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User Manual

GDUnet
TEST & CALIBRATION STATION

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DESCRIPTION

This User Manual provides information for use only with the GDUnet Test & Calibration Station (or "the GDUnet").

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 GDUnet, and it should be referred to for the life of the product.

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

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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.

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SAFETY PROCEDURES

The instruments which are used on the GDUnet 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 GDUnet 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.

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Table of Contents

1. Introduction

Figure 1-1: Gas Delivery Unit (GDUnet)

1.1. Basic Concepts

The objective of using a GDUnet (illustrated in Figure 1-1) is to check and correct instrument calibration, ensure compliance and to maintain records of instrument performance.

The GDUnet is used to automatically deliver gas to Gascoseeker, Gasurveyor, First Responder, Leak Surveyor, Oxygas and Shipsurveyor instruments, via one of the following applications:

1. *GDUnet as part of the GDCloud cloud-based system.*
   * Test and calibration configuration files generated using **flexiCal Pro** are copied to the GDUnet using USB memory stick.
   * Test and calibration results stored on the GDUnet are retrieved and sent to the cloud-based GDUnet database via the router connected to the GDUnet.
   * Network communication is via a cellular network. Multiple GDUnet's can be connected to the same GDCloud system at any time.
   * The setup consists of a **GDUnet**, **router**, **flexiCal Pro** and access to the **GDCloud** platform.

2. *GDUnet connected directly to a PC via USB cable.*
   * GDUnet is connected to the PC via the USB and driven directly by **flexiCal Pro**. Test and calibration results are stored on the PC.
   * The setup consists of a **GDUnet, PC** and **flexiCal Pro**.

3. *GDUnet in standalone mode.*
   * Test and calibration configuration files generated using **flexiCal Pro** are copied to the GDUnet using USB memory stick.
   * Test and calibration results stored on the GDUnet are retrieved using a USB memory stick.
   * The setup consists of a **GDUnet, PC** and **flexiCal Pro**.

1.2. Calibration Gases

The GDUnet shall be connected to traceable cylinders of calibration gas.

Up to 8 gas cylinders can be connected to the GDUnet. A 4-gas version is also available.

1.2.1. Recommended Types

The instrument should be calibrated with the gas it will be used to detect. Calibration factors should be avoided, (i.e. propane instruments should be calibrated with propane gas).

Calibration gases should be full scale or mid-range of scale (i.e. calibrate 100% LEL range with 50% LEL rather than 10% LEL).

Heavier hydrocarbon gases may take longer to clear the system than lighter ones like methane. This will dictate manifold position and test sequence.

1.2.2. Traceability

Gases should be traceable to National Standard. Gas test certificates should have the total gas analysis including air components.

1.2.3. Limits of Preparation

The limits of preparation of the gas should be clear, e.g. ±2%. These limits should be better than the accuracy required from the instrument.

The accuracy of preparation of the gas mixtures together with the analysis accuracy should be clearly marked on the cylinder.

1.2.4. Analysis

The cylinder analysis should be known and within the operating requirements as specified by the operating organisation.

- Individual cylinders should be analysed.
- Limits on analysis should be clear.
- Method of analysis should be known.

1.2.5. Preferred Values

Typical values for methane instruments are listed below. The list is not exhaustive but can be used for guidance:

- Zero Range (all instruments) - Control Air
- 0% LEL Range - 0.5% CH_4
- 100% LEL Range - 2.5% CH_4
- %GAS Range - 100% CH_4
- ppm Range - 800ppm CH_4
- CO Range - 500ppm CO
- H_2S Range - 50ppm H_2S

1.2.6. Specification

For detailed specifications on test limits and gases, users should consult instrument manuals, service bulletins, operating procedures and specifications to ensure that the specifications and limits suit their need and are in line with their Company procedures.

The manufacturer, or his agent, should be consulted for latest instrument information.

1.3. Calibration Limits

1.3.1. Gas Limits

Gas limits for calibration or test are at the discretion of the customer and are set up via **flexiCal Pro**. Limits should be based on the application but must always make allowance for the instrument specification and for the accuracy of the calibration gas.

Limits for various types of gases may change calibration test parameters. For example - butane requires wider limits than methane because of increased gain requirements.

1.3.2. Standards

Reference should be made to the TGMI's standards for instruments and equipment as well as end users' own standards.

1.4. Software

1.4.1. flexiCal Pro

flexiCal Pro, is a Windows™ based software suite designed to provide a streamlined process to create test and calibration files for use by the GDUnet.

flexiCal Pro provides the capability to tailor GDUnet configurations and will create specific parameters for the test or calibration, including gas types, concentrations, and predetermined pass/fail criteria.

1.4.2. GDCloud

GDCloud is an advanced cloud-based platform that facilitates easy browsing of test and calibration results, which are automatically retrieved from the GDUnet via the router.

2. GDUnet installation & commissioning

2.1. Hardware installation

2.1.1. Location

⚠️ **Caution: Do not install the GDUnet in small enclosed unventilated spaces.**

The GDUnet exhausts gas during its testing process, approximately 0.5 litres over a 1 minute span. In scenarios involving flammable gas testing, the quantity of gas released either during standard operation or even potential supply leakages, is such that under typical ventilation conditions (i.e., 1-2 air exchanges per hour), there's no risk of a flammable mixture.

However, it's crucial to ensure that the GDUnet has proper ventilation and isn't placed within a sealed compartment. Adherence to strict no-smoking guidelines is imperative while operating the unit.

The GDUnet can be used free standing on a desk or workshop bench, or alternatively, can be wall mounted.

2.1.2. Wall Mounting GDUnet

A wall mounted GDUnet should ideally be fixed to a firm wall surface capable of supporting both the GDUnet and the inserted instrument - typically a brick, concrete or block wall. Appropriate wall fixings should be used.

Where a partition type wall is used, the GDUnet must be mounted on a main support strut.

The mounting surface should not be prone to damp or extreme changes in temperature.

Care should be taken to avoid obstructions that might interfere with either operator or maintenance access.

See Figure 2-1 for suggested wall mounting dimensions.

22mm (0.87in.)
150mm (5.91in.)
250mm (9.84in.)
25mm (0.98in.)
1.1m (43.31in.)
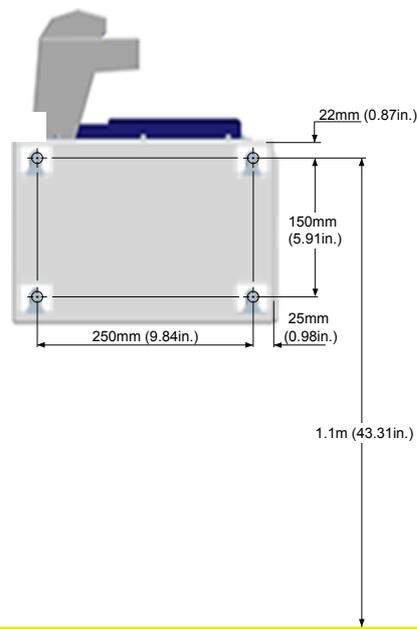
Figure 2-1: Wall Mounting Dimensions

2.1.3. Power Supply

There should be a 110V, 220V or 250V spur socket fitted with a 5A fuse and installed within 1 metre (3ft) of the proposed site of a GDUnet. The spur socket must be properly earthed and installed in compliance with the relevant local regulations.

The GDUnet is supplied with a universal 12V lockable power supply (PSU).

Specification:

Input: 100 - 240V 50 / 60Hz 30W.

Output: 12V 2.5A max.

The PSU is supplied with universal plug adapters, as illustrated in Figure 2-2, allowing mains connection regardless of socket type.

Figure 2-2: Universal PSU

The power supply plug, as illustrated in Figure 2-3, has a locking nut which must be tightened when fitted to the GDUnet.

Locking Nut

Figure 2-3: Power Supply Plug

Insert the power supply plug to the 12V DC connector on the GDUnet and secure in place by turning the locking nut clockwise, as shown in Figure 2-4.

NOTE: Ensure the locking nut is threaded correctly onto the 12V DC connector.
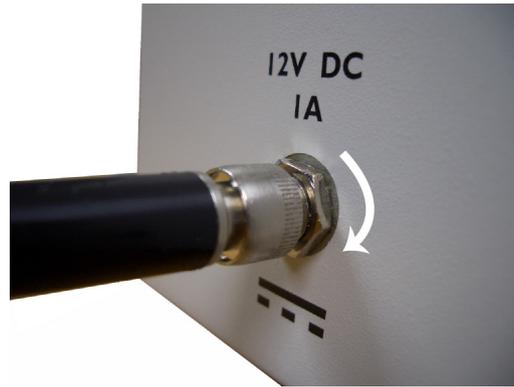
Figure 2-4: Connect Power Supply Plug

2.1.4. Network Connection

Connect the Ethernet cable from a network point to the Ethernet port on the GDUnet, as illustrated in Figure 2-5.

Figure 2-5: Connect Ethernet to GDUnet

2.1.5. USB Connection

If the GDUnet is to be connected to a PC, connect the USB cable from the PC to the USB connector on the GDUnet, as illustrated in Figure 2-6.

Figure 2-6: Connect USB to GDUnet

2.1.6. Gas Supply

The gas supply should be available within 1 metre (3ft) of the GDUnet. A shut-off valve should be attached to each gas pipe as necessary. The suggested pipe is 6mm or 1/4in copper or stainless steel pipe terminating in a stopcock with 6mm or 1/4in female fitting for connection to the GDUnet.

The regulator on the gas bottle should be set to 5 psi nominal with a pressure shut off valve on the 100% methane cylinder.

> NOTE: Disregard the pressure settings above, when using an external demand flow regulator on the gas bottle.

2.1.7. Pipework

The gas supply pipe leading from outside (e.g. cylinder cage) to the interior of a building, should be polyethylene, nylon or metallic pipe (stainless steel or copper).

Pipework material should be selected based on gas (e.g. hydrogen sulphide may require stainless steel or PTFE depending upon concentration).

Regulations, in particular installations, may dictate specific protection methods.

2.1.8. Purging

Any installation debris in the pipe can cause blockages in the GDUnet solenoids.

All pipes leading to the GDUnet should first be blown through and purged to ensure that no debris remains in the pipe.

2.1.9. Connecting Gas to the GDUnet

Connections should be made to the GDUnet using the appropriate tubing nut and ferrule kit (6mm or 1/4in.). Refer to Figure 2-7 and Figure 2-8 for details.
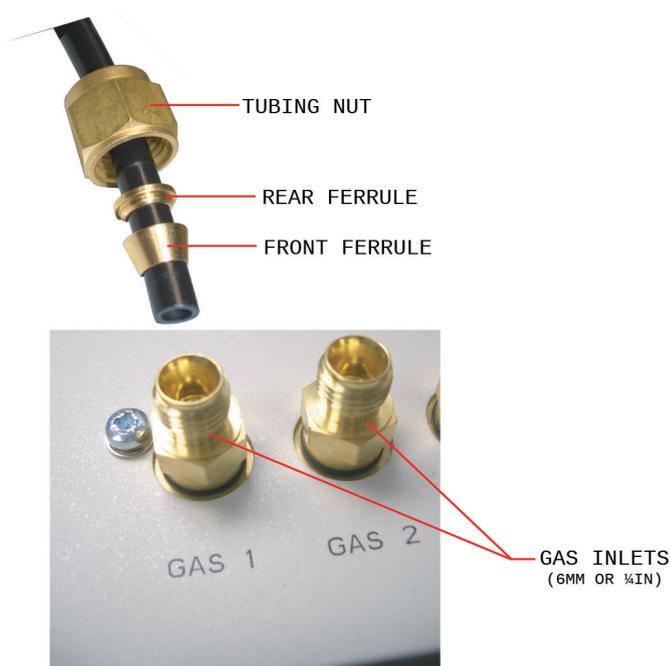
Figure 2-7: Tubing Nut / Ferrules Setup

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Figure 2-8: Gases connected to GDUnet

For gas inlet connectors with 6mm fittings - kit part number 14037.
Supplied complete with 6mm tubing nut and ferrule kit, as follows:

- 6mm. brass tubing nut   Part Number 14160
- 6mm. brass rear ferrule   Part Number 14162
- 6mm. brass front ferrule   Part Number 14161

For gas inlet connectors with 1/4in fittings - kit part number 14016.
Supplied complete with 1/4in. tubing nut and ferrule kit, as follows:

- 1/4in. brass tubing nut   Part Number 14434
- 1/4in. brass rear ferrule   Part Number 14436
- 1/4in. brass front ferrule   Part Number 14435

NOTE: When connecting the tubing nut to the GDUnet, it should be finger tightened and then further tightened by 1.25 turns maximum using the correct spanner/wrench (14mm or 9/16in).

2.1.10. Testing of Lines

All gas lines should be appropriately tested to ensure there are no leaks:

1. Pressurise the pipes to 20psi.
2. Note position of pressure dial.
3. Close the regulator.
4. After 30 minutes, check dial for any pressure drops.

   Only proceed when there are no pressure drops on gas lines.

For normal operation, the regulators should be reset to 5 psi nominal.

NOTE: Gases will have to be drawn, or lines bled, to achieve this.

2.1.11. Default Gas Setup

The GDUnet has the following default gas setup:

- Gas 1 - Air
- Gas 2 - 800 PPM methane
- Gas 3 - 50% LEL methane
- Gas 4 - 100% volume methane

This default set-up will allow an instrument to be tested to validate GDUnet installation and operation.

> NOTE: For instruction on how to test an instrument, refer to the Quick Operation Guide (part no. 14768) supplied with the GDUnet.

> NOTE: If the installed gases are not compatible with the default gas setup, the test will fail. To change the gas setup, refer to the instructions within **flexiCal Pro**.

2.2. Firmware Commissioning

2.2.1. Initial Setup

1. Connect a USB cable from the external USB port on the GDUnet to a PC/Laptop (refer to Figure 2-9).

Figure 2-9: External USB port

2. Ensure that the Ethernet cable is disconnected from the GDUnet.

3. Turn on the GDUnet and wait for the boot-up process to complete. Confirm that "GMI GDUnet / PC Mode" is displayed on the screen (see Figure 2-10).

Figure 2-10: PC mode

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

> NOTE: The **GDUnet Config** software is located on the USB flash drive supplied with the GDUnet.

2.2.2. Time Zone Setup

1. The software should automatically connect to the GDUnet and retrieve the current settings.

   If automatic retrieval was unsuccessfull, press 'Read from GDU' to get the information manually.

2. Select required Time Zone from the drop-down list.

3. Press 'Send to GDU'.
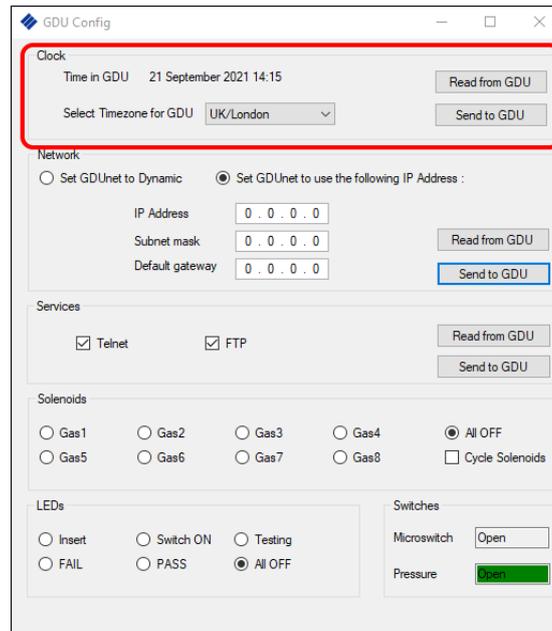
Figure 2-11: Time zone setup

NOTE: The GDUnet must remain switched ON after time zone setup to allow the real time clock battery to charge, otherwise the stored content may revert to default.

2.2.2. Static IP Addressing

By default, the GDUnet is set to obtain the IP address via DHCP (Dynamic) and the configuration boxes are not visible.

Before setting a static IP address, the following information MUST be obtained from the network administrator:

- IP Address
- Subnet mask
- Default Gateway

1. The software should automatically connect to the GDUnet and retrieve the current settings.

   If automatic retrieval was unsuccessfully, press 'Read from GDU' to get the information manually.

2. Select 'Set GDUnet to use following IP Address' to enable the IP configuration boxes.

3. Enter details obtained from the network administrator in the appropriate fields.
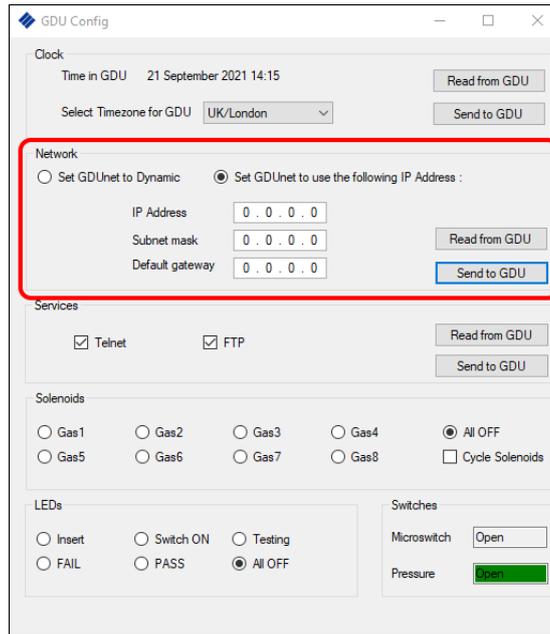
Figure 2-12: Static IP addressing

Figure 2-13: Example IP config

NOTE: The background of the field turns red. This indicates the configuration change has not been saved. It will remain in this state until the configuration is sent to GDUnet.

4. Press 'Send to GDU'.

5. To verify the static IP address is operational, test by pinging the IP address and the device name using a PC located on the same network.

    To ping the IP address, open the command line and type 'ping', followed by the IP of the GDUnet (e.g. "ping 192.168.0.110").

    To ping the device name, type 'ping', followed by the identifier (GMI02) + 6 digit serial number of the GDUnet (e.g. "ping GMI02088784").

    The serial number can be located on the label located next to the GDUnet's USB port (as illustrated in Figure 2-9.)

3. GDUnet Operation

3.1. GDUnet Models

There are eight models of GDUnet, as follows:

Metric gas inlets (6mm):

Gas Connections	Keypad	Part Number
8	Yes	14780
8	No	14750
4	Yes	14781
4	No	14751

Imperial gas inlets (¼ in):

Gas Connections	Keypad	Part Number
8	Yes	14780Q
8	No	14750Q
4	Yes	14781Q
4	No	14751Q

The differences between the models are:

- Metric or imperial gas inlets
- Ability to test / calibrate an instrument with up to 4 or 8 gases
- Keypad for ID entry

Other than keypad ID entry, the operation of models are identical.

3.2. Main Features

The main features of the GDUnet are illustrated in Figure 3-1 and described as follows:

Figure 3-1: Main Features

1. Gas inlets
2. Instrument communications
3. Microswitches
4. Gas nozzle
5. Front panel lock

6. Status LED's
7. Keypad (optional)
8. External connectors
9. LCD

3.2.1. Gas Inlets

The GDUnet can be fitted with 4 or 8 gas connections. The gases for testing and calibrating instruments are connected to the gas inlet adaptors as shown in Figure 3-2.

Figure 3-2: Gas inlet adaptors

NOTE: For correct installation of gases, refer to the Section 2: Hardware Installation.

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3.2.2. Instrument Communications

• **Optical Port**

Optical communication occurs when microswitch 2 has been activated.

The following examples are instruments that use optical communications:

   • Gasurveyor 500
   • First Responders
   • Leak Surveyor
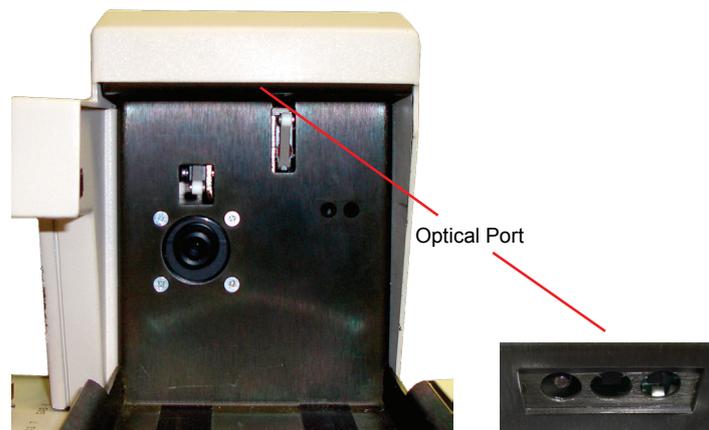
Optical Port

Figure 3-3: Optical port

• **IrDA Window**

Infrared communication occurs when microswitch 2 has not been activated.

The following examples instruments that use IrDA communications:

   • Gasurveyor 700
   • Shipsurveyor

IrDA COMMUNICATIONS

Figure 3-4: IrDA widow

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3.2.3. Microswitches

The GDUnet contains two contact microswitches located inside the instrument hood, as illustrated in Figure 3-5.

The purpose of these microswitches is as follows:

- MICROSWITCH (1): Detects when an instrument has been correctly located in the instrument tray and activates the 'Switch ON' LED.
- MICROSWITCH (2): Detects instrument type which determines what communications to activate:
    - Microswitch (2) activated: optical comms
    - Microswitch (2) not activated: IrDA comms
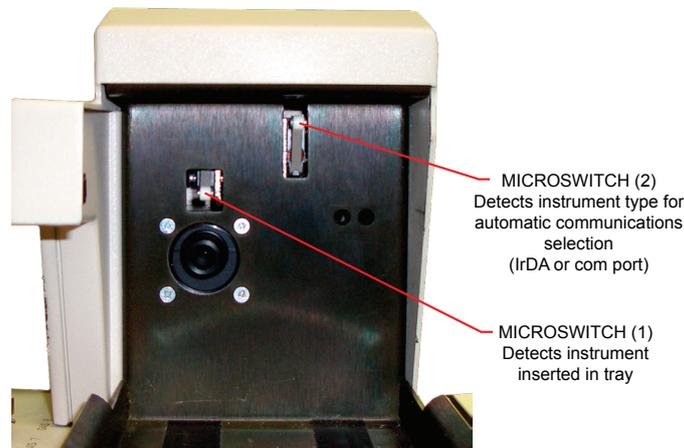
Figure 3-5: Microswitches

3.2.4. Gas Nozzle

Gas is delivered to the instruments by the GDUnet via the outlet nozzle. When the instrument is located correctly in the instrument tray, the nozzle 'O' ring ensures there is a gas-tight seal between the nozzle and the instrument.

The 'O' ring must be inspected and replaced routinely.

A damaged 'O' ring can cause leaks resulting in instruments failing the Leak Test. To facilitate this maintenance, a supply of 'O' rings should be provided near the GDUnet to enable users to change these on a regular basis, e.g. monthly.
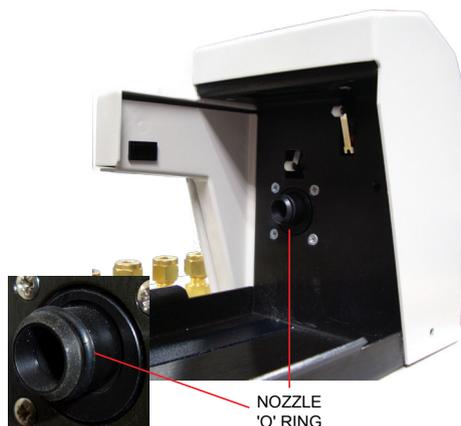
Figure 3-6: Gas outlet nozzle

3.2.5. Front Panel Lock

The front panel of the GDUnet is secured by the key-lock (illustrated in Figure 3-7). Two keys are supplied.

Figure 3-7: Front panel lock

3.2.6. Status LEDs

The GDUnet has six LEDs that indicate the current status of the GDUnet and instrument being tested.
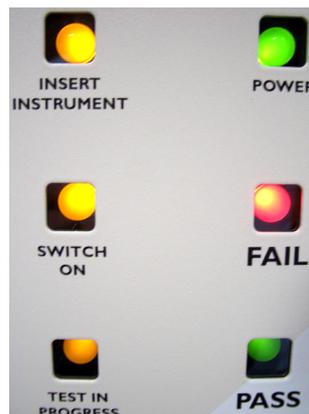
Figure 3-8: Test LEDs

3.2.7. Keypad (optional)

The keypad version of the GDUnet will only allow users to test / calibrate an instrument after a user ID has been entered.

The user, when prompted, enters an ID code (can be up to 9 digits) followed by the # key.

Figure 3-9: Keypad entry

The GDUnet will automatically revert back to 'Enter ID then #', in the following circumstances:

- After 10 seconds if an instrument has not been inserted. Additionally, the buzzer will sound and the test LED's will illuminate in sequence.
- An incorrect ID is entered. 'INVALID ID' will flash on the LCD.
- An instrument is removed from the GDUnet.

For fleet management purposes, the GDUnet records the User ID with each instrument test.

3.2.8. External Connectors

There are three external connectors on the side of the GDUnet:

- 12V power supply connection
- Ethernet connection for communication over a network
- USB connection for direct connection to a PC.

The connector locations are illustrated in Figure 3-10.

Figure 3-10: External connectors

3.2.9. LCD

The LCD displays information relating to the status of a test being undertaken or has instructions for the user, as illustrated in the example in Figure 3-11.

Figure 3-11: Example of LCD status

3.3. Using GDUnet in Standalone Mode

3.3.1. Create New Calibration Setup

> 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.
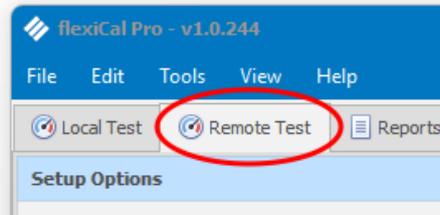
Figure 3-12: Remote Test

2. Open the *Setup Editor* by selecting the icon.
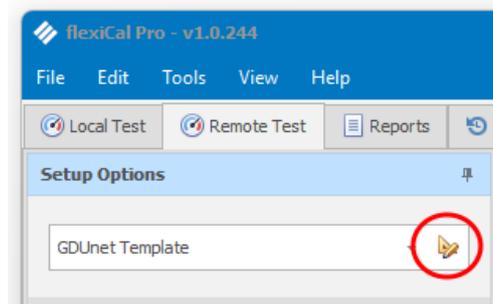
Figure 3-13: Setup Editor

3. In the *Setup Editor*, choose the desired configuration to edit from the *Setup Name* drop-down list.
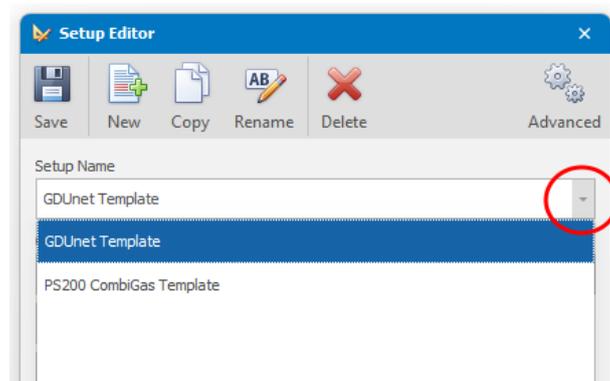
Figure 3-14: Setup Editor

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

4. Ensure 'GDUnet' is selected in the *Calibration Station Type* drop-down list (as illustrated in Figure 3-15).
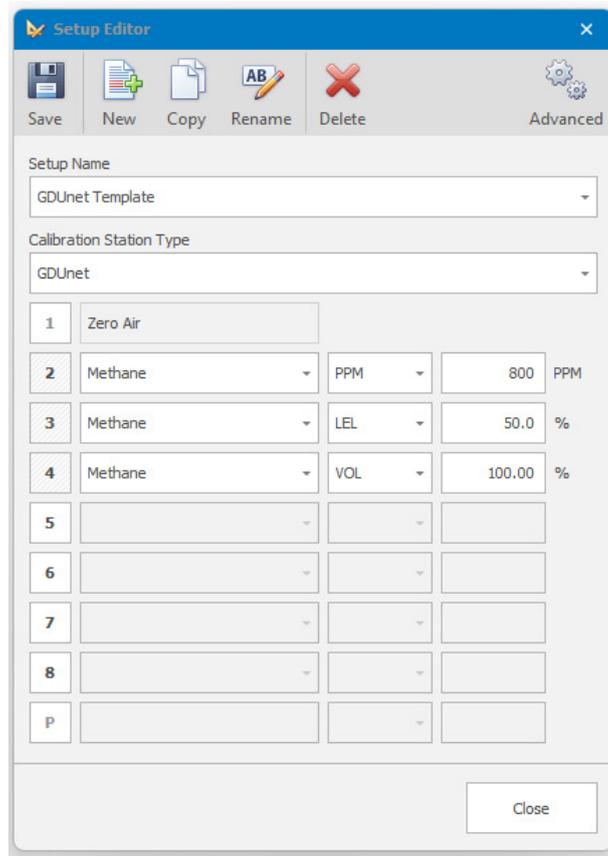
Figure 3-15: Setup Editor

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

Gas inlet 1 is exclusively allocated for Zero Air and cannot be changed. The remaining gas inlets are configurable and may be designated for various calibration gases or mixtures. The default pre-loaded configuration utilizes inlets 2, 3 and 4 for methane (i.e. ppm, %LEL and %Vol).

5. To add a new calibration gas into the setup, click on the corresponding inlet number. 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 (as illustrated in Figure 3-16).
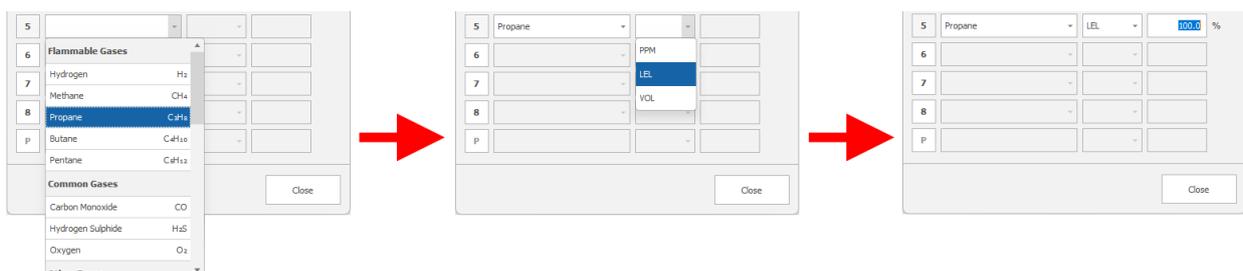
Figure 3-16: Adding gas range

To remove a calibration gas from the configuration, click on the corresponding inlet number that displays the gas information. This will erase the entry for that line and deactivate the inlet.

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. Up to five different gas ranges can be added. After defining the mixture, click the 'Done' to save the composition (as illustrated in Figure 3-17).
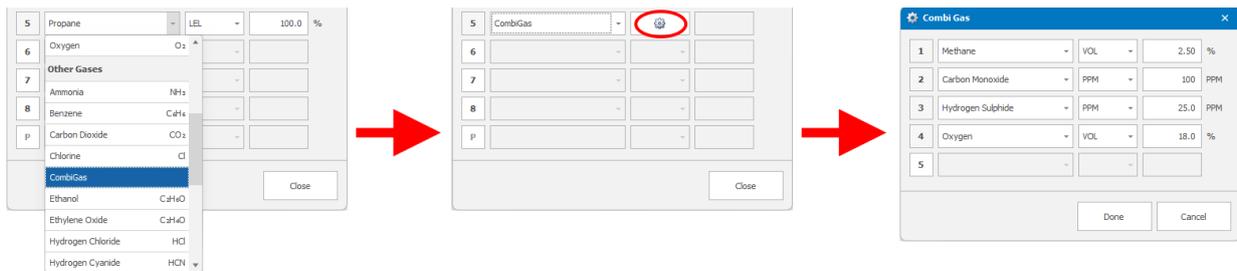
Figure 3-17: Adding combi gas

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

Figure 3-18: 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.

3.3.2. Transfer the Calibration Setup from PC to GDUnet

1. Insert blank USB flash drive into the computer.

2. Launch **flexiCal Pro** software and select the *Remote Test* tab.
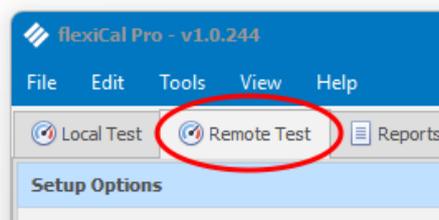
Figure 3-19: Remote Test

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 GDUnet station will be configured for by selecting either 'Bump' or 'Calibration' from the appropriate options.

5. Choose the 'USB Flash Drive' in the *'Send to...'* options.
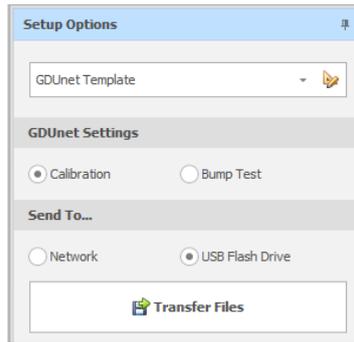
Figure 3-20: Setup Options

6. Click 'Transfer Files' and then select the appropriate drive letter corresponding to the inserted USB flash drive. This will copy the new configuration files to the selected drive.
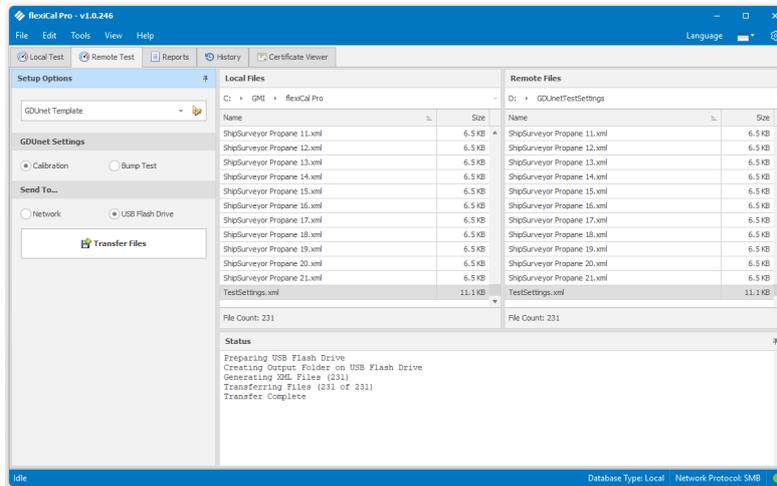
Figure 3-21: Copying the configuration files

7. After the file transfer has been completed, remove the USB flash drive from the computer.

8. Ensure that the GDUnet station is switched on and no test is running.

9. Open the front panel door and insert the USB flash drive into the USB port located on the front of the GDUnet PCB, as illustrated in Figure 3-21.

Figure 3-22: GDUnet USB port

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After inserting the USB flash drive, the GDUnet will automatically upload the configuration files. During this process, the PASS and FAIL LEDs will alternate. When upload is complete, the GDUnet will return to the idle state, as signified by the illumination of the 'Insert instrument' LED. It is now safe to remove the USB flash drive.

NOTE: If there is an error during the file upload process, the 'Test in Progress' LED will flash. This LED will continue to flash even when the USB flash drive is removed and will not switch off until the USB flash drive is reinserted (file upload process starts again), or, an instrument is placed in the GDUnet (test cycle begins).

10. Remove the USB flash drive from the USB port, and lock the front panel door.

3.3.3. GDUnet Power-up Sequence

1. The PASS and FAIL LEDs will illuminate. The LCD back light will be on but no message is displayed.

2. After approximately 1 minute, the buzzer will sound and the 6 status LEDs will illuminate in sequence.

3. For GDUnets with a keypad, the display will show 'Enter ID then #'. Enter the user ID to continue.

4. The 'INSERT INSTRUMENT' LED will illuminate and LCD will now display 'GDUnet #XXXXX INSERT GMI'. (XXXXX represents the GDUnet serial number).

5. The GDUnet is now ready to test & calibrate instruments. Keypad users have 10 seconds to start the test before the GDUnet reverts back to 'Enter ID then #'.

NOTE: The start-up sequence allows user to verify correct operation of the status LEDs and buzzer.

3.3.4. Test / Calibration Procedure

1. Ensure the correct gases are connected to the GDUnet and the GDUnet has the correct test & calibration configuration files (refer to Section 2: GDUnet Installation & Commissioning and Section 3.3.2: Transferring the calibration setup from PC to GDUnet for more details).

NOTE: Step 2 only applies to GDUnet stations fitted with a keypad.

2. Input the Operator ID using the keypad on the front of the GDUnet, then press the # key to confirm. If the Operator ID is correctly entered and recognized by the IMS or GDCloud databases, the screen will prompt the user to insert the instrument (as illustrated in Figure 3-23).

If the Operator ID is not recognized, the screen will show 'INVALID ID' and revert to the Operator ID input screen (as illustrated in Figure 3-24).

Enter ID then #

GDUnet #010001
INSERT GMI

Figure 3-23: Input the Operator ID

INVALID ID

Figure 3-24: Invalid Operator ID

3. Place the instrument on the instrument tray as shown in Figure 3-25. Ensure the GDUnet outlet nozzle connects with the instrument's inlet.

   If positioned correctly, the GDUnet will emit a continuous sound, the 'Switch On' LED will illuminate, and the on-screen message will prompt the user to switch the instrument on.

Figure 3-25: Insert the instrument

4. After switching the instrument on, the test will begin. The 'Test In Progress' LED will illuminate, and the GDUnet will apply the test gases in sequence as specified in the test settings file.

   Depending on instrument type and configuration, the test can range from 3 to 10 minutes.

   NOTE: The GDUnet can reset if there is communication disruption between the GDUnet and the instrument.

   Check:
   • instrument battery
   • optical communication windows are clean

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Figure 3-26: Test in progress

5. Once the test is complete, the GDUnet will display either:

*   Test Pass: green 'PASS' LED and 'All Test Pass' message.

*   Test Fail: red 'FAIL' LED and 'Failed Test' message

6. Remove the tested instrument from the GDUnet.

Figure 3-27: Remove the instrument

3.4. Accessing Test Results

3.4.1. Download Results from the GDUnet

1. Ensure that the GDUnet station is switched on and in a default state.

2. Open the front panel door and insert and empty USB flash drive into the USB port located in the front of the GDUnet PCB, as illustrated in Figure 3-29.

Figure 3-28: GDUnet USB port

After inserting the USB flash drive, the GDUnet will automatically download the test results. During this process, the PASS and FAIL LEDs will alternate. When the download has completed, the GDUnet will returns to the default state, as signified by the illumination of the 'Insert instrument' LED. It is now safe to remove the USB flash drive.

NOTE: If there is an error during the download process, the 'Test in Progress' LED will flash. This LED will continue to flash even when the USB flash drive is removed and will not switch off until the USB flash drive is reinserted (file download process starts again), or, an instrument is placed in the GDUnet (test cycle begins).

NOTE: After the test results are transferred onto the USB flash drive, the internal memory of the GDUnet will be automatically cleared.

3. Remove the USB flash drive from the USB port, and lock the front panel door.

3.4.2. View Test Results & Generate Certificate

1. Insert the USB flash drive with the test results into the PC's USB port.

2. Launch **flexiCal Pro** software and select *Certificate Printer* from the *File* menu.
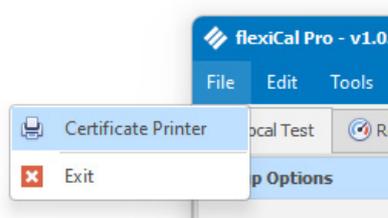
Figure 3-29: Certificate Printer

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

Figure 3-30: 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'.
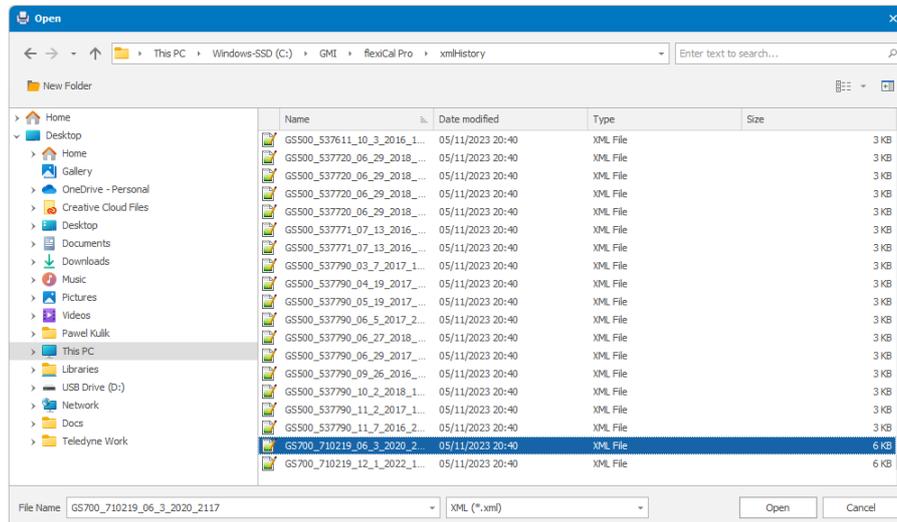
Figure 3-31: Certificate Printer

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.

Figure 3-32: Generated Certificates

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