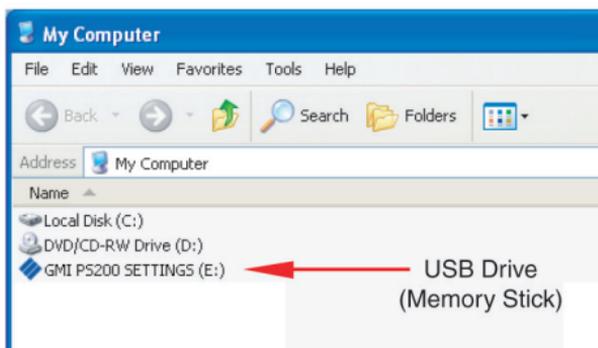


Fig. 5-8 Locate Settings Program

Position cursor on 'GMI PS200 SETTINGS' software program then double click mouse button to select.

The window, illustrated in Fig. 5-9, is displayed with disk contents as follows:

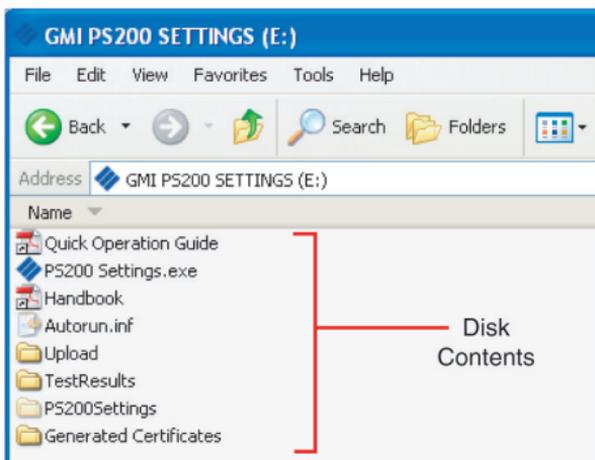


Fig. 5-9 Disk Contents

- Quick Operation Guide:
Bump / Calibration poster style document (in PDF format and included in package, Part No. 64186).
- Handbook:
Auto Bump / Calibration Station User Handbook (in PDF format).
- Upload Folder:
Contains configuration settings, used by Auto Bump / Calibration Station. **Do not edit.**
- Test Results:
Contains copies of all test results generated by Auto Bump / Calibration Station.
- PS200 Settings:
This is a systems folder. **Do not edit.**

- Generated Certificates:
Contains copies of all calibration certificates generated by Auto Bump / Calibration Station.

To access any of the above folders, position cursor on required folder then double click mouse button to select.

Examples as follows:

Test Results:

The contents of this folder includes all instrument test result files downloaded from each Auto Bump / Cal Station that the USB Memory stick has been used on.

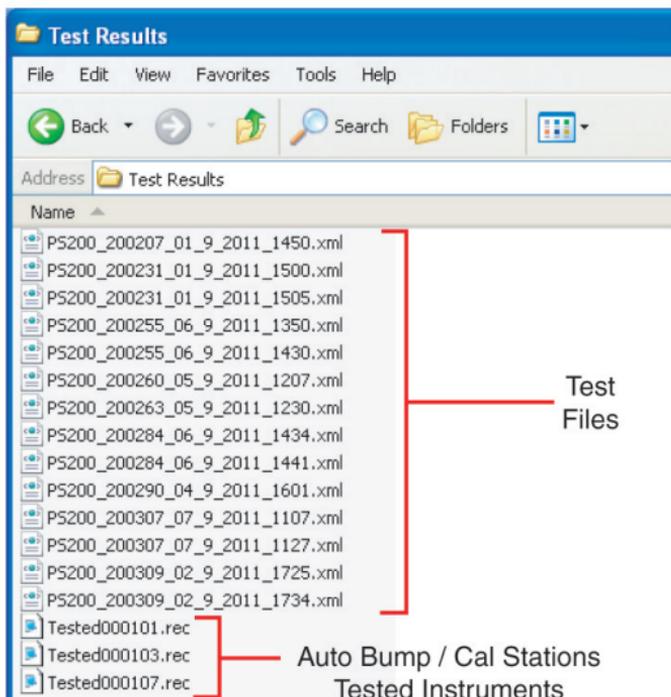


Fig. 5-10 'Test Results' Folder Contents

Test Result Files:

The test file names in the list, (e.g. PS_200_200207_01_9_2011_1450.xml) identifies serial number of the instrument (200207), the date tested in day, month, year (e.g. 01_09_2011) and the time testing was completed (e.g. 1450hrs).

Each '.xml' file can be opened individually to display a comprehensive list of test results obtained from that particular instrument.

To open a test file, position cursor on the file name then double click mouse button to select.

The following example, Fig. 5-11, illustrates information available, including:

- Instrument Type (e.g. GMI PS200)
- Test Type (e.g. Calibration)
- Instr. Serial No (e.g. 200255)
- New Cal Due Date (if Test registered as PASS)
- Station Serial No. (e.g. 000101)
- Date Tested (e.g. 06 September 2011)
- Time Tested (e.g. 2:30:04 PM)
- Overall Result (e.g. PASS)

Followed by a listing of gas input / target / Lo Limit / Hi Limit / result for each gas range.

Finally, an audible / visual alarm test result is displayed.

EXAMPLE (Fig. 5-11):

```
<?xml version="1.0" encoding="utf-8" ?>
- <resultset>
- <info>
  <instrument>GMI PS200</instrument>
  <testtype>CALIBRATION</testtype>
  <serial>200255</serial>
  <calGas>n/a</calGas>
  <lel100pc>4.4</lel100pc>
  <calDueDate>06 September 2012</calDueDate>
  <absSerialNum>000101</absSerialNum>
  <date>06 September 2011</date>
  <time>2:30:04 PM</time>
  <overallResult>PASS</overallResult>
</info>
- <airtests>
- <set>
  <range>% O2</range>
  <lolim>20</lolim>
  <reading>20.9</reading>
  <hilim>21.6</hilim>
  <prezero>PASS</prezero>
  <postzeroreading>20.9</postzeroreading>
  <postzero>PASS</postzero>
</set>
- <set>
  <range>PPM H2S</range>
  <lolim>1</lolim>
  <reading>0</reading>
  <hilim>1</hilim>
  <prezero>PASS</prezero>
  <postzeroreading>0</postzeroreading>
  <postzero>PASS</postzero>
</set>
</airtests>
- <gastests>
- <set>
  <description>18 %Vol Oxygen</description>
  <gasInput>1</gasInput>
  <target>18</target>
  <lolimit>17.6</lolimit>
  <reading>17.8</reading>
  <hilimit>18.5</hilimit>
  <result>PASS</result>
  <range>% O2</range>
```

```

</set>
- <set>
  <description>50 PPM H2S</description>
  <gasInput>1</gasInput>
  <target>50</target>
  <lolimit>48</lolimit>
  <reading>79</reading>
  <hilimit>52</hilimit>
  <result>FAIL</result>
  <range>PPM H2S</range>
  <recalval>50</recalval>
  <recalresult>PASS</recalresult>
</set>
</gastests>
- <alarmtests>
  <audibleAlarm>PASS</audibleAlarm>
  <visibleAlarm>PASS</visibleAlarm>
  <result>PASS</result>
</alarmtests>
</resultset>

```

Test results, as illustrated in Fig. 5-11, can be printed if required.

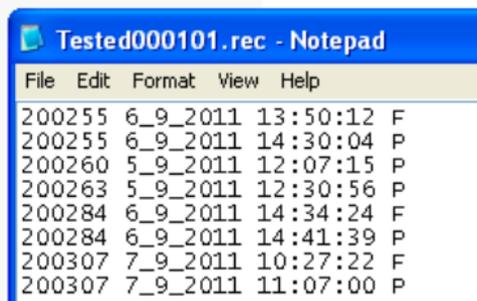
Bump / Cal Station Tested Instruments:

The tested files (e.g. Tested000101.rec) in the list, illustrated in Fig. 5-10, identifies serial number of each Auto Bump / Cal Station (e.g. 000101) that the Memory stick has been used to download data from. Each file contains a list of all instrument serial numbers tested on that particular station.

Each '.rec' file can be opened individually to display / print a comprehensive list of test results obtained from that particular Bump / Cal Station.

To open a file, position cursor on the file name then double click mouse button to select.

The following example, Fig. 5-12, illustrates a list of instruments tested on Station serial number 000101.



File	Edit	Format	View	Help
200255	6_9_2011	13:50:12	F	
200255	6_9_2011	14:30:04	P	
200260	5_9_2011	12:07:15	P	
200263	5_9_2011	12:30:56	P	
200284	6_9_2011	14:34:24	F	
200284	6_9_2011	14:41:39	P	
200307	7_9_2011	10:27:22	F	
200307	7_9_2011	11:07:00	P	

Fig. 5-12 Tested Instruments on 000101

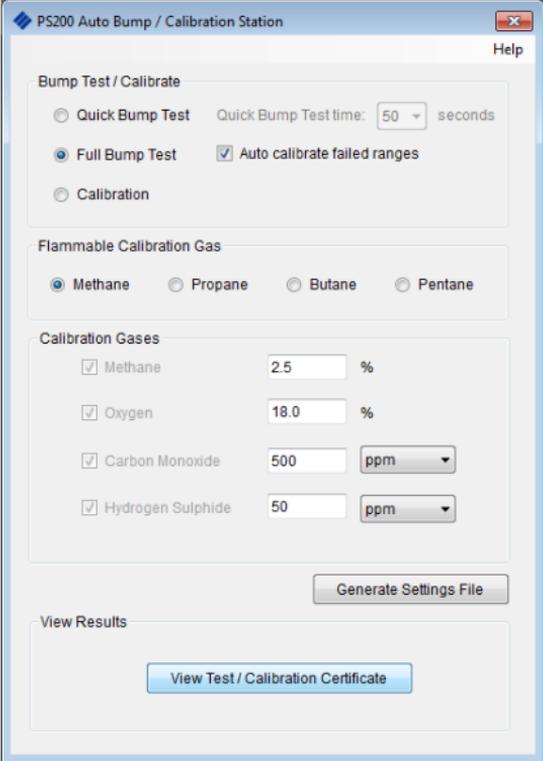
The file includes:

- A list of instruments tested
- Date Tested (day, month, year)
- Time Tested
- Test Result 'P' PASS or 'F' fail

Generated Certificates:

The contents of this folder includes a list of all Bump Test / Calibration Certificates generated when selecting the 'View Test / Calibration Certificate' button in the configuration window, as illustrated in Fig. 5-13.

The configuration window can be accessed by double clicking mouse button on  PS200 Settings.exe from the list of items in Fig. 5-9.



The screenshot shows the 'PS200 Auto Bump / Calibration Station' configuration window. It features a title bar with a close button and a 'Help' button. The main area is divided into several sections:

- Bump Test / Calibrate:** Contains three radio buttons: 'Quick Bump Test', 'Full Bump Test' (selected), and 'Calibration'. The 'Quick Bump Test' option has a 'Quick Bump Test time: 50 seconds' field. The 'Full Bump Test' option has a checked 'Auto calibrate failed ranges' checkbox.
- Flammable Calibration Gas:** Contains four radio buttons: 'Methane' (selected), 'Propane', 'Butane', and 'Pentane'.
- Calibration Gases:** Contains four checked checkboxes with corresponding input fields and units:
 - Methane: 2.5 %
 - Oxygen: 18.0 %
 - Carbon Monoxide: 500 ppm
 - Hydrogen Sulphide: 50 ppm

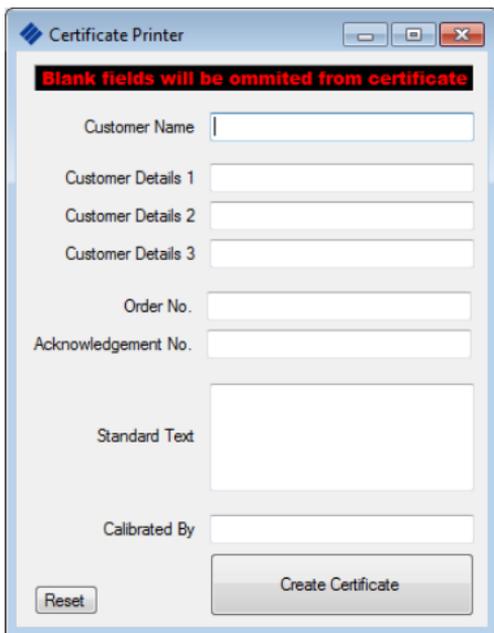
At the bottom right, there is a 'Generate Settings File' button. At the bottom left, there is a 'View Results' section containing a 'View Test / Calibration Certificate' button.

Fig. 5-13 Configuration Window

Certificate Content:

The certificates, as illustrated in Fig. 5-17 and 5-18, include company details, order number, etc. These details are completed in a 'Certificate Printer' window, accessed by clicking mouse button on 'View Test / Calibration Certificate' button in the configuration window, illustrated in Fig. 5-13.

The 'Certificate Printer' window is displayed, as illustrated in Fig. 5-14.



Blank fields will be omitted from certificate

Customer Name

Customer Details 1

Customer Details 2

Customer Details 3

Order No.

Acknowledgement No.

Standard Text

Calibrated By

Fig. 5-14 'Certificate Printer' Window

The window contents can now be completed to include company name, address, etc., as illustrated in Fig. 5-15.

The screenshot shows a window titled "Certificate Printer" with a blue header bar. Below the header is a red warning box with the text "Blank fields will be omitted from certificate". The form contains the following fields:

- Customer Name: Acme Inc.
- Customer Details 1: 100 High Street
- Customer Details 2: Anytown
- Customer Details 3: (empty)
- Order No.: 123456
- Acknowledgement No.: 654321
- Standard Text: (empty text area)
- Calibrated By: A N Other

At the bottom left is a "Reset" button, and at the bottom right is a larger "Create Certificate" button.

Fig. 5-15 Certificate Completed

When 'Certificate Printer' window is complete, select the 'Create Certificate' button, illustrated in Fig. 5-15, to print certificate as illustrated in example Fig. 5-18.

Include Company Logo:

To include your company's logo on printed certificate, insert the logo file, named **logo.jpg** into the 'Generated Certificates' folder on the Memory Stick (Part No. 64184). The logo will be included in the top right hand corner of the certificate, as illustrated in 'GMI' logo example in 'Bump Results' certificate, illustrated in Fig. 5-17.

Note: The logo (.jpg) file dimensions must not exceed 200 (W) x 50 (H) pixels.

Generated Certificate Files:

The certificate files (e.g. Certificate - 05 September 2011 1346.html) in the list, illustrated in Fig. 5-16, identifies date and time of each certificate's generation.

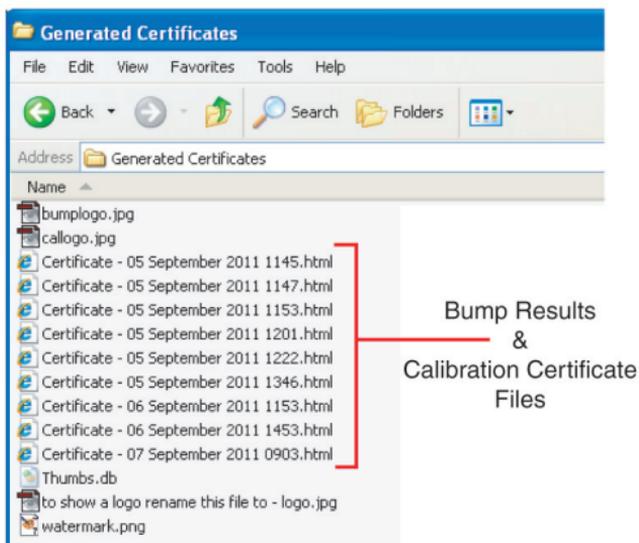


Fig. 5-16 Generated Certificate Files

Each '.html' file can be opened individually to display / print a 'Bump Results' / 'Calibration Certificate'.

Note: If background image (green tick), illustrated in Fig. 5-17 or 5-18, is not present adjust local printer settings.

To open a file, position cursor on the file name then double click mouse button to select.

An example of 'Bump Results' and 'Calibration Certificate' is illustrated in Fig. 5-17 and Fig. 5-18 respectively.

Bump Results

Customer Name Acme Inc
Customer Details 100 High Street
 Anytown

Order No. 123456
Acknowledgement No. 654321

Model GMI PS200
Serial No. 200263
Tested on 05 September 2011 - 13:46
Audible Alarm PASS
Visual Alarm PASS
Calibrated For METHANE
100% LEL equivalent 4.4% by VOL

Overall Result PASS

**Bump Results**

Gas Applied	Range	Reading	Result
Zero Air	% LEL	0	PASS
Zero Air	% O2	20.8	PASS
Zero Air	PPM CO	0	PASS
Zero Air	PPM H2S	0	PASS

Gas Applied	Range	Reading	Result
Full Bump Test %LEL Methane	% LEL	58	PASS
Full Bump Test %Vol Oxygen	% O2	17.8	PASS
Full Bump Test PPM CO	PPM CO	496	PASS [AFTER RECAL]
Full Bump Test PPM H2S	PPM H2S	49	PASS

Fig. 5-17 Bump Results

Calibration Certificate

Customer Name Acme Inc
 Customer Details 100 High Street
 Anytown
 Order No. 123456
 Acknowledgement No. 654321
 Model GMI PS200
 Serial No. 200263
 Tested on 05 September 2011 - 12:22
 Audible Alarm PASS
 Visual Alarm PASS
 Calibrated For METHANE
 100% LEL equivalent 4.4% by VOL
 Overall Result PASS



Calibration Results

Gas Applied	Range	Reading	Calibrated To	Result
Zero Air	% LEL	0	0	PASS
Zero Air	% O2	20.9	20.8	PASS
Zero Air	PPM CO	0	0	PASS
Zero Air	PPM H2S	0	0	PASS

Gas Applied	Range	Reading	Calibrated To	Result
57 %LEL Methane	% LEL	57	57	PASS
18 %Vol Oxygen	% O2	17.8	N/A	PASS
500 PPM CO	PPM CO	494	501	PASS
50 PPM H2S	PPM H2S	49	50	PASS

Calibrated by A N Other :

Fig. 5-18 Calibration Certificate

FIT MOUNTING BRACKET



*Fig. A-1 Auto Bump / Calibration Station
(with mounting bracket fitted)*

1.1 GENERAL DESCRIPTION

The GMI Personal Surveyor 200 (PS200) Series Auto Bump / Calibration Station is supplied with a mounting bracket and necessary screws to secure the station to a workbench or similar.

The bracket also provides the facility to 'daisy chain' a series of Bump / Cal Stations if required.

1.2 FIT MOUNTING BRACKET

1. Make sure that workbench surface is clean and free from dirt and grime.
2. Place clean cloth or similar on workbench to protect Bump / Cal Station front cover surface from scratching and / or scuffing.
3. Carefully place Bump / Cal Station face down on workbench. Refer to Fig. A-2.

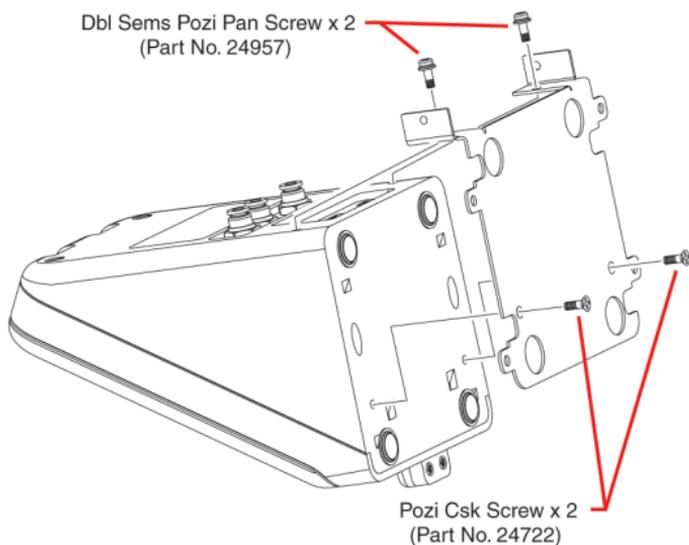


Fig. A-2 Attach Bracket to Bump / Cal Station

4. Loosely attach bracket to underside of Station with two pozi countersunk screws (Part No. 24722), as illustrated in Fig. A-2.

- Loosely attach two double sems pozi pan screws (Part No. 24957) through bracket and into rear panel of Bump / Cal Station, as illustrated in Fig. A-2.
- Using a No.2 Pozidrive screwdriver, tighten all four screws to secure.

1.3 ATTACH STATION to WORKBENCH / DAISY CHAIN OPTION

The bracket can be secured to a workbench or similar type surface using four suitable screws (not supplied).



Fig. A-3 Attach Bump / Cal Station to Workbench

A group of Bump / Cal Stations can be connected in a 'daisy chain' fashion by using a double semi pozi pan screw supplied (Part No. 24957) through bracket at rear of station and into captive nut of adjoining bracket. Refer to Fig. A-4.

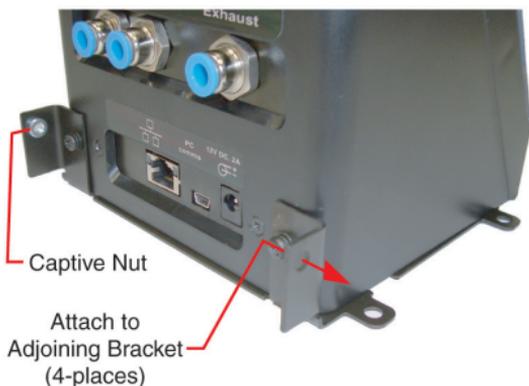


Fig. A-4 Attach Adjoining Bump / Cal Stations

INDEX

Symbols

30 DAY LIMITED
WARRANTY ii

A

ADDITIONAL
ACCESSORIES 1-5

AGREEMENT, LICENCE i

ATTACH STATION to
WORKBENCH / DAISY
CHAIN OPTION A-3

AUTO BUMP /
CALIBRATION
HARDWARE 1-4

AUTO BUMP / CAL
STATION FAULT
INDICATION 4-13

B

BRACKET, MOUNTING
A-2

BUMP / CALIBRATION
HARDWARE 1-4

Bump / Cal Station Tested
Instruments 5-9

Bump Test 3-5, 3-6

C

Calibration 3-10

CALIBRATION GAS 2-1

Calibration Gas Type 3-11

Calibration Gas Values
3-12

CALIBRATION
HARDWARE 1-4

CALIBRATION
SOFTWARE LICENCE i

Certificate Content 5-12

Certificate Files 5-14

Company Logo 5-13

Compare Gas Cylinder
Label with Software
Configura 2-2

Connect Air / Exhaust
Tubing to Auto Bump / Cal
2-6

CONNECT CALIBRATION
GAS & POWER SUPPLY
2-1

Connect Gas Cylinder to
Auto Bump / Cal Station
2-4

CONNECT POWER
SUPPLY 2-8

Content, Certificate 5-12

COPYRIGHT iii

D

DAISY CHAIN OPTION
A-3

DESCRIPTION, GENERAL
1-1, A-1

DOWNLOAD TEST
RESULTS 5-2

E

EDIT SOFTWARE
CONFIGURATION 3-1

Error, Test 4-13

F

FAULT INDICATION 4-13

Files, Certificate 5-14

File, Settings 3-14

FIT MOUNTING BRACKET
A-2

Full Bump Test
(Factory Default) 3-6

G

GAS, CALIBRATION 2-1

Gas Cylinder Label 2-2

Gas Type 3-11

Gas Values 3-12

GENERAL DESCRIPTION
1-1, A-1

Generated Certificate Files
5-14

Generated Certificates
5-11

Generate Settings File
3-14

H

HARDWARE,
CALIBRATION 1-4

I

Include Company Logo
5-13

INDICATION, FAULT 4-13

INSTALL INSTRUMENT
in AUTO BUMP / CAL
STATION 4-1

INSTRUMENT, INSTALL
4-1

INSTRUMENT, REMOVE
4-11

Instruments, Tested 5-9

INTRODUCTION

1-1, 5-1, A-1

L

LIABILITY iii

LICENCE AGREEMENT i

Licence, Software i

LIMITED WARRANTY ii

Logo, Company 5-13

M

MOUNTING BRACKET

A-2

P

PERFORM BUMP /
CALIBRATION 4-6

POWER SUPPLY 2-1, 2-8

PRINT TEST RESULTS
5-1, 5-4

Q

Quick Bump Test 3-5

R

REMOVE INSTRUMENT
from AUTO BUMP / CAL
STATION 4-11

Results, Test 5-6

RESULTS, TEST 5-1

S

Settings File 3-14

Software Configuration 2-2

SOFTWARE, EDIT 3-1

Software Licence i

SUPPLY, POWER 2-1, 2-8

T

Test, Bump 3-5, 3-6

Tested Instruments 5-9

Test Error 4-13

Test Result Files 5-7

Test Results 5-6

TEST RESULTS 5-1

TRADEMARK
INFORMATION iii

TRANSFER UPDATED
'PS200 SETTINGS'
SOFTWARE to AUTO 3-15

Type, Gas 3-11

V

Values, Gas 3-12

VIEW / EDIT SOFTWARE
CONFIGURATION 3-1

VIEW / PRINT TEST
RESULTS 5-1, 5-4

W

WARRANTY, LIMITED ii

Head Office

Inchinnan Business Park
Renfrew
Scotland
PA4 9RG
Tel: +44 (0)141 812 3211
Fax: +44 (0)141 812 7820
sales@gmiuk.com
www.gmiuk.com

Service & Calibration Centre

25 Cochran Close
Crownhill
Milton Keynes
England
MK8 0AJ
Tel: +44 (0)1908 568 867
Fax: +44 (0)1908 261 056
service@gmiuk.com

Service Centre - USA

25003 Pitkin Road D800
Spring
TX 77386
USA
Tel: +1 (713) 559 9230
service@detcon.com

