V!SA

Configuration & Field Calibration Handbook (CD)

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Instrument Service / Repair contact details are also provided inside the back cover of this handbook.

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MODIFICATION NOTICES

GMI aim to notify customers of relevant changes in the product operation and maintain this Handbook up to date. In view of the policy of continuous product improvement there may be operational differences between the latest product and this Handbook.

This Handbook is an important part of the **V!SA** product. Please note the following points:

- It should be kept with the instrument for the life of the product
- Amendments should be attached to this Handbook
- This Handbook should be passed on to any subsequent owner/user of the instrument
- Although every care is taken in the preparation of this Handbook it does not constitute a specification for the instrument.

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DISPOSAL ADVICE

When no longer in use, dispose of the instrument carefully and with respect for the environment. GMI will dispose of the instrument without charge if returned to the factory.

SAFETY

- The instrument must be regularly serviced and calibrated by fully trained personnel in a safe area.
- The rechargeable battery pack must only be recharged in a safe area.
- Never use a damaged battery pack.
- Make sure that the battery pack is fitted correctly before use.
- Never expose the battery pack or instrument to extreme heat.
- Only GMI replacement parts should be used.
- If the instrument detects gas, follow your own organisation's procedures and operational guidelines.
- Gas can be dangerous and care should always be taken in its use.

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

AREAS OF USE

Exposure to certain chemicals can result in a loss of sensitivity of the flammable sensor. Where such environments are known or suspected it is recommended that more frequent response checks are carried out. The chemical compounds that can cause loss of sensitivity include Silicones, Lead, Halogens and Sulphur. Do not use instrument in potentially hazardous atmospheres containing greater than 21% Oxygen.

STORAGE, HANDLING AND TRANSIT

The batteries in the rechargeable pack contain considerable energy and care should be taken in their handling and disposal.

The instrument is designed to handle harsh environments and is sealed to IP54. If not subjected to misuse or malicious damage, the instrument will provide many years of reliable service.

The instrument contains an electrochemical sensor with a life of 2 years. Under conditions of prolonged storage the sensor should be removed. The sensor contains potentially corrosive liquid and care should be taken when handling or disposing of the sensor, particularly when a leak is suspected.

There is no special precautions to be taken when the instrument is in transit.

WARRANTY

The GMI **V!SA** instrument has a warranty against faulty goods or workmanship of 5 years. Consumable and Mechanical parts are not included in this. These are covered under GMI standard warranty conditions. For details, please contact GMI Ltd (UK).

REVISION RECORD

Date	Issue	Description Of Change
02/02/2004	1	New Configuration &. Field Calibration Handbook (CD)
20/02/2006	2	To incorporate effect of CN 4224 and CN 4261
15/01/2008	3	To incorporate effect of CN 4319 and CN 4333
12/04/2010	4	To incorporate effect of CN 4669, CN 4789, CN 4831 and CN 4857.

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INTRODUCTION

This Handbook allows Field Calibration (Chapter 1), Alarm Configuration (Chapter 2), setup of Configuration Options (Chapter 3), Set Defaults (Chapter 4) and Clock Configuration (Chapter 5) to be carried out without the use of additional equipment such as PCs or tools.

The instrument must be switched on in Menu Mode, as detailed in each of the following procedures. With the exception of Clock Configuration, a code must be entered

before any of the instrument default settings can be altered.

This following procedures show the GMI factory default settings. When each screen is accessed, the current default setting is ‘highlighted’ on the instrument display.

These settings can be altered as detailed in the following procedures.

FIELD CALIBRATION

Field Calibration allows simple calibration to be carried out without the use of additional equipment such as PCs or tools. The Field Calibration function must be enabled in the SETUP menu to perform this operation. The instrument must be switched on in Menu Mode, as detailed in the following procedure, then a code entered.

Note: Some gas sensors respond to gases other than the target gas. Typically this cross response is not enough to result in operational problems, but sometimes a negative reading could occur. However, should you have any concerns please contact GMI.

For any other calibration, use only GMI software to ensure safe and proper function of these life-saving instruments.

SWITCHING THE INSTRUMENT ON

Press and hold the green Right Hand (RH) button to switch the instrument On.

Immediately following the **V!SA** screen display and while the instrument identification screen is displayed, as shown in the following paragraph, press the following buttons in sequence:

Yellow Left Hand (LH) button ↵,

Green (RH) button ⏻,

Yellow (LH) button ↵,

Green (RH) button ⏻.

The instrument begins its warm-up routine, which last 30 seconds. During the warm-up, a countdown timer appears in the top (RH) corner of the 4-Gas display, or top centre of the 5-Gas display.

If the correct button sequence is accepted, the countdown timer alternates with 'M' (Menu) symbol.

Note: The display backlight illuminates and remains on during warm-up. When warm-up is completed, the screen light automatically switches off.

Instrument Identification

During warm-up, the instrument display identifies the model, serial number, software version, datalogging (if instrument is a datalogging version) and battery status information as shown below:

Note: 4-Gas display illustrated in example.

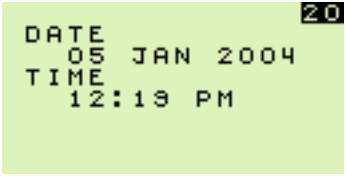
Battery Status

Provides the user with the Battery charge level, as shown in previous display. This will be indicated by a battery symbol with a bar graph showing FULL, 75%, 50% and 25%, which is shown for approximately five (5) seconds during warm up, then on the top of the display during normal operation.

Time and Date

The time and date from the instrument's built-in clock is displayed on the screen during warm-up.

Note: 4-Gas display illustrated in example.



If datalogging is being used, the time and date is set from this clock. This may be important when viewing the logged data.

Note: CAL DUE is also set from this clock.

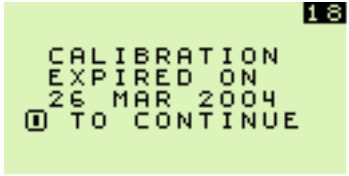
Calibration Due Date

The calibration due date appears on the display. *A configurable option is available not to display this screen.*

Note: 4-Gas display illustrated in example.

If the Calibration Due Date has expired, the audible and visual alarm activates and the following screen is displayed during warm-up:

Note: 4-Gas display illustrated in example.



Press and hold the green (RH) button once, to acknowledge the calibration due date is overdue, cancel the audible / visual alarm, and continue to the next display.

A configurable option is available to force the user to switch off the instrument.

Select Calibration Gas

This configurable option is available to allow the user to select a different flammable gas from that which was originally used to calibrate the instrument.

This action allows the instrument software to compensate and thus display more accurate readings when detecting the re-selected gas type.

When this option is displayed, as shown below, the gas that was originally used to calibrate the instrument is identified between two arrowheads.

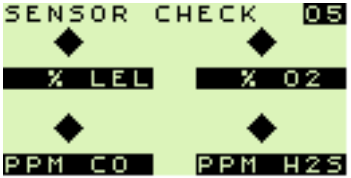
Note: The instrument calibration certificate also identifies the original calibration gas type.

To select a different gas type, press the yellow Left Hand (LH) button ↵ to scroll through the available options from Methane, Butane, Propane, Pentane and Ethanol. When the required option is highlighted, press and hold the green (RH) button ⓘ to select.

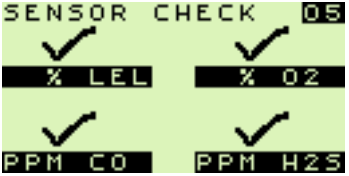
Note: Accuracy for the re-selected gas type is ± 20%.

Sensor Confirmation Check (4-Gas version)

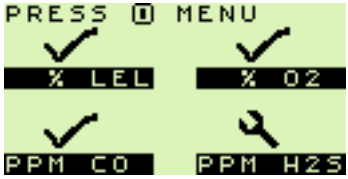
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



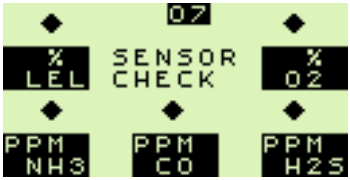
Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed:



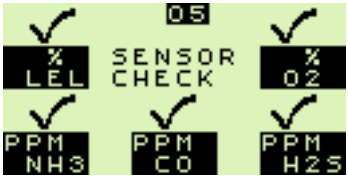
Press the green (RH) button ⓘ to display the Configuration Menu Screen.

Sensor Confirmation Check (5-Gas version)

The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by

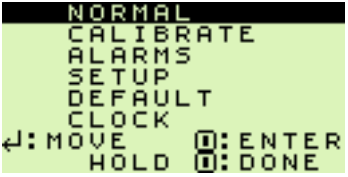


Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.

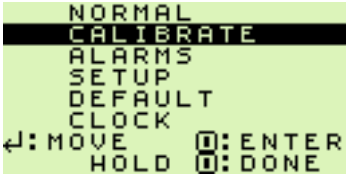
Press the green (RH) button ① to display the Configuration Menu Screen.

Configuration Menu Screen

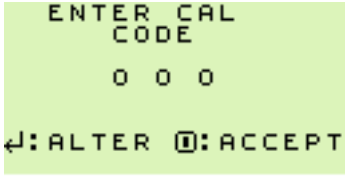
When warm-up is completed successfully, the screen light switches off and the instrument automatically displays the configuration menu screen. The alphanumeric screen now acts as a prompt to help you through the calibration process. An example of this display follows:



To enter CALIBRATE menu, press the yellow (LH) button ↵, repeatedly if necessary, to scroll through the options until CALIBRATE is highlighted in the display as follows:

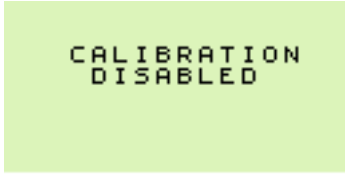


When 'CALIBRATE' is highlighted, press the green (RH) button (1). The following display will request the calibration code to be entered.

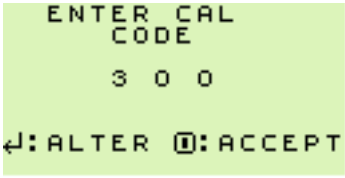


The factory-set default Calibration code is 333. This can only be changed by using GMI **V!SA** setup software.

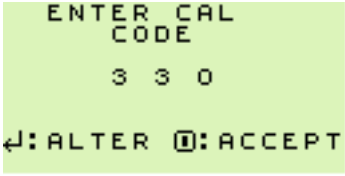
If the Field Calibration option is disabled in the set up menu, the following message will flash on the display. Field Calibration is only available if enabled in the Set-Up menu.



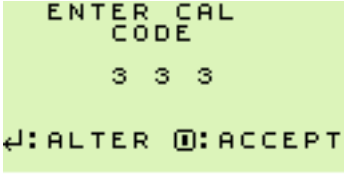
To enter the Calibration code, 333 in example, press the yellow (LH) button ↵ to alter the first 'flashing' digit. When the correct digit is displayed, as shown in the following screen, press the green (RH) button ⓘ to accept.



Once accepted, the second digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct second digit is displayed, as shown below, press the green (RH) button ⓘ to accept.



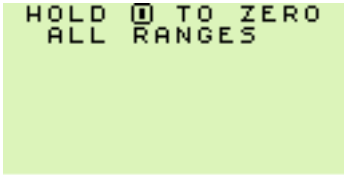
Once accepted, the third digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct third digit is displayed, as shown in the following display, press the green (RH) button ⓘ to accept and enter the calibration menu sequence.



Note: The automatic selection of each sensor for calibration is displayed similar to the layout of the sensors located in the instrument, i.e. in a clockwise direction from top left position (behind sensor grille).

Step 1: Zero All Ranges

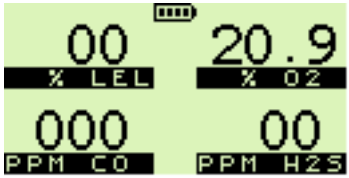
All sensors must be zeroed before the calibration can commence. Make sure that the instrument is in fresh air. To zero all ranges, press and hold the green (RH) button



Note: If an oxygen sensor is fitted, the sensor is zeroed to 20.9% oxygen.

Confirmation flashes on the screen, as shown below:

Note: 4-Gas display illustrated in example.



Note: The oxygen sensor is a single point calibration, therefore, this sensor requires only the calibration in Step 1 as zero for the oxygen sensor takes place in fresh air at 20.9% oxygen

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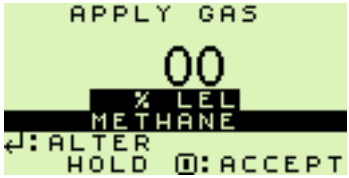
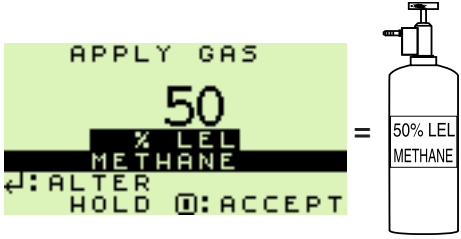
Step 2: Calibrate Range 2.



The display will show only the gas type / sensor to be calibrated. Note that in calibration mode, the pump if fitted, is automatically disabled. Refer to 'CALIBRATION GAS CONCENTRATIONS' Instruction Sheet (GMI Part No. 13939) for details of gases required by instrument type. Calibration gas for this sensor must now be applied at the instrument sample connection inlet. The correct calibration gas regulator should be used.

Note: If a negative reading is showing, allow it to go back to zero before applying the appropriate test gas.

The gas will flow through the instrument and exit at the sensor grille on front of the instrument. Refer to INSTRUCTION SHEET (GMI Part No. 99105) 'USE OF DIRECT FLOW REGULATOR VALVE' for details of gas concentration and flow rate to be used.
Allow reading to stabilise.



To adjust the gas reading, press the yellow (LH) button ↵ to alter the reading upwards. Pressing and holding the button will cause the reading to increase rapidly. When the reading is approaching the desired value, then slowly press the button to "fine tune" the readings.

When the gas reading is stable and corresponds to the value at the calibration gas in the cylinder, press and hold the green (RH) button ⓘ to accept, then move to the next step.

Note: If the gain limit is reached, the display may not be able to be adjusted to the value of the gas in the cylinder. The display will increase to the maximum achievable gain, then roll over to zero and start again. This means that the

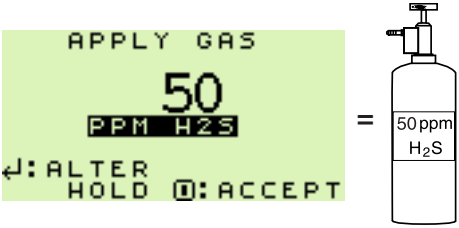
sensor has lost sensitivity, has reached maximum gain, and is not able to give accurate response to the calibration gas. Depending on your company procedures, the sensor will require to be replaced. All other calibration can be carried out as normal, only this sensor / gas type is affected.

Step 3: Calibrate Range 3

The instrument will automatically step onto the next sensor to be calibrated. The display will show only the gas type sensor to be calibrated.

Note: If a negative reading is showing, allow it to go back to zero before applying the appropriate test gas.

Calibration gas for this sensor must now be applied at the instrument sample inlet. Allow readings to stabilise. Adjust the gas reading as detailed in Step 2.



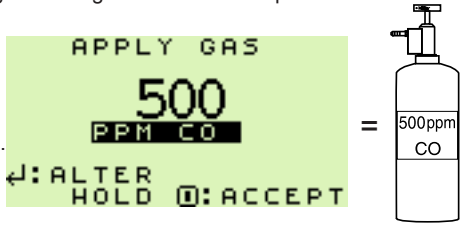
When the gas reading is stable and corresponds to the value of the calibration gas in the cylinder, press and hold the green (RH) button ① to accept, then move to next step.

Step 4: Calibrate Range 4

The instrument will automatically step on to the next sensor to be calibrated. The display will show only the gas type sensor to be calibrated.

Note: If a negative reading is showing, allow it to go back to zero before applying the appropriate test gas.

Calibration gas for this sensor must now be applied at the instrument sample inlet. Allow readings to stabilise. Adjust the gas reading as detailed in Step 2.



When the gas reading is stable and corresponds to the value of the calibration gas in the cylinder, press and hold

the green (RH) button ⓘ to accept, then move to next step.

Step 5: Accept Calibration

After the **V!SA** instrument has recognised that all the sensors fitted have been calibrated, the following screen is displayed:

To accept the highlighted option, press and hold the green (RH) button ⓘ and the display will move to the next step.

To alter the highlighted option, press the yellow (LH) button ↵ repeatedly to scroll through the options until the required option is highlighted.

Once required option is highlighted, press and hold the green (RH) button ⓘ to accept the option and move to the next step.

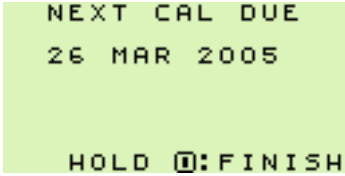
UPDATE: The calibration data, time and date will now be stored in the instrument memory. If the calibration period option is in use, the calibration due date will now be updated automatically from the calibration period option in the setup menu.

SAVE ONLY: The new gain setting will be updated but the calibration due date will not update if the calibration period is in use from the setup menu. This option may be selected if you were unable to calibrate all the sensors in the instrument but wish to save the gain setting for the sensors calibrated successfully.

ABANDON: Neither the gains or the calibration due date will be updated if this option is highlighted. The instrument will go directly to the MENU display.

Step 6: Next Calibration Due

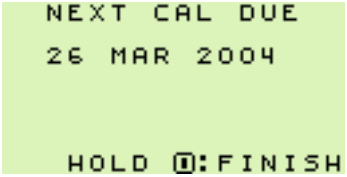
If the UPDATE (default) option was selected in Step 5, the 'Next Cal Due' is displayed as + 12 months as shown below:



Note: The time period is programmable from the 'calibration period' in the setup menu.

To confirm the new setting, exit the calibration menu and return to the Configuration menu display, press and hold the green (RH) button ①.

If the SAVE ONLY option was selected in Step 5, the existing 'Cal Due' remains unchanged as shown in the following display:



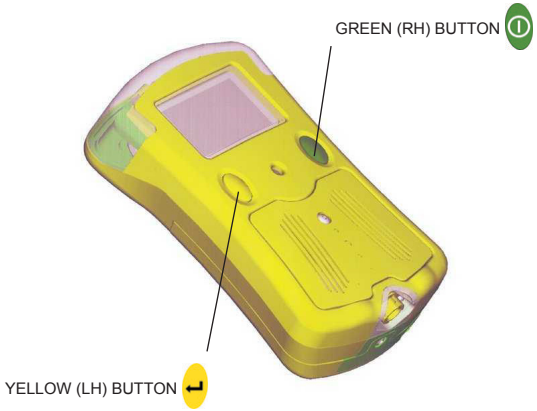
To exit the calibration menu and return to the configuration menu display, press and hold the green (RH) button ⓘ.

If the ABANDON option was selected in Step 5, the configuration menu is displayed, as shown:

Note 1: In calibration mode, the instrument's audible and visual alarms will activate briefly for each range fitted during the calibration gas mode. It will last for 3 seconds on each range. This means that, when the readings go above the preset instantaneous alarm value, the audible and visual alarm will be briefly energised to confirm their correct operation.

Note 2: The Calibration mode, or sequence, may be abandoned at any time by pressing and holding both buttons together for 3 seconds. The display will show QUIT CAL and count down from 3 seconds to Off.

ALARM CONFIGURATION



Alarm Configuration allows simple set-up of the alarms to be carried out without the use of additional equipment such as PCs or tools. The instrument must be switched on in Menu Mode, as detailed in the following procedure, then a code entered.

For any other configuration, refer to manual or use only GMI software to ensure safe and proper function of these life-saving instruments.

SWITCHING THE INSTRUMENT ON

Press and hold the green Right Hand (RH) button to switch the instrument On.

Immediately following the **V!SA** screen display and while the instrument identification screen is displayed, as shown in the following paragraph, press the following buttons in sequence:

Yellow Left Hand (LH) button ↵,

Green (RH) button ⏻,

Yellow (LH) button ↵,

Green (RH) button ⏻.

The instrument begins its warm-up routine, which last 30 seconds. During the warm-up, a countdown timer appears in the top (RH) corner of the 4-Gas display, or top centre of the 5-Gas display.

If the correct button sequence is accepted, the countdown timer alternates with 'M' (Menu) symbol.

Note: The display backlight illuminates and remains on during warm-up. When warm-up is completed, the screen light automatically switches off.

Instrument Identification

During warm-up, the instrument display identifies the model, serial number, software version, datalogging (if instrument is a datalogging version) and battery status information as shown below:

Note: 4-Gas display illustrated in example.

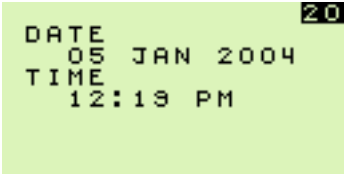
Battery Status

Provides the user with the Battery charge level, as shown in previous display. This will be indicated by a battery symbol with a bar graph showing FULL, 75%, 50% and 25%, which is shown for approximately five (5) seconds during warm up, then on the top of the display during normal operation.

Time and Date

The time and date from the instrument's built-in clock is displayed on the screen during warm-up.

Note: 4-Gas display illustrated in example.



If datalogging is being used, the time and date is set from this clock. This may be important when viewing the logged data.

Note: CAL DUE is also set from this clock.

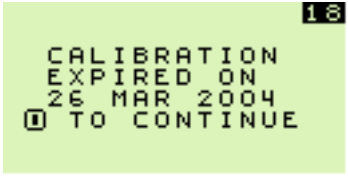
Calibration Due Date

The calibration due date appears on the display. *A configurable option is available not to display this screen.*

Note: 4-Gas display illustrated in example.

If the Calibration Due Date has expired, the audible and visual alarm activates and the following screen is displayed during warm-up:

Note: 4-Gas display illustrated in example.



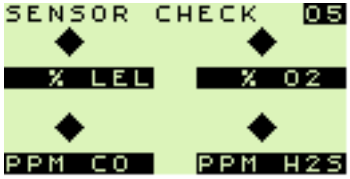
Press and hold the green (RH) button ⏻ once, to acknowledge the calibration due date is overdue, cancel the audible / visual alarm, and continue to the next display.

A configurable option is available not to display any of these screens, automatically proceed from the first screen or force manual switch off, as shown below.

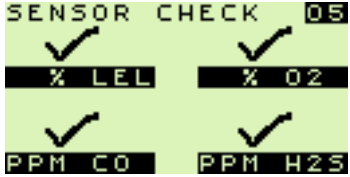
Note: 4-Gas display illustrated in example.

Sensor Confirmation Check (4-Gas version)

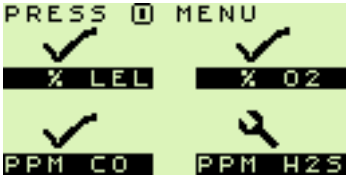
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



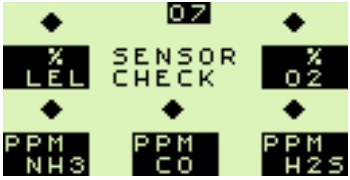
Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.



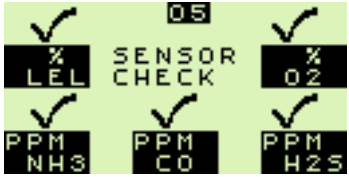
Press the green (RH) button (1) to display the Configuration Menu Screen.

Sensor Confirmation Check (5-Gas version)

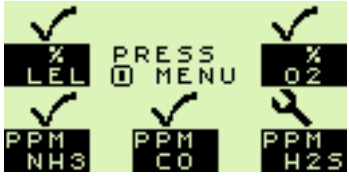
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.



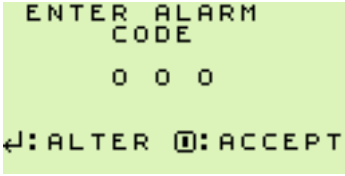
Press the green (RH) button ⓘ to display the Configuration Menu Screen.

Configuration Menu Screen

When warm-up is completed successfully, the screen light switches off and instrument automatically displays the configuration menu screen. The alphanumeric screen now acts as a prompt to help you through the set-up process. An example of this display follows:

To enter ALARMS menu, press the yellow (LH) button ↵ repeatedly until 'ALARMS' is highlighted.

When 'ALARMS' is highlighted, press the green (RH) button 1. The following display will request the Alarms code to be entered.

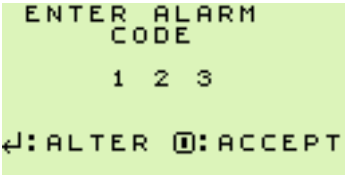


The factory-set default Alarm code is 123. This can only be changed by using GMI **V!SA** set-up software.

To enter the Alarm code, 123 in example, press the yellow (LH) button ↵ to alter the first 'flashing' digit. When the correct digit is displayed, as shown in the following image, press the green (RH) button ⓘ to accept.

Once accepted, the second digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct second digit is displayed, as shown below, press the green (RH) button ⓘ to accept.

Once accepted, the third digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct third digit is displayed, as shown in the following screen image, press the green (RH) button ⓘ to accept and enter the Alarm menu sequence.



ALARM SET-UP

Once the correct alarm code has been entered, the following menu is displayed:

There are three options in the alarm set-up menu:

1) LEVELS

   In this function, individual alarm setpoints can be adjusted or disabled. If an alarm is disabled it will appear in the 'Latching menu' and 'Mute menu' as disabled and cannot be changed unless an active setpoint is programmed in this section.

2) LATCHING

   In this function, individual alarms can be selected to be 'LATCH' or 'NONLATCH'. If 'Disabled' is set in the Levels menu it cannot be changed in this menu.

   Latch means when a gas alarm setpoint is exceeded, the audible and visual alarm will stay active until the gas value returns within the gas alarm setpoint and requires the user to PRESS and HOLD the green (RH) button  for approx one (1) second to clear.

   Non-latch means that when a gas alarm setpoint is exceeded, the audible and visual alarm will reset automatically when the gas value returns within the gas alarm setpoint.

3) MUTE

   This function allows certain alarms to be programmed, allowing the user to acknowledge a gas alarm and silence the AUDIBLE alarm for a period of 60 seconds. During this period the VISUAL alarm stays active during the presence of gas. After the 60 seconds has elapsed, the AUDIBLE alarm will sound again to alert the user the gas hazard still exists. If during the 'MUTE' period a different alarm occurs, the instrument will respond as normal, depending on the alarm configuration.

If ‘Disabled’ is set in the Levels menu, it cannot be changed in this menu.

Note: The following procedure and alarms tables show the GMI factory default settings. The instrument displays the current default settings. These settings can be altered as detailed in the following procedure.

GAS	LTEL	STEL	TYPICAL INSTANTANEOUS				
			Lo Lo	Lo	Hi	Hi Hi	Maximum Adjustment
0 to 100% Flammable LEL	None	None	None	None	Disabled	20	100
0 to 25% Oxygen(O_2)	None	None	19	Disabled	None	23	25
0 to 100 ppm Hydrogen Sulphide (H_2S)	5	10	None	None	Disabled	15	100
0 to 1000 ppm Carbon Monoxide (CO)	30	200	None	None	Disabled	300	500
0 to 30 ppm Sulphur Dioxide (SO_2)	1	1	None	None	Disabled	1	30
0 to 100 ppm Sulphur Dioxide (SO_2)	None	None	Disabled	Disabled	Disabled	25	100
0 to 10 ppm Chlorine (Cl_2)	0.5	1	None	None	Disabled	1.5	10
0 to 20 ppm Nitrogen Dioxide (NO_2)	5	5	None	None	Disabled	5	20
0 to 100 ppm Ammonia (NH_3)	25	35	None	None	Disabled	50	100
0 to 300 ppm Nitric Oxide (NO)	5	5	None	None	Disabled	5	300
0 to 5% Carbon Dioxide (CO_2)	0.5	1.5	None	None	Disabled	2.5	5
0 to 100 ppm Phosphine (PH_3)	None	None	None	None	20	40	100
0 to 100 ppm Volatile Organic Compounds (VOC)	Alarm Levels Set as per Contract Review						100

ALARM TYPE	LATCHING Y(es) or N(o)	MUTE Y(es) or N(o)	AUDIBLE INDICATION	VISUAL (RED LED) INDICATION
LEL 1 (Hi)	Disabled	Disabled	High Pitch Tone	All Slow Flashing
LEL 2 (Hi Hi)	Y	N	Continuous Warble	(2) Inner / Outer Siren Flash
O_2 1 (Hi Hi)	Y	N	Continuous Warble	(2) Inner / Outer Siren Flash
O_2 2 (Lo)	Disabled	Disabled	High Pitch Tone	All Slow Flashing
O_2 3 (Lo Lo)	Y	N	Continuous High Pitch Warble	(2) Inner / Outer Siren Flash
Toxic 1 / VOC (Hi)	Disabled	Disabled	High Pitch Tone	All Slow Flashing
Toxic 2 / VOC (Hi Hi)	Y	N	Continuous High Pitch Warble	(2) Inner / Outer Siren Flash
Toxic 3 / VOC (STEL)	Y	N	Continuous High Pitch Warble	(2) Inner / Outer Siren Flash
Toxic 4 / VOC (LTEL / TWA)	Y	N	Continuous High Pitch Warble	(2) Inner / Outer Siren Flash
Low Battery Fault	N / A	N / A	Low Pitch Tone	All Slow Flashing
Zero Fault	N / A	N / A	Low Pitch Tone	All Slow Flashing
Sensor Fault	N / A	N / A	Low Pitch Tone	All Slow Flashing
Sample Fault (Pumped Instr. Only)	N / A	N / A	Low Pitch Tone	All Slow Flashing
Low Flow (Pumped Instr. Only)	N / A	N / A	Low Pitch Tone	All Flashing
Calibration Required	N / A	N / A	Low Pitch Tone	All Slow Flashing
Calibration Expired	N / A	N / A	Low Pitch Tone	All Slow Flashing
Over Range (LEL)	Y	N / A	Continuous Wail	All Fast Flashing

N / A = Not Applicable

LEVELS

To enter LEVELS option, if 'LEVELS' is not highlighted in the display as shown below, press the yellow (LH) button ↵ repeatedly to scroll through options until 'LEVELS' is highlighted.

When 'LEVELS' is highlighted, press the green (RH) button ⓘ to display the alarm level for the first gas sensor.

The alarm levels, for each sensor, are displayed similar to the layout of the sensors located in the instrument, i.e. in a clockwise direction from top left position (behind sensor grille).

This example details a common 4 gas configuration, using Flammable LEL, Oxygen, Hydrogen Sulphide and Carbon Monoxide sensors.

LEL Alarms

The LEL sensor alarm setpoints are displayed, as follows:

The highlighted ‘HiHi’ alarm setpoint may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the alarm value in steps of 1%. Pressing and holding the button will cause the reading to increase rapidly.

When the desired alarm setpoint for the highlighted alarm is shown on the display, a short press the green (RH) button ⓘ will accept the alarm setpoint and step to the next LEL alarm.

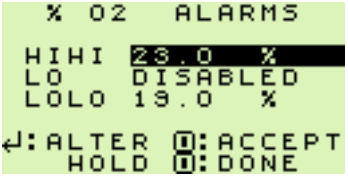
The display will now highlight the ‘Hi’ alarm setpoint.

If required, the ‘Hi’ alarm setpoint can be altered as before.

When complete, or at anytime during this procedure, press and hold the green (RH) button ⓘ to accept the (LEL) alarm setpoints then step to the next sensor.

Oxygen Alarms

The Oxygen (O_2) sensor alarm setpoints are displayed, as follows:



The highlighted ‘HiHi’ alarm setpoint may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the alarm value in steps of 0.1%. Pressing and holding the button will cause the reading to increase rapidly.

When the desired alarm setpoint for the highlighted alarm is shown on the display, a short press of the green (RH) button ⓘ will accept the alarm setpoint and step to the next oxygen alarm.

The display will now highlight the 'Lo' alarm set point.

If required, the 'Lo' alarm setpoint can be altered using the same procedure as before.

The 'LoLo' alarm is then highlighted and can also be altered using the same procedure as before.

When complete, or at anytime during editing procedure, press and hold the green (RH) button ⓘ to accept the (O_2) alarm setpoints then step to the next sensor.

Toxic Gas Alarms

The Hydrogen Sulphide (H_2S) sensor alarm setpoints are displayed, as follows:

The highlighted 'HiHi' alarm setpoint may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the alarm value in steps of 1ppm. Pressing and holding the button will cause the reading to increase rapidly.

When the desired alarm setpoint for the highlighted alarm is shown on the display, a short press of the green (RH) button ⓘ will accept the alarm setpoint and step to the next H_2S alarm.

The display will now highlight the 'Hi' alarm setpoint.

If required, the 'Hi' alarm set point can be altered using the same procedure as before.

The 'STEL' alarm is then highlighted and can also be altered using the same procedure as before.

The 'LTEL' alarm is then highlighted and can also be altered using the same procedure as before.

When complete, or at anytime during editing procedure, press and hold the green (RH) button ⓘ to accept the (H_2S) alarm setpoints then step to the next sensor.

The Carbon Monoxide (CO) sensor alarm setpoints are displayed, as follows:

The highlighted 'HiHi' alarm setpoint may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the alarm value in steps of 1ppm. Pressing and holding the button will cause the reading to increase rapidly.

When the desired alarm setpoint for the highlighted alarm is shown on the display, press the green (RH) button  to accept the alarm setpoint.

The display will now highlight the 'Hi' alarm setpoint.

If required, the 'Hi' alarm setpoint can be altered using the same procedure as before.

The 'STEL' alarm is then highlighted and can also be altered using the same procedure as before.

The 'LTEL' alarm is then highlighted and can also be altered using the same procedure as before.

When complete, or at anytime during editing procedure, press and hold the green (RH) button  to accept the (CO) alarm setpoints and return to the alarm setup menu.

Note: A Time Weighted Average (TWA) value is the mean average gas level over a specific period. The Short Term Exposure Limit (STEL) is 15 minutes and Long Term Exposure Limit (LTEL) is 8 hours. In accordance with UK legislation, this requires the time weighted averages to be averaged over a full 24 hour period whether the instrument is On or Off. Such averaging essentially makes the instrument 'Single User' application. *The option is available to restart the averaging after each instrument switch-off, thus allowing for 'Multiple User' application.*

LATCHING

Latch means that when a gas alarm setpoint is exceeded, the audible and visual alarm will stay active until the gas value returns within the gas alarm setpoint and also requires a press and hold (for approx. 1 second) of the green (RH) button ⓘ.

Non-latch means that when a gas alarm limit is exceeded, the audible and visual alarm will reset automatically when the gas value returns within the gas alarm limit.

To enter LATCHING option from the alarm setup menu, if 'LATCHING' is not highlighted in the display as shown below, press the yellow (LH) button ↵ repeatedly to scroll through options until 'LATCHING' is highlighted.

When 'LATCHING' is highlighted, press the green (RH) button ⓘ to display the latching options for the first gas sensor.

The latching options, for each sensor, are displayed similar to the layout of the sensors located in the instrument, i.e. in a clockwise direction from top left position (behind sensor grille).

This example details a common 4 gas configuration, using Flammable LEL, Oxygen, Hydrogen Sulphide and Carbon Monoxide sensors.

LEL Latching Alarms

The LEL Latching options, for each alarm type, are displayed as follows:

Note: When an alarm type is set to DISABLED the latching setting is not applicable, therefore the display shows alarm type followed by DISABLED. This can only be edited in the alarm levels menu.

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

To change the highlighted setting, press the yellow (LH) button ↵.

Once the required settings are displayed, for all (LEL) alarm types, press and hold the green (RH) button ⓘ to accept the settings then step to the next sensor.

Oxygen Latching Alarms

The Oxygen (O_2) Latching options, for each alarm type, are displayed as follows:

Note: When an alarm type is set to DISABLED the latching setting is not applicable, therefore the display shows alarm type followed by DISABLED. This can only be edited in the alarm levels menu.

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

To change the highlighted setting, press the yellow (LH) button ↵.

Once the required settings are displayed, for all (O_2) alarm types, press and hold the green (RH) button ⓘ to accept the settings then step to the next sensor.

Hydrogen Sulphide Latching Alarms

The Hydrogen Sulphide (H_2S) Latching options, for each alarm type, are displayed as follows:

Note: When an alarm type is set to DISABLED the latching setting is not applicable, therefore the display shows alarm type followed by DISABLED as shown in example. This can only be edited in the alarm levels menu.

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

To change the highlighted setting, press the yellow (LH) button ↵.

Once the required settings are displayed, for all (H_2S) alarm types, press and hold the green (RH) button ⓘ to accept the settings then step to the next sensor.

Carbon Monoxide Latching Alarms

The Carbon Monoxide (CO) Latching options, for each alarm type, are displayed as follows:

Note: When an alarm type is set to DISABLED the latching setting is not applicable, therefore the display shows alarm type followed by DISABLED as shown in example. This can only be edited in the alarm levels menu.

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

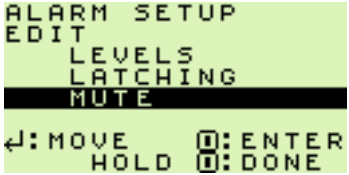
To change the highlighted setting, press the yellow (LH) button ↵.

Once the required settings are displayed, for all (CO) alarm types, press and hold the green (RH) button ⓘ to accept the settings and return to the alarm setup menu.

MUTE

This function allows individual alarms to be programmed, allowing the user to acknowledge a gas alarm and silence the AUDIBLE alarm for a period of 60 seconds. During this period, the VISUAL alarm stays active during the presence of gas. After the 60 second period has elapsed, the AUDIBLE alarm will sound again to alert the user that the gas hazard still exists.

To enter MUTE option from the alarm setup menu, if 'MUTE' is not highlighted in the display as shown below, press the yellow (LH) button ↵ repeatedly to scroll through options until 'MUTE' is highlighted.



When 'MUTE' is highlighted, press the green (RH) button ⓘ to display the muting options for the first gas sensor.

The muting options, for each sensor, are displayed similar to the layout of the sensors located in the instrument, i.e. in a clockwise direction from top left position (behind sensor grille).

This procedure details a common 4 gas configuration, using Flammable LEL, Oxygen, Hydrogen Sulphide and Carbon Monoxide sensors.

LEL Mute Alarms

The LEL mute options, for each alarm type, are displayed as follows:

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

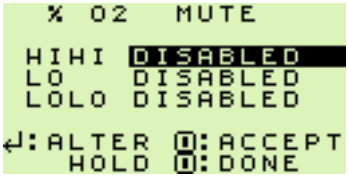
To change the highlighted setting, press the yellow (LH) button ↵.

Note: When an alarm setpoint is DISABLED in the alarm levels menu, the mute setting cannot be altered.

Once the required settings are displayed, for both (LEL) alarm types, press and hold the green (RH) button ⓘ to accept the settings then step to the next sensor.

Oxygen Mute Alarms

The Oxygen (O_2) mute options, for each alarm type, are displayed as follows:



To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

To change the highlighted setting, press the yellow (LH) button ↵.

Note: When an alarm setpoint is DISABLED in the alarm levels menu, the mute setting cannot be altered.

Once the required settings are displayed, for all (O_2) alarm types, press and hold the green (RH) button ⓘ to accept the settings then step to the next sensor.

Hydrogen Sulphide Mute Alarms

The Hydrogen Sulphide (H_2S) mute options, for each alarm type, are displayed as follows:

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

To change the highlighted setting, press the yellow (LH) button ↵.

Note: When an alarm setpoint is DISABLED in the alarm levels menu, the mute setting cannot be altered.

Once the required settings are displayed for all (H_2S) alarm types, press and hold the green (RH) button ⓘ to accept the settings then step to the next sensor.

Carbon Monoxide Mute Alarms

The Carbon Monoxide (CO) mute options, for each alarm type, are displayed as follows:

To accept the highlighted setting then move to the next alarm type, press the green (RH) button ⓘ.

To change the highlighted setting, press the yellow (LH) button ↵.

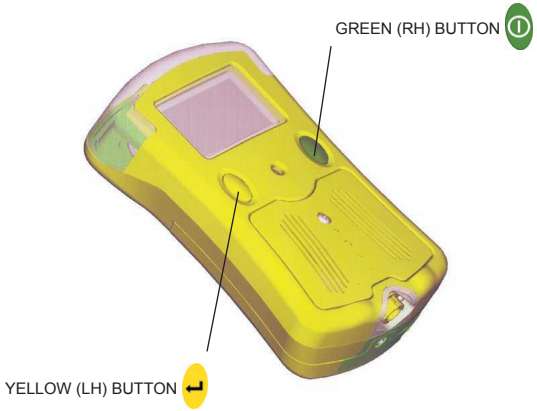
Note: When an alarm setpoint is DISABLED in the alarm levels menu, the mute setting cannot be altered.

Once the required settings are displayed for all (CO) alarm types, press and hold the green (RH) button ⓘ to accept the settings and return to the alarm setup menu.

Press the green (RH) button again to return to the configuration menu, as shown:

3

CONFIGURATION OPTIONS



Various configurable options are available to customise the instrument to the user's individual requirements. Some of the more common configurable options are as follows:

SET-UP OPTIONS

Set-up OPTIONS allows the user to easily configure the instrument to their personal needs, or their company's safety rules, without the use of additional equipment such as PCs or tools.

This can also be done by using GMI PC software. To ensure safe and proper function of these life-saving instruments, we recommend only competent personnel access these set up functions.

SWITCHING THE INSTRUMENT ON

Press and hold the green Right Hand (RH) button ⏻ to switch the instrument On.

Immediately following the **V!SA** screen display and while the instrument identification screen is displayed, as shown in the following paragraph, press the following buttons in sequence:

Yellow Left Hand (LH) button ↵,

Green (RH) button ⏻,

Yellow (LH) button ↵,

Green (RH) button ⏻.

The instrument begins its warm-up routine, which last 30 seconds. During the warm-up, a countdown timer appears in the top (RH) corner of the 4-Gas display, or top centre of the 5-Gas display.

If the correct button sequence is accepted, the countdown timer alternates with 'M' (Menu) symbol.

Note: The display backlight illuminates and remains on during warm-up. When warm-up is completed, the screen light automatically switches off.

Instrument Identification

During warm-up, the instrument display identifies the model, serial number, software version, datalogging (if instrument is a datalogging version) and battery status information as shown below:

Note: 4-Gas version illustrated in example.

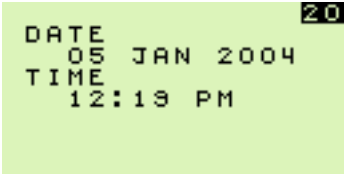
Battery Status

Provides the user with the Battery charge level, as shown in previous display. This will be indicated by a battery symbol with a bar graph showing FULL, 75%, 50% and 25%, which is shown for approximately five (5) seconds during warm up, then on the top of the display during normal operation.

Time and Date

The time and date from the instrument's built-in clock is displayed on the screen during warm-up.

Note: 4-Gas display illustrated in example.



If datalogging is being used, the time and date is set from this clock. This may be important when viewing the logged data.

Note: CAL DUE is also set from this clock.

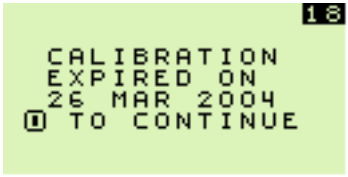
Calibration Due Date

The calibration due date appears on the display. *A configurable option is available not to display this screen.*

Note: 4-Gas display illustrated in example.

If the Calibration Due Date has expired, the audible and visual alarm activates and the following screen is displayed during warm-up:

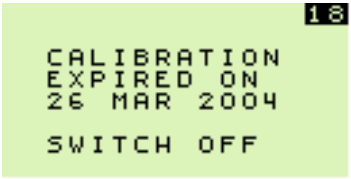
Note: 4-Gas display illustrated in example.



Press and hold the green (RH) button once, to acknowledge the calibration due date is overdue, cancel the audible / visual alarm, and continue to the next display.

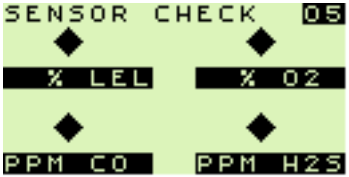
A configurable option is available not to display any of these screens, automatically proceed from the first screen or force manual switch off, as shown below.

Note: 4-Gas display illustrated in example.

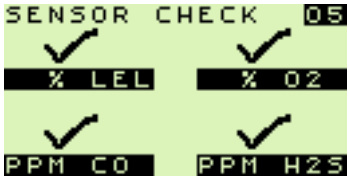


Sensor Confirmation Check (4-Gas version)

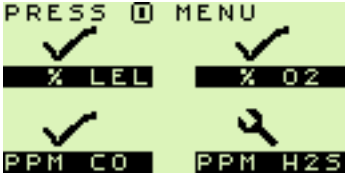
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



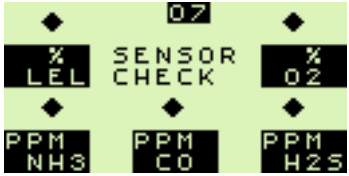
Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.



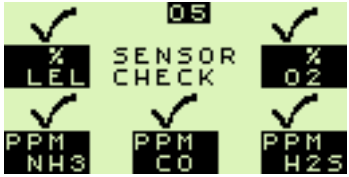
Press the green (RH) button to display the Configuration Menu Screen.

Sensor Confirmation Check (5-Gas version)

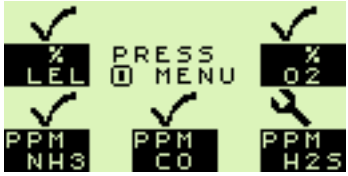
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.

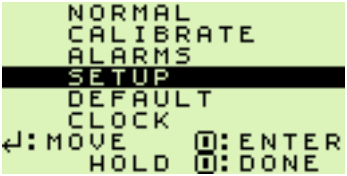


Press the green (RH) button to display the Configuration Menu Screen.

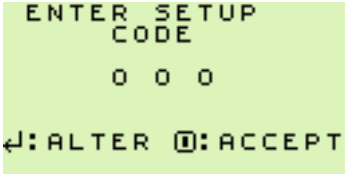
Configuration Menu Screen

When warm-up is completed successfully, the screen light switches off and instrument automatically displays the configuration menu screen. The alphanumeric screen now acts as a prompt to help you through the set-up process. An example of this display is shown below:

To enter SETUP menu, press the yellow (LH) button ↵ repeatedly until 'SETUP' is highlighted.

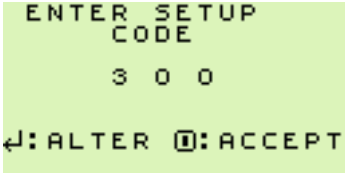


When 'SETUP' is highlighted, press the green (RH) button ⓘ. The following display will request the Setup code to be entered.

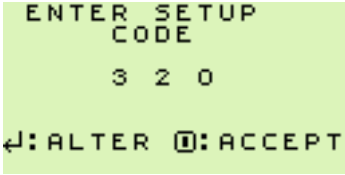


The default code, from the factory, for the Setup menu is 321. This can only be changed by using GMI **VISA** set-up software.

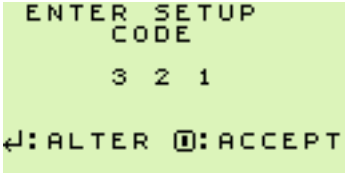
To enter the Setup code, 321 in example, press the yellow (LH) button ↵ to alter the first 'flashing' digit. When the correct digit is displayed, as shown in the following image, press the green (RH) button ⓘ to accept.



Once accepted, the second digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct second digit is displayed, as shown in the following screen, press the green (RH) button ⓘ to accept.



Once accepted, the third digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct third digit is displayed, as shown below, press the green (RH) button ⓘ to accept and enter the Setup options sequence.



Once the correct Setup code has been entered, the following options are displayed:

1. SAMPLE MODE

This function is used to allow the user to select suitable sample mode for the instrument.

If the instrument is supplied with a pump, or If a pump is retrofitted into an existing instrument, the highlighted default setting should be 'PUMPED', as shown in the following display.

In use, the (RH) button ⓘ will switch the pump ON for remote sampling and OFF for personal diffusion sampling.

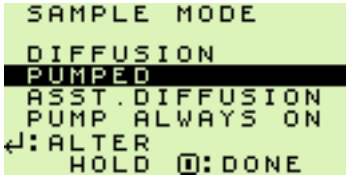
If the instrument is to be used for 'diffusion' sampling reactive gases using the instrument pump at low speed, the sample mode should be set to 'ASSISTED DIFFUSION'.

In use, the (RH) button ⓘ will switch the pump from low speed for personal sampling to high speed for remote sampling.

If the instrument is supplied without a pump or is to be used for sampling with the hand aspirator or without the use of a pump, 'DIFFUSION' mode should be selected.

Note: We strongly recommend that pumped instruments, configured with reactive gases, use assisted diffusion mode in preference to diffusion mode.

An option of 'PUMP ALWAYS ON' is also available.



To accept the highlighted option, press and hold the green (RH) button ⓘ and the display will step on to the next Setup option display.

To alter the highlighted option, press the yellow (LH) button ↵ to change the option. Once required sample mode is highlighted, press and hold the green (RH) button ⓘ to accept the option, then move to next Setup option display.

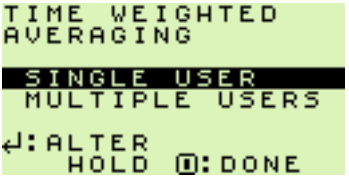
2. TIME WEIGHTED AVERAGING

A Time Weighted Average (TWA) value is the mean average gas level over a specific period. The Short Term Exposure Limit (STEL) is 15 minutes and Long Term Exposure Limit (LTEL) is 8 hours. In accordance with UK legislation, this requires the time weighted averages to be averaged over a full 24 hour period whether the instrument is On or Off. Such averaging essentially makes the instrument 'Single User' application.

The option is available to restart the averaging after each instrument switch-off, thus allowing for 'Multiple User' application.

This function allows the user to programme the TWA alarms for a single user or multiple users. Single User means the TWA alarm value is the mean value for the LTEL (8 hours exposure) and is calculated over a 24 hour period without resetting the value.

Multiple users means the TWA value will be reset to zero (0) after the end of each setting, i.e. at switch-off, the TWA alarm will be reset.



To accept the highlighted option, press and hold the green (RH) button 1 and the display will step on to the next Setup option display.

To alter the highlighted option to 'MULTIPLE USERS', press the yellow (LH) button ↵ to change the option. Once 'MULTIPLE USERS' is highlighted, press and hold the green (RH) button ⏻ to accept the option, then move to next Setup option display.

3. FLAMMABLE CALIBRATION

This function allows the user to set the calibration for different flammable gases.

To obtain best results from this, the instrument should be recalibrated using the selected flammable gas. However, when this is not available, the flammable calibration is reset to a named flammable gas and will give readings with an accuracy of ± 20% without re-calibration of the other gases.

To accept the highlighted option, 'METHANE', press and hold the green (RH) button ⏻ and the display will step on to the next Setup option display.

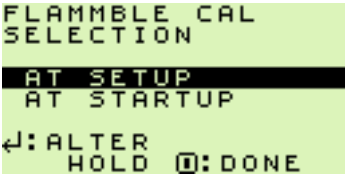
To alter the highlighted option to 'BUTANE', 'PROPANE', 'PENTANE', ETHANOL', 'HYDROGEN' or 'TOLUENE', press the yellow (LH) button ↵ repeatedly to scroll through the options until required option is highlighted.

Once required option is highlighted, press and hold the green (RH) button ⓘ to accept the option, then move to next Setup option display.

4. FLAMMABLE CALIBRATION SELECTION

This feature allows the user to change the flammable gas calibration while highlighting the calibration gas.

The user can quickly select an alternative calibration factor to be applied if the instrument is to be used for protection for a different gas, or it allows this feature only to be used by an operator who is familiar with the set up and configuration of the instrument.



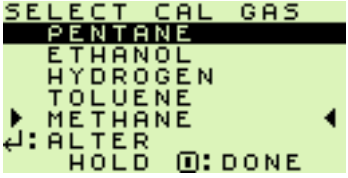
To accept the highlighted option, press and hold the green (RH) button ⓘ and the display will step on to the next Setup option display.

To alter the highlighted option to 'AT STARTUP', press the yellow (LH) button ↵ to change the option. Once 'AT STARTUP' is highlighted, press and hold the green (RH) button ⓘ to accept the option, then move to next Setup option display.

If 'AT STARTUP' option is selected, the instrument will pause during the warm-up routine and await user intervention to select which flammable gas the instrument will be set for.

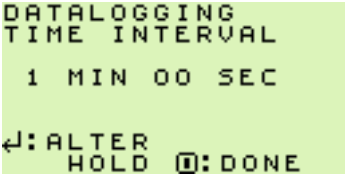
Please note, if this is different from the calibration gas the accuracy of the reading will be ± 20%. The screen will display one gas with two (2) adjacent arrow symbols indicating the calibrated gas.

A different gas type can be selected, but the arrow symbols remain on the calibrated gas, as shown below:



5. DATALOGGING TIME INTERVAL

If the GMI **V!SA** has the datalogging option build in when ordering, this function allows the user to set the time interval for each log to be stored in the Session log. The time is adjustable in steps, as detailed below, from one (1) second to ten (10) minutes.



SECONDS: 1 sec, 2 sec, 5 sec, 10 sec, 20 sec, 30 sec.

MINUTES: 1 min to 10 min. (in 1 min steps).

To accept the highlighted value, press and hold the green (RH) button ⓘ and the display will step on to the next option.

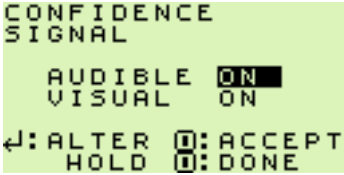
To alter the highlighted value, press the yellow (LH) button ↵ repeatedly to step through the above values.

Once the correct value is displayed, press and hold the green (RH) button ⓘ to accept the value, then move to next Setup option display.

6. CONFIDENCE SIGNAL

This function allows the user to select a visual and/or audible confidence signal.

During normal operation the confidence signal, if selected, will sound or flash green every 15 seconds to let the user know the instrument is still functioning correctly and is providing the necessary user protection.



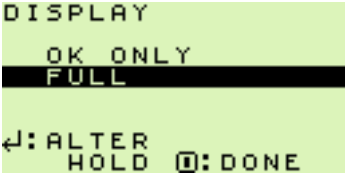
To accept the highlighted option, press and hold the green (RH) button ⏻ and the display will step on to the next option.

To alter the highlighted option to 'OFF', press the yellow (LH) button ↵ to change the option. Once 'OFF' is highlighted, a short press of the green (RH) button ⏻ to accept the option, then move to next option.

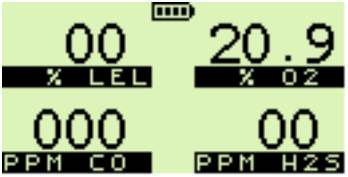
When complete press and hold the green (RH) button ⏻ to accept the Visual option, then move to next Setup option display.

7. DISPLAY OPTION

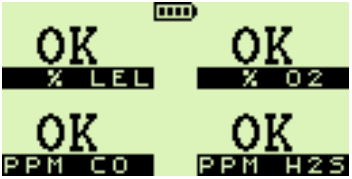
This function allows the user to select display type.



A 'FULL' display (4-Gas version, Example 1) shows all gas values continuously. Alternatively, 'OK ONLY' (4-Gas version, Example 2) displays OK instead of the gas readings until an alarm occurs when the OK will change to show alarm type, i.e. Hi, HiHi, Lo, etc. This display is sometimes called Go / No-Go display.



Example 1



Example 2

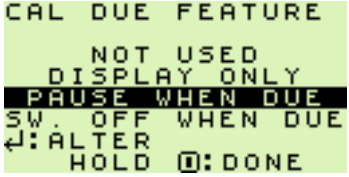
To accept the highlighted option, press and hold the green (RH) button ⏻ and the display will step on to the next Setup option display.

To alter the highlighted option to 'OK', press the yellow (LH) button ↵ to change the option. Once 'OK' is highlighted, press and hold the green (RH) button ⏻ to accept the option, then move to next Setup option display.

8. CALIBRATION DUE FEATURE

This function allows the user to set a number of options for action to be taken when the calibration expires on the instrument.

The instrument can remind the user when the calibration has expired. When this function is switched on, the calibration due date is shown when the instrument is switched on, during the warm-up routine.



The options are as follows.

NOT USED:	*The instrument starts without showing any calibration due information.*
DISPLAY ONLY:	*During warm up the instrument display shows the calibration due date for 10 seconds.*
PAUSE WHEN DUE:	*If the instrument has reached the date or passed the date when the next calibration is due, the warm-up routine will pause at the display of calibration due date. The visual alarm will flash red and the audible alarm will sound once each second, and show Calibration overdue prompting the user to press the green (RH) button*  *to continue.* *The instrument will operate using its previous calibration settings, however, as the sensors response may have diminished, the instrument should be recalibrated and tested.*
SW OFF WHEN DUE:	*If the instrument has passed the date when the next calibration is due, the warm-up routine will pause at the display of calibration due date and show 'Switch Off'. The instrument must be switched off and returned to an approved Service / Repair facility.*

To accept the highlighted option, 'PAUSE WHEN DUE', press and hold the green (RH) button  and the display will step on to the next Setup option display.

To alter the highlighted option, press the yellow (LH) button  repeatedly to scroll through the options until required option is highlighted.

Once required option is highlighted, press and hold the green (RH) button  to accept the option, then move to next Setup option display.

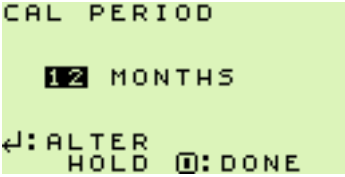
9. CALIBRATION PERIOD

Calibration validity is the responsibility of the user. Under normal operating conditions, a 12 month period can be expected. This is no guarantee however as the precise application of the product is unknown to GMI. Individual codes of practice may dictate shorter periods.

Regular checking establishes a pattern of reliability and enables the calibration check period to be modified in line with operational experience. The higher the risk, the more frequently calibration should be checked.

This function allows the user to determine the frequency between each calibration.

The frequency is adjustable in 1 month steps, from one (1) month to 24 months.



To accept the highlighted value, press and hold the green (RH) button ⓘ and the display will step on to the next Setup option display.

To alter the highlighted value, press the yellow (LH) button ↵ repeatedly to step through the values. The value will increase up to 24 months, then roll over to 1 month.

Once required value is highlighted, press and hold the green (RH) button ⓘ to accept the value, then move to next Setup option display.

10. ZERO FAULT ACTION

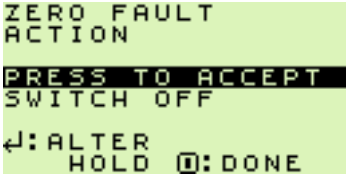
This function allows the user to decide what action should be taken if the instrument detects a zero fault in one or more sensors during start-up.

If a fault is detected, the visual alarm will flash red and the audible alarm will sound once each second. The display will prompt the user on what action should be taken.

The options are as follows:

a) 'PRESS TO ACCEPT' and continue the start-up routine. This will allow the instrument to be used, even though the faulty sensor may not be operating within its tolerance

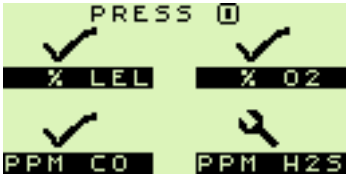
b) 'SWITCH OFF' which will pause the start-up routine and prompt the user to switch off the instrument.



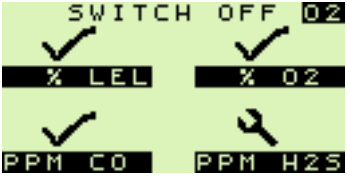
To accept the highlighted option, press and hold the green (RH) button ⓘ and the display will step on to the next Setup option display.

To alter the highlighted option, press the yellow (LH) button ↵ to change the option. Once 'SWITCH OFF' is highlighted, press and hold the green (RH) button ⓘ to accept the option, then move to next Setup option display.

Example (a) below, shows a 4-Gas start-up routine, paused with a 'Press to Accept'' option

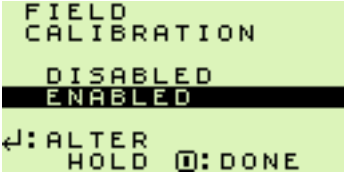


Example (b) below, shows a 4-Gas start-up routine, paused with a ‘Switch Off’’ option



11. FIELD CALIBRATION

This function allows the user to select, if the instrument has ‘Field Calibration’, the ability to perform calibration on the instrument using the push buttons ‘Enabled’ or ‘Disabled’.

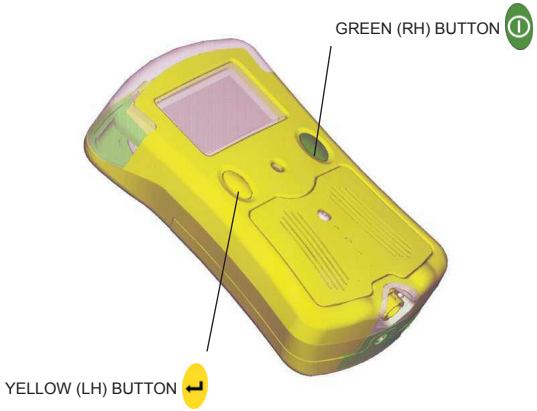


To accept the highlighted option, press and hold the green (RH) button ⓘ and the display will accept the option, then return to the Setup MENU display.

To alter the highlighted option, press the yellow (LH) button ↵ to change the option. Once ‘DISABLED’ is highlighted,

press and hold the green (RH) button ⏻ to accept the option then return to the configuration menu as shown:

SET DEFAULTS



This function will re-set the entire instrument to the factory default settings. If this function is selected, and once the correct default setting code has been entered / accepted, the display will normally show the NO option for re-setting to factory defaults. Care should be taken to only select the YES option if absolutely necessary. It is also important to check that all alarm values and configuration is set as per your company, or application, requirements. The factory defaults will set the instrument to alarm as per UK EH40 limits and work in standard set up.

It should also be noted that the instrument must be re-calibrated following the re-setting to factory defaults.

Note: This following procedure shows the GMI factory default settings. When each instrument setup option screen is displayed, the current instrument default setting is highlighted. These settings can be altered as detailed in the following procedure.

SET DEFAULT OPTIONS

Set default allows the user to easily set the instrument to the factory default settings.

SWITCHING THE INSTRUMENT ON

Press and hold the green Right Hand (RH) button ⏻ to switch the instrument On.

Immediately following the **V!SA** screen display and while the instrument identification screen is displayed, as shown in the following paragraph, press the following buttons in sequence:

Yellow Left Hand (LH) button ↵,

Green (RH) button ⏻,

Yellow (LH) button ↵,

Green (RH) button ⏻.

The instrument begins its warm-up routine, which last 30 seconds. During the warm-up, a countdown timer appears in the top (RH) corner of the 4-Gas display, or top centre of the 5-Gas display.

If the correct button sequence is accepted, the countdown timer alternates with 'M' (Menu) symbol.

Note: The display backlight illuminates and remains on during warm-up. When warm-up is completed, the screen light automatically switches off.

Instrument Identification

During warm-up, the instrument display identifies the model, serial number, software version, datalogging (if instrument is a datalogging version) and battery status information as shown below:

Note: 4-Gas version illustrated in example.

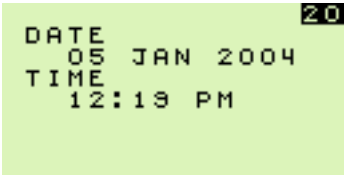
Battery Status

Provides the user with the Battery charge level, as shown in previous display. This will be indicated by a battery symbol with a bar graph showing FULL, 75%, 50% and 25%, which is shown for approximately five (5) seconds during warm up, then on the top of the display during normal operation.

Time and Date

The time and date from the instrument's built-in clock is displayed on the screen during warm-up.

Note: 4-Gas display illustrated in example.



If datalogging is being used, the time and date is set from this clock. This may be important when viewing the logged data.

Note: CAL DUE is also set from this clock.

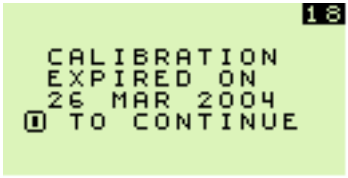
Calibration Due Date

The calibration due date appears on the display. *A configurable option is available not to display this screen.*

Note: 4-Gas display illustrated in example.

If the Calibration Due Date has expired, the audible and visual alarm activates and the following screen is displayed during warm-up:

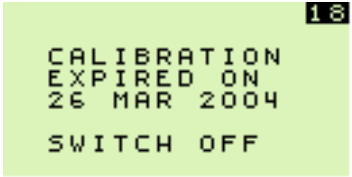
Note: 4-Gas display illustrated in example.



Press and hold the green (RH) button ① once, to acknowledge the calibration due date is overdue, cancel the audible / visual alarm, and continue to the next display.

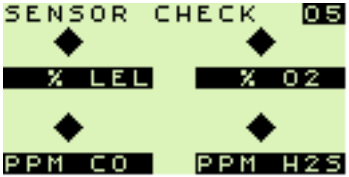
A configurable option is available not to display any of these screens, automatically proceed from the first screen or force manual switch off, as shown below.

Note: 4-Gas display illustrated in example.

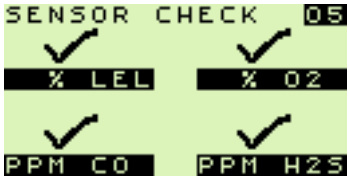


Sensor Confirmation Check (4-Gas version)

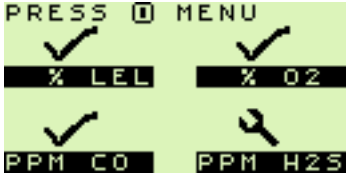
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



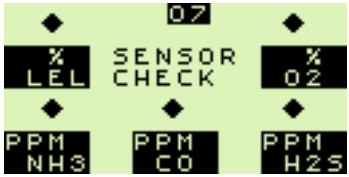
Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.



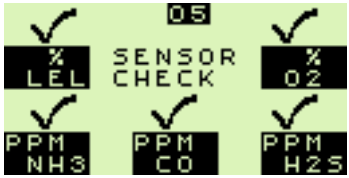
Press the green (RH) button to display the Configuration Menu Screen.

Sensor Confirmation Check (5-Gas version)

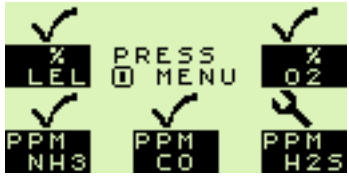
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.



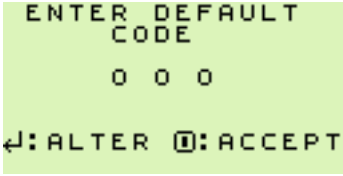
Press the green (RH) button ⓘ to display the Configuration Menu Screen.

Configuration Menu Screen

When warm-up is completed successfully, the screen light switches off and instrument automatically displays the configuration menu screen. The alphanumeric screen now acts as a prompt to help you through the set-up process. An example of this display is shown below:

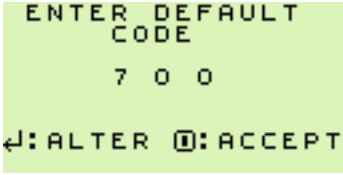
To enter DEFAULT menu, press the yellow (LH) button ↵ repeatedly until 'DEFAULT' is highlighted.

When 'DEFAULT' is highlighted, press the green (RH) button ⓘ. The following display will request the Default code to be entered.

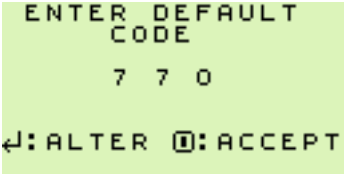


The default code, from the factory, for the Default menu is 777. This can only be changed by using GMI **V!SA** set-up software.

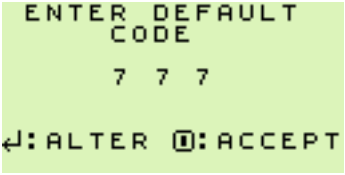
To enter the Default code, 777 in example, press the yellow (LH) button ↵ to alter the first 'flashing' digit. When the correct digit is displayed, as shown in the following image, press the green (RH) button ⓘ to accept.



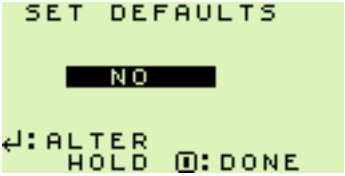
Once accepted, the second digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct second digit is displayed, as shown in the following screen, press the green (RH) button ⓘ to accept.



Once accepted, the third digit will flash. Press the yellow (LH) button ↵ to alter as before. Once the correct third digit is displayed, as shown below, press the green (RH) button ① to accept and enter the Default option sequence.



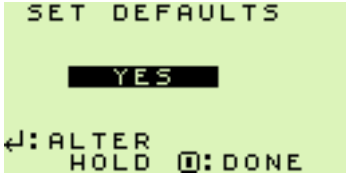
Once the correct Default code has been entered, the following screen is displayed:
Normally the display will show NO.



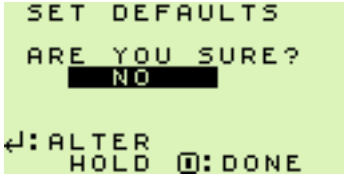
To accept the displayed option press and hold the green

(RH) button ⓘ and the display will return to the configuration menu screen.

To set default, press the yellow (LH) button ↵ while the previous screen is displayed. This action will change the option, as shown in the following display:



To accept the factory-set defaults option, press and hold the green (RH) button ⓘ. The following screen will request confirmation of this option.



If you are sure that the factory-set defaults option is required, press the yellow (LH) button ↵ to change the action to YES, then press and hold the green (RH) button ⓘ to confirm. The display will then return to the

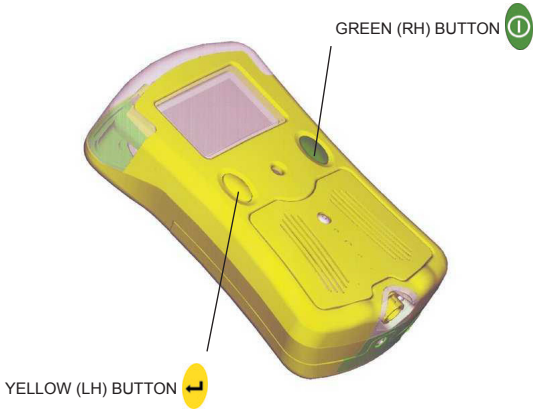
configuration menu as shown below:

If the defaults have been re-set, it is important that the instrument is now re-calibrated.

Refer to Chapter 1 'FIELD CALIBRATION'.

5

CLOCK CONFIGURATION



Clock Configuration allows simple set-up of the Clock to be carried out without the use of additional equipment such as PCs or tools. The instrument must be switched on in Menu Mode, as detailed in the following procedure.

For any other configuration, refer to manual or use only GMI software to ensure safe and proper function of these life-saving instruments.

SWITCHING THE INSTRUMENT ON

Press and hold the green Right Hand (RH) button to switch the instrument On.

Immediately following the **V!SA** screen display and while the instrument identification screen is displayed, as shown in the following paragraph, press the following buttons in sequence:

Yellow Left Hand (LH) button ↵,

Green (RH) button ⏻,

Yellow (LH) button ↵,

Green (RH) button ⏻.

The instrument begins its warm-up routine, which last 30 seconds. During the warm-up, a countdown timer appears in the top (RH) corner of the 4-Gas display, or top centre of the 5-Gas display.

If the correct button sequence is accepted, the countdown timer alternates with ‘M’ (Menu) symbol.

Note: The display backlight illuminates and remains on during warm-up. When warm-up is completed, the screen light automatically switches off.

Instrument Identification

During warm-up, the instrument display identifies the model, serial number, software version, datalogging (if instrument is a datalogging version) and battery status information as shown below:

Note: 4-Gas version illustrated in example.

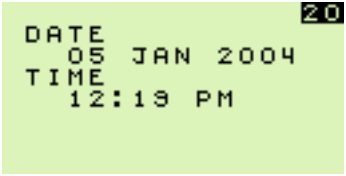
Battery Status

Provides the user with the Battery charge level, as shown in previous display. This will be indicated by a battery symbol with a bar graph showing FULL, 75%, 50% and 25%, which is shown for approximately five (5) seconds during warm up, then on the top of the display during normal operation.

Time and Date

The time and date from the instrument's built-in clock is displayed on the screen during warm-up.

Note: 4-Gas display illustrated in example.



If datalogging is being used, the time and date is set from this clock. This may be important when viewing the logged data.

Note: CAL DUE is also set from this clock.

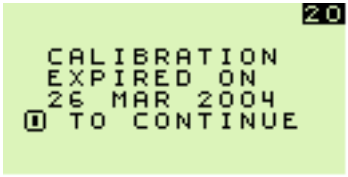
Calibration Due Date

The calibration due date appears on the display. *A configurable option is available not to display this screen.*

Note: 4-Gas display illustrated in example.

If the Calibration Due Date has expired, the audible and visual alarm activates and the following screen is displayed during warm-up:

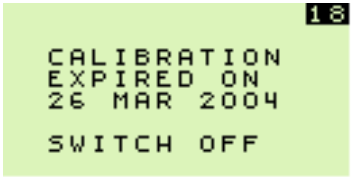
Note: 4-Gas display illustrated in example.



Press and hold the green (RH) button ① once, to acknowledge the calibration due date is overdue, cancel the audible / visual alarm, and continue to the next display.

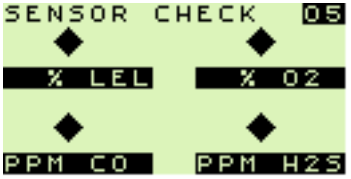
A configurable option is available not to display any of these screens, automatically proceed from the first screen or force manual switch off, as shown below.

Note: 4-Gas display illustrated in example.

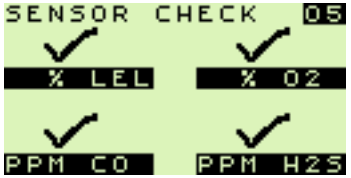


Sensor Confirmation Check (4-Gas version)

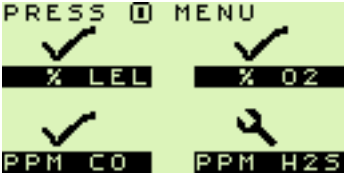
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



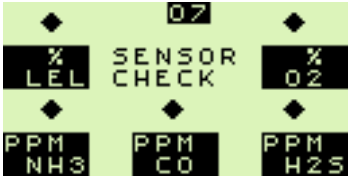
Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.



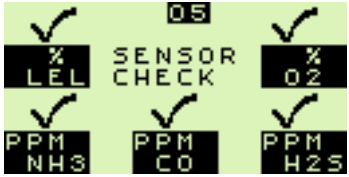
Press the green (RH) button ① to display the Configuration Menu Screen.

Sensor Confirmation Check (5-Gas version)

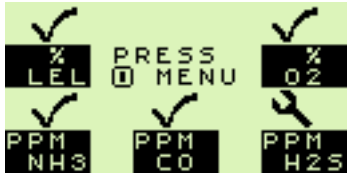
The symbol ◆ appears above each sensor type to confirm that the sensor has been recognised, is working correctly, and is being zeroed. When sensors are zeroed correctly, a symbol ✔ appears above each sensor.



followed by



Note: If a sensor fault or sensor calibration error is detected, the following screen is displayed.

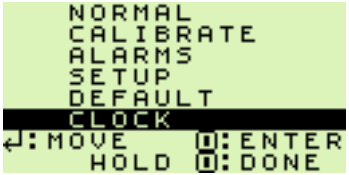


Press the green (RH) button ⓘ to display the Configuration Menu Screen.

Configuration Menu Screen

When warm-up is completed successfully, the screen light switches off and instrument automatically displays the configuration menu screen. The alphanumeric screen now acts as a prompt to help you through the set-up process. An example of this display follows:

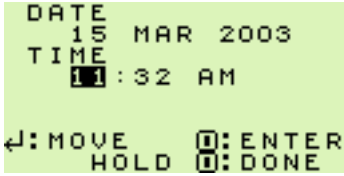
To enter CLOCK menu, press the yellow (LH) button ↵ repeatedly until 'CLOCK' is highlighted.



When 'CLOCK' is highlighted, press the green (RH) button 1. The following display will allow you to edit time and date

TIME AND DATE SET-UP

Once 'CLOCK' has been selected, the following TIME / DATE screen is displayed, highlighting the 'hour' setting:



Hour:

The highlighted 'hour' setting may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the setting by one (1) hour. Pressing and holding the button will cause the reading to increase rapidly. At 12, the 'hour' reading rolls over to 01.

When the desired 'hour' setting is shown on the display, press the green (RH) button ① to accept the 'hour' setting then highlight 'minute'.

Minute:

The highlighted 'minute' setting may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the setting by one (1) minute. Pressing and holding the button will cause the reading to increase rapidly. At 59, the 'minute' reading rolls over to 00.

When the desired ‘minute’ setting is shown on the display, press the green (RH) button ⓘ to accept the ‘minute’ setting then highlight ‘AM or PM’.

AM / PM:

The highlighted setting may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will toggle between AM and PM.

When the desired setting is shown on the display, press the green (RH) button ⓘ to accept.

Year:

The highlighted ‘year’ setting may be altered by a press of the yellow (LH) button ↵.

Each single press of the button will increase the setting by one (1) year. Pressing and holding the button will cause the reading to increase rapidly. At 2063, the ‘year’ reading rolls over to 2000.

When the desired ‘year’ setting is shown on the display, press the green (RH) button ⓘ to accept the ‘year’ setting then highlight ‘month’.

The display will now highlight the ‘month’ setting.

Month:

The highlighted 'month' setting may be altered by a press of the yellow (LH) button  .

Each single press of the button will scroll through the 'month' settings. Pressing and holding the button will cause rapid scrolling of the 'month' settings.

When the desired 'month' setting is shown on the display, press the green (RH) button  to accept the 'month' setting then highlight 'day'.

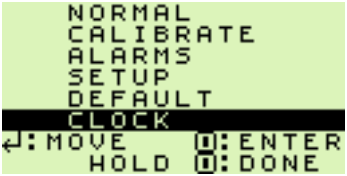
Day:

The highlighted 'day' setting may be altered by a press of the yellow (LH) button  .

Each single press of the button will increase the setting by one (1) day. Pressing and holding the button will cause the reading to increase rapidly. When the reading corresponds to the maximum number of days in that particular month, the day reading rolls over to 01.

When the desired 'day' setting is shown on the display, press the green (RH) button  to accept the 'day' setting then highlight 'hour'.

On completion of clock settings, press and hold the green (RH) button  to return to the configuration menu screen:



Return Instrument To Normal Operation

On completion of configuration settings and return instrument to normal operation, press the yellow (LH) button ↵ repeatedly until 'NORMAL' is highlighted.

Press and hold the green (RH) button ⓘ to return to normal operation.

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