TELEDYNE
GAS MEASUREMENT INSTRUMENTS
Everywhereyoulook™

User Manual

PS200 Auto Bump & Calibration (ABC) Station

WARNING: ALL INDIVIDUALS WHO, HAVE OR WILL HAVE, RESPONSIBILITY FOR USING, MAINTAINING, OR SERVICING THIS PRODUCT, MUST READ THIS ENTIRE MANUAL CAREFULLY. FAILURE TO USE THIS EQUIPMENT PROPERLY COULD RESULT IN SERIOUS INJURY OR DEATH.

LEGAL STATEMENT

DESCRIPTION

This User Manual provides information for use only with the PS200 Auto Bump & Calibration Station (or "ABC Station").

LIABILITY

Every care has been taken in the preparation of this User Manual, but the Company does not accept any responsibility for errors or omissions and their consequences. Information in this user guide is subject to change without notice. This User Manual does not constitute a specification or basis for a contract.

MODIFICATION NOTICES

The Company aims to notify customers of relevant changes in the product operation and maintain this user guide up to date. Due to continuous product improvement, there may be operational differences between the latest product and this user guide.

This User Manual is an important part of the ABC Station, and it should be referred to for the life of the product.

DISPOSAL ADVICE

Dispose of the ABC Station carefully and with respect for the environment. If returned, the Company will dispose of the ABC Station without charge.

SOFTWARE

Any software supplied must only be used in this product and may not be copied without the written permission of the Company. Reproduction or disassembly of such embodied programs or algorithms is prohibited. Ownership of such software is not transferable, and the Company does not warrant that the operation of the software will be error free or that the software will meet the customer's requirements.

This is a legal and binding contract between you (either an individual or an entity), the end user and Teledyne Gas Measurement Instruments Limited (TGMI). By opening sealed software packages or by installing, copying, or otherwise using the, 'flexiCal Pro' or 'GDCloud' programs ("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 the software packages and accompanying items (including written materials, binders and containers) to TGMI.

SOFTWARE LICENSE

1. Grant of license: The 'flexiCal Pro' and 'GDCloud' Licence Agreement (Licence) permits concurrent use of the SOFTWARE on the number of computers for which this licence grants (single user package licences one user; twenty user licence 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 to use TGMI products on one computer. If you require a second copy you must purchase that from TGMI 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 TGMI and is protected by United Kingdom copyright laws and international treaty provisions. Consequently, 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.

SAFETY PROCEDURES

The instruments which are used on the ABC Station are used to protect life and property and may be used in potentially explosive, toxic, and oxygen deficient atmospheres.

- Never attempt to calibrate, adjust or repair the product unless you are fully trained, aware of all potential hazards and have been assessed by an authorised body as to your competence. Unauthorised adjustment of the product may endanger yourself and others.

- Gases are dangerous. Care should always be taken when monitoring or handling gases. All personnel should be trained and competent in their use.
- Some gases need special handling or delivery techniques since inappropriate use of material or techniques may influence the calibration result. Please contact TGMI Customer Support if you have any queries.

Any right of claim relating to product liability or consequential damage to any third party against TGMI is removed if the above warnings are not observed.

MAINTENANCE, SERVICING & CALIBRATION

Maintenance of the ABC Station should only be undertaken by trained competent personnel. Failure to ensure this and the use of unauthorised parts or repairers may invalidate the approvals.

- Only TGMI replacement parts should be used.
- All instruments and associated equipment should be regularly serviced and calibrated.
- Certified traceable gases should be used at all times.
- Only calibrate the product in the gases it will be used for. TGMI does not recommend the use of correction factors for calibration.

Page intentionally left blank.

Table of Contents

1. Introduction

Figure 1-1: PS200 ABC Station

1.1. General Description

The Teledyne GMI PS200 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 ABC 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 set-points are reached.
- A 'Full' Bump Test (factory default), approximately 60 seconds gas duration, performs a full Bump Test of alarm set-points and sensor response. This is followed up with an automatic calibration of failed gas ranges, if applicable.
- A Full Calibration of the instrument, approximately 60seconds 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 ABC Station, then closes the cover initiating the automatic testing process.

The ABC 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 TGMI.

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 operating system installed.

Both the ABC Station and the USB memory stick are supplied from TGMI with necessary software pre-loaded, configured to factory default parameters. The software configuration parameters can be edited via PC or Laptop then the settings file transferred to the ABC 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 TGMI, 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 ABC Station. An Ethernet port is also provided at the rear of the unit to allow test results to be downloaded over a network. Both of these options require 'flexiCal Pro' software package, available from TGMI.

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 ABC 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 ABC Station after charging.

1.2. ABC Station Hardware (6mm fittings)

- The ABC Station (TGMI Part No. 64052) includes 12V output Universal Power Supply Unit (PSU), and USB Memory Stick with TGMI software pre-installed.
- A Test Gas Kit (TGMI Part No. 64060) is available as an accessory and is supplied complete with Combi Test Gas Cylinder (containing a mixture of 2.5% CH_4, 500ppm CO, 50ppm H_2S, 18% O_2 and balance N_2), On Demand Gas Flow Regulator and Tubing.

1.3. ABC Station Hardware (1/4in. fittings)

- The Auto Bump / Calibration Station (TGMI Part No. 64052Q) includes Adaptor Kit, 12V output Universal Power Supply Unit (PSU), and USB Memory Stick with TGMI **'PS200 Settings'** software pre-installed.
- A Test Gas Kit (TGMI Part No. 64060) is available as an accessory and is supplied complete with Combi Test Gas Cylinder (containing a mixture of 2.5% CH_4, 500ppm CO, 50ppm H_2S, 18% O_2 and balance N_2), On Demand Gas Flow Regulator and Tubing.

1.4. Additional Accessories

- 99146 - Combi Test Gas Cylinder (2.5% CH_4, 500ppm CO, 50ppm H_2S, 18% O_2 and balance N_2).
- 99118 - On Demand Gas Flow Regulator.
- 64265 - 1m Tygon® tubing complete with 6mm adaptor
- 67305 - Adaptor Kit - 6mm to 1/4in. adaptor x 3.

2. Station Installation & Commissioning

2.1. Hardware Installation

2.1.1. Connecting Gas Cylinders

Gas is supplied to the ABC Station from the Combi Test Gas Cylinder (TGMI Part No. 99146) via On Demand Flow Regulator (TGMI Part No. 99118) and Tygon® tubing complete with adaptor (TGMI Part No. 64265).

Figure 2-1: Calibration Gas Setup

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

When connecting gas cylinder to the ABC Station, it is important to verify that the gas composition listed on the cylinder label is consistent with the current configuration of the station.

Figure 2-2: Gas Cylinder Label

The ABC Station has the following gas setup:

- Methane - 2.5 %Volume
- Oxygen - 18 %Volume
- Carbon Monoxide - 500ppm
- Hydrogen Sulphide - 50ppm

To change the gas setup, refer to the Section 2.3 of this User Manual.

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. 2-3. 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.

Figure 2-3: 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 ABC Station, as illustrated in Fig. 2-4.

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

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. 2-5, before connecting tubing.

Figure 2-4: Connect Gas Tubing Adaptor to Station

Figure 2-5: Fit 6mm to 1/4 in. Adaptors (if required)

2.1.2. Connect Air & Exhaust Tubing

If the ABC 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.

TGMI 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. 2-6.

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 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.

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

Figure 2-6: 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 ABC Station, depress each blue coloured collar, in turn, to release then withdraw adaptor and tubing.

2.1.3. Power Supply

Power is supplied to the ABC 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. 2-7.

Figure 2-7: 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. 2-8.

Figure 2-8: Station 'ON' Indication

2.2. Firmware Commissioning for use with GDCloud

2.2.1. Initial Setup

1. Connect a USB cable from the Mini-USB port on the back of the ABC Station to PC/Laptop.
2. Ensure that no ethernet cable is connected at the back of the ABC Station.
3. Turn the ABC Station ON and wait for the boot-up process to complete. Confirm that the green LED is ON.

Figure 2-9: Station 'ON' Indication

4. Open the **GDU Config** application on the PC.

NOTE: The **GDU Config** software is located on the USB flash drive supplied with the ABC Station.

2.2.2. Time Zone Setup

1. The software should automatically connect to the ABC Station and retrieve the current settings. If automatic retrieval was unsuccessful, press 'Read from GDU' to get the information manually.
2. Select required Time Zone from the drop-down list.

3. Press 'Send to GDU'.

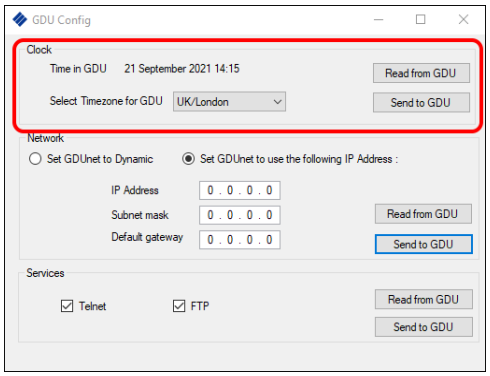


Figure 2-10: Time Zone setup

2.3. Gas Configuration (Standalone Mode - using PS200 Settings)

2.3.1. View and Edit the Configuration

The USB memory stick, supplied with the ABC Station, contains the 'PS200 Settings' software in factory default configuration. To adjust the settings, insert the Memory Stick into USB port on your PC / Laptop.

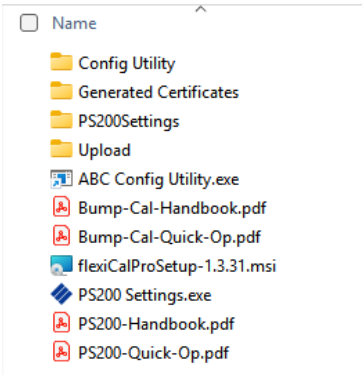


Figure 2-11: USB Contents Folder

Note that copy of this User Manual and the Quick Operation Guide (as included in ABC Station package), can be accessed from this folder.

To view or edit the configuration settings, access the PS200 Settings.exe software.

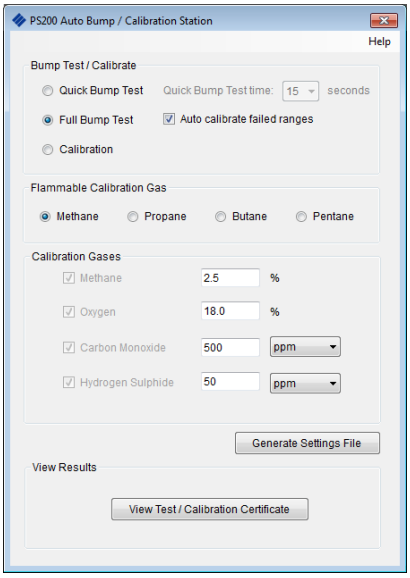


Figure 2-12: Configuration Window (Default Settings)

There are three available test options:

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 set-points are reached. The default quick bump test time for applying gas is set at 15 seconds when using the Teledyne GMI Test Gas Cylinder (Part No. 99146).

   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.

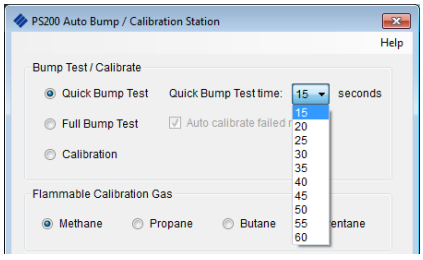


Figure 2-13: Test Time

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. 2-14, follow up with an automatic calibration of failed gas ranges, if applicable.

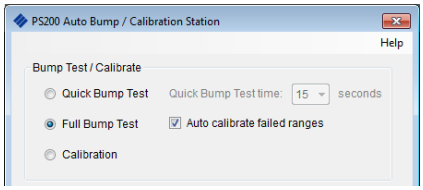


Figure 2-14: Default Selection

When gas is applied for a pre-set 60 seconds and when the instrument tolerance band listed below is reached for each gas range, the ABC 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.

3. Calibration

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

Gas is applied for a full 60 seconds and the ABC Station will record a 'Pass' when the target values, as listed in 'Testing Gases' window illustrated in Fig. 2-15, 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. 2-15.

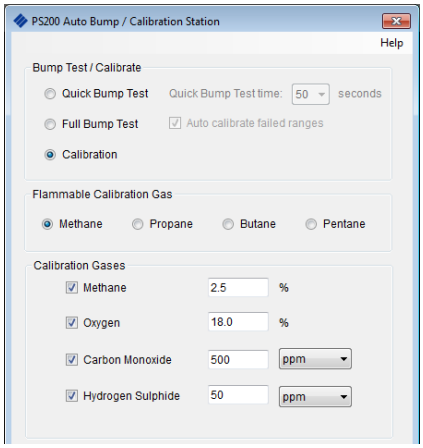


Figure 2-15: Calibration Option

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.

Flammable Calibration Gas

Flammable calibration gases available for selection are Methane (Default), Propane, Butane and Pentane.

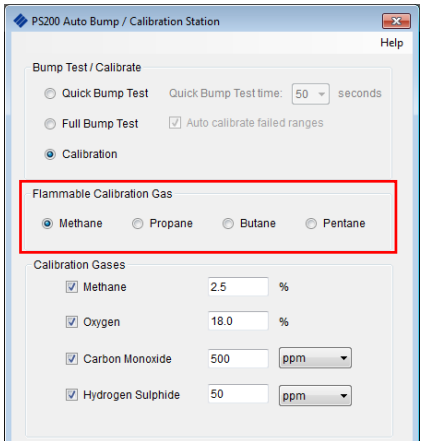


Figure 2-16: Cal Gas Selection

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

Calibration Gas Values

It is important that 'Testing Gases' values displayed in window, illustrated in Fig. 2-17, are consistent with values displayed on gas cylinder label.

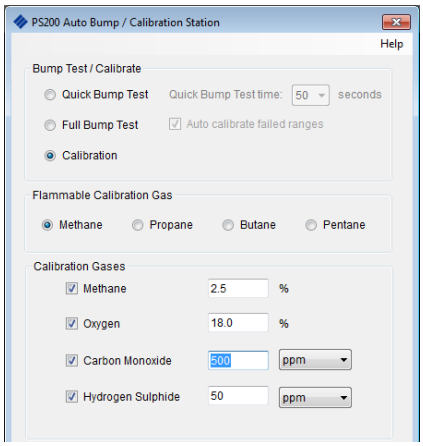


Figure 2-17: Gas Values

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 for Carbon Monoxide (CO) and Hydrogen Sulphide (H_2S) can be displayed as either 'ppm' (default) or mg/m^3. The unit type selected is reflected in ABC Station stored data and printed Test / Calibration Certificate.

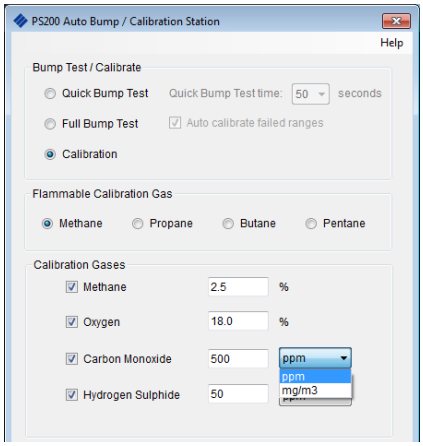


Figure 2-18: Measurement Units

The 'Generate Settings File' button saves any configuration changes to the USB memory stick.

2.3.2. Transfer the New Configuration to the ABC Station

To transfer the new settings to the ABC Station:

1. Make sure that 12V power supply is connected to the ABC Station and switched ON, indicated by an illuminated 'ON' LED on the front of the station and that the station has completed start-up.
2. Remove USB Memory Stick from PC / Laptop then insert in USB port on front face of Auto Bump / Cal Station, illustrated in Fig. 2-19.

Figure 2-19: ABC Station USB Port

3. When USB is inserted in station, the updated settings file is automatically transferred to the ABC Station, indicated by three flashing green LED's, as illustrated in Fig. 2-20.

Figure 2-20: Transferring Data to ABC Station

4. On completion of downloading updated settings file, the three LED's stop flashing. The ABC Station has stored the new data and is now ready for use.
5. The USB memory stick can now be removed.

2.4. Gas Configuration (Standalone & GDCloud Modes - using flexiCal Pro)

2.4.1. Create New Gas Configuration

NOTE: Refer to the flexiCal Pro User Handbook for details on how to install the software.

1. Launch **flexiCal Pro** software and select the *Remote Test* tab.

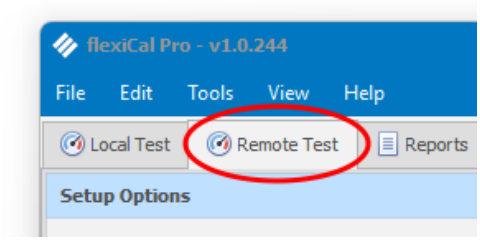


Figure 2-21: Remote Test

2. Open the *Setup Editor* by selecting the icon.

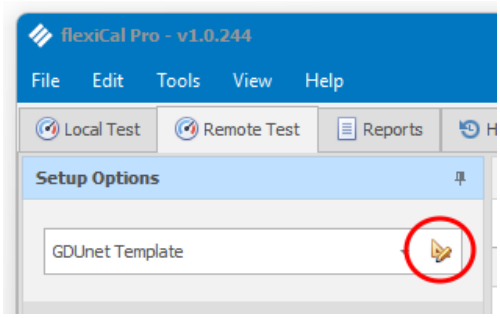


Figure 2-22: Setup Editor

3. In the *Setup Editor*, choose the desired configuration to edit from the *Setup Name* drop-down list.

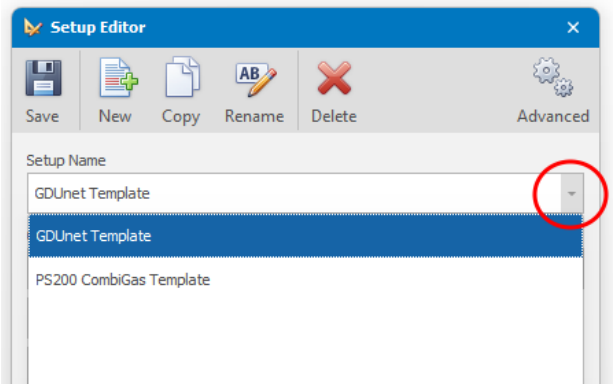


Figure 2-23: Setup Editor

NOTE: The **flexiCal Pro** software comes pre-installed with a PS200 ABC Station Template, which will be referred in this chapter.

4. Ensure 'PS200 Auto Bump & Cal Station' is selected in the *Calibration Station Type* drop-down list.

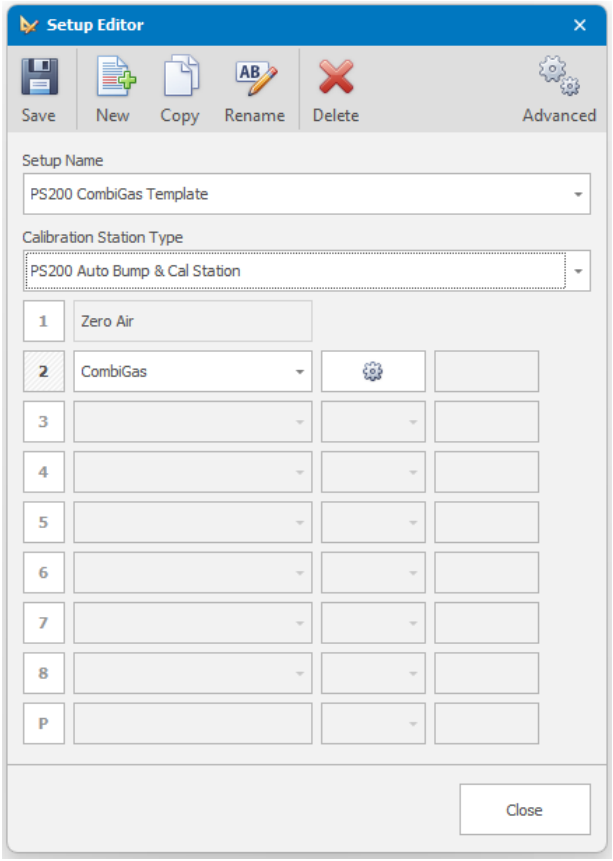


Figure 2-24: Setup Editor

NOTE: The numbers on the right side of the editor window correspond to the gas inlets numbers on the ABC Station.

Gas inlet 1 is exclusively allocated for Zero Air and cannot be changed.

5. To change the calibration gas, click on inlet number '2'. This will trigger a drop-down list from which the desired gas range can be selected. After selecting the range, a subsequent drop-down list will appear allowing the specific gas concentration to be entered.

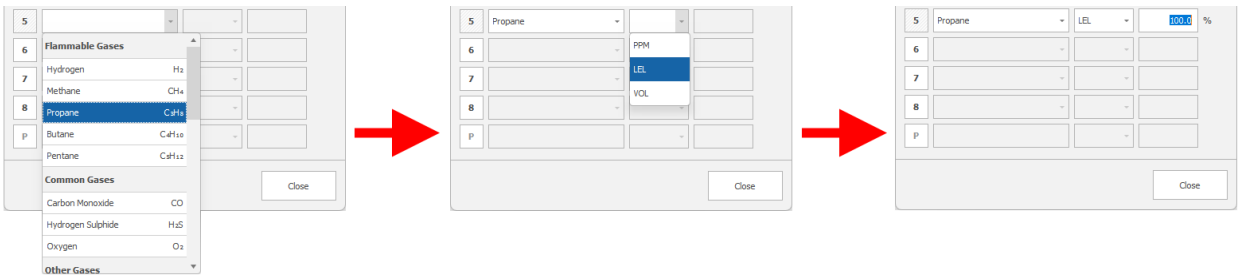


Figure 2-25: Adding gas range

To add a cylinder containing a combination of different gas ranges, choose 'Combi Gas' from the initial drop-down list. Then, click the settings icon. This will open a new window where the individual components of a mixed cylinder can be specified. After defining the mixture, click the 'Done' to save the composition.

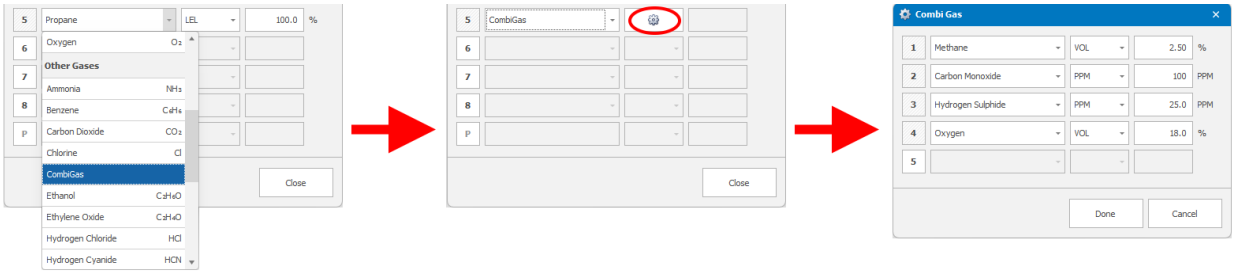


Figure 2-26: Adding combi gas

6. After defining the new setup, click 'Save' to store the configuration.

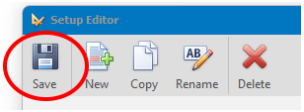


Figure 2-27: Save new config

NOTE: For guidance on how to use the Advanced Setup Editor feature, please refer to the flexiCal Pro User Handbook which can be found within the 'Help' menu of the software.

2.4.2. Transfer the New Configuration to the ABC Station

1. Insert blank USB Memory Stick into the PC / Laptop
2. Launch **flexiCal Pro** software and select the *Remote Test* tab.

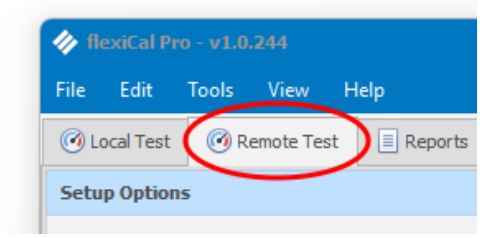


Figure 2-28: Remote Test

3. From the *Setup Options* section, choose the desired gas configuration you wish to transfer by selecting it from the corresponding drop-down list.
4. Choose the type of test that the ABC Station station will be configured for by selecting either 'Calibration', 'Full Bump Test' or 'Quick Bump Test' from the appropriate options.
5. Choose the Flammable Calibration Gas.

NOTE: For more details on types of test and flammable calibration gases please refer to the Section 2.3.1 of this User Manual.

7. Choose the 'USB Flash Drive' in the *'Send to...'* options.

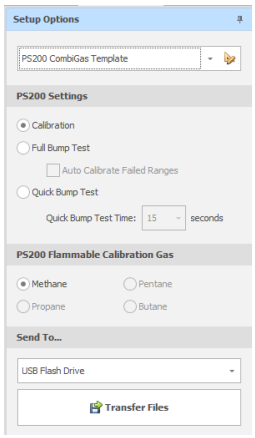


Figure 2-29: Setup Options

8. Click 'Transfer Files' and then select the appropriate drive letter corresponding to the inserted USB memory stick. This will copy the new configuration files to the selected drive.

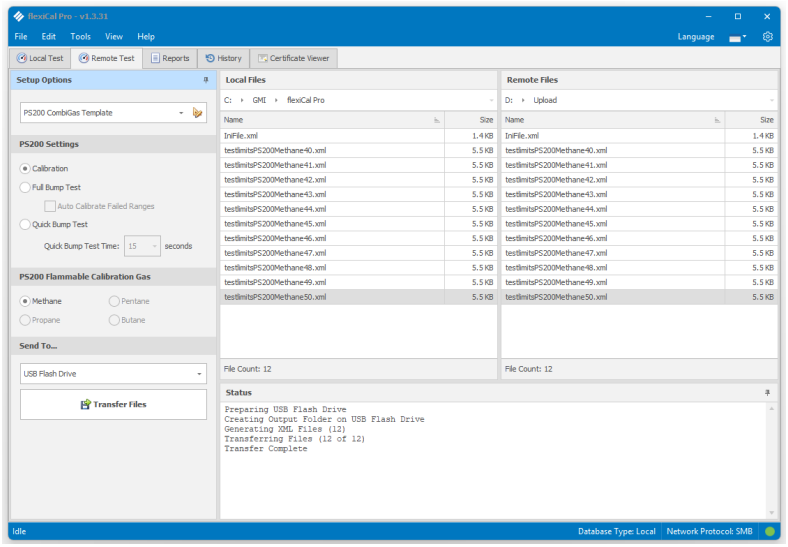


Figure 2-30: Copying the configuration files

9. Remove USB memory stick from PC / Laptop then insert in USB port on front face of ABC Station.

Figure 2-31: ABC Station USB Port

10. When USB is inserted in station, the updated settings file is automatically transferred to the ABC Station, indicated by three flashing green LEDs.

Figure 2-32: Transferring Data to ABC Station

11. 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.

12. The memory stick can now be removed.

3. Install Instrument In Station & Perform Test

3.1. Install Instrument In ABC 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.

Power to the unit is indicated by an illuminated green LED on the front of the station, as illustrated in Fig. 3-1.

Figure 3-1: Station 'ON' Indication

After 5 seconds all four LED's illuminate green, as illustrated in Fig. 3-2. This indicates that the station is loading operating software and preparing for testing.

Figure 3-2: 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 TGMI 'TEST' software has started.

Finally, the 'ON' indication is illuminated as illustrated in Fig. 3-1 and the ABC Station is now ready for operation.

To release the front cover of the ABC Station, press the cover latch downwards, as illustrated in Fig. 3-3, then open the cover fully.

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

Figure 3-3: Open Front Cover

Locate the instrument inlet connector over the gas supply nozzle in the station, as illustrated in Fig. 3-4.

Note: The instrument can be either switched ON or OFF when inserted into the ABC Station.

Note: The ABC Station is designed so that the instrument can be installed with or without rubber boot (accessory) fitted.

Figure 3-4: Locate Instrument on Gas Supply Nozzle

Push the instrument rearwards until correctly seated in the station recess, as illustrated in Fig. 3-5.

Figure 3-5: Instrument Correctly Seated

Close the front cover of the ABC Station, as illustrated in Fig. 3-6, then, using both thumbs, press the lower edge corners of the cover firmly until the latch 'clicks' shut.

Figure 3-6: Close Station Cover

The test starts up automatically following the locking of the station cover latch.

3.2. Perform Test

The instrument test starts up automatically following the locking of the station cover latch.

Figure 3-7: Perform Test

Immediately after the cover latch clicks shut, the orange 'Test in Progress' LED illuminates, as illustrated in Fig. 3-8.

Figure 3-8: Testing in Progress

Concurrently, the instrument automatically starts up and begins it's 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 the test.

Figure 3-9: 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 set-points are reached, the instrument backlight illuminates red, as illustrated in Fig. 3-10, the six LED's on the instrument flash red in one second intervals and the instrument's audible alarm activate.

Figure 3-10: Instrument in Alarm Condition

During the test, the gas values alternate with HIHI / HI or LOLO / LO indication, as illustrated in Fig. 3-11.

Figure 3-11: 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 set-point. 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.

Figure 3-12: PASS Indication

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

Figure 3-13: 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 ABC Station.

The test result indication is displayed until the instrument is removed from the ABC Station.

All test results are stored in the ABC Station memory and can be accessed as detailed in Chapter 4 of this User Manual.

3.3. Remove Instrument From ABC Station

To release the front cover of the ABC Station, press the cover latch downwards, as illustrated in Fig. 3-14, then open the cover fully.

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

Figure 3-14: 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. 3-15.

Figure 3-15: Lift Instrument Clear of Gas Nozzle

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

3.4. ABC Station Fault Indication

Fault detection indication is via the LED's on the front face of the ABC Station, as follows:

Test Error

A 'Test Error' is indicated by a orange flashing LED, as illustrated in Fig. 3-16.

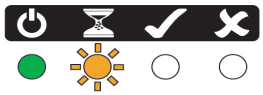


Figure 3-16: Test Error

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 Section 2.3.

4. View & Print Test Results (Standalone mode)

4.1. Introduction

The test results of all instruments that have been Bump Tested / Calibrated in the Station are stored in the station's internal memory. These results must be downloaded to a PC / Laptop for viewing or printing.

Any memory stick can be used to download data from several TGMI ABC Stations, if required.

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

4.2. Download Test Results

Make sure that the ABC Station is 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. 4-1.

Figure 5-1: Station 'ON' Indication

Insert USB memory stick into the USB port on the front face of the ABC Station, as illustrated in Fig. 4-2.

Figure 4-2: ABC Station USB Port

When the USB memory stick is inserted into the ABC Station, all stored test results are automatically transferred. During this process three green LED's flash in sequence from left to right, as illustrated in Fig. 4-3.

Figure 4-3: Downloading Data

This is followed by all four green LED's illuminating, as illustrated in Fig. 4-4, indicating that download is complete.

Figure 4-4: Download Complete

Next, LED's coloured orange, orange and red illuminate, as illustrated in Fig. 4-5. This indicates that the test data has been downloaded and station has re-started.

Figure 4-5: Station re-start

Next, the three (orange, orange and red) LED's extinguish, leaving only the 'ON' LED illuminated, as illustrated in Fig. 4-5.

Figure 4-6: 'ON' Indication

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

4.3. View Test Results

Insert the USB memory stick into the USB port on PC / Laptop.

The content of the USB memory stick shall be as follows:

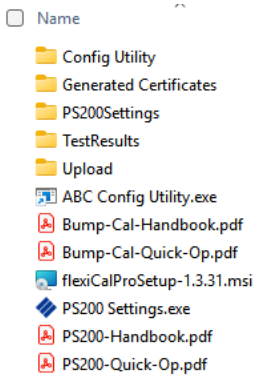


Figure 4-7: Disk Contents

- Upload Folder:
  Contains configuration settings, used by ABC Station. **Do not edit.**
- Test Results:
  Contains copies of all test results generated by ABC Station.
- PS200 Settings:
  This is a systems folder. **Do not edit.**
- Generated Certificates:
  Contains copies of all calibration certificates generated by ABC Station.

Test Results:

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

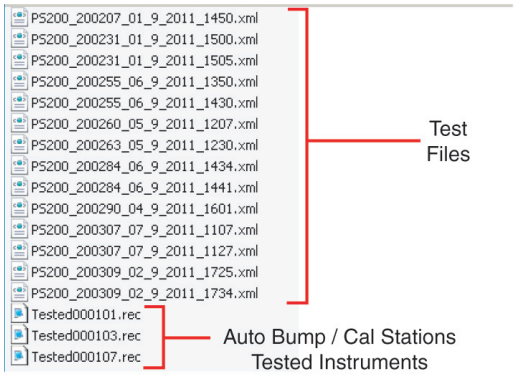


Figure 4-8: 'Test Results' Folder Contents

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.

The following example, Fig. 4-9, illustrates information available, including:

- Instrument Type (e.g. TGMI 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.

```
<?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>
```


Figure 4-9: Test Result Example

Test results, as illustrated in Fig. 4-9, can be printed if required.

The tested files (e.g. Tested000101.rec) in the list, illustrated in Fig. 4-8, identifies serial number of each ABC 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 ABC Station.

The following example, Fig. 4-10, illustrates a list of instruments tested on Station serial number 000101.

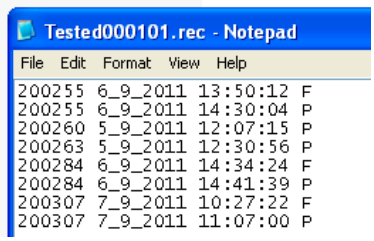


Figure 4-10: Tested Instruments on 000101

The file includes:

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

4.4. Generate Test Certificates

1. Insert the USB Memory Stick with the test results into the PC's USB port.
2. Launch **flexiCal Pro** software and select *Certificate Printer* from the *File* menu.

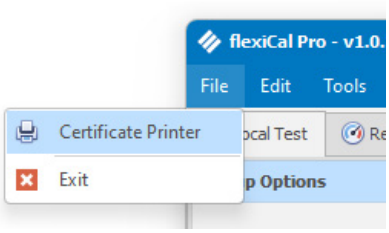


Figure 4-11: Certificate Printer

3. In the *Certificate Printer* window, complete the required fields and click 'Create Certificate'.

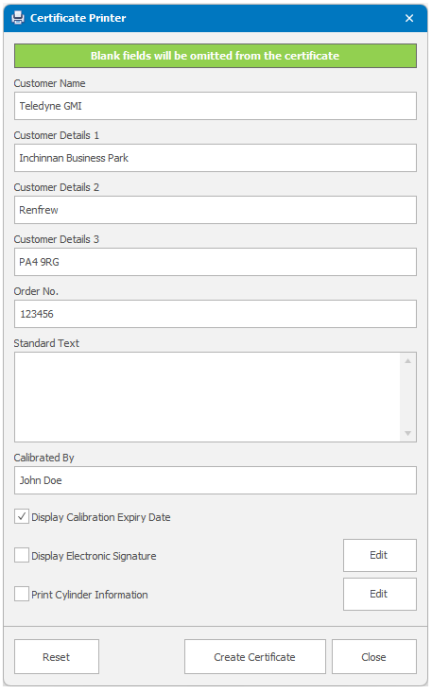


Figure 4-12: Certificate Printer

NOTE: Fields left blank will be omitted from the certificate.

4. Choose the desired test result file for the certificate and click 'Open'.

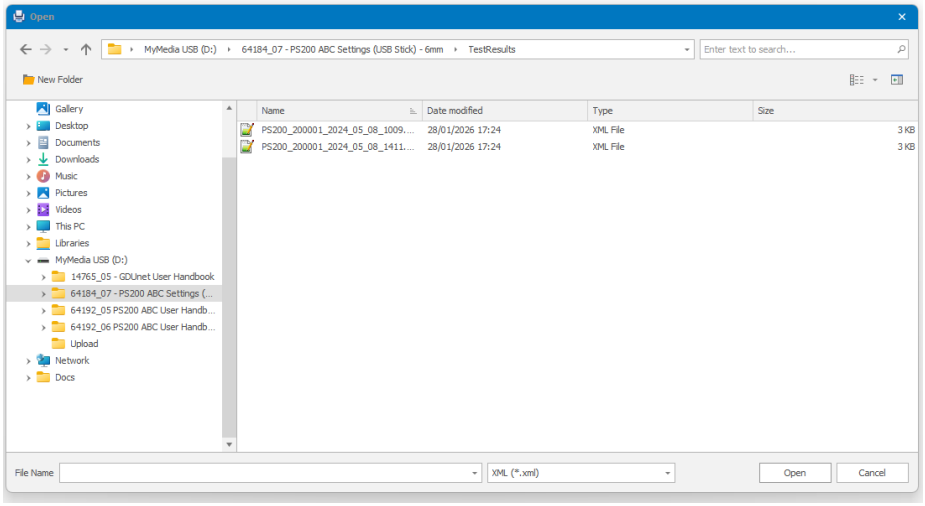
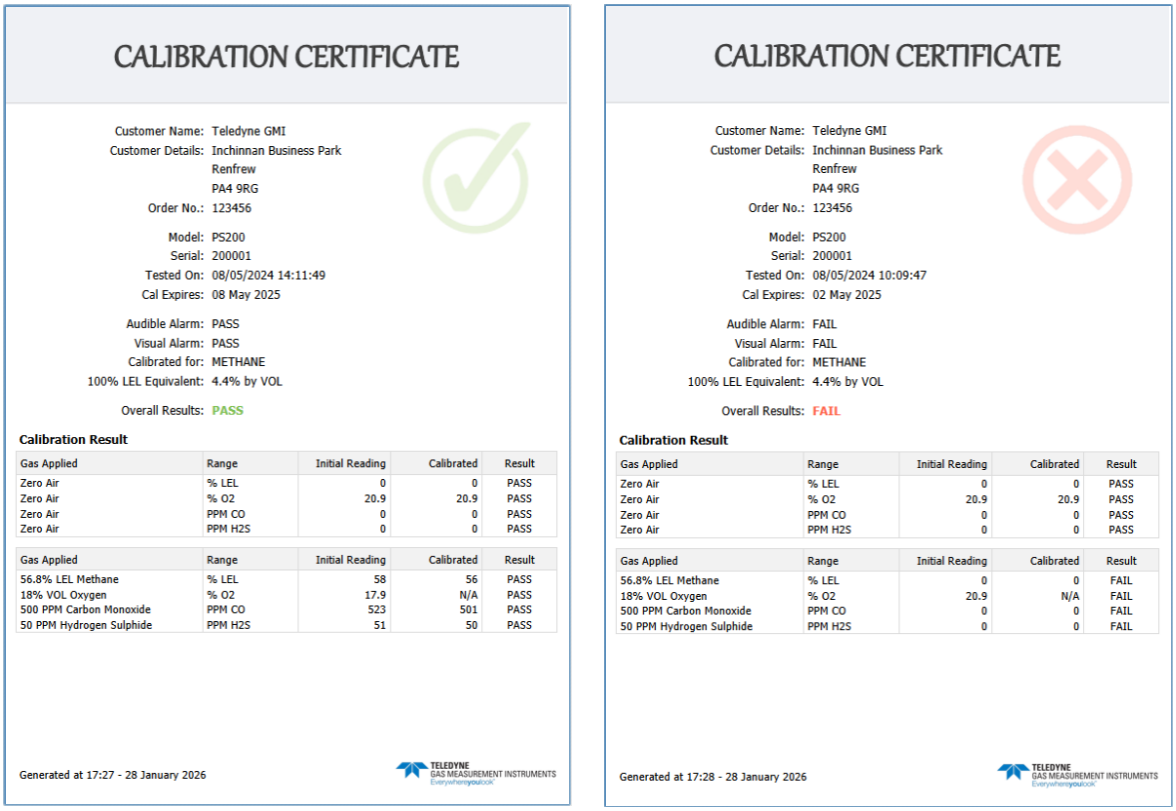


Figure 4-13: Certificate Printer

NOTE: Certificates can be generated for Pass or Fail tests which will be clearly indicated on the document.

5. A PDF file of the test certificate is now generated and stored in the 'Created Certificates' folder located in the application's root directory.

   Use *Certificate Viewer* in **flexiCal Pro** to browse and print certificates directly from the application.



CALIBRATION CERTIFICATE

Customer Name: Teledyne GMI
Customer Details: Inchinnan Business Park
Renfrew
PA4 9RG
Order No.: 123456

Model: PS200
Serial: 200001
Tested On: 08/05/2024 14:11:49
Cal Expires: 08 May 2025

Audible Alarm: PASS
Visual Alarm: PASS
Calibrated for: METHANE
100% LEL Equivalent: 4.4% by VOL

Overall Results: PASS

Calibration Result

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

Gas Applied	Range	Initial Reading	Calibrated	Result
56.8% LEL Methane	% LEL	58	56	PASS
18% VOL Oxygen	% O2	17.9	N/A	PASS
500 PPM Carbon Monoxide	PPM CO	523	501	PASS
50 PPM Hydrogen Sulphide	PPM H2S	51	50	PASS

Generated at 17:27 - 28 January 2026

TELEDYNE GAS MEASUREMENT INSTRUMENTS Everywhereyoulook

CALIBRATION CERTIFICATE

Customer Name: Teledyne GMI
Customer Details: Inchinnan Business Park
Renfrew
PA4 9RG
Order No.: 123456

Model: PS200
Serial: 200001
Tested On: 08/05/2024 10:09:47
Cal Expires: 02 May 2025

Audible Alarm: FAIL
Visual Alarm: FAIL
Calibrated for: METHANE
100% LEL Equivalent: 4.4% by VOL

Overall Results: FAIL

Calibration Result

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

Gas Applied	Range	Initial Reading	Calibrated	Result
56.8% LEL Methane	% LEL	0	0	FAIL
18% VOL Oxygen	% O2	20.9	N/A	FAIL
500 PPM Carbon Monoxide	PPM CO	0	0	FAIL
50 PPM Hydrogen Sulphide	PPM H2S	0	0	FAIL

Generated at 17:28 - 28 January 2026

TELEDYNE GAS MEASUREMENT INSTRUMENTS Everywhereyoulook

Figure 4-14: Generated Certificates

Appendix A: Fit Mounting Bracket

Figure A-1: ABC Station with mounting bracket fitted

A.1. General Description

The TGMI ABC Station can be easily secured to a workbench or similar surface using an optional mounting bracket (Part No. 64295S).

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

A.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 ABC Station front cover surface from scratching and/or scuffing.
3. Carefully place ABC Station face down on workbench. Refer to Fig. A-2.

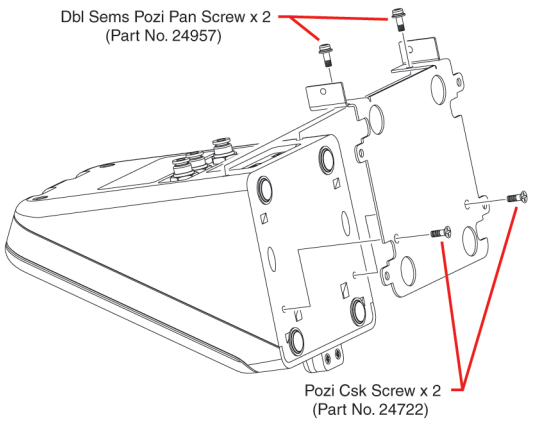


Figure A-2: Attach Bracket to Bump / Cal Station

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

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

A.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).

Figure A-3: Attach ABC Station to Workbench

A group of ABC Stations can be connected in a 'daisy chain' fashion by using a double sems 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.

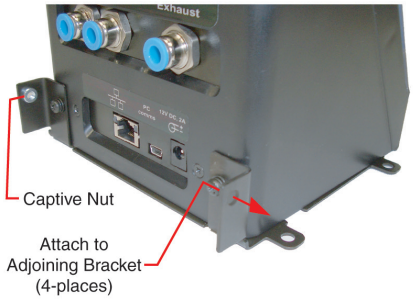


Figure A-4: Attach Adjoining ABC Stations

TELEDYNE
GAS MEASUREMENT INSTRUMENTS
Everywhereyoulook™

AMERICAS
14880 Skinner Road
Cypress,
TX 77249, USA
Tel: +1-713-559-9200

EMEA
Inchinnan Business Park
Renfrew, PA4, 9RG
Scotland, UK
Tel.: +44 (0) 141 812 3211

ASIA PACIFIC
290 Guigiao Road
Pudang, Shanghai 201206
People's Republic of China
Tel.: +86-21-3127-6373

www.teledynegasandflamedetection.com

64192 Revision 6