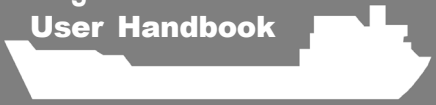
GMI

Configuration &. Field Calibration
User Handbook



SHIPSURVEYOR

BSI
UKAS QUALITY MANAGEMENT
003
Q 09760

Issue 2

29/04/09

Part Number: 48164

GMI welcomes comments on all our publications.
Your comments can be of great value in helping us to improve our customer publications. Please send any comments that you have to our Sales Department at GMI. Contact details are provided inside the back cover of this handbook.

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

Copyright © Gas Measurement Instruments Ltd 2009

COPYRIGHT

This User Handbook is copyright of Gas Measurement Instruments Ltd. (GMI) and the information contained within, is for use only with **SHIPSURVEYOR** instruments. Reproduction, in whole or in part, including utilisation in machines capable of reproduction or retrieval without written permission of Gas Measurement Instruments Ltd. is prohibited. Reverse engineering is not permitted.

LIABILITY

Every care has been taken in the preparation of this document, but GMI Ltd. do not accept any responsibility for errors or omissions and their consequences. Information in this document is subject to change without notice. This document does not constitute a specification or basis for a contract. Your statutory rights under law are not affected.

MODIFICATION NOTICES

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

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

- It should be kept with the instrument for the life of the product.
- Amendments should be attached.
- 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.

SOFTWARE

Software supplied on EPROM or similar device for use in a particular product, may only be used in that product and may not be copied without the written permission of Gas Measurement Instruments Ltd. Reproduction or disassembly of such embodied programmes or algorithms is prohibited. Ownership of such software is not transferable and GMI Ltd does not warrant that the operation of the software will be error free or that the software will meet the customer's requirements.

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.

REVISION RECORD

Date	Issue	Description Of Change
27/02/2009	1	New Handbook
29/04/2009	2	To incorporate effect of CN 4737

CONTENTS

COPYRIGHT i
LIABILITY i
MODIFICATION NOTICES i
SOFTWARE i
DISPOSAL ADVICE ii

REVISION RECORD iii

INTRODUCTION 1-1

CALIBRATE 2-1
2.1 Switch the Instrument ON 2-1
2.2 Enter Calibrate Mode 2-3
2.2.1 Enter Calibration Code 2-4
2.3 Zero All Ranges 2-5
2.4 Define Calibration Gases 2-6
2.4.1 Set 'CALGAS 1' Value(s): 2-7
2.4.2 Set 'CALGAS 2' (to CALGAS 5) Value(s) 2-10
2.4.3 CALGAS Editing Complete 2-11
2.5 Apply Calibration Gas 2-12
2.5.1 Calibrate 'CALGAS 1' 2-12
2.5.2 Calibrate 'CALGAS 2' (to CALGAS 5) 2-13
2.5.3 Calibration Complete 2-14

2.6 Save Calibration Results 2-14

ALARMS 3-1
3.1 Switch the Instrument ON 3-1
3.2 Enter Alarms Mode 3-3
3.2.1 Enter Alarms Code 3-4
3.3 View / Edit Alarms 3-5
3.3.1 View / Edit Alarm Settings 3-5
3.4 Exit Alarms Configuration 3-10

CONFIGURATION SETUP 4-1
4.1 Switch the Instrument ON 4-1
4.2 Enter Setup Mode 4-3
4.2.1 Enter Setup Code 4-4
4.3 Language Setup 4-5
4.3.1 Select Language Option 4-6
4.4 Battery Type 4-7
4.4.1 Select Battery Option 4-7
4.5 Alarms 4-8
4.5.1 Alarm Setup Options 4-8
4.5.1 TWA Alarm Options 4-9
4.6 Flammable Calibration 4-10
4.6.1 Edit Calibration Gas Type / Value 4-11
4.7 Datalogging Interval 4-12
4.7.1 Edit Datalogging Interval 4-13

4.8 Location (LOC) at Start-Up 4-13
4.8.1 Select LOC Option 4-14
4.9 Confidence Signal 4-14
4.9.1 Select Confidence Signal Option 4-14
4.10 Cal Due Feature 4-15
4.10.1 Select Cal Due Option 4-16
4.11 Cal Period 4-17
4.11.1 Edit Cal Period 4-17
4.12 Cal Extended Period 4-18
4.12.1 Edit Cal Extended Period 4-18
4.13 Service Due Feature 4-19
4.13.1 Select Service Due Option 4-20
4.14 Service Period 4-20
4.14.1 Edit Service Period 4-21
4.15 Service Extended Period 4-21
4.15.1 Edit Service Extended Period 4-22
4.16 Zero Fault Action 4-22
4.16.1 Select Zero Fault Action 4-23
4.17 Field Cal 4-23
4.17.1 Select Field Calibration Option 4-24

SET DEFAULTS 5-1
5.1 Switch the Instrument ON 5-1
5.2 Enter Defaults Mode 5-3
5.3 Set Defaults 5-5
5.3.1 Set Defaults 5-5

CLOCK CONFIGURATION 6-1
6.1 Switch the Instrument ON 6-1
6.2 Enter Clock Mode 6-3
6.3 Edit Time / Date 6-5
6.3.1 Edit Time / Date 6-5

INDEX i

1

INTRODUCTION

Fig. 1-1 Shipsurveyor Instrument

This handbook details how the following five procedures,

- Field Calibration (Chapter 2)
- Alarms (Chapter 3)
- Configuration Setup (Chapter 4)
- Set Defaults (Chapter 5)
- Clock Configuration (Chapter 6)

can be carried out without the need of any additional equipment including PC's.

Each of the five procedures require a code to be entered before any instrument setting can be changed.

The five procedures (detailed in Chapters 2 to 6) illustrate the GMI factory default settings with possible options detailed in *italic* text. When each screen is accessed, the current setting is 'highlighted' on the instrument display.

The top and / or bottom line of the instrument display may indicate button press options.

Note 1: If the option is highlighted, a press and hold is required.

Note 2: If the option is not highlighted, a single press is required.

For example, to select **EXIT** from the screen option in Fig. 1-2, press and hold the Top Button ⓘ .

To select **NEXT**, press and hold the Bottom Button ⊠.

Fig. 1-2 Button Press Options

This principle of selecting options from the top and / or bottom line of the instrument display is used throughout all **SHIPSURVEYOR** instrument operations.

CALIBRATE

This option allows the instrument to be calibrated without the need of any additional equipment.

Before the instrument can be calibrated, the user must access the Configuration & Field Calibration Menu. This is achieved as follows:

2.1 Switch the Instrument ON

1. Press and hold the Bottom Button to switch the instrument ON in fresh air.

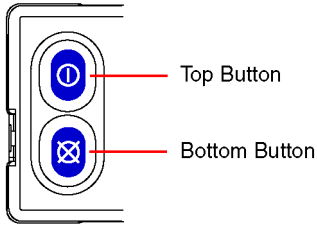


Fig. 2-1 Button References

2. During the warm-up sequence, the instrument identification screen is displayed as illustrated in Fig. 2-2.

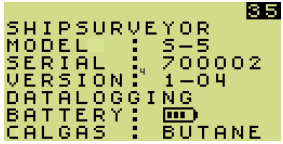


Fig. 2-2 Identification Screen

3. While this screen is displayed, press the following buttons in sequence:

   - Top Button
   - Bottom Button
   - Top Button
   - Bottom Button

Note: Allow a slight pause between each (single) press of the buttons.

4. If the code has been entered correctly, the countdown timer alternates with 'M' (menu) symbol, as illustrated in Fig. 2-3.

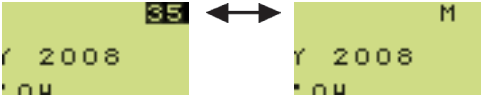


Fig. 2-3 Timer Alternating with 'M' Symbol

The instrument now proceeds through the normal start-up sequence.

After the warm-up is complete, the instrument will display the Configuration & Field Calibration menu screen as illustrated in Fig. 2-4.

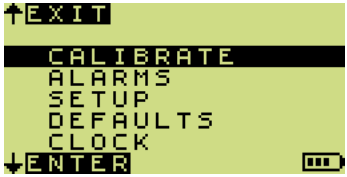


Fig. 2-4 Configuration & Field Calibration Menu

Note: A press and hold of **EXIT** at this stage returns instrument display to 'live' detection readings.

2.2 Enter Calibrate Mode

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊗ until the **CALIBRATE** option is highlighted in the display, as illustrated in Fig. 2-5.

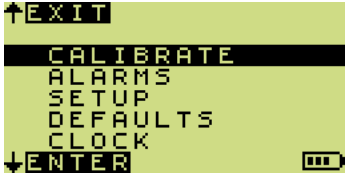


Fig. 2-5 'Calibrate' Mode Highlighted

2. When **CALIBRATE** is highlighted, press and hold **ENTER** (Bottom Button) ⊗ to select.

The following screen, Fig. 2-6, will request the calibration code to be entered.

Fig. 2-6 Enter Calibration Code

2.2.1 Enter Calibration Code

To continue, the calibration code (333) must be correctly entered.

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to edit the highlighted character.
2. Press and hold **NEXT** (Top Button) ⓘ to select the second character.
3. When all three characters display the correct code, press and hold **OK** (Bottom Button) ⊠ to accept.

2.3 Zero All Ranges

This screen displays the zero status of the instrument, as illustrated in Fig. 2-7

All sensors must be zeroed before calibration can begin. **Make sure that the instrument is in fresh air.**

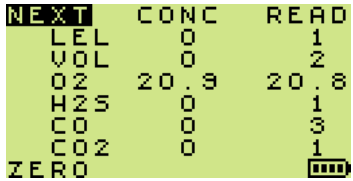


Fig. 2-7 Instrument Readings Before Zeroing

1. Press **ZERO** (Bottom Button) to zero all ranges:

The values in the 'READ' (Reading) column should reflect the values shown in the 'CONC' (Concentration) column for each corresponding gas type.

The following example screen, illustrated in Fig. 2-8, is then displayed:

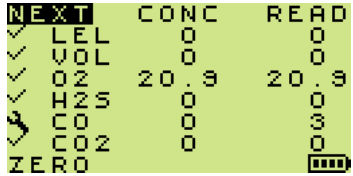


Fig. 2-8 Adjusted Zero

- (‘tick’ symbol) indicates that the range has been successfully zeroed, as illustrated in Fig. 2-8.
- (‘spanner’ symbol) indicates that the range has failed to zero, as illustrated in Fig. 2-8.
  To correct a failed zero, it is suggested that a second attempt is applied.

2. Press and hold **NEXT** (Top Button) to accept successful zero and continue.

2.4 Define Calibration Gases

This procedure defines the calibration gases, i.e. setting the CALGAS values and making compatible with corresponding gas bottles used to calibrate the instrument.

The **SHIPSURVEYOR** instrument is capable of defining up to five (5) calibration gas mixtures (CALGAS 1 to CALGAS 5). The initial screen displayed with ‘CALGAS 1’ highlighted is typical for a new instrument being calibrated for the first time, as illustrated in Fig. 2-9.

Fig. 2-9 ‘CALGAS 1’ Display

Note: If calibration has previously taken place, a typical screen would be that illustrated in Fig. 2-10.

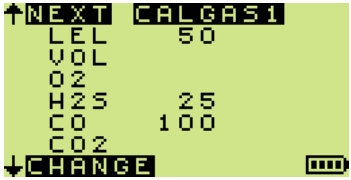


Fig. 2-10 'CALGAS 1' Display

2.4.1 Set 'CALGAS 1' Value(s):

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊗ to highlight the gas type LEL, as illustrated in Fig. 2-11.

Fig. 2-11 LEL Selected

Note: Oxygen is not calibrated and should therefore not be selected during this procedure.

2. Press and hold **CHANGE** (Bottom Button) ⊗ to highlight the gas concentration (50% LEL) as illustrated in Fig. 2-12.

Fig. 2-12 LEL Value Selected

Note: Either GMI default value or previously entered value will be displayed.

3. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to increase or decrease the value until it matches the gas concentration of gas cylinder to be used.

Note: When scrolling through the values, the readings will roll over to zero when the top limit of the range is reached.

Fig. 2-13 LEL Value Edited

4. Press and hold **OK** (Bottom Button) ⊠ to accept displayed value.

5. Repeat steps 1 to 4 to adjust other gas values for 'CALGAS 1'. Fig. 2-14 illustrates CALGAS 1 set for 50% LEL, 25ppm H2S and 100ppm CO.

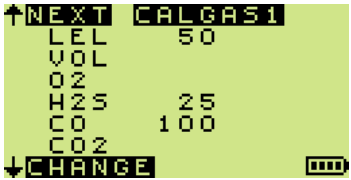


Fig. 2-14 CALGAS 1 Example

Note: The gas values entered must be in accordance with the information provided by the supplier of the gas. GMI default values are illustrated in Fig. 2-15.

GAS TYPE	RANGE	GMI DEFAULT VALUE
CALGAS	1 - 5	1
LEL	1 - 100	50
VOL	1 - 100	100
Oxygen (O2)	0 - 25	-
Hydrogen Sulphide (H2S)	0 - 100	25
Carbon Dioxide (CO2)	0 - 20	5
Carbon Monoxide (CO)	0 - 1000	100

Fig. 2-15 GMI Default Values

2.4.2 Set 'CALGAS 2' (to CALGAS 5) Value(s)

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊗ until **CALGAS 1** is highlighted, as illustrated in Fig. 2-16.

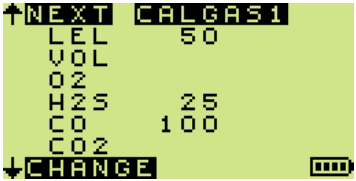


Fig. 2-16 CALGAS 1

2. Press and hold **CHANGE** (Bottom Button) ⓘ until the required 'CALGAS' option (**CALGAS 2** to **CALGAS 5**) is highlighted, as illustrated in Fig. 2-17.

Fig. 2-17 Select CALGAS 2

3. Repeat the steps in section 2.4.1 to enter the gas concentrations for the selected 'CALGAS'.

   Fig. 2-18 illustrates **CALGAS 2** set to 100% VOL.

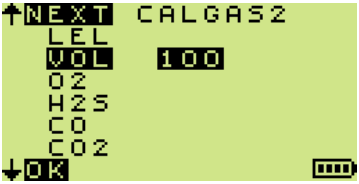


Fig. 2-18 CALGAS 2 Value

2.4.3 CALGAS Editing Complete

1. To continue to the next stage, make sure that **CALGAS #** is highlighted in the display, as illustrated in example Fig. 2-19, then press and hold **NEXT** (Top Button) ⓘ.

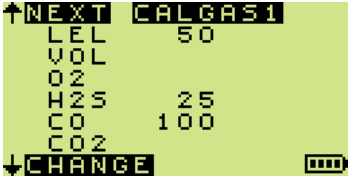


Fig. 2-19 CALGAS 1 Example

2.5 Apply Calibration Gas

This stage involves applying calibration gas to the instrument.

The instrument receives calibration cylinder gas through a Balanced Flow Regulator Valve and via a sample line connected to the instrument inlet nozzle and exiting through the exhaust outlet.

The following example, Fig. 2-20, shows a typical CALGAS 1 instrument display when applying calibration gas. Note that the first column displays each range, the second column displays the target values, the third column indicates the actual gas readings.

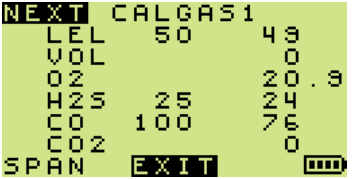


Fig. 2-20 Typical Calibration Gas Application

2.5.1 Calibrate 'CALGAS 1'

1. After the calibration gas has been applied and the readings have stabilised, the user must press **SPAN** (Bottom Button) to calibrate the ranges.

The instrument is adjusted so that the values in the third column agree with the target values in the second column.

- A successful span is confirmed by a ✓ ('tick' symbol) adjacent to each applicable gas range.

- A failed span is identified by a (‘spanner’ symbol) adjacent to the failed gas range.

An example of a calibration gas span operation is illustrated in Fig. 2-21.

Fig. 2-21 Span Operation Example

When the calibration is complete and if all applicable gas ranges display a ‘tick’ symbol, the user can either exit the ‘CALGAS 1’ span operation, or apply another calibration gas, e.g. ‘CALGAS 2’. Refer to section 2.5.2.

2. If any of the ranges fail the span operation, as illustrated in Fig. 2-21, the span operation can be repeated.

   Press the SPAN (Bottom Button) to repeat, if necessary.

   If a range fails span after several attempts, the instrument should be returned for servicing.

2.5.2 Calibrate ‘CALGAS 2’ (to CALGAS 5)

1. If another CALGAS is to be applied, press and hold **NEXT** (Top Button) .

2. Select CALGAS 1 to CALGAS 5, as appropriate, then repeat process detailed in section 2.5.1.

2.5.3 Calibration Complete

1. When calibration is complete, press and hold **EXIT** (Bottom Button) ⊠ to continue.

2.6 Save Calibration Results

Once calibration has been completed, the options illustrated in Fig. 2-22 are displayed.

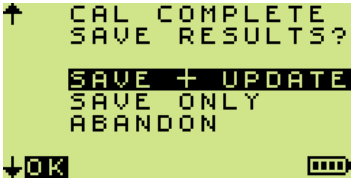


Fig. 2-22 Save Results

Three options are available, as illustrated in Fig. 2-22:

SAVE + UPDATE: Saves changes and updates the Cal Due Date. This option is only available if all ranges have been successfully calibrated.

SAVE ONLY: Saves changes but does not update the Cal Due Date.

ABANDON: Will not save any changes

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight the required option.

2. Press **OK** (Bottom Button) ⊠ to confirm selection.

If the '**SAVE + UPDATE**' option is selected, the following screen is displayed showing the updated Cal Due Date.

Fig. 2-23 Updated Cal Due Date

3. Press and hold **OK** (Bottom Button) ⊠ to continue.

If the '**SAVE ONLY**' option is selected, a screen is displayed showing the existing, unchanged, Cal Due Date. Press and hold **OK** (Bottom Button) to continue.

If the '**ABANDON**' option is selected, the main menu will be displayed.

Calibration is now complete and the user is returned to the Configuration and Field Calibration menu screen, as illustrated in Fig. 2-4.

ALARMS

This option allows alarms settings to be easily viewed / edited without the need of any additional equipment.

3.1 Switch the Instrument ON

Before the instrument alarms can be viewed / edited, the user must access the Configuration & Field Calibration Menu. This is achieved as follows:

1. Press and hold the Bottom Button to switch the instrument ON in fresh air.

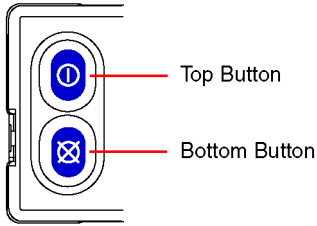


Fig. 3-1 Button References

2. During the warm-up sequence, the instrument identification screen is displayed as illustrated in Fig. 3-2.

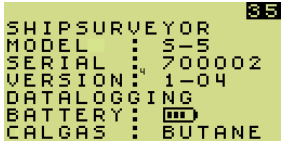


Fig. 3-2 Identification Screen

3. While this screen is displayed, press the following buttons in sequence:

   - Top Button
   - Bottom Button
   - Top Button
   - Bottom Button

Note: Allow a slight pause between each (single) press of the buttons.

4. If the code has been entered correctly, the countdown timer alternates with 'M' (menu) symbol, as illustrated in Fig. 3-3.

Fig. 3-3 Timer Alternating with 'M' Symbol

The instrument now proceeds through the normal start-up sequence.

After the warm-up is complete, the instrument will display the Configuration & Field Calibration menu screen as illustrated in Fig. 3-4.

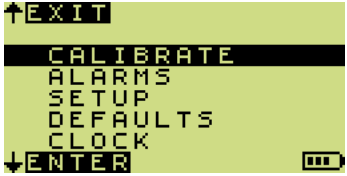


Fig. 3-4 Configuration & Field Calibration Menu

Note: A press and hold of **EXIT** at this stage returns instrument display to 'live' detection readings.

3.2 Enter Alarms Mode

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ until the **ALARMS** option is highlighted in the display, as illustrated in Fig. 3-5.

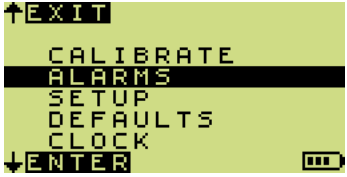


Fig. 3-5 'Alarms' Mode Highlighted

2. When **ALARMS** is highlighted, press and hold **ENTER** (Bottom Button) ⊠ to select.

The following screen, Fig. 3-6, will request the alarms code to be entered.

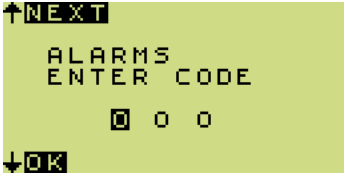


Fig. 3-6 Enter Alarms Code

3.2.1 Enter Alarms Code

To continue, the alarms code (123) must be correctly entered.

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to edit the highlighted character.
2. Press and hold **NEXT** (Top Button) ⓘ to select the second character.
3. When all three characters display the correct code, press and hold **OK** (Bottom Button) ⊠ to accept.

3.3 View / Edit Alarms

After successfully entering the alarms code, a list of gas types is displayed, as illustrated in Fig. 3-7. These gas types have alarm settings that can be viewed or edited.

Fig. 3-7 List of Installed Sensor Types

Note1: Volume Gas is not available in the alarm configuration process.

Note 2: A press and hold of **EXIT** (Top Button) during this procedure will exit the alarms option and return to the Configuration & Field Calibration menu.

3.3.1 View / Edit Alarm Settings

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight the gas type to be viewed / edited. (CO in example illustrated in Fig. 3-8).

Fig. 3-8 Select CO

2. Press and hold **CHANGE** (Bottom Button) ⊠ to select highlighted gas type (CO) and view alarm settings as illustrated in Fig. 3-9.

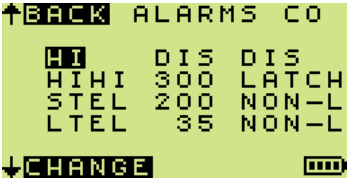


Fig. 3-9 View CO Alarm Settings

In this example there are four (4) CO alarm types, Hi ; HiHi ; STEL (Short Term Exposure Limit) ; and LTEL (Long Term Exposure Limit), listed in the first column.

The second column details the alarm setting for each of the alarm types. DIS indicates that the alarm level is disabled and therefore has no value.

The third column indicates whether the alarm is LATCH (Latching) or NON-L (Non-Latching). DIS indicates that this option is disabled.

Edit Alarm Settings

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight alarm type (Hi / HiHi / STEL / LTEL) to be edited.

   In this example HiHi alarm type is selected, as illustrated in Fig. 3-10.

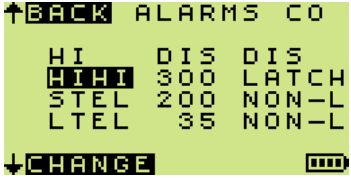


Fig. 3-10 Select HiHi Alarm

2. Press and hold **CHANGE** (Bottom Button) to highlight the current HiHi value (300), as illustrated in Fig. 3-11.

Note: A press and hold of **BACK** (Top button) takes the user to the previous screen.

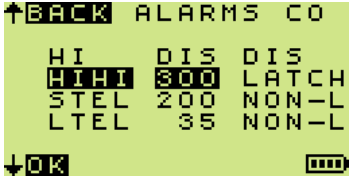


Fig. 3-11 Select HiHi Alarm Value

3. Press ↑ (Top Button) to increase value or ↓ (Bottom Button) to decrease value of alarm setting.

Note: To disable an alarm setting, set the value to zero (0). This also automatically disables the latching option.

4. Once the new value has been entered, press and hold **OK** (Bottom Button) ⊠ to confirm and highlight next setting, i.e. latching / non-latching option, as illustrated in Fig. 3-12.

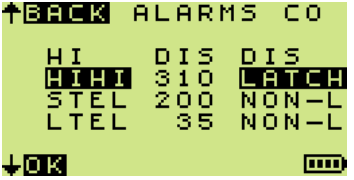


Fig. 3-12 Select Latch / Non-Latch Option

5. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to edit the alarm operation between 'LATCH' and 'NON-L'.

Note: A press and hold of **BACK** (Top button) takes the user to the previous screen, i.e. alarm setting.

6. Press and hold **OK** (Bottom Button) ⊠ to confirm new setting as illustrated in Fig. 3-13.

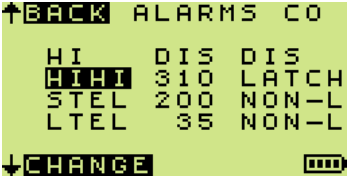


Fig. 3-13 New Setting

At this stage other CO alarm types can be selected / edited if required.

When all CO alarm types are displayed as required, save and store revised settings.

7. Press and hold **BACK** (Top Button) ⓘ to save and store revised CO alarm settings, as illustrated in Fig. 3-14.

Once an alarm gas range has been saved / stored, the following screen is displayed. Note the 'tick' symbol adjacent to the revised gas range to indicate that changes have been made to that range.

Fig. 3-14 Revised CO Range

Note: If no changes were made, a 'tick' symbol will not be displayed. A gas range displaying a 'tick' symbol can be re-edited as required. The 'tick' symbol remains displayed, even if the second revision does not result in further changes.

At this stage other gas range alarms can be selected / edited if required.

8. To edit gas settings for other gas types, repeat process detailed in section 3.3.1.

3.4 Exit Alarms Configuration

1. Press and hold **EXIT** (Top Button) to exit alarms configuration and return to Configuration and Field Calibration menu.

4

CONFIGURATION SETUP

This option allows the instrument to be individually configured without the need of any additional equipment.

Before the instrument configuration can be edited, the user must access the Configuration & Field Calibration Menu. This is achieved as follows:

4.1 Switch the Instrument ON

1. Press and hold the Bottom Button to switch the instrument ON in fresh air.

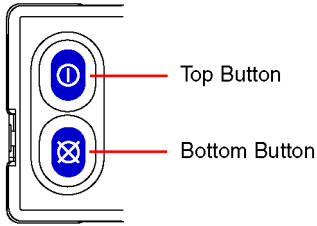


Fig. 4-1 Button References

2. During the warm-up sequence, the instrument identification screen is displayed as illustrated in Fig. 4-2.

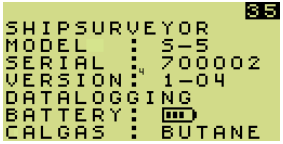


Fig. 4-2 Identification Screen

3. While this screen is displayed, press the following buttons in sequence:

   - Top Button ⓘ
   - Bottom Button ⊠
   - Top Button ⓘ
   - Bottom Button ⊠

Note: Allow a slight pause between each (single) press of the buttons.

4. If the code has been entered correctly, the countdown timer alternates with 'M' (menu) symbol, as illustrated in Fig. 4-3.

Fig. 4-3 Timer Alternating with 'M' Symbol

The instrument now proceeds through the normal start-up sequence.

After the warm-up is complete, the instrument will display the Configuration & Field Calibration menu screen as illustrated in Fig. 4-4.

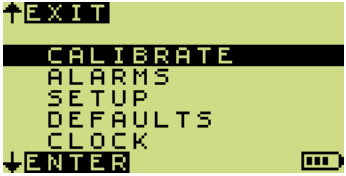


Fig. 4-4 Configuration & Field Calibration Menu

Note: A press and hold of **EXIT** at this stage returns instrument display to 'live' detection readings.

4.2 Enter Setup Mode

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ until the **SETUP** option is highlighted in the display as shown in Fig. 4-5.

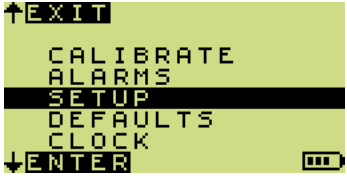


Fig. 4-5 'Setup' Mode Highlighted

- When **SETUP** is highlighted, press and hold **ENTER** (Bottom Button) ⊠ to select.

The following screen, Fig. 4-6, will request the setup code to be entered.

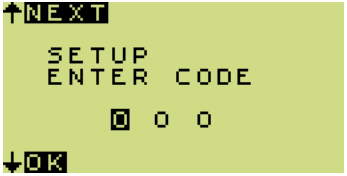


Fig. 4-6 Enter Setup Code

4.2.1 Enter Setup Code

To continue, the setup code (321) must be correctly entered.

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to edit the highlighted character.
2. Press and hold **NEXT** (Top Button) ⓘ to select the second character.
3. When all three characters display the correct code, press and hold **OK** (Bottom Button) ⊠ to accept.

4.3 Language Setup

After successfully entering the setup code, the 'SET LANGUAGE' option is displayed, as illustrated in Fig. 4-7.

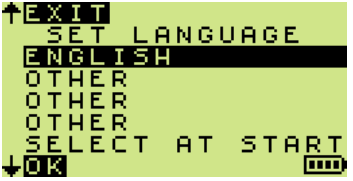


Fig. 4-7 Installed Language Types

The default language installed is English.

Other languages can be added via the USB - IRDA link (GMI Part No. 48104). The instrument is capable of storing English plus up to three (3) additional languages.

The language to be used can be selected at this stage, or selected at start-up. Refer to User Handbook (GMI Part No. 48160) for example of language selection at start-up option.

Note: A press and hold of **EXIT** (Top Button) during this procedure returns display to Configuration & Field Calibration menu.

4.3.1 Select Language Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required language or option to **SELECT AT START** from example illustrated in Fig. 4-8.

Note: If other languages have been programmed into the instrument, the display would appear as in example, Fig. 4-8. This illustrates 'ESPANOL' and 'FRANCAIS' as additional language options.

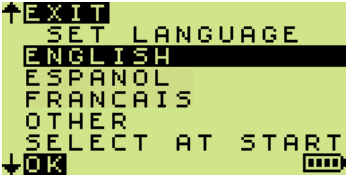


Fig. 4-8 Languages Screen

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection of highlighted language and continue.

4.4 Battery Type

The instrument can operate on either alkaline or rechargeable (NiMH) batteries.

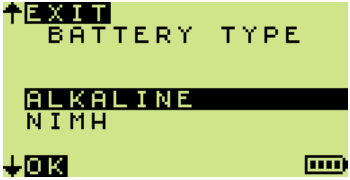


Fig. 4-9 Select Battery Type

Note: To obtain optimum accuracy of the battery status indicator during operation, it is recommended to correctly set the battery type.

4.4.1 Select Battery Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight the required battery type option from list in Fig. 4-9.
2. When required option is highlighted, press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.5 Alarms

This screen displays the status of alarms in Confined Space Monitor (CSM) mode. Alarms can be set to **ON** (default), **OFF** or **SELECT AT START**, as illustrated in Fig. 4-10.

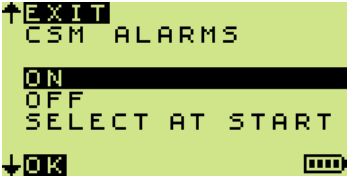


Fig. 4-10 Alarms Setup

Note: A press and hold of **EXIT** (Top Button) during this procedure returns display to Config & Field Calibration menu.

4.5.1 Alarm Setup Options

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-10.
2. When required option is highlighted, press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.5.1 TWA Alarm Options

Next, the Time Weighted Average (TWA) option screen is displayed, as illustrated in Fig. 4-11.

Fig. 4-11 TWA Option

By default, TWA alarms are enabled in CSM mode.

They can be disabled, if required.

1. Press ▲ (Top Button) ⓘ or ▼ (Bottom Button) ⊗ to highlight required option.
2. When required option is highlighted, press and hold **OK** (Bottom Button) ⊗ to confirm selection.

Next, the TWA user option screen is displayed, as illustrated in Fig. 4-12. This option controls the operation of the TWA.

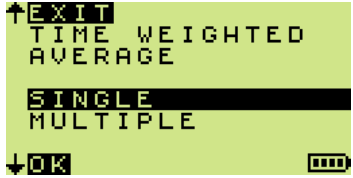


Fig. 4-12 TWA User Option

By default, the TWA is set for a single user. There is an option to change setting to **MULTIPLE** (multiple users). This means that the TWA values are reset when the instrument is switched OFF.

3. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-12.
4. When required option is highlighted, press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.6 Flammable Calibration

This option allows the user to specify the calibration gas.

Following manufacture, the instrument is calibrated using a specific flammable gas type.

If the calibration gas type is edited, it is imperative that a re-calibration of the instrument must follow.

The user can select from four (4) flammable gases (Methane, Propane, Butane and Pentane).

Having selected the flammable calibration gas, the user can then enter the volume gas concentration equivalent to 100% LEL. For example, Fig. 4-13 illustrates that this instrument is calibrated for METHANE (highlighted) and that 100% LEL Methane corresponds to 4.4% Volume Methane.

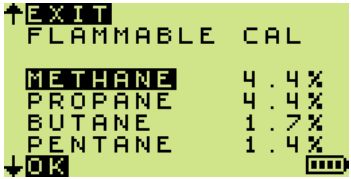


Fig. 4-13 Flammable Calibration Setup

Note: A press and hold of **EXIT** (Top Button) during this procedure returns display to Configuration & Field Calibration menu.

4.6.1 Edit Calibration Gas Type / Value

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊗ until the required calibration gas type option is highlighted in the display, as illustrated in Fig. 4-13.

2. Press and hold **OK** (Bottom Button) ⊗ to confirm selection.

The associated 100% LEL value is then highlighted in the display, as illustrated in Fig. 4-14.

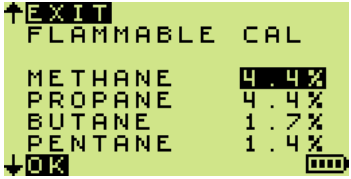


Fig. 4-14 Flammable Calibration Setup

3. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to increase or decrease the highlighted value (concentration) in 0.1% steps until required value is displayed.

4. Press and hold OK (Bottom Button) ⊠ to save and continue.

4.7 Datalogging Interval

This option allows the user to specify the interval between automatic datalogs as illustrated in Fig. 4-15. The interval can be set between one (1) second and ten (10) minutes.

Fig. 4-15 Datalogging Interval Setup

Note 1: Automatic datalogging is only available in CSM mode.

Note 2: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.7.1 Edit Datalogging Interval

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to increase or decrease interval time value.

2. Press and hold **OK** (Bottom Button) ⊠ to save time value and continue.

4.8 Location (LOC) at Start-Up

The datalogs can be assigned to a certain location in the location selector.

This option allows the user to specify which entry in the location list is initially accessed.

There are three (3) options available as illustrated in Fig. 4-16:

FIRST LOC: First entry in location list accessed

LAST USED: Last entry in location list accessed

DISABLE LOC: Location option is disabled

Fig. 4-16 Location Access

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.8.1 Select LOC Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-16.

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.9 Confidence Signal

In CSM mode, the confidence signal consists of an audible 'beep' and a flash of two red LED's to indicate that the instrument is functioning normally.

The audible and visual confidence signal can be configured as illustrated in Fig. 4-17.

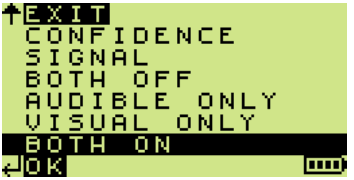


Fig. 4-17 Confidence Signal Select

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.9.1 Select Confidence Signal Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-17.

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue

4.10 Cal Due Feature

This function allows the user to specify the optional actions when the calibration expires on the instrument.

When this function is enabled, the calibration due date is shown when the instrument is switched on, during the warm-up routine.

The five (5) options are listed in Fig. 4-18.

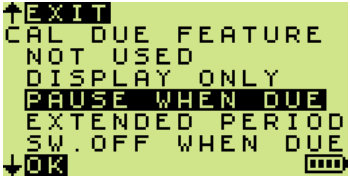


Fig. 4-18 Cal Due Feature

NOT USED: *Cal Due or Cal Expired message is not displayed during warm-up.*

DISPLAY ONLY: *Cal Due message is displayed. This message is replaced by Cal Expired when date is overdue. In both instances, the instrument warm-up continues normally.*

PAUSE WHEN DUE: Cal Due message is displayed with pause feature when date has expired (Default). If the user selects **OK**, the instrument warm-up continues normally.

EXTENDED PERIOD: *Cal Due message is displayed with user acknowledge for extended period option, if overdue. Extended period can be set from 1 to 31 days. After extended period, a forced switch-off will occur.*

SWITCH OFF WHEN DUE: *Cal Due message is displayed with prompt to switch OFF when date has expired. The instrument warm-up will not continue.*

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.10.1 Select Cal Due Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-20.

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.11 Cal Period

This function allows the user to set the next calibration due date.

The frequency is adjustable in one (1) day steps, from one (1) day to 400 days, with a default setting of 365 days.

Fig. 4-19 Cal Period

Note: A press and hold of **EXIT** (Top Button) during this procedure returns display to Configuration & Field Calibration menu.

4.11.1 Edit Cal Period

1. Press ↑ (Top Button) ⓘ to increase, or ↓ (Bottom Button) ⊠ to decrease the highlighted cal period.

2. Press and hold **OK** (Bottom Button) ⊠ to store the calibration period and continue.

Note: The Cal Due Date is only updated after a successful calibration.

4.12 Cal Extended Period

This function allows the user to set an extended cal period to the Cal Due Date. This extended period can be set from one (1) day to 31 days with a default of 15 days.

Fig. 4-20 Extended Cal Period

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.12.1 Edit Cal Extended Period

1. Press ↑ (Top Button) ⓘ to increase, or ↓ (Bottom Button) ⊠ to decrease the highlighted calibration extended period.

2. Press and hold **OK** (Bottom Button) ⊠ to store the extended period and continue.

4.13 Service Due Feature

The Service due date is set to two (2) years by default from last service date. The date is adjustable from 1 to 24 months in 1 month steps.

Note : By default, the service due date is not displayed at start up, but if display option is selected, it will be shown at 90 days prior to the preset date.

The five (5) options are listed in Fig. 4-21

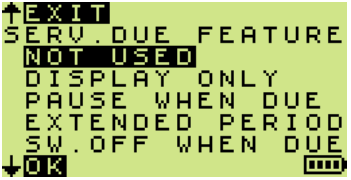


Fig. 4-21 Service Due Feature

NOT USED: Ser Due or Ser Expired message is not displayed during warm-up (Default).

DISPLAY ONLY: *Ser Due message is displayed. This message is replaced by Ser Expired when date is overdue. In both instances, the instrument warm-up continues normally.*

PAUSE WHEN DUE: *Ser Due message is displayed with pause feature when date has expired. If the user selects OK, the instrument warm-up continues normally.*

EXTENDED PERIOD: *Ser Due message is displayed with user acknowledge for extended period option, if overdue. Extended period can be set from 1 to 31 days.*

Note: After extended period, a forced switch-off will occur.

SWITCH OFF WHEN DUE: *Ser Due message is displayed with prompt to switch OFF when date has expired. The instrument warm-up will not continue.*

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.13.1 Select Service Due Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-21.

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.14 Service Period

This function allows the user to set the next service due date.

The period is adjustable in one (1) month steps, from one (1) month to 24 months, with a default setting of 24 months.

Fig. 4-22 Service Period

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.14.1 Edit Service Period

1. Press the ↑ (Top Button) ⓘ to increase, or ↓ (Bottom Button) ⊠ to decrease the highlighted service period.

2. Press and hold **OK** (Bottom Button) ⊠ to store the service period and continue.

4.15 Service Extended Period

This option allows the user to set an extension to the service due date. The extended period can be set from 1 day to 31 days with a default of 7 days.

Fig. 4-23 illustrates an extension period set to 15 days.

Fig. 4-23 Extended Service Period

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.15.1 Edit Service Extended Period

1. Press ↑ (Top Button) ⓘ to increase, or ↓ (Bottom Button) ⊗ to decrease the highlighted service extended period.

2. Press and hold **OK** (Bottom Button) ⊗ to store the extended period and continue.

4.16 Zero Fault Action

If an instrument sensor fails to zero, either during warm-up, or during operation, then a zero fault screen is displayed. By default, this can be acknowledged and the instrument can be used with the remaining gas ranges. Alternatively, the user can be forced to switch off the instrument.

This option allows the user to specify action following a zero fault. There are two options available, as illustrated in Fig. 4-24.

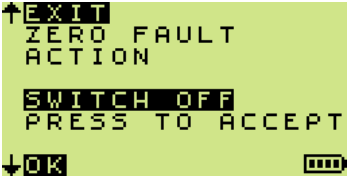


Fig. 4-24 Zero Fault Action

PRESS TO ACCEPT: User acknowledges the fault and continues to use the instrument (Default).

SWITCH OFF: *Instrument must be switched off.*

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.16.1 Select Zero Fault Action

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-24.

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection and continue.

4.17 Field Cal

This option allows the user to enable or disable field calibration.

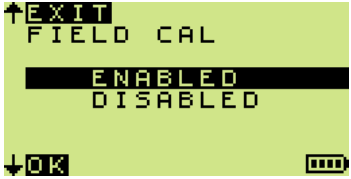


Fig. 4-25 Field Cal Feature

Note: A press and hold of **EXIT** (Top Button) returns display to Configuration & Field Calibration menu.

4.17.1 Select Field Calibration Option

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to highlight required option from list in Fig. 4-25.

2. Press and hold **OK** (Bottom Button) ⊠ to confirm selection and return to the Configuration & Field Calibration menu, as illustrated in Fig. 4-4.

SET DEFAULTS

This option allows the user to easily set the instrument to the GMI factory default settings. Care should be taken to use this function only if absolutely necessary. It is also important to check that configuration values are set as per your company or application requirement.

CAUTION: The instrument must be re-calibrated after setting the defaults.

Before the instrument defaults can be edited, the user must access the Configuration & Field Calibration Menu. This is achieved as follows:

5.1 Switch the Instrument ON

1. Press and hold the Bottom Button to switch the instrument ON in fresh air.

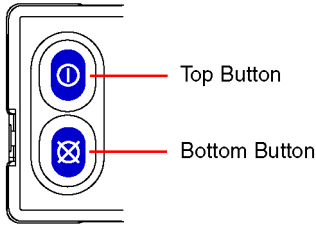


Fig. 5-1 Button References

2. During the warm-up sequence, the instrument identification screen is displayed as illustrated in Fig. 5-2.

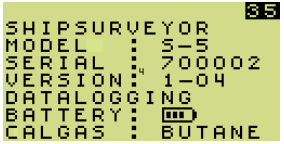


Fig. 5-2 Identification Screen

3. While this screen is displayed, press the following buttons in sequence:

   - Top Button
   - Bottom Button
   - Top Button
   - Bottom Button

Note: Allow a slight pause between each (single) press of the buttons.

4. If the code has been entered correctly, the countdown timer alternates with 'M' (menu) symbol, as illustrated in Fig. 5-3.

Fig. 5-3 Timer Alternating with 'M' Symbol

The instrument now proceeds through the normal start-up sequence.

After the warm-up is complete, the instrument will display the Configuration & Field Calibration menu screen as illustrated in Fig. 5-4.

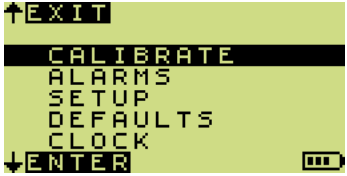


Fig. 5-4 Configuration & Field Calibration Menu

Note: A press and hold of **EXIT** at this stage returns instrument display to 'live' detection readings.

5.2 Enter Defaults Mode

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊗, until the **DEFAULTS** option is highlighted in the display, as illustrated in Fig. 5-5.

Fig. 5-5 'Defaults' Mode Highlighted

2. When **DEFAULTS** is highlighted, press and hold **ENTER** (Bottom Button) ⊠ to select.

The following screen, Fig. 5-6, will request the defaults code to be entered.

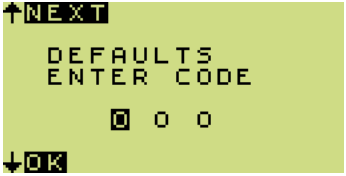


Fig. 5-6 Enter Defaults Code

5.2.1 Enter Defaults Code

To continue, the defaults code (777) must be correctly entered.

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to edit the highlighted character.
2. Press and hold **NEXT** (Top Button) ⓘ to select the second character.
3. When all three characters display the correct code, press and hold **OK** (Bottom Button) ⊠ to accept.

5.3 Set Defaults

After successfully entering the defaults code, the 'SET DEFAULTS' screen is displayed as illustrated in Fig. 5-7. The user has the option of setting the instrument to the GMI factory default settings.

Fig. 5-7 Set Defaults

5.3.1 Set Defaults

Note: Selecting **NO** at this stage will abandon 'set defaults' then return instrument to Configuration & Field Calibration menu.

1. Press and hold **YES** (Top Button) ⏻ to re-set instrument to factory default settings and display the following confirmation screen.

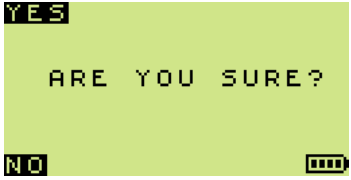


Fig. 5-8 Confirm Set Defaults

2. Press **YES** Top Button ⓘ to confirm factory default settings and return instrument to Configuration & Field Calibration menu.

Note: Selecting **NO** will abandon 'set defaults' then return instrument to Configuration & Field Calibration menu.

CAUTION: **The instrument must be re-calibrated after setting the defaults.**

CLOCK CONFIGURATION

This option allows the user to easily configure the instrument's date and time settings.

Before the instrument clock can be configured, the user must access the Configuration & Field Calibration Menu. This is achieved as follows:

6.1 Switch the Instrument ON

1. Press and hold the Bottom Button to switch the instrument ON in fresh air.

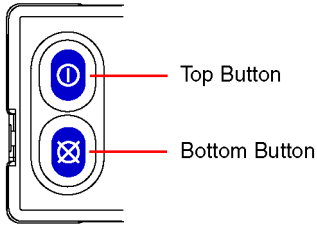


Fig. 6-1 Button References

2. During the warm-up sequence, the instrument identification screen is displayed as illustrated in Fig. 6-2.

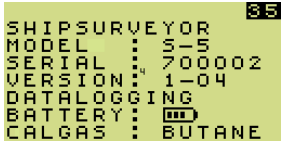


Fig. 6-2 Identification Screen

3. While this screen is displayed, press the following buttons in sequence:

   - Top Button
   - Bottom Button
   - Top Button
   - Bottom Button

Note: Allow a slight pause between each (single) press of the buttons.

4. If the code has been entered correctly, the countdown timer alternates with 'M' (menu) symbol, as illustrated in Fig. 6-3.

Fig. 6-3 Timer Alternating with 'M' Symbol

The instrument now proceeds through the normal start-up sequence.

After the warm-up is complete, the instrument will display the Configuration & Field Calibration menu screen as illustrated in Fig. 6-4.

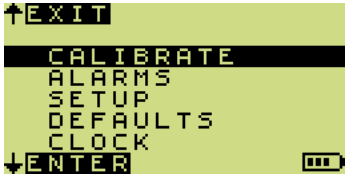


Fig. 6-4 Configuration & Field Calibration Menu

Note: A press and hold of **EXIT** at this stage returns instrument display to 'live' detection readings.

6.2 Enter Clock Mode

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠, until the **CLOCK** option is highlighted in the display, as illustrated in Fig. 6-5.

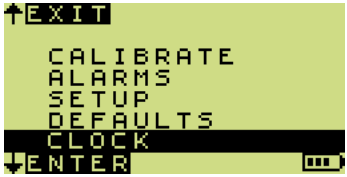


Fig. 6-5 'Clock' Mode Highlighted

- When **CLOCK** is highlighted, press and hold **ENTER** (Bottom Button) ⊠ to select.

The following screen, Fig. 6-6, will request the clock code to be entered.

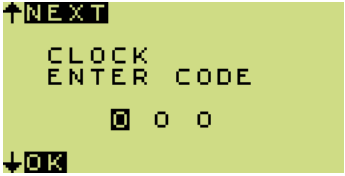


Fig. 6-6 Enter Clock Code

6.2.1 Enter Clock Code

To continue, the calibration code (407) must be correctly entered.

1. Press ↑ (Top Button) ⓘ or ↓ (Bottom Button) ⊠ to edit the highlighted character.
2. Press and hold **NEXT** (Top Button) ⓘ to select the second character.
3. When all three characters display the correct code, press and hold **OK** (Bottom Button) ⊠ to accept.

6.3 Edit Time / Date

After successfully entering the clock code, the Time / Date screen is displayed, as illustrated in Fig. 6-7.

Fig. 6-7 Time / Date Screen

Note: The instrument has 24 hour clock configuration.

6.3.1 Edit Time / Date

1. Press and hold **NEXT** (Bottom Button) ⊗ to highlight required option, as shown in Fig. 6-7.
2. Press the Top Button ⓘ to increase, or Bottom Button ⊗ to decrease the highlighted option.
3. Repeat the previous two steps until all options have been amended as required.
4. To accept and save all amended options, press and hold **EXIT** (Top Button) ⓘ.

The instrument will then return to the Configuration & Field Calibration menu, as illustrated in Fig. 6-4.

Index

Symbols

(LOC), Location Selector 4-13

A

ADVICE, DISPOSAL ii
Alarm Settings 3-6
Alarm Setup Options 4-8
ALARMS 3-1
Alarms 4-8
Alarms Code 3-4
Alarms Menu 3-3
Apply Calibration Gas 2-12

B

Battery Option 4-7
Battery Type 4-7

C

Cal Due 4-16
Cal Due Feature 4-15
Cal Extended Period 4-18
Cal, Field 4-23
Cal Period 4-17
CALGAS Editing Complete 2-11
Calibrate ‘CALGAS 1’ 2-12
Calibrate ‘CALGAS 2’ (to CALGAS 5) 2-13
Calibration Code 2-4
Calibration Complete 2-14
CALIBRATION, FIELD 2-1
Calibration, Field 4-24
Calibration Gas 2-12
Calibration, Gas 4-10
Calibration Gases 2-6
Calibration Menu 2-3
Calibration Results 2-14
Clock Code 6-4
CLOCK CONFIGURATION 6-1
Clock Menu 6-3
Code, Alarms 3-4
Code, Calibration 2-4
Code, Clock 6-4
Code, Defaults 5-4
Code, Setup 4-4
Complete, Calibration 2-14
Confidence Signal 4-14

CONFIGURATION, CLOCK 6-1
CONFIGURATION SETUP 4-1
Configuration Setup Menu 4-3
COPYRIGHT i

D

Datalogging Interval 4-12, 4-13
Date 6-5
Defaults Code 5-4
Defaults Menu 5-3
DEFAULTS, SET 5-1
Defaults, Set 5-5
Define Calibration Gases 2-6
DISPOSAL ADVICE ii
Due, Cal 4-15, 4-16
Due, Service 4-19

E

Edit Alarm Level(s) 3-5
Edit Alarm Settings 3-6
Edit Cal Extended Period 4-18
Edit Cal Period 4-17
Edit Calibration Gas Type / Value 4-11
Edit Datalogging Interval 4-13
Edit Service Extended Period 4-22
Edit Service Period 4-21
Edit Time / Date 6-5
Editing, CALGAS Complete 2-11
Enter Alarms Code 3-4, 3-5
Enter Alarms Menu 3-3
Enter Calibration Code 2-4
Enter Calibration Menu 2-3
Enter Clock Code 6-4
Enter Clock Menu 6-3
Enter Configuration Setup Menu 4-3
Enter Defaults Code 5-4
Enter Defaults Menu 5-3
Enter Setup Code 4-4, 4-6, 4-7
Extended Period 4-18, 4-21, 4-22

F

Fault, Zero 4-22
Field Cal Feature 4-23
FIELD CALIBRATION 2-1
Field Calibration 4-24
Flammable Gas Calibration 4-10

G

Gas Calibration 4-10
Gas, Calibration 2-12
Gases, Calibration 2-6

I

Interval, Datalogging 4-12, 4-13
INTRODUCTION 1-1

L

Language Setup 4-5
LIABILITY i
LOC Option 4-14
Location (LOC) Selector 4-13

M

Menu, Alarms 3-3
Menu, Calibration 2-3
Menu, Clock 6-3
Menu, Defaults 5-3
MODIFICATION NOTICES i

N

NOTICES, MODIFICATION i

O

Option, Battery 4-7
Option, LOC 4-14

P

Period, Cal 4-17
Period, Extended 4-18, 4-21, 4-22
Period, Service 4-20, 4-21

R

RECORD, REVISION iii
Results, Calibration 2-14
REVISION RECORD iii

S

SAFETY ii
Save Calibration Results 2-14
Select Cal Due Option 4-16
Select Confidence Signal Option 4-14
Select Field Calibration Option 4-24
Select LOC Option 4-14
Service Due Feature 4-19
Service Extended Period 4-21
Service Period 4-21
Service Period Feature 4-20
SET DEFAULTS 5-1
Set Defaults 5-5
Settings, Alarm 3-6

Setup Code 4-4
SETUP, CONFIGURATION
4-1
Setup, Language 4-5
Signal, Confidence 4-14
SOFTWARE i
Switch the Instrument ON
2-1, 3-1, 4-1,
5-1, 6-1

T

Time 6-5
Time / Date 6-5
TWA Alarm Options 4-9
Type, Battery 4-7

V

View / Edit Alarm Level(s)
3-5, 3-10

Z

Zero All Ranges 2-5
Zero Fault Feature 4-22

GMI Head Office:
Inchinnan Business Park,
Renfrew,
PA4 9RG,
Scotland, U.K.
Telephone +44 (0)141 812 3211
Fax +44 (0)141 812 7820
e-mail: sales@gmiuk.com
http://www.gmiuk.com

GMI Instrument Service / Repair Centre:
25 Cochran Close, Crownhill,
Milton Keynes,
MK8 OAJ,
England, U.K.
Telephone +44 (0)1908 568867
Fax +44 (0)1908 261056
e-mail: service@gmiuk.com