



operating instructions

SURVEYOR INSTRUMENTS

IAQ SURVEYOR PRO / IAQ SURVEYOR II



AIR QUALITY MEASUREMENT

HELP US TO HELP YOU

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TWENTY SHORT-CUTS

The following may be of help as a quick reference:

How do I?		You should: (then press MENU/METER to return to the Measurement screen)	Or Refer To Section:
1	Change the units of measurement for one of the sensors. <i>(not available for all sensors).</i>	Press MENU/METER ; select Channel Setup ; select sensor to change; select Select Units ; select new units; press ACCEPT .	2.4.3.1
2	Find out when a sensor was last calibrated.	Press MENU/METER ; select Channel Setup ; select sensor; select Channel Info .	2.4.3.5
3	Calibrate a sensor. (Not available for all sensors)	Press MENU/METER ; select Channel Setup ; select sensor; select Calibrate Sensor . Select Do Standard Low Cal ; calibrate; press ACCEPT . Select Do Standard High Cal ; calibrate; press ACCEPT .	6.1
4	Revert to the factory calibration settings for a sensor.	Press MENU/METER ; select Channel Setup ; select sensor; select Calibrate Sensor ; select Clear Cal ; press ACCEPT .	6.3.3
5	Display the min/max/average values.	Press MENU/METER ; press ACCEPT ; press left/right arrows to show all available data.	2.5.1

TWENTY SHORT-CUTS

How do I?		You should: (then press MENU/METER to return to the Measurement screen)	Or Refer To Section:
6	Reset the min/max/average calculations.	Press MENU/METER ; select Clear Min/Max/Avg ; press ACCEPT .	2.5.3
7	Change the name of a Site/Location.	Press MENU/METER ; select Data Logging ; select Rename Site/Loc ; use alphanumeric screen to rename; press ACCEPT .	4.2.2
8	Change the default Site/Location.	Press MENU/METER ; select Data Logging ; press ACCEPT ; select new Site/Location; press ACCEPT .	4.2.4
9	Change the default logging interval.	Press MENU/METER ; select Data Logging ; select Log Timing ; change timing; press ACCEPT .	4.3.5
10	Set the instrument to log overnight.	Press MENU/METER ; select Data Logging ; select Log Timing ; change Auto St. to ON ; set start time/date; set finish time/date; press ACCEPT	4.3.4

TWENTY SHORT-CUTS

How do I?		You should: (then press MENU/METER to return to the Measurement screen)	Or Refer To Section:
11	Find out how much log memory remains.	Press MENU/METER ; select Instrument Info ; press ACCEPT .	2.2.3
12	View the log data that is stored in the instrument.	Press MENU/METER ; select Data Logging ; select View Log Data ; select Site/Location; select session to view; limit data to be viewed; press ACCEPT .	4.4.2
13	Print the log data that is stored in the instrument.	Press MENU/METER ; select Data Logging ; select Print Logged Data ; select Site/Location; press ACCEPT ; select session; limit data to be printed; press ACCEPT .	4.4.4
14	Display the battery remaining life percentage	Press MENU/METER ; select Instrument Info , press ACCEPT	2.2.3
15	Lock the keypad.	Press MENU/METER ; select Instrument Setup ; select Lock Keypad ; press ACCEPT .	2.3.3.4
16	Unlock the keypad.	Press the cursor left and right arrows at the same time.	2.3.3.4

TWENTY SHORT-CUTS

How do I?		You should: (then press MENU/METER to return to the Measurement screen)	Or Refer To Section:
17	Switch on/off the alarm or keypad bleep.	Press MENU/METER ; select Instrument Setup ; press ACCEPT ; press right arrow; press up for On or down for Off; press ACCEPT .	2.3.3.1
18	Change the alarm levels for one of the sensors.	Press MENU/METER ; select Channel Setup ; select sensor to change; select Set Alarms ; change alarm level; press ACCEPT .	2.4.4
19	Display the serial number of a probe.	Press MENU/METER ; select Instrument Info ; press ACCEPT	2.2.3
20	Switch off one of the sensors.	Press MENU/METER ; select Channel Setup ; select sensor to switch off; select Disable Channel ; press ACCEPT .	2.4.3.4

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1. INTRODUCTION

1.1 INTRODUCTION

The IAQ Surveyor Pro and IAQ Surveyor II (Figure 1) are two instruments capable of measuring a variety of air parameters. These parameters include airspeed, temperature, relative humidity, CO, CO₂, etc depending on the type of probe connected to the instrument. It should be noted that certain probes will only operate with the IAQ Surveyor Pro. Up to four measured parameters are continuously displayed on the instrument's large graphics display and these readings may be stored internally. A maximum of 16 parameters are available depending upon the type of probes fitted to the instrument.

The instruments can be used for hand held walk through surveys or set up to periodically log readings which can later be downloaded to a PC for further analysis.

This manual covers both instruments and therefore some features listed may not be available on the Surveyor II.

Accessories

Connecting Point.
For PC, Printer or an external ac supply.

Liquid Crystal Display

Simple to use Keypad

Battery Compartment

Probe Connections

Thermocouple Socket (Surveyor Pro only)

Pressure Ports (Surveyor Pro only)

Start/Stop Average Datalog.

Probe Mounting. Showing one of the probes available.

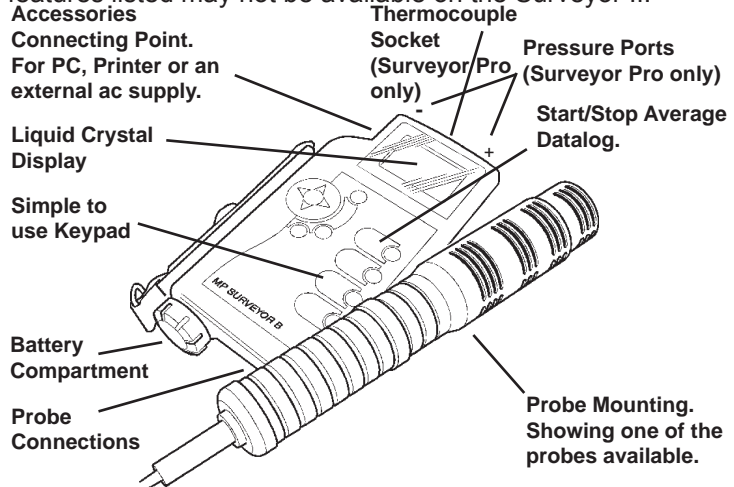


Figure 1 Surveyor Instruments

1. INTRODUCTION

1.2 MAIN FEATURES

1.2.1 IAQ Surveyor Pro

- a. Auto data logging with log download to PC.
- b. Two smart probe sockets.
- c. Supports all types of smart probe.
- d. Supplied with 1260GSS IAQ Multi-parameter probe as standard.
- e. Built-in micromanometer and Type k thermocouple socket.
- f. Duct Averaging facility.

1.2.2 IAQ Surveyor II

- a. Auto data logging with log download to PC.
- b. Two smart probe sockets.
- c. Supports all types of smart probe.
- d. Supplied with 1260GSS IAQ Multi-parameter probe as standard.

1. INTRODUCTION

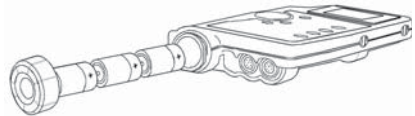
1.3 POWER SUPPLIES

Power supplies for the instruments may be:

- a. Three alkaline dry cells.
Duracell MN1400 LR 14 types are recommended.
- b. Three rechargeable cells.
Nickel Cadmium, Nickel Metal Hydride (NiMH) or
Lithium Ion (Li Ion).

Note: Alkaline dry cell batteries are used for battery life indications these indications are not valid with any other type of battery.

Insert the three batteries, positive terminal first, into the battery compartment and securely tighten the battery end cap.



Rechargeable batteries must be removed from the instrument and recharged externally using a proprietary battery charger.

Alternatively the instrument may be operated from an external GrayWolf AC Adaptor operating from a 110/240 V ac supply.

Note: When the adaptor is plugged into the instrument the internal batteries are automatically disconnected. There is therefore no need to remove the batteries from the instrument when an ac adaptor is being

1. INTRODUCTION

used.

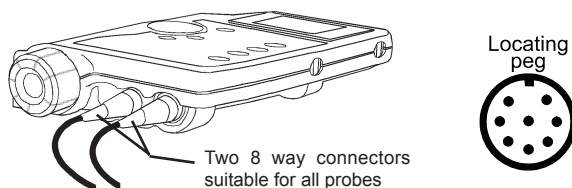
1.4 BATTERY LIFE

Approximately 30 hours: Using a 1260GSS IAQ Multi-parameter probe

Approximately 170 hours: Using a 2300AHTS Multi-parameter probe (assumes zero air speed)

1.5 PROBE CONNECTIONS

Both versions of the instrument may operate two smart probes simultaneously. Probes are connected to sockets located at the bottom of the instrument as shown below:



Location of the Probe Connectors

When connecting a probe ensure that the locating peg on the probe plug is aligned with the corresponding slot in the socket. Push the plug firmly into the socket and carefully screw the plug collar into the security ring.

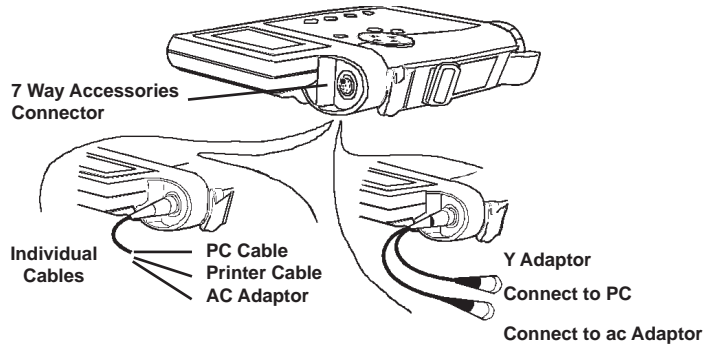
With the exception of the IAQ Surveyor II, an additional external temperature measurement can be made using a suitable thermocouple connected to the k type socket on the top of the instrument.

Two ports on the top of the instrument allow the connection of tubing for the measurement of differential pressure (micromanometry).

1. INTRODUCTION

1.6 CONNECTING AUXILIARY EQUIPMENT

Both instruments are fitted with an accessories socket on the top left of the instrument as shown below:



Accessories Connector

The following equipment may be connected to the accessories socket:

- An ac adaptor.
- Equipment such as a PC or printer.

The GrayWolf **ACC-ADY125-CL** Y adaptor may be used when connecting both the ac adaptor supply and the external equipment to the instrument.

1. INTRODUCTION

1.7 KEYPAD FUNCTIONS

The instrument operation is controlled from an easy to use keypad which includes a four way cursor key for selecting sub menus. The keypad functions are shown below:

When the instrument is switched on, the display will briefly

LOG/F1

Press to initiate Continuous Logging. (F1 refers to menu functions only)

STORE/F2

Press to store the displayed measurement. (F2 refers to menu functions only)

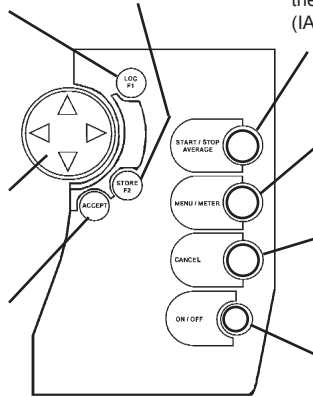
START/STOP

AVERAGE
Press to initiate START/STOP duct averaging using the STORE/F2 key (IAQ Surveyor Pro only)

4 Way Cursor Key
Press the appropriate arrow to move to other information.

ACCEPT

Used in conjunction with the menu selections. (ie. to accept site and locations).



MENU/METER
Toggles between METER mode and MENU mode.

CANCEL
Used to abort menu selections.

ON/OFF

Press to switch on. To switch off, press until countdown 3, 2, 1 is complete.

Keypad

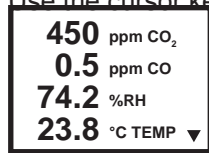
show the time and date. Shortly afterwards and if a probe is connected, the display will show readings from the probe with the selected units. Some sensors need time to stabilize when first switched on and during this time the display will show three arrows until the probe has stabilized. The thermocouple channel will display 3 arrows until a thermocouple probe is connected (not Surveyor II). If the IAQ Surveyor Pro does not detect a probe connection, e.g. if the connector has not been fully inserted, the display will only show the built in thermocouple and micromanometer readings. The IAQ Surveyor II will display **WARNING Probe not connected**.

The display can show up to four separate readings

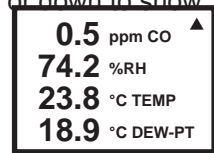
1. INTRODUCTION

simultaneously. However, where information extends beyond that displayed, scrolling arrows are shown on the right hand side of the display as shown below:

Use the cursor keys to scroll the display up or down to show



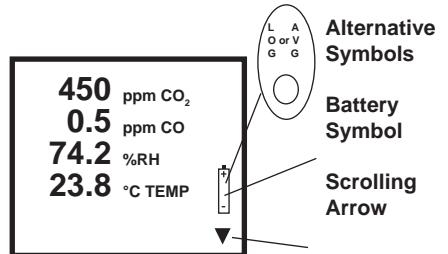
When indicated, press the cursor down arrow to show additional information.



Alternatively, press the cursor up arrow to show additional information

the additional information.

The display is also used to display calculated data such as dewpoint and averages, logged data, instrument setup information and instrument warnings as shown:



Abbreviations are used for the measurement units and symbols for operational information.

Scrolling arrows and other symbols that may be seen on the display, are as follows:

- ▶ ◀ Press the corresponding arrow on the cursor key to view the additional information (ie. a continuation to the right/left of the current display).
- ▼ ▲ Press the corresponding arrow on the cursor key to view the additional information (ie. a continuation below/above the current display).

1. INTRODUCTION



The instrument is in the duct averaging mode. (IAQ Surveyor Pro only)



The instrument is carrying out a preprogrammed logging function (referred to as Continuous logging).



A fully programmed logging sequence is set up and waiting (referred to as Autostart).



The batteries need to be changed.



Three arrows (down or up) indicate an out of range measurement.

Note: Three dots after a menu item (eg. Channel Setup... in the Main Menu) indicate that the item involves subsequent selections from more than one screen.

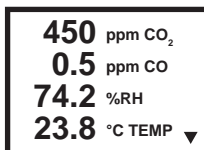
1.8 MODES OF OPERATION

1.8.1 General

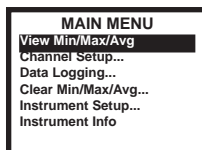
The instruments have two display modes, Meter mode and Menu mode. The instrument will start up in the Meter Mode when initially switched on and can be changed from Meter Mode to Menu mode by pressing the **MENU/METER** button. Subsequent pressing of the **MENU/METER** button toggles the instrument between Meter and Menu modes.

1.8.2 Meter Mode

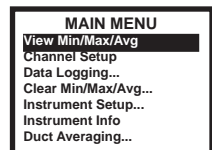
Meter Mode
(Typical Display)



Menu Mode
IAQ Surveyor II



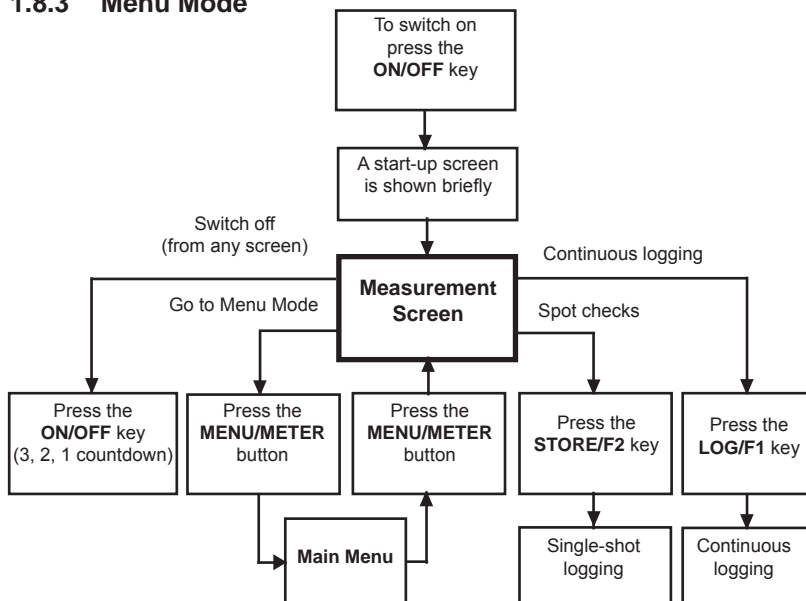
Menu Mode
IAQ Surveyor Pro



1. INTRODUCTION

The instrument displays the probe instantaneous readings and the sequence of keypad operations is as shown below:

1.8.3 Menu Mode

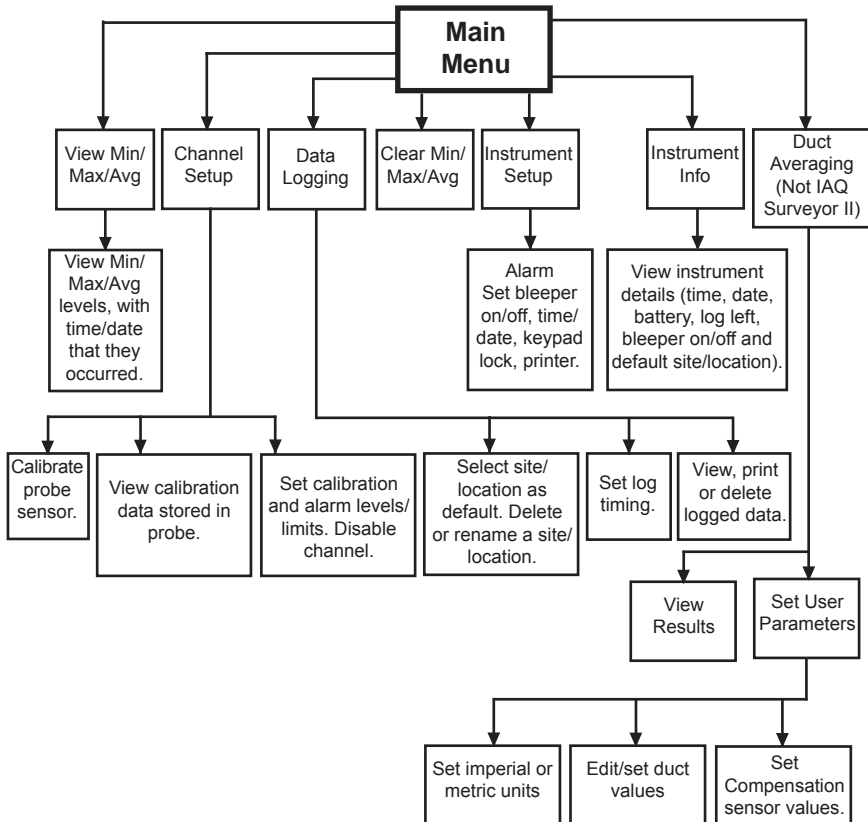


Sequence of Keypad operations - Meter Mode

1. INTRODUCTION

The Menu mode allows operations to be carried out such as probe sensor calibration, set up and configuration of site and location references, alarm level settings, date and time, etc. Any of these configuration procedures can be aborted by pressing the **CANCEL** button.

The sequence of keypad operations is as shown below:



Sequence of Keypad operations - Menu Mode

2. USING THE INSTRUMENTS

2.1 GETTING STARTED

The instrument automatically detects the type of probe connected to it and displays the appropriate measurement units. The instrument screen displays shown in this section assume that a 1260GSS IAQ Multi-parameter probe (four function probe) is connected to the instrument.

Before using the instrument:

- (1) Ensure that a probe suitable for the measurement requirements is connected and securely locked to the instrument.
- (2) Press the **ON/OFF** button and note that the time and date are briefly displayed followed by the measurement screen for the connected probe.

*Note If a probe is not connected to the instrument, the measurement screen will just display the thermocouple and micromanometer readings or, in the case of the IAQ Surveyor II, the display will show **Probe not connected**.*

- (3) Ensure that there is sufficient battery life for the period of monitoring that is about to be undertaken.



If the battery symbol **is** displayed all three batteries should be replaced.

If the battery symbol is **not** displayed there are at least 15 minutes battery life remaining.

A more detailed state of the batteries may be obtained using the **Instrument Info** menu screen under **Battery**.

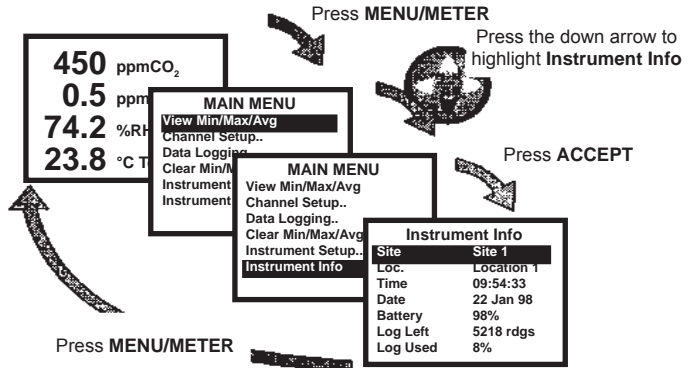
2. USING THE INSTRUMENTS

- (4) To switch off, press and hold the **ON/OFF** button until the display **3, 2, 1** countdown is complete.

2.2 USING THE INSTRUMENT INFORMATION FACILITY

2.2.1 General

The default settings of the instrument may be displayed on the Instrument Info screen.



2.2.2 Getting to the Instrument Info Screen

- (1) From the Measurement screen, press the **MENU/METER** button to display the Main Menu screen.
- (2) From the Main Menu screen, use the cursor key to highlight the **Instrument Info** option.
- (3) Press **ACCEPT** to display the Instrument Info screen.

2. USING THE INSTRUMENTS

- (4) Press the **MENU/METER** button to return to the Measurement screen.

2.2.3 Details on the Instrument Info Screen

Parameter details, as shown on the Instrument Info screen, are read only. Scroll to show details that are not immediately visible by pressing the up/down (▼ ▲) cursor keys.

Unless otherwise stated, refer to Section 2.3 to change the default parameters settings.

Site	Default site reference (normally Site 1). This reference will be offered as first choice when pressing the LOG or STORE button. Refer to Section 4.2 to change.
Loc.	Default location reference (normally Location 1). This reference will be offered as first choice when you press the LOG or STORE button. Refer to Section 4.2 to change.
Time	Time, in hours:minutes:seconds that is set into the instrument. eg. 14:47:41 .
Date	Day: Month: Year that is set into the instrument. eg. 19 Aug 04 . <i>Note: This format cannot be changed.</i>
Battery	Approximate percentage of capacity remaining. Calculation for capacity remaining assumes that alkaline batteries are being used. There is no direct correlation with other types of battery (eg. rechargeable Li Ion).
Log Left	Number of readings that can be logged before

2. USING THE INSTRUMENTS

the log memory is full. This reading is calculated on the probes currently connected and the channels that are enabled.

Log Used Approximate percentage of the log memory capacity that contains data.

Key Beep **ON/OFF** refers to the beep that sounds each time one of the instrument buttons is pressed.

Auto Log **ON/OFF** refers to the Autostart log facility (see Section 4.3).

ON indicates that Autostart logging has been programmed to take place, although it may not have yet started.

Log Status **ON/OFF** refers to the Continuous Logging facility (see Section 4.3).

Continuous Logging is started, or stopped, by pressing the **LOG** button (while the Measurement screen displayed).

Refer to Section 4.3 to change Auto Log and Log Status.

Prb 1 S/No. Serial number of the probe that is connected to the Connector 1 position.

Prb 1 Ver. Version number of the probe configuration.

Prb 1 Filter Whether the probe has adaptive filtering enabled.

Prb 2 S/No. Serial number of the probe that is connected to the Connector 2 position.

Prb 2 Ver. Version number of the probe configuration.

2. USING THE INSTRUMENTS

- Prb 2 Filter** Whether the probe has adaptive filtering enabled.
- Prb 3 S/No** Serial number of the internal probe.
(not implemented in IAQ Surveyor II)
- Prb 3 Ver.** Version number of the internal probe configuration.
(not implemented in IAQ Surveyor II)
- Prb 3 Filter** Whether the internal probe has adaptive filtering enabled. (not implemented in IAQ Surveyor II)
- Printer** Number of columns (27, 40 or 80) of the printer to be connected to the instrument. Refer to Section 4.4 for printing details.
- ON/OFF** Refers to the printer line feed facility.
- S/W Ver.** Version number of the instrument software that is configured into the instrument.

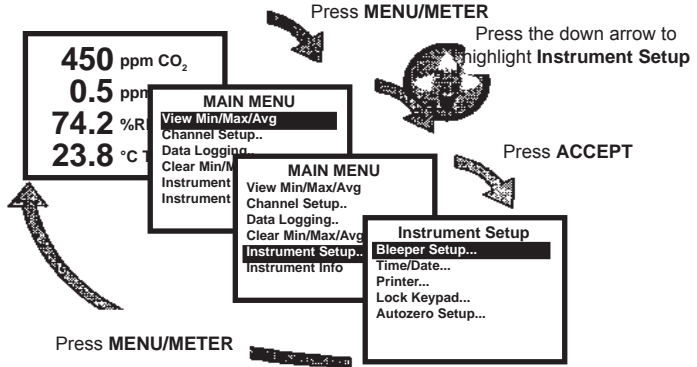
2.3 USING THE INSTRUMENT SETUP FACILITY

2.3.1 General

Four of the default instrument settings (bleeper on/off, time/date, printer configuration, keypad lock and Autozero Setup for pressure measurements) can be changed using the Instrument Setup screen.

2. USING THE INSTRUMENTS

Once changed, the new default settings are retained when



the instrument is switched off.

2.3.2 Getting to the Instrument Setup screen

- 1) With the Measurement screen displayed, press the **MENU/METER** button to show the Main Menu screen.
- 2) On the Main Menu screen, use the down arrow key to highlight the **Instrument Setup** option.
- 3) Press **ACCEPT** to display the Instrument Setup screen with the **Bleeper Setup** option highlighted.
- 4) Press **MENU/METER** to return to the Measurement screen.

2.3.3 Using the Instrument Setup Options

The Instrument Setup screen can be used to configure the following options:

2.3.3.1 Bleeper Setup

2. USING THE INSTRUMENTS

Provides an optional sounding of the bleeper with each key press, or when an alarm condition has been exceeded.

- (1) With **Beeper Setup** highlighted, press **ACCEPT** to display the Beeper Setup screen.
- (2) Use the cursor up/down arrows to highlight **Keypress** or **Alarm** as required.
- (3) Press the cursor right arrow.
- (4) Press the cursor down arrow to change to **OFF**, or the up arrow to change to **ON** as required.
- (5) Press **ACCEPT** to return to the Instrument Setup screen.

2.3.3.2 Time/Date

Provides adjustment of the internal clock/calendar.

- (1) With **Time/Date** highlighted, press **ACCEPT** to display the Set Time/Date screen.
- (2) Use the cursor up/down arrow to highlight the **Time** or **Date** as required.
- (3) Press the cursor right/left arrow to highlight the component to be changed (Hours or Minutes of the time; or Day, Month or Year of the date).
- (4) Press the cursor down arrow to decrease or the up arrow to increase, the highlighted component as required.
- (5) Press **ACCEPT** to return to the Instrument Setup screen.

2. USING THE INSTRUMENTS

2.3.3.3 Printer

Sets the instrument to suit the printer that is connected to the instrument.

- (1) With **Printer** highlighted, press **ACCEPT** to display the Printer Setup screen.
- (2) Use the cursor up/down arrows to highlight **Cols** or **Line Feed** as required.
- (3) Press the cursor right arrow.
- (4) For **Cols**, press the cursor up/down arrows to select between **27**, **40** or **80**.

For **Line Feed**, press the cursor down arrow to change to **OFF** or the up arrow to change to **ON**.

- (5) Press **ACCEPT** to return to the Instrument Setup screen.

2.3.3.4 Lock Keypad

By locking the instrument keypad, you can prevent accidental misuse.

- (1) With **Lock Keypad** highlighted, press **ACCEPT** to display the Lock Keypad screen.
- (2) If required, press **ACCEPT** to lock the keypad.

The display returns automatically to the Measurement screen and if an instrument button is now pressed the

2. USING THE INSTRUMENTS

prompt: **Keypad is Locked** is displayed. Press cancel to return the measurement screen to the display.

- (3) To unlock, press the left and right cursor arrows at the same time. If one arrow is pressed slightly ahead of the other, the prompt: **Keypad is Locked** is displayed.

2.3.3.5 Autozero (IAQ Surveyor Pro only)

Provides adjustment of the time period at which the micromanometer autozero function operates.

- (1) With **Autozero** highlighted, press **ACCEPT** to display the Autozero Setup screen.
- (2) Use the cursor up/down arrow to highlight the autozero enable or autozero interval as required.
- (3) Press the cursor right arrow to highlight the component to be changed (autozero on/off, interval).
- (4) Press the cursor up arrow to turn the autozero function **ON**, the down cursor arrow to turn **OFF**.
- (5) The autozero interval is given in minutes. To increase

2. USING THE INSTRUMENTS

the value press the up cursor arrow, to decrease the value press the down arrow.

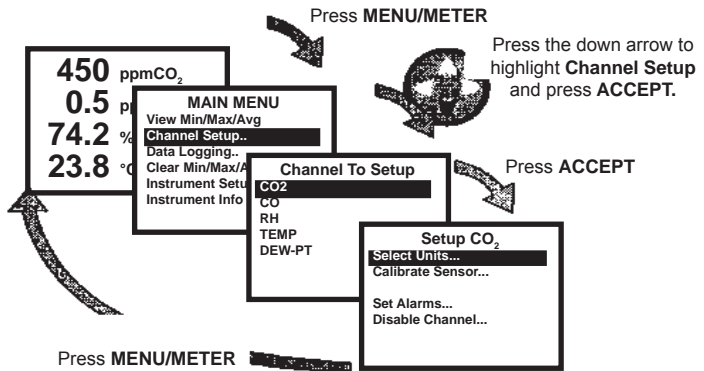
- (6) Press **ACCEPT** to return to the Instrument Setup screen.

2.4 USING THE CHANNEL SETUP FACILITY

2.4.1 General

The units and alarm levels for each probe sensor can be displayed using the Channel Setup facility. These settings are stored within the probe and apply when the probe is next used, even if this is on another instrument.

The Channel Setup facility is also used to calibrate the sensors. (Refer to Section 6 and the Probe Operating Instructions for further details).



Note: In most cases a channel corresponds to a sensor. Dewpoint is however one of the exceptions to this, there being no sensor. It is calculated from the temperature and humidity measurements.

2. USING THE INSTRUMENTS

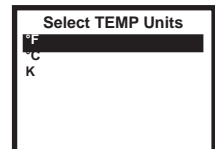
2.4.2 Getting to a Channel Setup Screen.

- (1) With the Measurement screen displayed, press the **MENU/METER** button to show the Main Menu screen.
- (2) On the Main Menu screen, use the down arrow key to highlight the **Channel Setup** option.
- (3) Press **ACCEPT** to display the Channel To Setup screen.
- (4) Use the up/down cursor to highlight the required sensor.
- (5) Press **ACCEPT** to display the associated Setup screen.
- (6) Press **MENU/METER** to return to the Measurement screen.

To change the units that are used in the min/max/average calculations, as well as selecting the units for each channel, refer to Section 2.4.3.

2.4.3 Using the Channel Setup Options

As an example of the Channel Setup options, those available on the Setup TEMP screen are listed below. Other channels may have fewer options, eg. calibration is not available for the dewpoint channel.



2.4.3.1 Select Units

If available, alternative units can be selected for the measurement display.

- (1) With **Select Units** highlighted, press **ACCEPT** to display the corresponding Select Units screen.

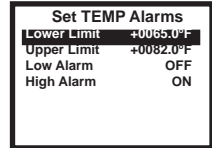
2. USING THE INSTRUMENTS

- (2) Highlight the required units and press **ACCEPT** (display returns to the Setup screen).

2.4.3.2 Calibrate Sensor

Refer to Section 6 for details.

2.4.3.3 Set Alarms



Allows the high and low alarms to be set, enabled and disabled (refer to Section 2.4.4 for details).

- (1) With **Set Alarms** highlighted, press **ACCEPT** to display the corresponding Set Alarms screen.
- (2) Use the cursor up/down arrows to highlight a **Limit** or an **Alarm** as required.
- (3) To change a limit, refer to Section 2.4.4.
- (4) Press the cursor right arrow.
- (5) To set an alarm to **ON**, press the up arrow. To set an alarm to **OFF**, press the down arrow.
- (6) Press the cursor left arrow and if necessary, highlight and change other selections.
- (7) Press **ACCEPT** to return to the Setup screen.

2.4.3.4 Enable/Disable Channel

If disabled a channel measurement not displayed on the Measurement screen, used the min/max/average calculations made available for datalogging.



- (1) With **Disable Channel** highlighted, press **ACCEPT** to

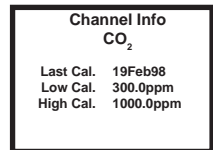
2. USING THE INSTRUMENTS

disable the channel. The menu option will then change to **Enable Channel**. The channel is now disabled.

- (2) With **Enable Channel** highlighted, press **ACCEPT** to enable the channel. The menu option will change to **Disable Channel**. The channel is now enabled.
- (3) Press **MENU/METER** to return to the Measurement screen.

2.4.3.5 Channel Info

Displays information that is stored within the probe.



- (1) With **Channel Info** highlighted, press **ACCEPT** to display the corresponding Channel Info screen.

The displayed information is read only.

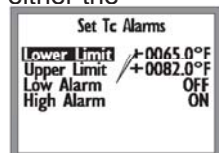
To change the calibration levels, refer to Section 6.3.2.

- (2) Press **CANCEL** to return to the Setup screen.

2.4.4 Changing the Alarm Limits

An alarm condition exists when a measurement is **below** the lower limit that is set for the channel, or **above** the upper limit that is set.

An alarm is only indicated if the alarm is enabled for the channel. The related measurement flashes on and off and the bleeper sounds if the bleeper is enabled for the channel. The alarm indication is only removed when either the measurement returns to a value between the lower and upper limits, or the **ACCEPT** button is pressed. If the alarm level is still present, the reading flashes again and the bleeper will sound if enabled.



2. USING THE INSTRUMENTS

To change the lower and upper alarm limits:

- (1) On the appropriate Set Alarms screen, highlight either **Lower Limit** or **Upper Limit** as required.
- (2) Press the cursor right arrow, to highlight the least significant digit of the limit.
- (3) Use the cursor up/down arrows to adjust the value of the last digit as required.

Note: The value can only be set between 0 and 9. ie. Pressing the down arrow at zero or the up arrow at nine is ignored.

- (4) Press the cursor left arrow, to highlight the next to last digit and adjust this digit as required.
- (5) Repeat steps (3) and (4) for any other digits that need changing.

Notes 1. The cursor right arrow can be used to return to digits that you have already adjusted.

2. The position of the decimal point cannot be changed.

3. Where the reading may go negative, the + sign can be toggled between + and -.

4. If the lower limit is set greater than the upper limit, the alarm will operate continuously.

- (6) Press **ACCEPT** to return to the Setup screen.

2.4.5 Displayed Channel Information

2. USING THE INSTRUMENTS

On the selected setup screen, highlight **Channel Info...** and press accept. The channel information displayed from a channel setup option comprises:

Channel Info		
CO ₂		
ast Cal.	19Feb98	L
sw Cal.	300.0ppm	L
gh Cal.	1000.0ppm	Hi

2.4.5.1 Last Cal.

Refers to the date on which the channel was last calibrated.

2.4.5.2 Low Cal.

The low calibration level that was used when the channel was last calibrated. When next calibrated, a new low calibration level may be used.

2.4.5.3 High Cal.

The high calibration level that was used when the channel was last calibrated. When next calibrated, a new high calibration may be used.

2.5 USING THE MIN/MAX/AVERAGE FACILITY

2.5.1 General

Minimum, maximum and average values are calculated automatically by the instrument. These calculations are initiated:

- at instrument switch on.
- from a manual reset.
- when a probe is changed.

Min/max/average calculations continue to be updated during the time that the instrument is used in Menu mode, or is used

2. USING THE INSTRUMENTS

for datalogging.

For the min/max/average values to be meaningful, they must be reset manually (see Section 2.5.3).

The resultant calculated values can be viewed by selecting the **View Min/Max/Avg** option of the Main Menu. These values are updated approximately once every second while being displayed.

Note: When the units are changed for a channel, the units shown on the min/max/average display are automatically changed as well.

2.5.2 Viewing the Min/Max/Average Values

- (1) With the Measurement screen displayed, press the **MENU/METER** button to display the Main Menu screen, with the **View Min/Max/Avg** option highlighted.
- (2) Press **ACCEPT**, to display the first of four min/max/average screens.

Notes: 1. If a channel has been disabled it is not shown on the min/max/average screens.

2. If out of range measurements have occurred, the corresponding minimum or maximum, and probably the average, is shown as three vertical

◀ Levels	Min	Max ▶
ppm CO2	351	405
ppm CO	0.7	1.5
% RH	40.5	41.2
°C TEMP	24.5	26.8
°C	23.4	25.7
DEW-PT		

First display (Min, Max values). Press ▶ arrow to show **Time** that min/max occurred.

◀ Time	Min	Max ▶
CO2	10.27	10.44
CO	10.15	10.46
RH	9.55	10.47
TEMP	9.21	10.47
DEW-PT	12.22	13.10

Time that **Min, Max** occurred. Press ▶ arrow to show **Date**.

◀ Date	Min	Max ▶
CO2	22Feb	22Feb
CO	22Feb	22Feb
RH	22Feb	22Feb
TEMP	22Feb	22Feb
DEW-PT	22Feb	22Feb

Date that **Min, Max** occurred. Press ▶ arrow to show **Average** values.

◀ Levels	Average ▶
ppm CO2	376
ppm CO	1.2
% RH	40.8
°C TEMP	25.2
°C	23.8
DEW-PT	

Average values. Press ▶ arrow to show **Min/Max** values.

2. USING THE INSTRUMENTS

arrows (eg ↓↓↓).

- (3) Move between the four screens by using the cursor left/right arrows.
- (4) Press **METER/MENU** to return to the Measurement screen.

2.5.3 Resetting the Min/Max/Average Values

Min/max/average calculations are cleared by using the **Clear Min/Max/Avg** option of the Main Menu, by changing a probe or by switching off the instrument.

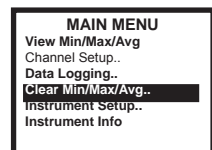
In practice, the min/max/average values should be reset by using the **Clear Min/Max/Avg** option on the Main Menu. The reset at switch on, or when a probe is changed, does not exclude out of range measurements that may occur during the warm up of the probe sensors.

It is recommended that the min/max/average calculations are reset as follows:

- (1) With the Measurement screen displayed, wait until the displayed measurements have stabilized.

Note: Depending on the type of probe being used, stabilisation after switch on can take two or three minutes.

- (2) Press the **MENU/METER** button to display the Main Menu screen.
- (3) Highlight the **Clear Min/Max/Avg** option and press **ACCEPT**.

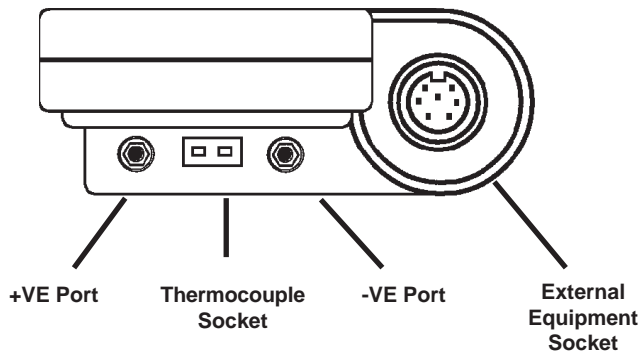


- (4) Note the prompt, **Clear Min/Max/Avg Readings?**
- (5) Press **ACCEPT** to reset the min/max/average calculations and to return to the Main Menu screen.

3. MICROMANOMETER AND THERMOCOUPLE

3.1 GENERAL

The IAQ Surveyor PRO, but not the IAQ Surveyor II, has a built-in Micromanometer and type k Thermocouple socket. The Micromanometer can be used to measure differential pressure or, in conjunction with a pitot static tube, to provide a direct indication of velocity and volume flow rate.



3.2 THERMOCOUPLE

Any Type k thermocouple or thermocouple probe may be connected to the thermocouple socket. Simply connect the thermocouple probe to the instrument and locate the probe in the environment to be measured. The instrument can display temperature in the range -80 °C to +1100 °C.

3.3 MICROMANOMETER

3.3.1 General

Differential pressure is applied between the two input ports (+VE and -VE, see Section 3.1) and the resultant measurement is displayed in user selected units. The instrument is factory calibrated using a deadweight tester which is designed to accurately apply a pressure differential between the two ports. Note that if a negative pressure differential is applied to the +VE port the measurement accuracy may not be within specification.

3. MICROMANOMETER AND THERMOCOUPLE

Depending upon the application, the pressure differential can be used to indicate pressure, a velocity or calculate volume flow rate (VFR) if the duct area is programmed into the instrument. Used in conjunction with a pitot static tube, the micromanometer is particularly useful in determining the parameters of air flow in ducts and pipework, and can provide three basic measurement modes:

3.3.2 Pressure Measurements

A differential pressure of up to ± 7000 Pa can be applied between the instrument inlet ports. The range and units used for the display are user-selected and the display resolution is to 0.1 Pa. In conjunction with these pressure measurements, instrument facilities are available as follows:

- a. Manual selection of the most appropriate pressure range to optimise the resolution of the indicated pressure.
- b. Selection of the most meaningful units of measurement. For example, a 3,000 Pa pressure can be displayed as a 30.0 mbar or 306 mm H₂O.
- c. An averaging facility to provide the mean value of a series of selected measurements.
- d. A datalogging facility to automatically store a series of measurements, which can be taken at timed intervals or selected manually. The logged information can be downloaded to a PC via the external equipment output connector, using the WolfSensePC software package.

3. MICROMANOMETER AND THERMOCOUPLE

3.3.3 Auto Zero Facility

The auto zero facility is particularly useful in applications where ambient temperature changes occur during the measurement procedure. At user selectable intervals, the instrument automatically resets the instrument zero by disconnecting the external pressure circuit and connecting together the two input pressure ports for approximately five seconds. During this zeroing process, **ZEROING** is indicated on the display and the digital display is held at the last measured pressure-difference (or velocity/VFR). Refer to section 2.3.3.5 for details of how to setup the Autozero function.

3.3.4 Pressure Connections

WARNING

None of the instruments are suitable for use with corrosive gas or for liquid pressure measurements and are not approved for use in life support applications.

CAUTIONS

1. Pressures greater than 100 kPa (400 in H₂O) above atmospheric must not be applied to the instrument input ports.
2. While in use, the instrument must not be left in direct sunlight for long periods.
3. Moisture can block the instrument pressure ports. Do not moisten the ends of the pressure tubes or apply pressure by mouth.

3. MICROMANOMETER AND THERMOCOUPLE

- Notes:*
- 1. Normally, the light colored, or clear, silicone tubing is used for the positive pressure connection (+VE) and the dark colored silicone tubing for the negative pressure connection (-VE).*
 - 2. Ensure that the connections to both pressure ports are of the same length and that the tubing is neither kinked nor squashed.*
 - 3. To avoid any liquid or contaminant draining into the pressure ports when making measurements on saturated or dirty airstreams, use the full length of the tubing provided with the instrument and keep the instrument above the pressure tapping point. If possible, allow the tubing to descend below the level of the tapping point before rising to the instrument.*

Connect to the pressure ports as follows:

- (1) For positive static measurements, connect the gauge pressure tapping (for example, duct static, plenum pressure and inlet cone depression), to the **+VE** port, and leave the **-VE** port open to atmosphere.
- (2) For negative static measurements, connect the gauge pressure tapping to the **-VE** port, and leave the **+VE** port open to atmosphere.
- (3) For differential pressure measurements (for example, orifice plates, venturi devices, flow grids, valves, diaphragms and filters) connect the upstream tapping to the **+VE** port and the downstream tapping to the **-VE** port.

3.3.5 Volume Flow Rate

In order for the instrument to calculate volume flow rate from

3. MICROMANOMETER AND THERMOCOUPLE

Table 1 Instrument Display Ranges

Units	Range (\pm)	Zero Indication	Displayed Resolution
Pressure Indications			
Pa	± 7000 Pa	0.0	0.1 Pa
mm H ₂ O	700.00	0.00	0.01 mm H ₂ O
in H ₂ O	± 30.000	0.000	0.001 in H ₂ O
mbar	± 70.00	0.00	0.01 mbar

air velocity, the duct dimensions must be entered into the Surveyor instrument. The dimensions can be in the form of a duct cross sectional area (csa) in m² (or ft²), or duct height and width in meters (or feet).

- (1) Press Meter/Menu.
- (2) Use the cursor key to select 'Duct Averaging' and press accept.
- (3) With 'User Parameters' highlighted, press accept.
- (4) With 'Units' highlighted, press accept and select 'Imperial' or 'Metric'.
- (5) With 'Duct Values' highlighted, press accept.
- (6) Select 'Edit Area' 'Yes' to enter csa dimensions, or 'No' to enter height and width dimensions.
- (7) Press 'Cancel' to return to meter mode.

The Volume Flow Rate reading displayed and logged will now be calculated using these duct dimensions.

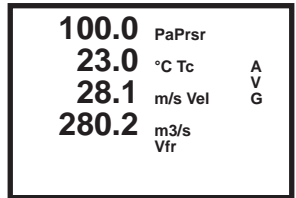
3. MICROMANOMETER AND THERMOCOUPLE

3.3.6 Duct Averaging - Storing Readings

The IAQ Surveyor Pro provides a facility to record measurements as a duct is traversed and then to automatically calculate the average values.

To enter the duct averaging mode:

- (1) Press the **START/STOP AVERAGE** button and then select the Site and Location.
- (2) To indicate that the instrument is in the averaging mode, the display will show the letters **AVG** vertically on the right side of the screen.
- (3) Place the probe in the required location and wait for the instrument reading to stabilise.
- (4) Log the displayed readings at the selected location by pressing the **STORE (F2)** button.
- (5) Repeat steps (3) and (4) at all the required locations.
- (6) When all the required readings have been taken and logged, press the **START/STOP AVERAGING** button.
- (7) When prompted to cancel the logging process, press the **ACCEPT** button.



3.3.7 Duct Averaging - Viewing Readings

To view the readings taken:

- (1) Press the **MENU/METER** button to display the Main Menu.
- (2) Select **Duct Averaging** and press **ACCEPT**.

3. MICROMANOMETER AND THERMOCOUPLE

- (3) Select **View Results** and press **ACCEPT**.
- (4) Select site and location and press **ACCEPT**.
- (5) Select Session and press **ACCEPT**.
- (6) Select appropriate channel (such as velocity) and press **ACCEPT**.
- (7) The instrument will display the minimum, average and maximum readings obtained during the traversing period.
- (8) Refer to Section 4.4.2 if it is required to view individual

4. DATALOGGING FACILITIES

4.1 GENERAL

Once the instrument has been set up with an appropriate probe, each channel that is required to record is switched on, checked and set to the required units, individual measurements may be **Stored** or a longer term **Log** may be initiated.

To ensure that the results of the survey may be identified, the appropriate **Site** and **Location** reference must be set before logging starts.

The logged data stored in the instrument may be viewed or printed, or the WolfSensePC Software may be used to download and analyze the results on a PC.

4.2 CONFIGURING THE SITE/LOCATION REFERENCES

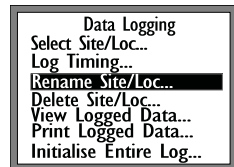
4.2.1 General

The Site and Location references can be configured to be suitable for each IAQ Survey undertaken. The configuration that is set up is retained when the instrument is switched off.

Configuring these references is simplified using the WolfSensePC Software and a PC.

4.2.2 Changing an Existing Site or Location Reference

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **Rename Site/Loc** and press **ACCEPT** to display the Rename Site/Loc screen.



4. DATALOGGING FACILITIES

- (4) Navigate to the required Site or Location as detailed in Section 4.2.6.
- (5) Press **F1** to display the alphanumeric selection screen. Change the name of the Site or Location as described in Section 4.2.7.

Note: When the name of a Location is changed, any existing logged data remains available under the new name.

4.2.3 Adding a New Site or Location Reference

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen, **Select Site/Loc** is highlighted.
- (3) Press **ACCEPT** to display the Select Site/Loc screen.

*Note: This screen is also accessed by pressing **LOG** or **STORE** when the Measurement screen is displayed and pressing **F1** to change the site location (refer to Section 4.3).*

- (4) To add a Site, highlight one of the existing Sites. To add a Location, navigate to an existing Location at the required Site (see Section 4.2.6).

- (5) Press **F1** to display the Add Site/Loc alphanumeric screen. Add a new Site or Location reference as described in Section 4.2.7.



- (6) Press **ACCEPT** to confirm the addition.

4. DATALOGGING FACILITIES

4.2.4 Changing the Default Site/Location Reference

If **LOG** or **STORE** is pressed with the Measurement screen displayed, confirmation is required that the default Site/Location is the reference against which the data is to be stored. To change this default Site/Location:

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen, **Select Site/Loc** is highlighted.
- (3) Press **ACCEPT** to display the Select Site/Loc screen.
- (4) Navigate to the required Site/Location as described in Section 4.2.6.
- (5) Press **ACCEPT** to set the selected Site/Location as the default.



4.2.5 Deleting a Site or Location

Before deleting a Site or Location reference, or just the stored data at that reference, ensure that there is no further use for any of the data by viewing it (see Section 4.4.2) or printing it out (see Section 4.4.4).

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **Delete Site/Loc** and press **ACCEPT** to display the Delete Site/Loc screen.

4. DATALOGGING FACILITIES

- (4) Navigate to the required Site/Location as described in Section 4.2.6 and press **ACCEPT** to display the Delete What? screen.



- (5) Select **Data Only** or **Data & Site** and press **ACCEPT**.
- (6) Confirm the deletion. Press **ACCEPT** to returned to the Delete Site/Loc screen.
- (7) As necessary, delete any other Sites or Locations, or press **MENU/METER** to return to the Measurement screen.

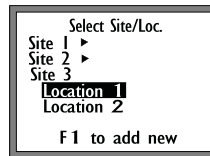
4.2.6 Navigating to a Site and Location

When a screen showing Site/Location information is displayed (eg. when it is required to log the IAQ measurements to other than the default Site/Location), the available Sites are displayed with a right arrow at the end of the name.

- (1) Use the cursor up/down keys to highlight the required Site.



Highlight the Site



then press the 'right' arrow

- (2) Press the cursor right arrow to display the Locations that are available at the selected Site.

4. DATALOGGING FACILITIES

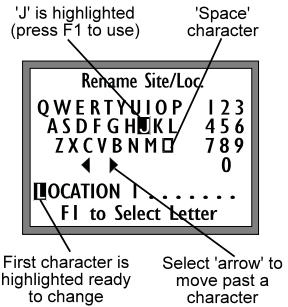
- (3) Use the cursor up/down arrows to select the required Location.
- (4) If necessary, press the cursor left arrow to return to the list of Sites.

4.2.7 Using the Alphanumeric Selection Screen

Use the alphanumeric selection screen to add, or rename, a Site or Location (see Sections 4.2.2 or 4.2.3).

An alternative to using this screen is to connect the instrument to a PC and use the WolfSensePC Software to rename the Site or Location.

Note: Upper case characters are only available when using the alphanumeric selection screen, however, upper or lower case characters are available when using the WolfSensePC Software.



- (1) When the alphanumeric screen is first displayed, the letter **J** is highlighted, together with the first character of the Site or Location name.
- (2) Use the four cursor keys, up/down and left/right, to move the cursor around the **QWERTY** display and to highlight the first alphanumeric character that is required for the new name.
- (3) Press **F1** to select the character, which is then inserted in the Site or Location name at the position of the highlighted character.

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*Note: If **ACCEPT** is pressed instead of **F1**, the name is accepted as it is and if this is incorrect the rename process will have to be repeated (see Section 4.2.2).*

- (4) As necessary, use the following options to complete the renaming of the Site or Location.
 - a. To insert a space, select the square symbol (next to the letter M) and press **F1**.
 - b. To move past characters that you do not want to change, select the left or right arrows (▶ ◀) and press **F1**.

Notes: 1. You cannot move past a blank position, you must insert a space or a character.

2. You cannot delete a character, you must overwrite it with a new character (or space).

- (5) When you have compiled the Site or Location name, press **ACCEPT**.

Note: If you repeat an existing Site/Location reference, you are prompted to change the name that you have just entered.

4.3 LOGGING THE ENVIRONMENTAL CONDITIONS

4.3.1 General

Every time a log is carried out at a particular location a new session is started. A session consist of one or more samples of readings, new sessions will be started under the following conditions:

- a. Addition of a probe.

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- b. Removal of a probe.
- c. Pressing the STORE F2 button.
- d. Stopping and starting another continuous log session.

Sessions are displayed based upon the start time.

4.3.2 Storing Individual Probe Measurements

To store individual probe measurements (eg. for a spot check IAQ survey):

- (1) Press the **STORE** button.
- (2) Press **ACCEPT** to confirm that the measurements are required to be stored against the default Site/Location.
- (3) Alternatively, press **F1** to navigate to another reference (see Section 4.2.6) or to add a new Site or Location (see Section 4.2.3).

4.3.3 Logging Continuously

To log continuously, at the default time interval (see Section 4.3.5), press the **LOG** button to start logging and the **LOG** button again to stop logging.

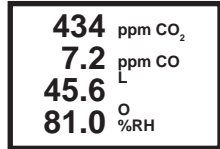
While a continuous logging session is in progress, the Menu mode can be used to view the instrument information, including the data being logged (see Section 4.4.2), but:

- a. switching off the instrument ends the continuous logging session (ie. the session does not restart when the instrument is switched on again).
- b. the **STORE** button or the **Channel Setup** facility **cannot** be used and the Data Logging screen has a

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restricted number of options.

- c. the logging interval, the measurement units or the alarm levels cannot be changed. During a continuous logging session, a sensor cannot be calibrated or disabled, or a Site or Location deleted.
- d. a probe may be changed while datalogging but this will stop the current session and start a new session.



- (1) Press the **LOG** button to start logging.
- (2) Press **ACCEPT** to confirm the measurements are to be stored against the default Site/Location, to start logging and to return to the Measurement screen (the **LOG** symbol is displayed).

*Note: The **LOG** symbol is extinguished each time a reading is being stored.*

Data is logged at each default logging interval (see Section 4.3.5).

- (3) Alternatively, press **F1** to navigate to another reference (see Section 4.2.6) or to add a new Site or Location (see Section 4.2.3).
- (4) Press **LOG** to end the logging session.
- (5) Confirm the end of the logging session by pressing **ACCEPT**, or **CANCEL** to continue logging.

4.3.4 Using the Data Logging Autostart Facility

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
The instrument can be set to log overnight, for example, at start and finish times when it is known that a building will be unoccupied.

Autostart allows the instrument to automatically start and stop a continuous logging session using start and stop times specified by the user.

Notes: 1. Ensure that the instrument clock is correct before using Autostart. The instrument clock time is displayed briefly when first switched on or by accessing the instrument info screen (see section 2.2.3). See section 2.3.3.2 on setting the clock.

2. The clock time may be changed during Autostart logging but the logging session will be ended if the clock time goes outside the start and finish times.

Autostart logging takes place during two time intervals:

- a. The first interval is before the specified start time. During this time, no logging takes place but the Autostart symbol () is displayed to show that Autostart is configured. If the instrument is switched off and back on again before the specified start time, the Autostart remains configured.
- b. The second interval is between the specified start and finish times. During this time, continuous logging takes place and the **LOG** symbol is displayed, however the restrictions described in Section 4.3.3 apply.

Autostart logging can be stopped by pressing the **LOG** button.

To configure Autostart:

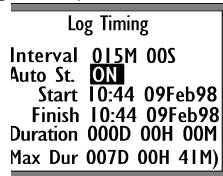
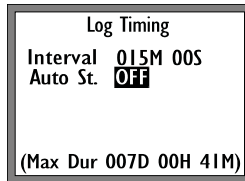
- (1) Press **MENU/METER** to display the Main Menu

4. DATALOGGING FACILITIES

screen.

- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **Log Timing** and press **ACCEPT** to display the Log Timing screen, with **Interval** highlighted. The time shown is the default time interval.
- (4) If necessary, change the default time interval by pressing the cursor right arrow once to highlight the units of minutes, or twice to highlight the units of seconds.

Increase these times by using the up arrow, or



Log Timing screen ... with the Autostart **ON**
decrease by using the down arrow, then press the left
arrow until **Interval** is highlighted.

- (5) Highlight **Auto St.** and then press the right arrow to highlight **OFF**.
- (6) Press the up arrow to change to **ON** (down arrow to return to **OFF**) and to add the Autostart **Start** and **Finish** times to the display.
- (7) To set the **Start** time, highlight **Start** and use the left/right arrows to move to the required portion of the time/date. Use the up/down arrows to change the time/date.

4. DATALOGGING FACILITIES

- (8) Similarly, set the **Finish** time.

About the **Start** and **Finish** times of Autostart:

- a. The displayed **Start** and **Finish** times both default to the current time and date. To use Autostart, the **Finish** time must be changed.
 - b. If the **Start** time is incremented, the **Finish** time will follow automatically.
 - c. The **Duration** time is automatically changed to show the difference between the **Start** and **Finish** times.
 - d. The **Max Dur.** time is calculated automatically and depends on the memory available to store the proposed measurements. That is, it is reduced as memory is used up but increased if some of the probe sensors are disabled (see Section 2.4.3.4). In the case of the IAQ Surveyor II, if no probe is connected, the instruments calculate this value assuming a 1260GSS IAQ Multi-parameter probe is to be used.
- (9) Press **ACCEPT** to return to the Data Logging screen. If logging is configured to start at the current time (eg. the **Start** time is not altered) the prompt **Autostart Datalogging Commenced** will be displayed. Press **ACCEPT** to return to the Data Logging screen.
- (10) Press **MENU/METER** to return to the Measurement screen, which shows the Autostart symbol (☐) at the right-hand side.
- If logging is configured to start at the current time (see Step 9), the **LOG** symbol is displayed (see Step 11).
- (11) When the **Start** time is reached, the prompt **Autostart Datalogging Commenced** is displayed. Press

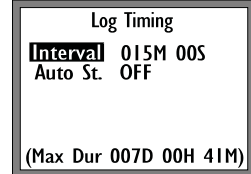
4. DATALOGGING FACILITIES

ACCEPT and the **LOG** symbol is displayed.

*Note: Logging starts at the **Start** time, it does not wait for the **ACCEPT** to be pressed.*

4.3.5 Setting the Default Logging Interval

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **Log Timing** and press **ACCEPT** to display the Log Timing screen, with **Interval** highlighted. The time shown is the default time interval (normally 15 minutes).
- (4) Press the cursor right arrow once to edit the units of minutes, or twice to edit the units of seconds.



Increase these times with the up arrow, or decrease with the down arrow.

Note: The value can only be set between 0 and 9. ie. Pressing the down arrow at zero or the up arrow at nine is ignored.

- (5) Press **ACCEPT** to configure the new default logging interval.

Note: The default logging interval is not altered when you switch off.

4.4 ACCESSING THE LOGGED DATA

4. DATALOGGING FACILITIES

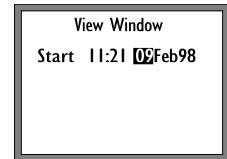
4.4.1 General

Data that has been logged to the instrument can be viewed on the instrument display, selectively deleted or printed to a printer that is attached to the instrument.

Alternatively, these procedures can be carried out more effectively by using the WolfSensePC Software.

4.4.2 Viewing Logged Data

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **View Logged Data** and press **ACCEPT** to display the View Logged Data screen.
- (4) Navigate to the required Site/Location as described in Section 4.2.6 and press **ACCEPT** to display the **Select Session** screen.



Select the logged session that is required to be viewed and press **ACCEPT** to display the view window screen.

The **Start** time that is shown is for the first data that has been logged to the selected Site/Location. The data that is required to be viewed may be much later than this start time.

- (5) In order to limit the view window to the required data, use the left/right arrows to highlight the sections of the time/date that is to be altered.

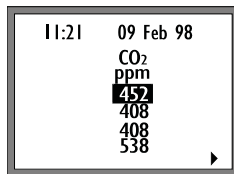
Use the up/down arrows to change the time/date.

4. DATALOGGING FACILITIES

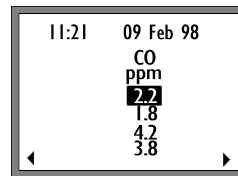
An attempt to change the time/date past that for which there is data is ignored.

- (6) Press **ACCEPT** to display the logged data, starting at the time specified in step (5).
- (7) After viewing the data, press **MENU/METER** to return to the Measurement screen.

Log data is displayed for the first probe channel and is arranged vertically with the most recent at the top and with



Log data for CO₂ is displayed ...
 ... press the right
 the top measurement highlighted.



arrow to view CO data

Use the up/down arrows to highlight other measurements for the same channel. As other measurements are highlighted, the time/date at the top of the screen changes to refer to the data that is highlighted.

Display the data from any other channels by using the left/right arrows. If the data has been logged from the 1260GSS IAQ Multi-parameter probe, up to five channels are available.

4.4.3 Deleting Logged Data

4.4.3.1 General

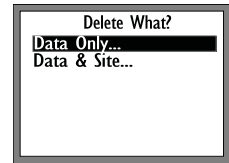
4. DATALOGGING FACILITIES

Logged data can be deleted either by initialising the complete log memory or by deleting data at individual Site/Location references.

CAUTION

Before deleting any log data, ensure that there is no further use for it by viewing the data (see Section 4.4.2) or printing it out (see Section 4.4.4).

4.4.3.2 *Deleting Log Data at an Individual Site/Location*



To delete log data at an individual Site/Location, proceed as follows:

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **Delete Site/Loc** and press **ACCEPT** to display a list of Sites and Locations.
- (4) Navigate to the required Site/Location as described in Section 4.2.6 and press **ACCEPT** to display the Delete What? screen.
- (5) Select **Data Only** or **Data & Site** and press **ACCEPT**.

For a specific Location, selecting **Data Only** deletes all the log data stored against that Location. For **Data & Site** the Location name is removed from those available at the associated Site.

For a specific Site, selecting **Data Only** deletes the log data stored against all the Locations associated with that Site. For **Data & Site** the Site name, and all associated Locations, are

4. DATALOGGING FACILITIES

also removed.

- (6) Press **ACCEPT** to confirm the deletion and the prompt **Now deleting, please wait** is displayed.

The display returns to the Delete Site/Loc screen.

- (7) Delete data at any other Sites or Locations as required. Press **MENU/METER** to return to the Measurement screen.

4.4.3.3 *Initializing the Complete Log Memory*



This procedure deletes all logged data. To initialize the complete log memory, proceed as follows:

- (1) Press **MENU/METER** to display the Main Menu screen.
- (2) Highlight **Data Logging** and press **ACCEPT** to display the Data Logging screen.
- (3) Highlight **Initialize Entire Log** and press **ACCEPT** to display the Initialise Data Log screen, with a prompt asking for confirmation of the deletion.
- (4) Press **ACCEPT** to confirm the deletion and to return to the Data Logging screen.

Note: Log data at all Sites and Locations is deleted, but the Site and Location structure is not affected.

4.4.4 **Printing Logged Data**

To print the log data that is stored in the instrument, ensure that the printer:

4. DATALOGGING FACILITIES

- a. Has a serial port (a 25-pin female connector on the printer).
- b. Is configured to print from a serial port.
- c. Has the serial interface set to:
 - baud rate of 9600;
 - 8 data bits;
 - no parity bit;
 - one stop bit
 - X On/Off is not used
 - DTR is not used
- d. Line Feed On/Off and the number of columns is correctly configured. Use the Instrument Setup option of the Main Menu to change these settings as described in Section 2.3.

To be sure about these items refer to the documentation that was provided with the printer.

Note: Alternatively, the WolfSensePC Software may be used to print stored data to a printer that is attached to your PC.

- (1) Connect the GrayWolf printer cable (reference ACC-CA1-PR) to the instrument external accessories connector (7-pin DIN).
- (2) Connect the other end of the printer cable (25-pin male connector) to the serial socket of the printer.

Print Window

Start 11:21 09Feb98

End 12:08 12Feb98
- (3) Switch on the instrument and press **MENU/METER** to display the Main Menu screen.
- (4) Highlight **Data Logging** and press **ACCEPT** to display

4. DATALOGGING FACILITIES

the Data Logging screen.

- (5) Highlight **Print Logged Data** and press **ACCEPT** to display the Print Logged Data screen, which allows selection of the required Site/Location.
- (6) Navigate to the required Site/Location as described in Section 4.2.6.
- (7) Press **ACCEPT** to display the Print Window screen, which shows the first and last time/dates at which data has been stored against the selected Site/Location.
- (8) To limit the window to the required data, adjust the **Start** and **End** times and dates.

The display cannot be moved outside the start and end times and dates that were first displayed.

Note: When the hours reading is increased to more than 24, the date also changes.

- (9) Press **ACCEPT** and the prompt **Now Printing** is displayed. Depending on the amount of data selected for printing, this prompt could remain displayed for two or three minutes.

The display returns to the Print Window screen.

*Note: If the configuration of the printer, or the connection to the instrument is incorrect, the **Now Printing** prompt can remain displayed permanently. Under these conditions, press **CANCEL** to return to the Print Window screen.*

- (10) Select any other data for printing, or press **MENU/METER** to return to the Measurement screen.

5. PC SOFTWARE

5.1 GENERAL

The IAQ Surveyor Pro and IAQ Surveyor II can be connected to a PC in order to download logged data to a Microsoft Excel™ spreadsheet. A software utility (WolfSensePC) is available to enable transfer of the data to a hard disk and provide basic graphical analysis. The utility also enables easy setup of the logging parameters such as site locations, etc.

Using the WolfSensePC Software can simplify the operation of the instrument, particularly in configuring it for datalogging and in analyzing the results of an IAQ survey.

6. CALIBRATION PROCEDURES

6.1 INTRODUCTION

Calibration procedures are detailed in the Probe Operating Instructions that accompany each of the GrayWolf probes. This section provides a summary of those calibration procedures.

Each sensor should be calibrated at two levels (low and high) and for some sensors (ie. carbon monoxide) the low calibration level is zero.

Use the Quick Cal facility to calibrate the low calibration level for a sensor, but this method does rely on the sensor being in the correct zero environment at the time of calibration (see Section 4.2).

If a probe or sensor fails to calibrate, it should be returned to GrayWolf or one of their approved agents for repair or replacement.

6.2 USING THE QUICK CAL FACILITY

This procedure is not applicable for all sensors (i.e. dew point or temperature).

CAUTION

Take great care when using Quick Cal that the environmental conditions to which the sensor is exposed are known. For example, do not assume that the carbon monoxide level in the atmosphere is zero.

- (1) Display the channel Setup screen for the sensor as described in Section 2.4.2.
- (2) With **Calibrate Sensor** highlighted, press **ACCEPT** to

6. CALIBRATION PROCEDURES

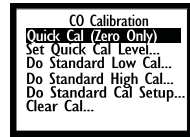
display the Calibration screen for the selected sensor.



- (3) With **Quick Cal (Zero Only)** highlighted, press **ACCEPT**.

- (4) The prompt **Zeroing Sensor, Are you sure?** will be displayed.

Press **ACCEPT** to zero the sensor at the default low calibration level (refer to Section 6.3.2 to change this calibration level).



- (5) Press **MENU/METER** to return to the Measurement screen.

6.3 CHANGING THE CALIBRATION LEVELS

6.3.1 General

To calibrate a sensor at a level that is different to that programmed into the probe, (eg. if the appropriate gas is not available), change the calibration level as described in Section 6.3.2 and, when calibrated, the new level will be programmed into the probe.

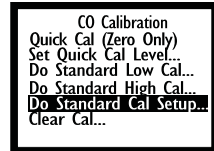
An adjustable Calibration Time is provided for each sensor. This time is in addition to any time that has been allowed for sensor measurements to stabilise, and is intended as a time to allow the sensor measurement to be observed prior to calibration.

The calibration levels for each sensor that are programmed into the probe may be changed at any time back to those originally used in the factory. By doing this (see Section 6.3.2) the output of the sensor is automatically set to correspond with that expected at the factory setting.

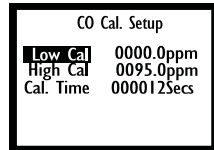
6. CALIBRATION PROCEDURES

6.3.2 Setting new Calibration Levels

- (1) Display the channel Setup screen for the appropriate sensor as described in Section 2.4.2.
- (2) With **Calibrate Sensor** highlighted, press **ACCEPT** to display the Calibration screen for the selected sensor.
- (3) With **Do Standard Cal Setup** highlighted, press **ACCEPT** to display the associated Cal Setup screen.
- (4) Highlight the required calibration level, **Low Cal** or **High Cal**.
- (5) Press the cursor right arrow, to highlight the least significant digit of the calibration level.



- (6) Use the cursor up/down arrows to adjust the value of this digit.



Note: The value can only be set between 0 and 9. ie. Pressing the down arrow at zero or the up arrow at nine is ignored.

- (7) Press the cursor left arrow, to highlight the next to last digit. Adjust this digit if required. Adjust any other digits as required.

Note: The position of the decimal point cannot be changed.

- (8) Repeat Steps 4 to 7, if required, to adjust the other calibration levels.

Adjusting the Calibration Time:

- (9) On the Cal Setup screen, highlight **Cal. Time**.

6. CALIBRATION PROCEDURES

- (10) Repeat Steps 5 to 7 to adjust the Calibration Time.

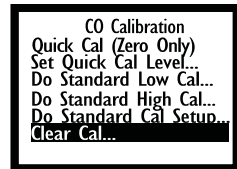
*Note: **Cal Time** digits are adjusted by positioning the cursor to the **left** of the required digit.*

- (11) Press **ACCEPT** to return to the Calibration screen and **MENU/METER** to return to the Measurement screen.

6.3.3 Reverting to the Factory Settings

Use this procedure to change the calibration levels that are stored in the probe back to those originally used during production. The calibration levels that are programmed into the instrument are not changed. These levels remain as previously set, but will change automatically to correspond with any new probe that is connected to the instrument.

- (1) Display the channel Setup screen for the appropriate sensor as described Section 2.4.2.
- (2) With **Calibrate Sensor** highlighted, press **ACCEPT** to display the Calibration screen for the selected sensor.
- (3) With **Clear Cal** highlighted, press **ACCEPT** and a prompt **Clear Calibration?** is displayed.
- (4) Press **ACCEPT** to restore the factory calibration levels, including the Calibration Time, for the selected sensor.



*Note: The sensor alarm levels are **not** restored to their factory settings.*

- (5) Press **MENU/METER** to return to the Measurement screen.

7. MAINTENANCE PROCEDURES

7.1 INTRODUCTION

Routine maintenance of the instruments consists of external care only. Except for the batteries, there are no user serviceable parts inside the instrument. Opening the instrument voids the warranty.

This section provides details of the recommended preventive maintenance, advice on battery maintenance and lists some simple checks that can be carried out if operational problems are experienced.

7.2 PREVENTIVE MAINTENANCE

- (1) Ensure that the battery end cap is fully screwed into position.
- (2) Ensure that the exterior of the instrument is clean, dry and free of corrosive contaminants. If necessary, wipe with a cloth moistened with a mild detergent. Allow to dry before using the instrument.
- (3) Ensure that the batteries are kept in a useable condition.

7.3 BATTERY MAINTENANCE

7.3.1 Dry Cell Batteries

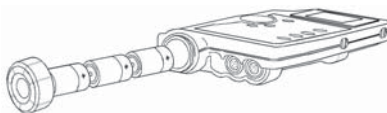
- (1) When the battery warning symbol is shown on the instrument display, switch off and replace all three dry cell batteries.

This symbol indicates that there is at least 15 minutes use remaining. For a more precise estimation, refer to the **Instrument Info** option of the Main Menu (see Section 2.2.3).



7. MAINTENANCE PROCEDURES

- (2) Insert the new batteries into the instrument battery compartment, positive terminal first, and ensure that the battery end cap is replaced securely.



7.3.2 Rechargeable Batteries

To charge rechargeable batteries, first remove them from the instrument.

- (1) NiCd batteries should be fully discharged before charging.
- (2) Charge fully discharged NiCd, NiMH or Li Ion batteries according to the instructions supplied with your external battery charger.
- (3) Insert the recharged batteries into the instrument battery compartment, positive terminal first and ensure that the battery end cap is replaced securely.

7.4 TROUBLESHOOTING

Basic problems that may encountered with the instruments are listed in Table 3 and a summary of possible displayed warnings in Table 4.

7.5 SERVICE

GrayWolf offers calibration and repair services at many locations throughout the world. Contact GrayWolf for details of your nearest Service Location.

7. MAINTENANCE PROCEDURES

The instrument is warranted for one year and is manufactured to the specifications applicable at that time. GrayWolf is under no obligation to update or modify products once sold.

If an instrument failure occurs:

- (1) Carefully read these Operating Instructions and the Probe Operating Instructions, ensuring that the problem is not a user fault or easily corrected.
- (2) Notify GrayWolf or your nearest Authorized Distributor, giving full details of the problem, including the instrument Serial Number and details of any displayed fault messages.
- (3) Forward the instrument with shipping prepaid according to the shipping instructions.
- (4) The time required for servicing the Surveyor instruments depends on whether the instrument is returned to a GrayWolf Service Location or if it can be repaired or replaced locally.

For instrument returns in the UK or North America, please contact the nearest Service Location for a Return Authorization Number before despatching the instrument. This procedure helps GrayWolf to provide a speedy response and accurate tracking of the instrument.

7. MAINTENANCE PROCEDURES

Table 2 Basic Problems and Suggested Remedies

Problem	Checks	Suggested Remedies
Display is blank.	<p>Is the instrument switched on?</p> <p>Are the batteries inserted and in a satisfactory condition?</p> <p>Is the external power supply connected and switched on?</p>	<p>Press the On/Off button.</p> <p>Check that the battery end cap is screwed in fully.</p> <p>Replace/recharge the batteries.</p>
Measured indication is either zero or obviously incorrect. (ie. showing as three arrows).	<p>Is the probe connected correctly?</p> <p>Have you allowed time for the probe to warm up?</p> <p>Is the probe calibrated?</p> <p>Is the probe damaged or malfunctioning?</p>	<p>Check that the probe connection is tight.</p> <p>Allow three minutes for the probe to warm up (also, try moving the probe in the air).</p> <p>Calibrate the probe.</p> <p>Try another probe.</p>
One, or more, of the displayed measurements is flashing on and off.	<p>Are the sensors in an alarm condition?</p> <p>Is the probe damaged or malfunctioning?</p>	<p>Try switching off the sensor alarms (use the Channel Setup menu option).</p> <p>Try another probe.</p>
Some of the min/max/average values are obviously incorrect.	<p>Have you reset the min/max/average values?</p> <p>Is the probe functioning correctly?</p>	<p>Reset the min/max/average values (use the Clear min/max/avg option).</p> <p>Try another probe.</p>
Pressing the LOG/F1 button does not display the Log symbol.	<p>Is the keypad locked?</p> <p>Is the Autostart symbol already displayed?</p>	<p>Press the right and left arrows together to release the lock.</p> <p>Check the Log Status from the Instrument Info menu option.</p>
There is no display from one of the	<p>Was logging already running?</p>	<p>Check the enable/disable status from the Channel Setup menu option.</p>

7. MAINTENANCE PROCEDURES

Table 2 Basic Problems and Suggested Remedies (Cont.)

Problem	Checks	Suggested Remedies
sensors of a Multi Function probe.	<p>Is the sensor disabled?</p> <p>Was the probe ordered with a full set of sensors?</p> <p>Is the probe damaged or malfunctioning?</p>	<p>Check your original order.</p> <p>Try another probe.</p> <p>Calibrate using known good (and appropriate) test gases.</p>
One of the sensors of the Multi Function probe will not calibrate.	<p>Are the test gases appropriate to the sensor being calibrated?</p> <p>Are you trying to calibrate by using Quick Cal in an unclean atmosphere?</p> <p>Is the probe damaged or malfunctioning?</p>	<p>Try another probe.</p> <p>Keep the ON/OFF button pressed until the 3, 2, 1 countdown has finished.</p>
Pressing the ON/OFF button does not switch off the instrument	<p>Are you holding the button pressed long enough?</p> <p>Is the keypad locked?</p>	<p>Press the right and left arrows together to release the lock.</p>

7. MAINTENANCE PROCEDURES

Table 3 Summary of the Warning Messages

Warning Ref.	Warning Text	Reason for Warning	Refer To Section
1001	Sensor Failed to Zero	Displayed when a sensor cannot be zeroed (Quick Cal), either because of a faulty sensor or the sensor output is not within the zeroing range.	6.3
1002	Unable to Log. Log is Full	Displayed when the log memory is full and either the LOG or STORE button is pressed.	4.1
1003	Unable to Add New Site/Loc. List is Full	Displayed when the combined number of Sites and Locations is at a maximum, and the LOG button is pressed to initiate logging to a new Site or Location.	4.2.3
1004	Unable to Add New Site/Loc. List is Full	As Warning 1003, but the STORE button is pressed.	4.2.3
1005	Unable to Add New Site/Loc. List is Full	As Warning 1003, but Menu mode is used to try to add a new Site or Location.	4.2.3
1006	Site/Loc. Exists. Please Enter New Name	Displayed if you try to add a Site (or Location at a Site) that already exists.	4.2.3
1007	Name is Blank. Please Enter New Name	Displayed if you try to add a blank name as a Site or Location.	4.2.7
1008	Site Exists. Please Enter New Name	Displayed if you try to rename a Site (or Location at a Site) the same as one that already exists.	4.2.3
1009	Name is Blank. Please Enter New Name	Displayed if you try to rename a Site or Location with a blank name.	4.2.3
1010	No data is logged at this location.	Displayed if you try to view log data from a Location where data has not been logged or has been deleted.	4.4.2

7. MAINTENANCE PROCEDURES

Table 3 Summary of the Warning Messages (Cont.)

Warning Ref.	Warning Text	Reason for Warning	Refer To Section
1011	No data is logged at this location.	Displayed if you try to print log data from a Location where data has not been logged or has been deleted.	4.4.1
1012	All Channels are now Disabled	Displayed if you try to disable all available channels.	2.4.3.4
1013	Sensor Failed to Calibrate	Displayed when a sensor cannot be calibrated, probably because of a faulty sensor. Return to Zellweger Analytics.	6.1
1014	Instrument Clock Not Set	Displayed if the clock has never been set. Normally only seen during production.	2.3.3.2
1015	BATTERIES FLAT PLEASE REPLACE	Displayed if the batteries reach a critical low voltage. Only the ON/OFF button can be used.	1.3
1016	User has removed a Probe	Displayed in the Menu mode when a probe is disconnected. Probe is not Connected prompt is displayed in Meter mode when a probe is disconnect.	1.7
1017	User has attached a Probe	Displayed in Menu mode when a probe is connected. Probe is not Connected prompt display in Meter mode is removed when a probe is connected.	1.7
	Autostart Datalogging Commenced	Displayed when the set start time of Autostart datalogging is reached. Press ACCEPT to carry on using Menu mode while datalogging takes place.	4.3.4

7. MAINTENANCE PROCEDURES

Table 3 Summary of the Warning Messages (Cont.)

Warning Ref.	Warning Text	Reason for Warning
1019	Autostart enabled or running.	Displayed when manually trying to log a reading whilst logging is running.
1021	Invalid probe detected.	Probe is not supported by the instrument.
1022	No data points recorded.	Displayed when trying to view duct averaging results when no data has been logged.
1023	Averaging session initiated.	

8. SPECIFICATION

8.1 DIMENSIONS AND WEIGHT

Depth:	40 mm (1.57 inches).
Width:	130 mm (5.12 inches).
Length:	260 mm (10.24 inches).
Weight (Including Battery):	
IAQ Surveyor II	815 g (28.8 oz)
IAQ Surveyor Pro	893 g (31.5 oz)

8.2 DISPLAY

Liquid Crystal Display (LCD):	128 x 64 point dot matrix.
Viewing Area:	65 mm (2.55 inches) x 40 mm (1.6 inches).

8.3 SERIAL INTERFACE (PRINTER)

Baud Rate:	9600.
Data Bits:	8.
Parity:	none.
Stop Bits:	1.
X On/Off:	Not used.
DTR Polarity:	Not used.

8.4 HOUSING

Material:	ABS moulded plastic. Rubber grip. Nylon and rubber hand strap .
Sealing:	to IP54 (NEMA4).

8.5 BATTERY LIFETIME AT 20°C

	Typical Life Using IAQ Multi-function probe
Alkaline:	up to 30 hours

8. SPECIFICATION

8.6 ENVIRONMENTAL

Operation Range: -10°C (+15°F) to +55°C
 (+131°F).
 0 to 100% rh (non condensing)

Storage Range: -20°C (-5°F) to +60°C (+140°F)
 0 to 100% rh (non condensing)

8.7 ELECTROMAGNETIC COMPATIBILITY (EMC)



Within the limits of EMC Directive 89/336/EEC, the design of the instrument has been tested to EN 50270:1999 and is compliant with respect to RFI, ESD and RF emissions.

8. SPECIFICATION

8.8 MEASUREMENT RANGES

Quantity to be Measured	Available Probe	Measurement Range
Relative Humidity	1260GSS Multi-Function Probe	0 to 100% rh.
Relative Humidity	2300AHTS Multi-Function Probe	0 to 100% rh.
Dewpoint Temperature	1260GSS Multi-Function Probe	-45°C to +71°C. -50°F to +160°F.
Dewpoint Temperature	2300AHTS Multi-Function Probe	-33°C to +70°C. -50°F to +160°F.
Air Temperature	1260GSS Multi-Function Probe	-23°C to +93°C. 10°F to 200°F.
Air Temperature	2300AHTS Multi-Function Probe	-26°C to +70°C. -15°F to 158°F.
Air Temperature	Type K Thermo-couple Probe	-80°C to +1100°C. -112°F to 2012°F.
Airspeed (discont'd)	Vane Anemometer	0 to 40 m/s. 200 ft/min to 8000 ft/min.
Airspeed (discont'd)	Hot Wire Anemometer	0 to 12 m/s. 0 ft/min to 2500 ft/min.
Airspeed	2300AHTS Multi-Function Probe	0 to 12 m/s. 0 ft/min to 2500 ft/min.
Airspeed * +	Differential Pressure	0 to 100 m/s. 400 ft/min to 20000 ftmin.

8. SPECIFICATION



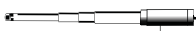



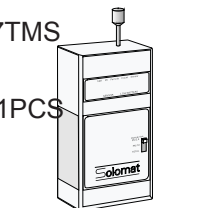
Differential Air Pressure	* Differential Pressure	±7000 Pa. ±30 in. H ₂ O.
Rotational Speed (discont'd)	Infrared Tachometer	0 to 30000 rpm. 0 Hz to 500 Hz.
CO Concentration	1260GSS Multi-Function Probe	0 to 1000 ppm.
CO ₂ Concentration	1260GSS Multi-Function Probe	0 to 5000 ppm.
Particles per Unit Volume (discont'd)	1401PC Particle Counter	0 to 100 kp/cf. (size 0.3 µm to 2.5 µm). 0 to 2000 kp/cf. (size 0.3 µm to 1 µm). 0 to 64 µg/m ³ . (size 0.3 µm to >100 µm).
Volumetric Flow Rate	2300AHTS Multi-function Probe	0 to 1198 M ³ /min. 0 to 19.98 M ³ /sec. 0 to 42,300 ft ³ /min. 0 to 2,540,113 ft ³ /hr.

* IAQ Surveyor Pro only.

+ When used with a pitot static tube (not included).

9. PROBES AND ACCESSORIES

9.1 PROBES AVAILABLE FOR USE WITH THE SURVEYOR INSTRUMENTS

1	IAQ Multi-function probe. Measuring CO, CO ₂ , temperature and humidity (dewpoint is calculated within the instrument).	NDIR 1260SS	
2	Differential Pressure probe, with auto zeroing. (Discontinued)	561LPS	
3	Hotwire Anemometer (Discontinued)		
4	Vane Anemometer (Discontinued)	129MSS	
5	Pitot Static Tube	228MSS	
6	Optical Tachometer (Discontinued)	220MS	
7	Particle Counter (Discontinued)	327TMS 1401PCS	
8	HVAC Multi-function Probe		

2300AHTS

9.2 GRAYWOLF ACCESSORIES AVAILABLE FOR USE WITH THE SURVEYOR INSTRUMENTS

9. PROBES AND ACCESSORIES

1	Carrying Case (included)	PCC-31-CL
2	AC Adaptor	ACC-AA2-CL
3	PC Cable (included)	ACC-CA1-CL
4	Printer Cable	ACC-CAP-CL
5	Printer	ACC-PR1
6	Power/Comms Y Adaptor Cable	ACC-ADY125-CL
7	Gas Calibration Kit (CO/CO ₂)	CA-GCK4-CL
8	Relative Humidity Calibration Kit	CA-HC4-COL
9	1.5m dual tubing (included with Surveyor Pro))	ACC-bbTU6

10. PITOT STATIC TUBES AND ACCESSORIES

10.1 GRAYWOLF PITOT STATIC TUBES

The pitot static tube type PIT-50-4 is a portable instrument set with four easily assembled sections, which provide pitot tube lengths up to 1.3m (51 inches). The nose and head form are designed to internationally recognised standards, with a short tip/stem ratio and a wide yaw angle tolerance. All four sections of the pitot static tube type PIT-50-4 are constructed in stainless steel tubing throughout. Standard accessories include:

- a. Sliding spring clip markers on the head section, to indicate the depth of head insertion at the measurement location.
- b. Two direction pointers, which can be fitted to the pitot tube sections and used to indicate the pitot head orientation.
- c. Flexible tubes, which are pre-fitted to the total (clear tube) and static (dark tube) outputs, and are suitable for connection to the IAQ Surveyor Pro pressure ports.
- d. Marker pen, which can be used as an alternative to the spring clip depth markers.
- e. Pitot nose protector.

The PIT-229EXT pitot tube is telescoping. Other pitot static tubes (types PIT-229MS, PIT-229MM and PIT-229ML) are of fixed length construction.

10. PITOT STATIC TUBES AND ACCESSORIES

10.2 SPECIFICATIONS

Note: Unless stated otherwise, the following details apply to all the pitot static tubes.

10.2.1 Nose and Head Section

Type:	NPL MENC, all welded construction.
Design Standard:	BS 1042 Pt 2A 1973.
Calibration Coefficient:	Typically 0.997 to 0.998 at air speeds more than 1.5m/s.
DP Error:	Less than 1% for yaw angles up to 24°.

10.2.2 Rigid Tubes Types 229MS, 229MM, 229ML

Material: Stainless steel, type 304.

10.2.3 Flexible Tubes (Types 50-4,229EXT)

Material: Stainless steel, type 304.

10.2.4 Dimensions and Weight (Type 50-4)

Fully Assembled Length: 1.3m (51 inch).

Weight: 0.43kg.

Dimensions (other pitot static tubes):

Type 229MS: 200mm long x 4mm diameter.

Type 229MM: 500mm long x 8mm diameter.

Type 229ML: 1000mm long x 8mm diameter.

10. PITOT STATIC TUBES AND ACCESSORIES

APPENDIX A GLOSSARY OF TERMS AND ABBREVIATIONS

The following terms and abbreviations are used in this Manual or are associated with surveys of Indoor Air Quality:

AHU	Air handling unit.
Alarm condition	Condition that exists when an alarm level has been exceeded, but which is ignored unless the channel has been enabled. Associated measurement flashes on and off, and bleeper sounds (if enabled for that alarm).
Alarm level	Two levels that are available for most channels, which can be preset from the instrument but which are stored in the probe: High above which an alarm condition exists Low below which an alarm condition exists.
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers.
atm	Atmospheric pressure.
Auto Log	Another name for Autostart.
Autostart logging	Continuous logging that has a specified start and finish time/date.
Autorange	Automatic selection of measurement range.
Auto zero	Automatic zeroing of the pressure sensors.
Bleep	Momentary audible sound.
Button	LOG/F1, STORE/F2, ACCEPT, MENU/METER, CANCEL and ON/OFF switches are referred to as buttons.
Calibration date	Date at which a particular measurement channel was last calibrated.
Channel	One measurement, which may be derived from more than one sensor. eg. Dewpoint is derived from temperature and humidity.
Clock time	Time and date .
Columns	Printer function, determined by the width of the printer paper. Most A4 printers use 80 columns.
Configure	Set the instrument parameters, such as the alarm limits.
Continuous logging	Repetitive storing of measurement data

APPENDIX A GLOSSARY OF TERMS AND ABBREVIATIONS

Countdown	at the logging time interval. Started and finished, by pressing the LOG button. Delayed switch off to avoid accidental use of the ON/OFF button.
Cursor key	4-way switch on the Surveyor instruments front panel.
Datalogging	Storing measurement data within the Surveyor instruments under controlled conditions.
Datalogging session	Log data identified by a Site Code.
Dewpoint	Temperature at which the moisture held in the atmosphere condenses.
Duration	Difference between the start and finish times of Autostart logging.
EC	Electrochemical Cell.
EMC	Electromagnetic compatibility.
ESD	Electrostatic discharge.
Factory setting	Default values of calibration and alarm levels that are set into a probe during manufacture.
Hg	Mercury.
Highlight	Indication in white on a black background.
HVAC	Heating, ventilation and air conditioning.
IAQ	Indoor Air Quality.
Instrument setup	Instrument options set for a particular application.
K	Kelvin.
Key	Four way cursor switch.
Keypad	General term that includes the 4-way cursor switch and the instrument buttons.
Keypad lock	Security facility that disables all the instrument switches, except for the left and right cursor keys.
kp/cf	Kilo particles per cubic foot.
LCD	Liquid crystal display.

APPENDIX A GLOSSARY OF TERMS AND ABBREVIATIONS

Line feed	Printer function, to move to the next line. Most printers have line feed as an automatic function.
Location	Reference for logged measurements. Sub division of a Site.
Log data	Stored information for each channel that was enabled during a logging session.
Logging interval	Time between repetitively storing measurement data. Applies to Continuous logging as well as Autostart logging.
Logging session	Log period from start to finish, which includes Continuous logging and Autostart.
Measurement screen	Pressure, velocity or volume flow rate.
MENC	Modified ellipsoidal nose configuration.
Menu mode	Mode in which the Surveyor instruments can be configured or retained data can be viewed. Press MENU/METER when in Meter mode.
Meter mode	Mode in which the probe measurements are displayed. Press MENU/METER to change to Menu mode.
Navigate	Use the cursor key to move the highlighted selection around the displayed information.
NDIR	Non-dispersive Infrared.
NiCd	Nickel cadmium rechargeable battery.
NiMH	Nickel metal hydride (rechargeable battery).
OSHA	Occupational Safety and Health Administration.
Out of range	Measurement that is outside the channel specification. Usually occurs while the probe is warming up, either after switch on or when a probe has been changed.
Overrange	Measurement exceeds the selected range.
Pa	Pascals (pressure).
PC	Personal computer.
Probe	Measurement device that can be attached to the Surveyor instruments and which contains up to four sensors.

APPENDIX A GLOSSARY OF TERMS AND ABBREVIATIONS

RFI	Radio frequency interference.
rh	Relative humidity.
Site	Reference for logged measurements. Sub divided into Locations.
Site Code	4-digit code, used to identify the site location
Software version	Refers to the software within the Surveyor instruments.
STP	Standard temperature and pressure.
Store	Datalogging IAQ measurements (either as a result of spot checks or continuous logging).
Time-interval datalogging Toggle	Datalogging at user-selected time intervals Sequential selection of two functions.
Underrange	Measurement is less than the selected range.
VFR	Volume flow rate.
WolfSensePC Software	GrayWolf software system that enables the Surveyor instruments to be configured from a PC, and also to display logged data in various formats.
Y adaptor	Connector that allows the Surveyor instruments to be connected to both a PC and an ac adaptor.

APPENDIX B USEFUL CONVERSIONS

B1. PRESSURE CONVERSIONS

			Useful Approximations
1 Pascal	0.010 mbar	7.501×10^{-3} mm Hg	0.01 mbar
	0.102 mm H ₂ O	1.451×10^{-4} psi	0.1 mm H ₂ O
	0.004 inch H ₂ O	9.869×10^{-6} atm	10×10^{-6} atm
1 mbar	100.0 Pa	0.750 mm Hg	100 Pa
	10.20 mm H ₂ O	0.014 psi	10 mm H ₂ O
	0.402 inch H ₂ O	9.869×10^{-4} atm	0.4 in H ₂ O
1 mm H ₂ O	9.806 Pa	0.074 mm Hg	0.04 in H ₂ O
	0.098 mbar	1.423×10^{-3} psi	10 Pa
	0.039 inch H ₂ O	9.678×10^{-5} atm	0.1 mbar
1 in H ₂ O	249.1 Pa	1.868 mm Hg	250 Pa
	2.491 mbar	0.036 psi	25 mm H ₂ O
	25.40 mm H ₂ O	2.458×10^{-3} atm	2.5 mbar
1 mm Hg	133.3 Pa	0.535 inch H ₂ O	0.5 H ₂ O
	1.333 mbar	0.019 psi	0.02 psi
	13.60 mm H ₂ O	1.316×10^{-3} atm	133 Pa
1 psi	6892 Pa	27.67 inch H ₂ O	700 mm H ₂ O
	68.92 mbar	51.70 mm Hg	50 mm Hg
	702.8 mm H ₂ O	0.068 atm	0.07 atm
1 atm	101.3 Pa	406.78 inch H ₂ O	15 psi
	1013.2 mbar	760 mm Hg	100 kPa
	10330 mm H ₂ O	14.696 psi	400 in H ₂ O

B2. VELOCITY CONVERSIONS

1 m/s	197 ft/min
1 ft/min	5.08×10^{-3} m/s

B3. VOLUME FLOW RATE CONVERSIONS

1 m ³ /s	2.12×10^3 cfm	10 ³ l/s
1 cfm	5.08×10^{-3} m ³ /s	0.47 l/s
1 l/s	13.2 gal/min	792 gal/hr

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