

**Field Guide
for
1312 Photoacoustic Multi-gas Monitor**

From serial number: 001 001

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About this Field Guide

This field guide is intended as a quick reference for the more commonly used features of the monitor when measuring in the field. It provides you with the information to set-up the monitoring system, start and stop the measurements, select and display the measurement data and contains a short trouble shooting guide of warning and error messages, which may be displayed while measuring.

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Safety Considerations

The 1312 Photoacoustic Multi-gas Monitor complies with IEC 348; Safety Requirements for Electronic Measuring Apparatus and IEC 1010–1; Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, and is supplied in a safe condition. To ensure safe operation and retain the 1312 in a safe condition, note the following:

EXPLOSION HAZARD!

TO AVOID THE POSSIBILITY OF AN EXPLOSION, MONITORING OF FLAMMABLE GASES IN EXPLOSIVE CONCENTRATIONS MUST NEVER BE ATTEMPTED.

Never operate the Photoacoustic Multi-gas Monitor in potentially explosive environments.

When monitoring potentially flammable or toxic gases it is essential that:

- The instrument itself is placed in a well-ventilated area outside the potentially hazardous zone.
- A sufficiently long tube is connected to the air-outlet on the back panel so that the sampled gas is carried away to the open air or to an extraction and/or filtration unit.

WARNINGS!


- Avoid water condensation in the instrument.
- Switch off all equipment before connecting or disconnecting their digital interface. Failure to do so could damage the equipment.
- Whenever it is likely that the correct function or operating safety of the apparatus has been impaired, the apparatus must be made inoperative and be secured against unintended operation.
- Any adjustment, maintenance and repair of the open apparatus under voltage must be avoided as far as possible and, if unavoidable, must be carried out only by trained service personnel.


Safety Considerations

APPLYING POWER


Before using the Monitor, check that it is set to match the available mains voltage and that the correct fuses are installed.

SAFETY SYMBOLS

 The apparatus will be marked with this symbol when it is important that the user refers to the associated warning statements given in the User Guide.

 Frame or Chassis

 Protective earth

 Dangerous voltage

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Chapter 1

Preliminary Tasks

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Chapter 1 – Preliminary Tasks

Installing the 1312PC Software

When taking delivery of the 1312 Photoacoustic Multi-gas Monitor, five very important and necessary preliminary tasks must be completed before starting to operate it:

- Install the 1312PC Software (to enable operation from via a PC) (see section 1.1).
- Connect the Monitor to a PC (see section 1.2).
- Adjustment of the “Mains Voltage” selector (see section 1.3).
- Check/Change the fuses in the monitor (see section 1.4).
- Set the Communication Parameters (see section 1.5).

1.1 Installing the 1312PC Software

Before installing the software, the PC must meet the following requirements:

Hardware:	An Intel 486 (50MHz) processor or better Min. 16Mbytes of RAM Min. 40Mbytes of space available on the hard disk VGA monitor or better One RS-232 port Mouse
Software:	Windows®95

The 1312PC software comes complete with an installation program. Insert the disk labelled “1312PC Software Disk 1” and use the standard Windows®95 procedure to run `SETUP.EXE`.

If you are unsure how to install programs, refer to your Windows®95 Help.

After the installation is successfully completed, five icons appear in the 1312PC program menu. These are labelled:

- ONLINE
- PRESENTATION
- CALIBRATE
- OFFLINE

Chapter 1 – Preliminary Tasks **Connecting the Monitor to the PC**

● DATABASE ADMINISTRATION

These icons can be placed on your desktop for easy access to the programs.

1.2 Connecting the Monitor to the PC

The monitor comes complete with a 9-pin to 25-pin null modem RS-232 interface cable. If your PC has a 25-pin serial port, an adaptor can be fitted to enable the supplied cable to be used.

1.2.1 Fitting the RS-232 Cable

1. Ensure that both the 1312 and the PC are switched off at the mains. Failure to do so may result in your equipment being damaged.
2. Locate the serial port at the back of the PC, refer to your PC manual if in doubt.
3. Push the connector on the RS-232 cable on to the serial port socket, and secure it firmly using the securing screws.
4. Locate the output labelled “RS-232” at the back of the 1312.
5. Push the connector at the other end of the RS-232 cable on to this socket, and secure it firmly using the securing screws.

If the mains voltage selector has been set, the instruments can be turned on at the mains now.

1.3 Adjusting the “Mains Voltage” Selector

The 1312 is able to operate in two different AC voltage ranges:

100 V – 127 V, and

200 – 240 V.

Before the 1312 is operated, the mains voltage selector (labelled “Mains Voltage”) on the back panel of the 1312 (see Fig 1.1) must

Chapter 1 – Preliminary Tasks

Adjusting the “Mains Voltage” Selector

be adjusted to match the voltage of the AC mains power supply being used.

To set the voltage selector:

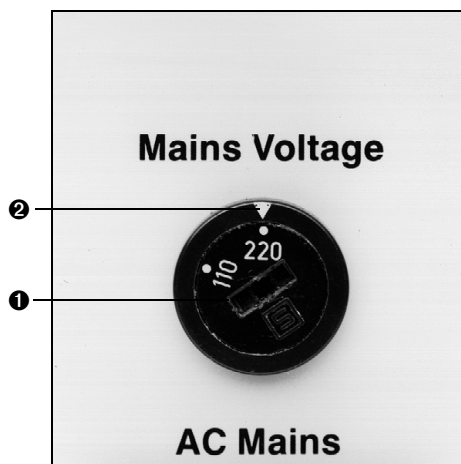
Insert a small screwdriver into the groove ❶ on the “Mains Voltage” selector and turn it so that the white arrowhead ❷ points towards either:

- **110** if the voltage of the AC mains voltage supply to be used lies between 100 and 127 V;

or

- **220** if the voltage of the AC mains voltage supply to be used lies between 200 and 240 V.

Fig 1.1 The “Mains Voltage” selector



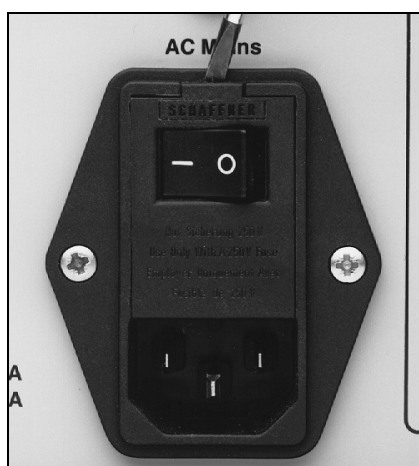
Chapter 1 – Preliminary Tasks
Checking/changing the Fuses in the 1312

1.4 Checking/changing the Fuses in the 1312

The voltage-rating of the mains power supply determines the rating of the fuses that need to be installed in the 1312 before it is used. This is done as follows:

1. Insert a small screwdriver under the top edge of the plate covering the “AC Mains” socket and use it to lever the plate downwards (see Fig 1.2).

Fig. 1.2 The “AC Mains” socket



2. Take out the fuse-holders (they each have a small white arrow on them) and fuses. Check that the installed fuses have the correct rating. The fuses used must be:

Supply Voltage	Fuse Ratings
100 - 127 V	Slow-blow (T) fuses with a rating of 1.25 A
200 - 240 V	Slow-blow (T) fuses with a rating of 0.63 A

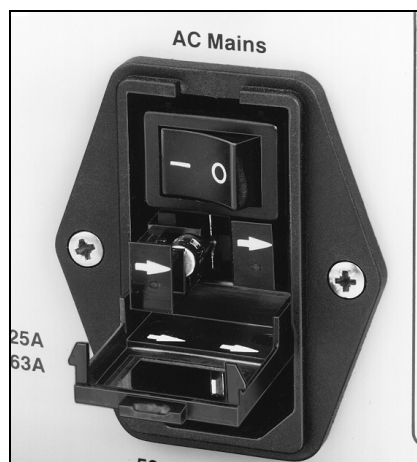
Chapter 1 – Preliminary Tasks

Setting the Communication Parameters

If the installed fuses do not have the correct rating, remove them from the fuse-holders and install fuses which have the correct rating.

3. Turn the fuse-holders so that the arrows on them are pointing in the same direction as the arrows on the inside surface of the plate covering the fuses in the “AC Mains” socket, and slide the fuse-holders (with fuses) into position in the 1312 (see Fig 1.3).

Fig.1.3 Taking out and putting back the fuse-holders



4. Flip the top plate back and “click” it into position by pressing it gently against the back panel of the 1312.

1.5 Setting the Communication Parameters

The 1312PC software and the monitor communicate using the RS – 232 interface. In order for the communication to be successful, it is essential that the communication parameters in the two instruments are set correctly. This is a two stage process: the PC communication port is selected via the 1312PC software while

Chapter 1 – Preliminary Tasks

Setting the Communication Parameters

the baud rate, parity, data bits and stop bits are defined via the monitor.

The communication parameters necessary for the monitor to communicate with the 1312PC software are shown below:

Baud rate	9600
Stop bits	1
Data bits	7
Parity	Even
Hardwire mode	Leased line
Handshake Type	Hardwire

These values are set as the default values in the monitor.

To prevent communication errors, the text line terminator, print data log and print error log must be set as shown below.

Text line Terminator	CR-LF
Print Data Log	NO
Print Error Log	NO

1.5.1 Selecting the PC Communication Port

This is just a simple case of selecting the correct port on the PC. The software offers four to choose from: COM1, COM2, COM3 and COM4. If you are not sure which port the cable is connected to on your computer, refer to your PC manual.

Start any one of the 1312PC software options: Online, Offline, or Calibrate.

1. Pull down the **Task** menu. Click on **Communication**. The Communication dialogue is displayed.
2. Click on the radio push-button next to the correct port name.

Chapter 1 – Preliminary Tasks

Setting the Communication Parameters





3. Click on **OK** to store the selection and exit the dialogue.


1.5.2 Checking/Changing the Communication Parameters

The communication parameters for the serial interface must be set using the push-buttons on the front of the monitor. With the PC and the monitor already connected, as described in section 1.2:

1. Press **SET-UP** **S3** **S1** **S3** **S1**. The screen display now shows the following text.

SELECT BAUD RATE 9600
PRESS ENTER TO CHANGE VALUE

2. If the baud rate displayed is incorrect, press  and use  and  to display the correct value. Press  again to store your selection.

If the baud rate displayed is correct, then press  to continue on to the next parameter.

3. Press **S1** to select 1 STOP BIT.
4. Press **S1** to select 7 DATA BITS.
5. Press **S2** to select an EVEN PARITY.
6. Press **S3** to select LEASED-LINE.
7. Press **S3** to select HARD-WIRED HANDSHAKE.
8. Press **SET-UP** to exit the set-up mode.
9. Press **RESET** and **S1** to enable the new settings.

The monitor and 1312PC software are now able to communicate together.

Chapter 1 – Preliminary Tasks
Setting the Communication Parameters

1.5.3 Checking/Changing the Text line Terminator

With the PC and the monitor already connected, as described in section 1.2:

Press **SET-UP** **S2** ▼ ▼ **S3**.

1.5.4 Checking/Changing the Data Log and Error Log Options

With the PC and the monitor already connected, as described in section 1.2:

Press **SET-UP** **S3** **S1** **S1** **S3** ▼ **S1** **S1**.

Chapter 1 – Preliminary Tasks
Setting the Communication Parameters

Chapter 2

Overview of 1312PC Software

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Chapter 2 – Overview of 1312PC Software

Introduction

2.1 Introduction

The 1312PC Software provides 5 separate programs:

- Online
- Offline
- Calibration
- Presentation
- Database Administration

These programs enable you to set-up the multi-gas monitor, start a monitoring task, present measurement data while monitoring, as well as present it after a monitoring task is completed. If post-processing of the data is required, this is possible and data can be used in other programs, for example to produce reports or presentation materials, either by using the clipboard option or by exporting raw data to the desired programs.

2.1.1 Description of Programs

A full description of the individual programs is given below.

Online

This program should be used when a PC can be connected to the monitor before, during and after a monitoring task. This enables you to setup the monitor via the PC and view “real-time” measurement data on the PC screen, both in graphic and tabular formats, while monitoring. Measurement data is stored directly on to the computer’s hard disk, enabling extended monitoring periods. During a monitoring task, the Online program always shows the latest data on screen. Should you wish to view measurement data without the screen being continually updated, then the Presentation program can be opened simultaneously.

Offline

This program should be used when a PC can be connected to the monitor to setup the monitoring task, but it is necessary to perform “stand-alone” measurements. During the monitoring

Chapter 2 – Overview of 1312PC Software

Overview of 1312PC Software

task, measurement data is stored in the monitor's memory. When the monitoring task is completed, the monitor and the PC can be connected again, and the measurement data uploaded from the monitor's memory and stored in the PC. The Presentation program can then be used to view the measured data.

Presentation

This program is used to display measurement data that is already stored in the PC. This program can run simultaneously with the Online, Offline and Calibration programs. Measurement data can be displayed both in tables and as graphs. Without destroying or altering the stored data, units can be changed, averaging intervals introduced or redefined and unwanted gas results removed from the display. The zoom function enables you to look more closely at specific measurement data, while the copy function enables you to copy data to the clipboard for use in other programs.

Calibration

This program enables you to use the PC environment to calibrate the monitor. Once the filters are installed and the calibration gases connected, a normal monitoring task takes place. Once all the raw data is collected, this software enables you to use the best raw data to calculate the calibration factors. Once this has been done, you can then download these factors to the desired filter banks. This raw data and calibration factors are stored with unique names, enabling them to be reused.

Database Administration

This program enables you to backup, restore and delete your databases. This provides you with greater security, as both your measurement and calibration data can be stored in a safe place.

2.2 Overview of 1312PC Software

Online

Task.....	New.....	provide new name now
	Open.....	select existing name
	Close.....	
Communication.....	Com Port.....	select between : com1/com2/com3/com4
Units.....	Setup Information.....	
	Default Units.....	Humidity.....select correct units
		Pressure.....select correct units
		Temperature.....select correct units
		Gas Conc.....select correct units
		Length.....select correct units
	Normalization Temp.....	select correct normalization temperature value
Font.....	Standard Windows procedures	
Print.....	Print / Print Review / Print Setup	
Sequence.....	Settings.....	Sampling Mode.....Continuous
		Fixed Sampling Interval.....Fixed Sampling Interval
		Flushing.....Auto (tube length)
		Gas Monitor Display.....Fixed time (chamber and tube times)
		Average.....de-/activate averaging
		Air Pressure (actual).....enter correct pressure
		Compensation.....de-/ activate Water compensation
		.....de-/ activate cross interference
Gas.....	Gas Setup.....	select Filters/gases
	Sample Integration Time.....	define integration times
Alarms.....	Select gas.....	select gases
	Limit.....	select limit
	Action.....	de-/activate PC, gas monitor, Relay 1, Relay 2
Edit.....	Window Properties.....	Interval.....Time/Measurement number
		Rolling Average.....define interval displayed (time/no. of measurements)
		Column (Numeric window).....define which gases are displayed in the window
		Left Y-axis (graphic window).....define the gases displayed and their appearance
		Right Y-axis (graphic window).....define the gases displayed and their appearance
User Event.....	Select where event is inserted; previous measurement; next measurement; at cursor	
Copy to clipboard.....	copies data/curves in active window to the clipboard	
View.....	Tool Bar (standard windows commands)	
	Status Bar (standard windows commands)	
	Zoom in.....only available when cursors are active	
	Zoom out.....only possible if zoom is active (doubles the measurement interval displayed)	
Window.....	New Numeric window.....	(displays measurement data in tabular format)
	New Graphic window.....	(displays measurement data in graphics format)
	Cursor Values.....	(opens cursor values dialogue; necessary when using cursors)
	Alarm Status.....	(displays alarms currently active)
	Measurement status.....	(displays values for all gases measured, even if not displayed on screen)
	Cascade, Tile & Arrange icons (windows functions)	
	List of windows currently open	

values

Offline

.....	Sampling Mode.....	Sample Continuously
.....	.....	Fixed Sampling Interval
.....	Flushing	Auto (tube length)
.....	.....	Fixed time (chamber and tube times)
.....	Gas Monitor Display	Average.....
.....	Current Air Pressure	enter correct pressure
.....	Compensation.....	de-/ activate Water compensation
.....	.....	de-/ activate cross interference
.....	Gas.....	Gas Setup.....
.....	.....	select filters & gases
.....	Sample Integration Time	select the desired time
.....	Alarms	Select Gas
.....	Limit	select gases
.....	.....	define alarm limit
.....	Up/Download	Upload new or existing task
.....	.....	Download Settings from Offline software to Gas Monitor
.....	Units.....	Default Units
.....	.....	Humidity.....
.....	.....	select correct units
.....	.....	Pressure.....
.....	.....	select correct units
.....	.....	Temperature.....
.....	.....	select correct units
.....	.....	Gas Conc.....
.....	.....	select correct units
.....	.....	Length.....
.....	.....	select correct units
.....	Normalization Temp.....	select correct normalization temperature value

Calibration

Task.....	New.....	provide new name
	Open.....	Select existing name
	Close.....	
Communication.....	Com Port.....	select between : com1/com2/com3/com4
Units.....	Setup information.....	
	Default Units.....	Humidity.....select correct units
	Pressure.....	select correct units
	Temperature.....	select correct units
	Gas Conc.....	select correct units
	Length.....	select correct units
	Normalization Temp.....	select correct normalization temperature value
Font.....	Standard Windows procedures.....	
Print / Print Preview / Print Setup.....		
Sequence.....	Settings.....	Calibration.....
		Zero Point Calibration.....
		Humidity Calibration.....
		Perform Water Vapour Span Calibration.....de-activate selection
		Humidity Interference Calibration.....define water conc.
		Active Filter.....de-activate selection
		Single-point Calibration.....select filter
		Perform Two-point Calibration.....define gas conc.
		Cross-interference calib.....Cross-interference calib.
		Current Air Pressure (actual).....enter correct pressure
	Gas.....	Filter Setup.....select calibration filters/gases
		Sample Integration Time.....select integration time
	Sampling.....	Flushing.....Auto.....define tube length
		Fixed time.....define chamber and tube times
	Start/Stop/Pause.....	Starts, Stops or Pauses calibration measurements, depending on current state
	Mark Interval.....	Marks the define interval, used to calculate calibration factors
	Unmark All.....	Removes all marks from displayed measurement data
Values.....	Calculate.....	define which marked values you want calculated: Zero Point, Humidity (Water Span &/or Humidity interference), Span (select filters and type of calibration)
	Download.....	define which filter banks in the monitor will be loaded with the calculated calibration factors
Bank.....	Upload banks from gas monitor.....	select single or all banks
	Download banks to gas monitor.....	select single or all banks
	Print all banks from gas monitor.....	define print setup
Edit.....	Window Properties.....	define interval displayed (time/no. of measurements), the gases displayed and their appearance (see window properties for Online)
	Copy to clipboard.....	copies data/curves in active window to the clipboard
View.....	Zoom in/Zoom out.....	only available when cursors are active
Window.....	Numeric window.....	displays measurement data in tabular format
	Graphic window.....	displays measurement data in graphics format
	Cursor Values.....	opens cursor values dialogue, necessary when using cursors
	Cascade, Tile, Arrange icons (windows functions).....	

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Overview of 1312PC Software

Chapter 3

Setting-up a Monitoring Task

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Chapter 3 – Setting Up a Monitoring Task

Unit Parameter Set-up

Before a measurement task can commence, there are a variety of parameters that *must* be defined first. This is called “Setting up the 1312”.

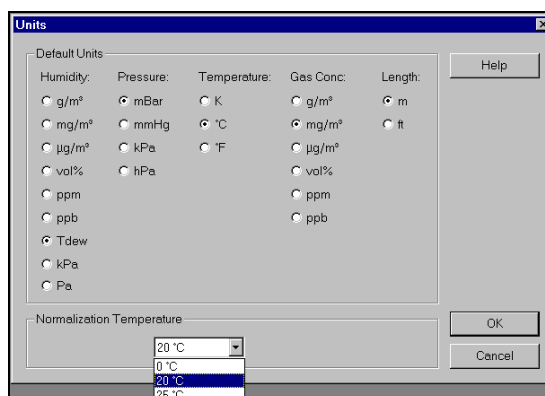
3.1 Unit Parameter Set-up

3.1.1 For Online Use

With the Online program running, follow the instructions below.

1. Pull down the **Task** menu. Click on **Units** and the unit dialogue appears, see Fig.3.1.

Fig.3.1 The Units dialogue



2. Click on the radio push-buttons to select the desired units.
3. If you have selected the mg/m^3 unit for the gas concentration, click in the *Normalization Temperature* field.
4. Note these temperature values change depending on the temperature units selected, i.e. °C, °F and K.
5. Select the desired value and click on **OK**.

All the parameters' units are now set.

3.1.2 For Offline Use

With the Offline program running:

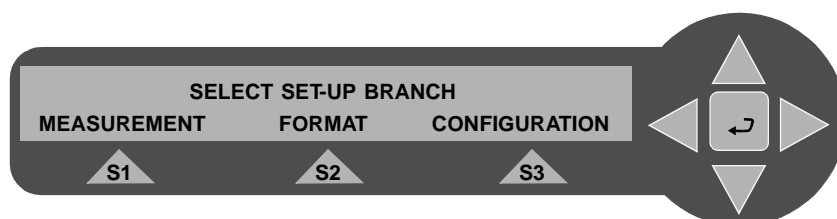
1. Click on the **Units** softkey at the bottom of the dialogue box. The Units dialogue appears, see Fig.3.1.
2. Click on the radio push-buttons to select the desired units.
3. If you have selected the mg/m^3 unit for the gas concentration, click in the *Normalization Temperature* field.
4. Note these temperature values change depending on the temperature units selected, i.e. °C, °F and K.
5. Select the desired value and click on **OK**.

All the parameters' units are now set.

3.1.3 For Stand-alone Use

For those of you setting up the monitor using these instructions, it may be useful for you to follow the steps taken using the “set-up tree”.

To enter at the top of the Set-up tree, press **SET-UP** and the monitor displays the following screen text.



1. Press **S3** to enter the **CONFIGURATION** branch. The new text displays three branches.

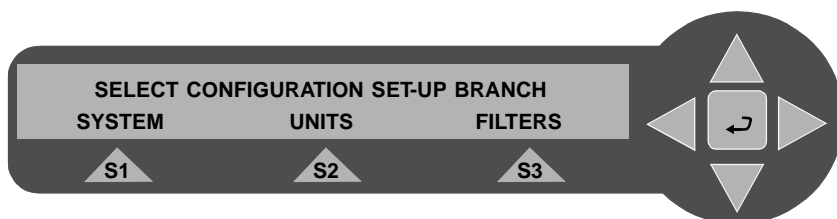
Chapter 3 – Setting Up a Monitoring Task

Measurement Parameter Set-up

Units branch

2. Press **S2** to enter the **Units** branch.
3. Use the select push-buttons to define the concentration unit.
4. Use the select push-buttons to define the length unit.
5. Use the select push-buttons to define the temperature unit.
6. Use the select push-buttons to define the pressure unit.
7. The humidity unit is displayed. Use the direction push-buttons to change it to the correct value.

When step 7. is completed, the display returns to the top of the **Units** branch.



Press **▲** to go to the top of the set-up tree, or press **SET-UP** to exit the setup mode.

3.2 Measurement Parameter Set-up

3.2.1 For PC Use – Online and Offline

If you are using the Online program, follow the instructions below. If you are using the Offline program go directly to step 5.

Chapter 3 – Setting Up a Monitoring Task
Measurement Parameter Set-up

1. Pull down the **Task** menu. Click on **New** if you want to create a new database, or click on **Open** to use an existing database.
2. In the database window:
For new databases: click in *Enter name for* field and type in the desired name.
For existing databases, click on the desired database name.
3. Click on **OK**.
A graphic window and an extended menu bar appear.
4. Pull down the **Sequence** menu. Click on **Settings** and the Setup window appears
In the new window there are several labelled “index card” separators. Each index card contains several parameters.

Sampling index card

5. Click on the radio-button for the desired sampling mode. If Sample Interval is selected, set the time to the correct value.
6. Click on the radio-button for the desired flushing mode.
 - a. If Auto is selected, set the correct tube length
 - b. If Fixed Time is selected, set the chamber flushing time and tube flushing time.
7. If water vapour and cross interference are required, click in the appropriate check boxes.
8. If average values are to be displayed on the gas monitors screen, click in the Average check box, and set the interval to correct value.
9. Click in the *Air Pressure* field and type in the value read from your barometer.

Chapter 3 – Setting Up a Monitoring Task
Measurement Parameter Set-up

Gas index card

10. Click on the “Gas” index card.
11. Click in the check box to the left of the desired filter.
12. Click in the field to the right of the selected filter and select the correct gas.
13. Repeat steps 11. & 12. until all the filters which are required for the measurements are selected and the correct names are displayed.
14. Click in the *Sample Integration Time* field and select the desired option.
15. (Advanced settings only) Note that a new field has appeared to the right of the gas names. Click in the field and define the times for the selected filters.

Alarms index card

16. Click on the “Alarms” index card
17. Click in the *Select gas* field to display the list of gas names.
18. Click on the desired gas name.
19. Click in the *Select Limit* field, and type in the desired concentration.
20. *Online Only* – Click on the Maximum Limit or Minimum Limit radio push-button.
21. *Online Only* – Click on the Instantaneous or Rolling Average radio push-button. If you select Rolling Average, click in the field to the right and define the averaging interval for the alarm.
22. *Online Only* – Click in the desired *Action* check boxes.

Chapter 3 – Setting Up a Monitoring Task
Measurement Parameter Set-up

23. Click on **Add New** or **Insert Before** if you want to insert the new entry at the top of the list.

24. Repeat steps 17. to 23. until all the required alarms are set.

Note: if you wish to remove an alarm, select the gas in the *Alarms:* field and click on **Remove**.

If you are using the Offline program, go to step 25.

If you are using the Online program, and you have completed all the steps, click on **OK**, the system is now ready to start measuring, see section 3.4.1.

Up/Download index card – Offline Only

25. Click on the Up/Download index card

26. Click on the **Download Settings** softkey. This will download the settings in the Sequence Settings dialogue to the monitor.

27. When the transfer is complete, Click on the **Close** softkey to exit the Offline program.

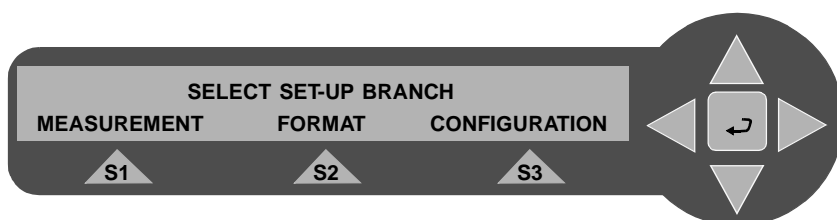
You are now ready to start measuring, see section 3.4.2.

3.2.2 For Stand-alone Use

For those of you setting up the monitor using these instructions, it may be useful for you to follow the steps taken using the Quick Set-up Guide.

Chapter 3 – Setting Up a Monitoring Task Measurement Parameter Set-up

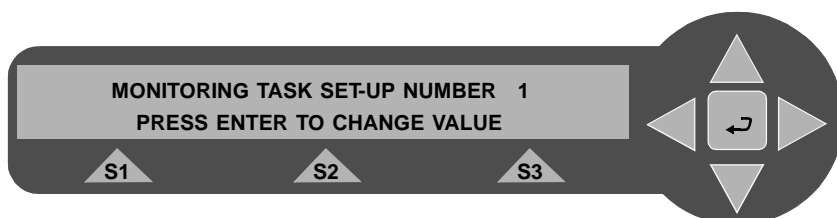
To enter the Set-up tree, press **SET-UP** and the monitor displays the following screen text.



1. Press **S1** to enter the **MEASUREMENT** branch. The new text displays two branches.

Monitoring Task branch

2. Press **S1** to enter the **Monitoring Task** branch.
The following text is displayed:



3. Up to ten different monitoring tasks can be defined here. These are labelled from 1 to 10. Use the direction push-buttons to select the desired set-up number and move on to the next display.
4. Use the select push-buttons to define if you want to sample continuously:

Chapter 3 – Setting Up a Monitoring Task
Measurement Parameter Set-up

If you select No (**S1**), go to step 5.

If you select Yes (**S3**), go to step 6.

5. The sampling interval is displayed. Use the direction push-buttons to change it to the correct value.
6. Use the select push-buttons to define if you want to monitor for a pre-set period:
If you select Yes, go to step 7.
If you select No, go to step 8.
7. The monitoring period is displayed. Use the direction push-buttons to change it to the correct value.

The **MONITORING PERIOD** is entered as Days Hours:Minutes. For example, if this particular measurement cycle needs to be performed during 5 days, 14 hours and 30 minutes, the “monitoring period” should be “entered” as 5 14:30. The 1312 will then automatically stop monitoring 5 days, 14 hours and 30 minutes after the measurement cycle with this particular set-up number is started. The range of acceptable values and the default value of the monitoring period is shown in Table 3.1.

Table 3.1 The range of acceptable values and the default value of the monitoring period

Display Text	Acceptable Values	Default Value
ENTER MONITORING PERIOD	days hours:minutes 0 00:01 to 7 00:00	days hours:minutes 0 01:00

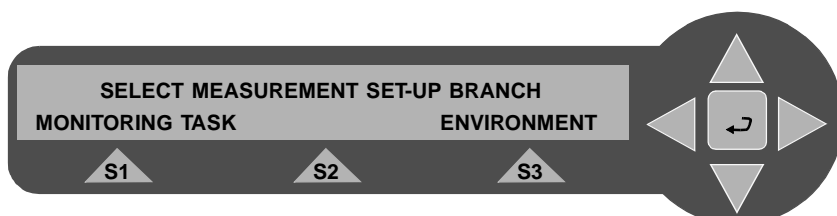
The 1312's *Display Memory* has finite storage capacity. The data storage time available depends upon the number of gases being measured, as well as the frequency with which measurements are performed (that is, the sampling interval). Section 5.9 provides information about how you can roughly calculate the length of time the data from a particular monitoring task can be stored in the *Display Memory*.

Chapter 3 – Setting Up a Monitoring Task Measurement Parameter Set-up

It is important to realise that once the *Display Memory* has been filled up by the results of a particular monitoring task, the results of any further measurements in the same monitoring task will start to overwrite the data already stored in the memory.

8. Use the select push-buttons to define if you want to compensate for water vapour interference.
9. Use the select push-buttons to define if you want to cross compensate for interferences.
10. Use the select push-buttons to select the filters/gases you want to measure. This step can be repeated up to 5 times if 5 filters are installed.
11. Use the select push-buttons to define if you want to measure water vapour.

When step 11 is completed the display returns to the top of the branch.




Environment branch

12. Press **S3** to enter the **Environment** branch.
13. Use the select push-buttons to select the desired flushing mode.
If you select Auto, go to step 16.
If you select Fixed Time, go to step 14.

Chapter 3 – Setting Up a Monitoring Task
Measurement Parameter Set-up

14. Use the direction push-buttons to define the Chamber Flushing Time
15. Use the select push-buttons to select Tube Flushing.
If you don't want tube flushing, select NO and go to step 17.
If you select tube flushing, use the direction push-buttons to define the flushing time and go to step 17.
16. Use the direction push-buttons to select the desired sample tube length and move on to the next display.
17. Use the direction push-buttons to enter the actual air pressure.
18. Use the direction push-buttons to select the desired normalization temperature.

When step 18. is completed, the display returns to the top of the **MEASUREMENT** branch.

Press  to go to the top of the Set-up Tree.

If you want measurement data presented as averaged concentration values, then go to step 19. If you want your measurement data presented as sample concentration values, then press **SET-UP** to exit the set-up function.

Format Branch

If you are starting here, press **SET-UP**:

19. Press **S2** to enter the **FORMAT** branch.

AVERAGING PERIOD 00:10
PRESS ENTER TO CHANGE VALUE

20. Use the direction push-buttons to enter the correct averaging period.
21. Use the select push-buttons to choose if you want to print each gas.

Chapter 3 – Setting Up a Monitoring Task
Setting-up the 1312's Alarm Levels

If you select Yes, go to step 23.

If you select No, go to step 22.

22. Use the select push-buttons to choose which individual gases should be printed. Each time one of the select push-buttons are pressed, the gas in the next filter is displayed. This step can be repeated up to 6 times, depending on the number of filters installed.
23. Use the select push-buttons to select the Text line Terminator.
24. The text screen returns to the top of the set-up tree. Press **SET-UP** to exit the set-up tree.

If you want to set Alarm limits for the measured gases, go to section 3.3.

3.3 Setting-up the 1312's Alarm Levels

The alarm limit of a gas is that concentration of gas which should activate any alarm relay connected to the 1312 via its back panel “**Alarm Relay**” socket. There are two different alarm relays. The alarm level parameters are found in the **Filters** branch of the set-up “tree”.

Warning! If the UA number for any filter is changed here, then all the calibration data for that filter will be lost and the filter will need to be recalibrated.

1. Press **SET-UP** **S3** **S3**. The following text is displayed.

CHECK AND/OR CHANGE SET-UP FOR FILTER A	
NO	YES

2. Use the select push-buttons to ignore this filter or to select this filter if the alarm is to be set.
3. Press ▼ 5 times until the following text is displayed.

GAS A'S ALARM LIMIT _____ mg/m³
PRESS ENTER TO CHANGE VALUE

4. Use the direction push-buttons to set the alarm concentration.

If you do not wish to activate the alarm function for a particular gas, select the **DEFAULT**. This will “blank out” the alarm level value for the gas and deactivate the alarm for that gas.

5. Repeat steps 2 to 4 to set the alarms for the other filters.
6. Press **SET-UP** to exit the alarm set-up.

3.4 Starting a Monitoring Task

Monitoring tasks can be started in two ways. They can be started immediately, or set to start at a pre-set time. The duration of the monitoring sequence can also be determined. A monitoring task can continue until it is stopped manually, or at a pre-set time.

When using the Online program, there are no limits to the duration of a monitoring task. However, if the measurement results are being stored in the monitor's memory, the duration of the monitoring task should be considered as there is only a finite amount of memory in the monitor. See section 7.2 for full details about the storage capacity of the monitor.

3.4.1 PC Use – using the Online Program

Using the 1312PC, a monitoring task can be paused or stopped and then re-started at your convenience. This means a monitoring task can comprise of one or more monitoring sequences, where each sequence has a distinct name. When sequences are measured consecutively, using the same name, a number appears after the name (starting at 1). This shows the order in which they were measured.

Chapter 3 – Setting Up a Monitoring Task

Starting a Monitoring Task

Before a monitoring task is started, the set-up, as described in section 3.2, must be completed.

1. Pull down the **Sequence** menu and click on **Start**. The New Measurement Sequence window opens.
2. In the *Enter sequence description:* field, type in the name of the monitoring sequence. If you do not enter a name, the default name is used: *Sequence 1*.
3. In the Start Time group:
To start the measurement immediately, click on the Now radio-button.
or
To delay the start, click on the Start at: radio-button and define the start time.
4. In the Stop Time group:
If no stop time is required, click on the None radio-button. This means the measurement must be stopped manually.
or
To determine the duration of the monitoring sequence, click on the Stop at: radio-button and define the stop time.
5. Press **OK** to start the monitoring task.

Stopping the Monitoring Task

If no pre-set monitoring period is defined, then to stop the monitoring task, pull down the **Sequence** menu and click on **Stop**.

3.4.2 PC Use – using the Offline Program

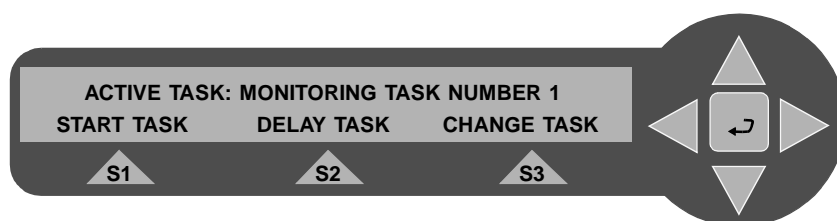
Before a monitoring task is started, the monitor should be warmed up and the set-up, as described in section 3.2, must be completed and downloaded to the monitor.

1. Press **MEASURE**.

Chapter 3 – Setting Up a Monitoring Task

Starting a Monitoring Task

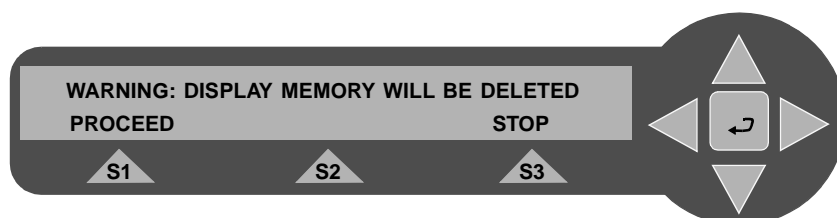
The following text appears on the screen:



Please note: if you do not use one of the “select” keys within a short time after the above text appears, the 1312 will automatically stop operating in **Measure** mode (the light-emitting diode in the **MEASURE** key switches off). If this happens just press **MEASURE** again.

2. To start the measurement immediately, press **S1**.
To delay the start, press **S2**.

The following warning then appears on the display:



Display Memory is where the 1312 stores the results of all measurements while it is performing a monitoring task. If the monitoring task is stopped and then started again all the data already collected will be deleted from *Display Memory*. However, the data in *Display Memory* can be copied into

Chapter 3 – Setting Up a Monitoring Task

Starting a Monitoring Task

and stored in the 1312's *Background Memory*. This operation is described in section 7.2.

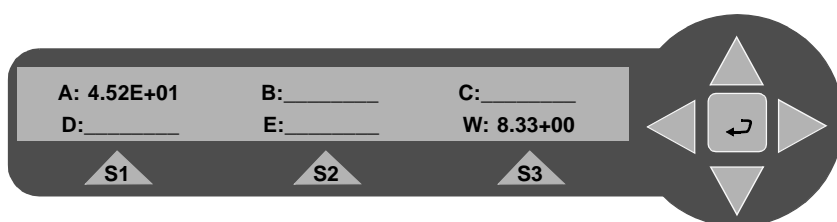
3. Press **S1**.

Immediate Start

If you selected an immediate start, the following text appears on the screen:

**MEASUREMENT IN PROGRESS
RESULTS NOT YET AVAILABLE**

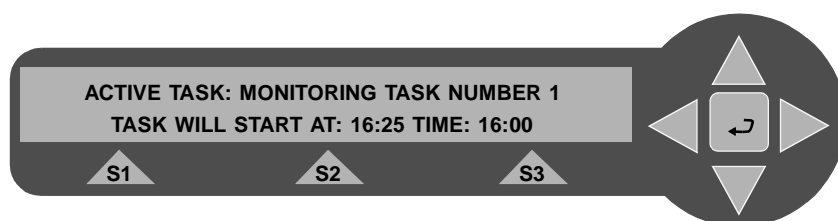
4. When the first measurement cycle is complete the 1312 will automatically display the results and update them every time a new measurement cycle is completed. An example is shown below:



This display gives the overview of the gas/vapour concentrations last measured — in this case the concentration of gas A and humidity of the water vapour are in the units that were selected — that is mg/m^3 for gas A and Tdew for water vapour.

Delayed Start

If you selected a delayed start, the following text is displayed:



The time shown in the TIME: field is the current time. When the monitoring task starts, the monitor's screen will change and display the same messages as those displayed when a monitoring task starts immediately.

Stopping the Monitoring Task

If no pre-set monitoring period is defined, then to stop the monitoring task, press **MEASURE** and **S3**.

3.4.3 Stand-alone Use – using Front Panel Push-buttons

Before a monitoring task is started, the set-up, as described in section 3.5, must be completed:

Before any monitoring task is started, all data stored in the 1312's *Display Memory* is removed (cleared). The *Display Memory* is where the 1312 stores the results of all measurements while it is performing a monitoring task. However, the data in *Display Memory* can be copied into and stored in the 1312's *Background Memory*. This operation is described in section 7.2.

When you start a new monitoring task the following warning is displayed **WARNING: DISPLAY MEMORY WILL BE DELETED** to remind you to store any data that is presently stored in the *Display Memory*. If a monitoring task is stopped, any data already stored

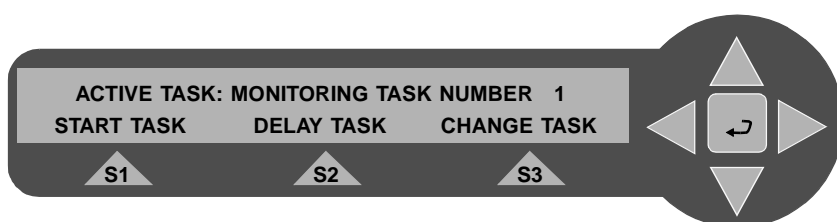
Chapter 3 – Setting Up a Monitoring Task

Starting a Monitoring Task

in *Display Memory* will be deleted when a monitoring task is started.

1. Press **MEASURE**.

The following text appears on the screen:



Please note: if you do not use one of the “select” keys within a short time after the above text appears, the 1312 will automatically stop operating in **Measure** mode (the light-emitting diode in the **MEASURE** key switches off). If this happens just press **MEASURE** again.

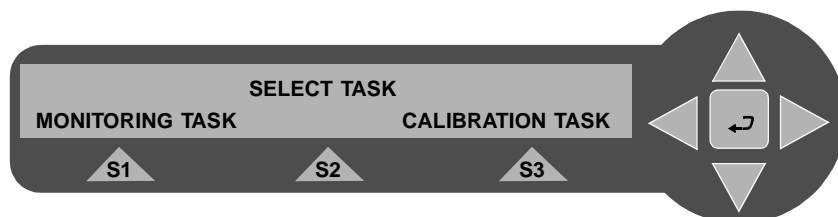
The **active** monitoring task number is the number of the monitoring task you wish the 1312 to perform.

2. If the monitoring task number displayed is correct, then go to step 5.

If the number on the display is **not** correct then press **S3** to change the task number.

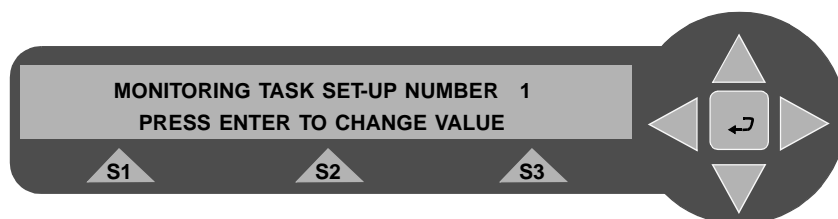
Chapter 3 – Setting Up a Monitoring Task
Starting a Monitoring Task

This changes the display text to the following:



3. Press **S1**.

This causes the following text to appear on the display:



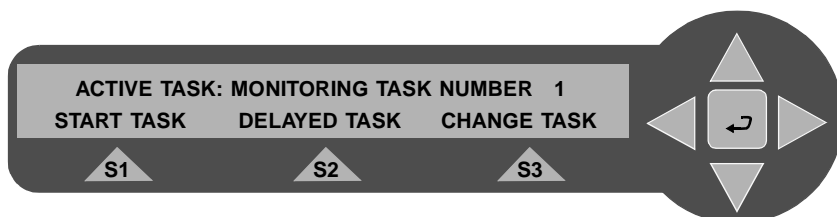
The number appearing on the screen will be a number from 1 to 10.

4. Press **↩** and use the direction keys to change the monitoring task number to the desired value. Then press **↩** again to accept the task number.

Chapter 3 – Setting Up a Monitoring Task

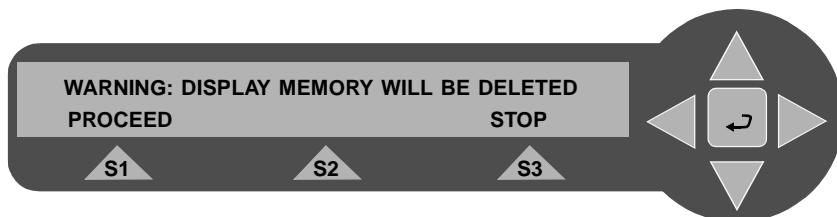
Starting a Monitoring Task

The following text appears on the display screen:



5. To start the measurement immediately, press **S1**.
To delay the start, press **S2**.

The following warning then appears on the display:

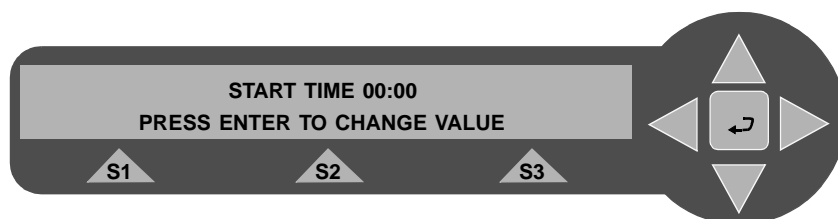


6. Press **S1**.

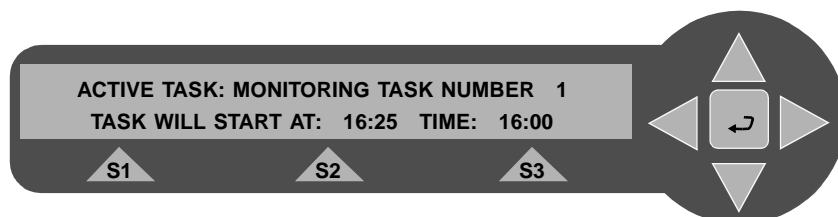
Chapter 3 – Setting Up a Monitoring Task
Starting a Monitoring Task

Delayed Start

If you selected a delayed start, the following text is displayed:



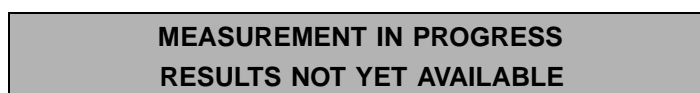
Use the direction push-buttons to enter the desired start time, e.g. 16:25. The following text is displayed:



When the monitoring task starts, the screen will change and display the same messages as those displayed when a monitoring task starts immediately.

Immediate Start

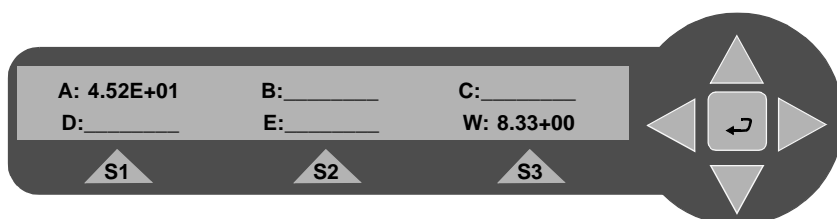
If you selected an immediate start, the following text appears on the screen:



Chapter 3 – Setting Up a Monitoring Task

Starting a Monitoring Task

- When the first measurement cycle is complete the 1312 will automatically display the results and update them every time a new measurement cycle is completed. An example is shown below:



This display gives the overview of the gas/vapour concentrations last measured — in this case the concentration of gas A and humidity of the water vapour are in the units that were selected — that is mg/m^3 for gas A and Tdew for water vapour.

Stopping the Monitoring Task

If no pre-set monitoring period is defined, then to stop the monitoring task, press **MEASURE** and **S3**.

Chapter 4

Displaying Measurement Data – PC Use

4.1	Measurement Data	4 – 2
4.2	Events Marks	4 – 2
	Inserting a User Event Marker	4 – 3
4.3	Using the Cursors	4 – 4
	“Single” Cursor	4 – 4
	Two Cursors	4 – 5
4.4	Displaying Measurement Results.....	4 – 6

Chapter 4 – Displaying Measurement Data – PC Use **Measurement Data**

4.1 Measurement Data

In order for the measurement data to be viewed using the PC software, the data must be stored in the PC. For Offline and Stand-alone use, where the measurement data is stored in the monitor, then the data must be Uploaded to the PC.

All measurement data from the 1312 monitor, regardless of what is being displayed on screen during the measurement, is transferred to the PC and stored in a MS-Access[®] format. This measurement data can be viewed on screen, analyzed and used in other software programs that utilize ODBC.

4.2 Event Marks

When measurement data is displayed on screen, several event marks are also displayed. The significance of these marks is described below.

Communication Errors: are marked by a line with a “C” at the end of it. These indicate when a communication error has occurred between the monitor and the PC.

Alarms: are marked with a small red triangle. These indicate when the alarm was triggered, and which gas triggered the alarm.

New Air Pressure Entered: are marked by a line with an “N” at the end of it. These indicate that a new air pressure was entered during a measurement.

User Events: are marked with by a cursor with a “U” at the end of it.

Chapter 4 – Displaying Measurement Data – PC Use

Event Marks

Gas Monitor Warnings/Errors:

Event Marks	Description
Common Marks: apply to all filters	
"P"	The 1312 stopped measuring due to a power failure, but automatically re-started monitoring again after regaining power. The 1312 was "reset" because a fault was detected.
"U"	The measurement was marked by the user when the Event button was pressed.
"W"	An operational error was detected, or a warning was given during the measurement. The accuracy of the measurement cannot be guaranteed.
Gas Marks: apply to individual filters	
"B"	The 1312 was incapable of calculating this gas concentration.
"F"	After this measurement the filter carousel was found to be out of alignment. If the misalignment is only slight, then accuracy of the measurement has not been affected, but the accuracy of such a measurement can not be guaranteed.
To see which gas the Gas Mark adheres to, open a numeric window.	

User Event Marks can be entered both in the Presentation and the Online programs. This is described in section 4.2.1.

When using the Presentation program, these event marks can be "hidden" by removing the tick in the check boxes on the Event Marker index card.

4.2.1 Inserting a User Event Marker

1. If you want to insert a User Event marker at the cursor, position the "single" cursor.
2. Pull down the **Edit** menu. Click on **Insert User Event** and a new dialogue box opens.

Chapter 4 – Displaying Measurement Data – PC Use Using the Cursors

3. *Online only* – click on the radio-button for the desired position.
4. Type in any comments you may have in the Events Text field.
5. Click on **OK**.

The user event marker will appear at the designated point.

4.3 Using the Cursors

Cursors can be used in both the numeric and graphic windows. The way they are used and the information they provide is the same in both situations. Before the cursors can be displayed, the Cursor Values window must be opened and the window in which you wish to position the cursor(s) must be selected. Once the Cursor Values window is open, you click on the curve (in the graphic window) or on the value (in the numeric window) that you are interested in.

The cursor function is divided into two parts: when a single cursor is displayed and when two cursors are displayed.

4.3.1 “Single” Cursor

When you click in the window, a single cursor appears in the graphic window while two cursors appear either side of a single value in the numeric window. The Cursor Values dialogue gives several pieces of information:

Cursor Position: this can be given as either a time and date or a measurement number, depending on what was defined in the Window Properties dialogue.

The displayed gases (and their display units) are listed on the left-hand side of the dialogue. Opposite each gas, under the heading Cursor Value, there is a value displayed. This is the measured value for the gas where the cursor has been positioned.

Chapter 4 – Displaying Measurement Data – PC Use Using the Cursors

There is a soft-key, **View Settings**, which enables you to see the measurement's settings (see section 3.2) for the measurement sequence.

Note: the View Settings soft-key is only available when this "single" cursor is displayed.

4.3.2 Two Cursors

If you are interested in the measurement data in a particular range, or need to zoom in, then two cursors can be used. The second cursor is displayed when you click on the initial cursor (either of the cursors in the numeric window), hold the left mouse button down and drag the cursor to the desired position and then release the mouse button. The two cursors are quite easy to see now. The information in the Cursor Values dialogue changes.

When using the Online program, the cursors can be used to look at any of the data more closely. But, note that as soon as a new measurement is available from the monitor, this will be displayed, disturbing your zoomed in view. In this case, it is more convenient to use the Presentation program simultaneously.

Left Cursor Position: this can be given either as a time and date or a measurement number, depending on what was defined in the Window Properties dialogue.

Right Cursor Position: this can be given as either a time and date or a measurement number, depending on what was defined in the Window Properties dialogue.

The displayed gases (and their display units) are listed on the left-hand side of the dialogue. Opposite each gas are several values under the headings:

Minimum: this shows the minimum value for each gas between the cursors.

Average: this gives the linear average value for all the values for each gas between the cursors.

Maximum: this shows the maximum value for each gas between the cursors.

Chapter 4 – Displaying Measurement Data – PC Use

Displaying Measurement Results

Standard Deviation: this is the standard deviation of a particular gas's measurements from the average value of this gas.

Note: the **View Settings** soft-key is not displayed when two cursors are displayed.

Zoom Function

When two cursors are displayed, the zoom function can be used. By pulling down the **View** menu and clicking on **Zoom in**. All the measurement data outside the cursors is removed from the screen. By setting new cursors, the zoom can be repeated.

Note: the Cursor Values dialogue updates each time the new cursors are displayed.

There are two ways to zoom out again.

You can pull down the **View** menu and click on **Zoom out**.

or

You can redefine the time “window” or the number of measurements displayed in the Window Properties dialogue.

4.4 Displaying Measurement Results

Measurement results can be displayed both during a monitoring task, using the Online program, and on completion of the monitoring task, using the Presentation program.

The Online program always displays the latest measurement, while the Presentation program enables you to look at specific measurement data regardless of when it was recorded.

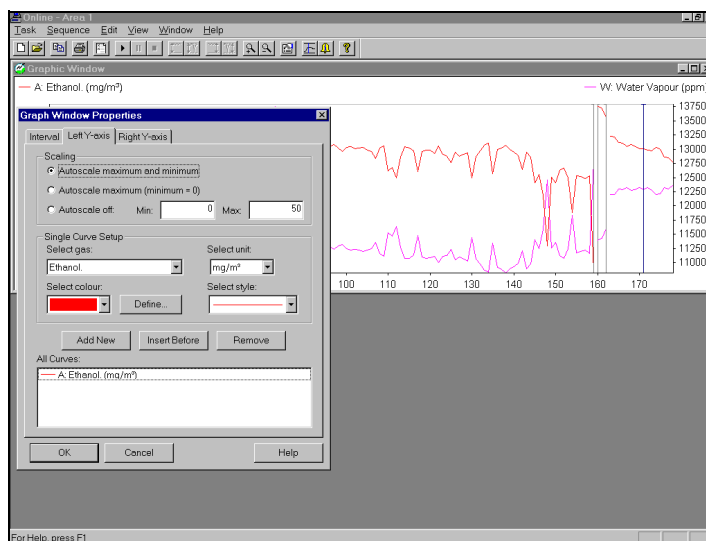
Measurement data can be displayed in both graphic and a numeric windows, simultaneously.

With the Online program running and a monitoring task started, or the Presentation program running and a database selected:

1. Open the Window Properties dialogue, see Fig. 4.1.

Chapter 4 – Displaying Measurement Data – PC Use Displaying Measurement Results

Fig 4.1 The Window Properties dialogue for a graphic window



Interval index card

2. *Presentation only* – Click in the *Measurement Sequence* field and a list of all the sequences in the monitoring task is displayed.
3. *Presentation only* – Select the desired sequence or all sequences.
4. *Presentation only* – If you select all, then you can zoom in on the individual areas using the cursor function (see section 4.3.2).
5. Select the interval units for the x-axis. Click on either *Time* or *Measurement Number* radio-buttons and define the values in the *From:* and *To:* fields.
6. Select the displayed measurement values.

Chapter 4 – Displaying Measurement Data – PC Use

Displaying Measurement Results

If you want to display instantaneous values, ensure that the check box in the Rolling Average group is *not* ticked.

If you want to display rolling average values, click in the Rolling average check box and define the averaging interval.

If you have opened a numeric window, go to step 7. If you have opened a graphic window go step 13.

Column index card

7. Click on the Column index card.
8. If the gases and their units displayed in the *All Columns* field are not correct, click on the gas you want to change.
9. If the gas you want to display is not present in the *All Columns* field, click on **Add New** or **Insert Before**.
10. In the Single Gas Setup group, click in the *Select Gas* field and select the desired gas name.
11. Click in the *Select unit* field and select the desired units.
12. Repeat steps 8. to 11., selecting the other gases you want to display.

The selected gases will now be displayed in the numeric window as they become available.

Presentation only – Go to step 26. to define the event markers that you want displayed in the numeric window.

Left Y-axis index card

13. Click on the Left Y-axis index card
14. In the Scaling group, select the desired scaling mode by clicking on the correct radio-button.
15. If the gases and their units displayed in the *All Curves* field are not correct, click on the gas you want to change.

If the gas you want to display is not present in the *All Curves* field, click on **Add New** or **Insert Before**.

Chapter 4 – Displaying Measurement Data – PC Use Displaying Measurement Results

16. In the Single Curve Setup, click in the *Select Gas* field and select the desired gas name.
17. Select the desired colour, style and units.
18. Repeat steps 15. to 17. until all the gases you want displayed on the left y-axis are in the *All Curves* list.

Right Y-axis index card

19. Click on the Right Y-axis index card
20. In the Scaling group, select the desired scaling mode by clicking on the correct radio-button.
21. If the gases and their units displayed in the *All Curves* field are not correct, click on the gas you want to change.
22. If the gas you want to display is not present in the *All Curves* field, click on **Add New** or **Insert Before**.
23. In the Single Curve Setup, click in the *Select Gas* field and select the desired gas name.
24. Select the desired colour, style and units.
25. Repeat steps 21. to 24. until all the gases you want displayed on the right y-axis are in the *All Curves* list.

Presentation program users – go to step 26.

Online program users – press **OK** to save the selections and exit the dialogue box. The measured data will now be displayed on screen as it becomes available.

Events index card

26. Click on the Events index card.
27. Click in the desired check boxes to display the different event markers.
28. Press **OK** to save selections and exit the dialogue box.

Chapter 4 – Displaying Measurement Data – PC Use
Displaying Measurement Results

Although the measurement data may be displayed on screen, you can change any of the parameters, including the averaging value, in the Window Properties dialogue when ever you please without losing any data in the process

Chapter 5

Displaying Measurement Data – Stand-alone Use

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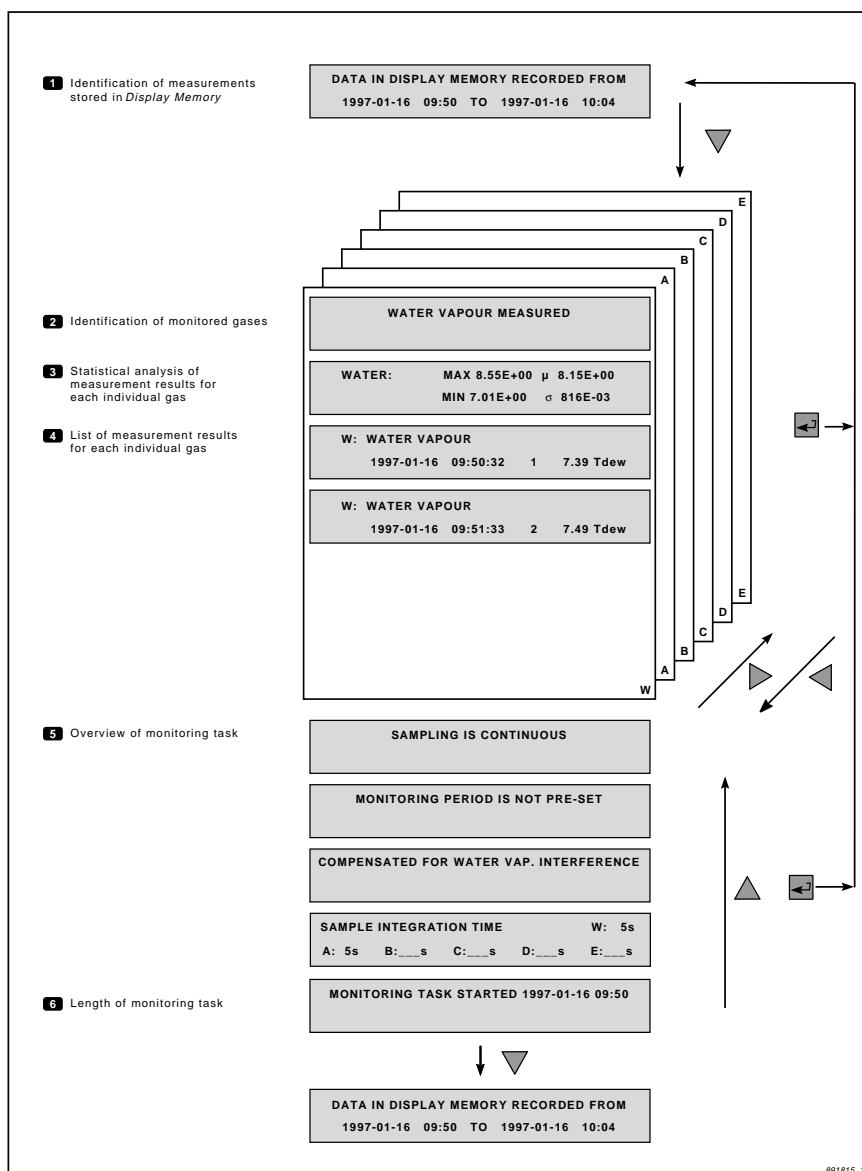
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Chapter 5 — Displaying Measurement Data – Stand-alone Use

Fig.5.1 Organisation of monitoring-task data displayed on the 1312's



Chapter 5 — Displaying Measurement Data – Stand-alone Use Viewing Data via the Front Panel Display

5.1 Viewing Data via the Front Panel Display

When the 1312 contains monitoring data, but is not being operated in any **mode**, the screen display text identifies the data stored in its *Display Memory* by displaying the day and time of the first stored measurement cycle of the monitoring task as well as the day and time of the last measurement cycle of the monitoring task. For example:

**DATA IN DISPLAY MEMORY RECORDED FROM
1997-01-16 09:50 TO 1997-01-16 10:04**

You can scroll through the set-up parameters as well as the data collected during the task by using the direction push-buttons. This is illustrated in Fig. 5.1.

If desired, the measurement data can be viewed as time-averaged concentration values. This is described in Section 5.2.

5.2 Obtaining Time-weighted Average (TWA) Values

By using the **AVERAGE** button, Time-weighted Average concentrations (C_{TWA}) of all the monitored gases can be obtained over any user-defined period of time (T hours). The following steps are involved:

1. Press **SET-UP** and **S2**.
2. “Enter” the period of time required for averaging — this could for example be 8 hours if you are interested in finding out whether the 8 hour Time Weighted Average concentration of gases are in compliance with National Occupational Exposure Limits; or, alternatively, the averaging period could be 15 minute Time-Weighted Average if you are interested in finding out whether the Short Term Exposure Limit

Chapter 5 — Displaying Measurement Data – Stand-alone Use

Symbols used in Displayed Measurement Data

(STEL) of the gases complies with National Occupational Exposure Limits.

3. Press **SET-UP** and then **AVERAGE**.

When steps 1 to 3 are complete, scroll through the measurement results displayed on the screen (*Display Memory*). Notice that all measurements have been averaged over the chosen averaging period.

5.3 Symbols used in Displayed Measurement Data

If an asterisk (*) appears on the display alongside any gas concentration, it indicates that something happened during the measurement. You can find out what the asterisk indicates by pressing the **INFO** button. The following display appears for a short period of time:

GAS X: COMMON MARK: PUW GAS MARK: BFA	
EVENT NO: xxxx	TIME: hh:mm

“EVENT NO” will appear on the screen only if the Event Mark button was used during the monitoring task. In this case, the letter “E” will also appear as a Common Mark. The symbols which can appear after the text **COMMON MARK** and **GAS MARK** are listed below with a short explanation of what they mean:

Common Marks:

- “P” (1) The 1312 stopped measuring due to a power failure but has automatically re-started the monitoring task again after regaining power;
(2) the 1312 has been “reset” either because of a detected fault or because **RESET** was pressed.
- “E” The measurement has been marked by the User.
- “O” This symbol indicates that an operational error was detected during this measurement. The accuracy of such a

Chapter 5 — Displaying Measurement Data – Stand-alone Use **Printing-out Data from the 1312**

measurement cannot always be guaranteed.

- “W”** This symbol indicates that a warning was detected during this measurement. The accuracy of such a measurement cannot always be guaranteed.

Gas Marks:

- “B”** The 1312 was incapable of calculating this gas concentration
- “F”** After this measurement the filter carousel was found to be out of alignment. If the carousel was only slightly out of alignment then the accuracy of the measurement has not been affected. The accuracy of such a measurement cannot always be guaranteed.
- “A”** This gas concentration measured during this measurement cycle was found to exceed the user-defined alarm limit for this gas.

5.4 Printing-out Data from the 1312

Before data can be printed out from the 1312, the communication parameters must be checked/changed. This is explained in Section 5.8.1 for RS-232 communication and Section 5.8.2 for IEEE communication. The text line terminator must be set (see Section 5.8.3) before printing can proceed

It is also necessary to define the averaging period if the **AVERAGE** option is selected. Setting the Data Logging function is described in Section 5.5.

5.4.1 Starting a Print-out

Press **PRINT** and then one of select push-buttons **S1** **S2** or **S3** depending on which data block you wish to print-out.

Chapter 5 — Displaying Measurement Data – Stand-alone Use Data Logging Function

5.4.2 Stopping a Print-out which is in Progress

If a print-out is in progress and you wish to stop it, then the following steps need to be followed:

1. Press the **PRINT** button on the 1312's front panel.

The following text will appear on the display:

**PRINT ABORTING
PLEASE WAIT**

The printer will stop printing data.

2. Use the Line Feed function on the printer if the paper is not ejected automatically.

5.5 Data Logging Function

If the 1312 is connected up to a printer, and it is set-up to transmit data to the printer, this function enables measurement data to be printed out, automatically, as soon as it becomes available during a measurement or calibration.

The procedure is as follows:

1. Press the following sequence: **SET-UP** **S3** **S1** **S1**, and the following text is displayed:

**SELECT GENERAL SET-UP BRANCH ?
CLOCK SOUND TESTS**

2. Press **S3** ▽ **S3** **SET-UP**. This activates the data logging function.

Chapter 5 — Displaying Measurement Data – Stand-alone Use Error Logging Function

5.6 Error Logging Function

If the 1312 is connected up to a printer, and it is set-up to transmit data to the printer, this function enables any warning or error messages that are displayed, to be recorded in the printed error log, automatically.

The procedure is as follows:

1. Press the following sequence: **SET-UP** **S3** **S1** **S1**, and the following text is displayed:

SELECT GENERAL SET-UP BRANCH ?		
CLOCK	SOUND	TESTS

2. Press **S3** ▾ ▾ **S3** **SET-UP**. This activates the error logging function.

5.7 Symbols Used in Print-outs of Measurement Data

Displayed measurements marked with the **COMMON MARKS** “O” and “W”, and the **GAS MARKS** “A” and “F”, are printed-out with an “X” symbol. However, any displayed measurements marked with the **COMMON MARKS** “P” and/or “E”, and the **GAS MARK** “B” are not printed-out with these symbols. These measurements are marked in a different way:

Common Marks:

The symbol “P” is replaced by the text “**1312 Restarted**”. This indicates that the 1312 stopped and then started-up again sometime between the previous sample time and the time which appears alongside this message.

The symbol “E” is replaced by the text **User Event NumberX**: This indicates that the **EVENT** button was pressed while this measurement cycle was being performed. The number indicates the total number of “events” which have been marked during this monitoring task, at the time this sample was taken.

Chapter 5 — Displaying Measurement Data – Stand-alone Use

Setting-up Communication Parameters

Gas Marks:

The symbol “B” is replaced by a straight line (_____) which indicates that the 1312 was unable to calculate the concentration of the named gas in this sample.

Other Marks Used:

..... This symbol indicates either:
 (1) that this gas was not measured;
 or
 (2) that this gas was not selected to be printed out (see Section 12.5).

5.8 Setting-up Communication Parameters

WARNING!: You must perform a **PARTIAL RESET** of the 1312 (press the **RESET** and **S1** buttons) if the **active** value of any parameter in this branch of the set-up “tree” is changed. If the 1312 is not partially reset, then the 1312 will not up-date the communication-parameter data which it used the last time data was transmitted via either of its interfaces. By performing a partial reset you ensure that the 1312 has the parameters necessary to enable it to transmit data to the attached printer.

Press **SET-UP** **S3** **S1** **S3** and the following text is displayed:

SELECT COMMUNICATION SET-UP BRANCH ?		
RS 232	IEEE 488	CONNECTIONS

If you are using the RS – 232 interface, go to section 5.8.1. If you are using the IEEE interface, go to section 5.8.2.

5.8.1 RS-232 Interface

A brief description of the communication parameters is given below. A list of the parameters, together with the values available and their default values are shown in Table 5.1.

Chapter 5 — Displaying Measurement Data – Stand-alone Use Setting-up Communication Parameters

The parameters in this branch decide how the 1312 communicates via the RS 232 interface.

SELECT BAUD RATE gives the rate at which data should be transmitted from the 1312 via its RS-232 interface.

SELECT NUMBER OF STOP BITS gives the number of stop bits which should be used when data is transmitted from the 1312 to other equipment.

SELECT NUMBER OF DATA BITS gives the number of data bits which should be used when data is transmitted between the 1312 and other equipment.

SELECT PARITY CHECK The user chooses whether or not transmitted data should be checked for transmission errors using the parity checking system.

SELECT HARDWARE MODE The user chooses which communication line (wire) should be used to control data transmission between the 1312 and other equipment.

SELECT HANDSHAKE TYPE The user chooses which type of “handshake” should be used for transmission via the RS 232 interface.

Table 5.1 The available choices and the default values for each RS-232 communication parameter

Display Text	Acceptable Values	Default Value
SELECT BAUD RATE	300/600/1200 2400/4800/9600	9600
SELECT NUMBER OF STOP BITS	1 BIT, 2 BITS	1 BITS
SELECT NUMBER OF DATA BITS	7 BITS, 8 BITS	7 BITS
SELECT PARITY CHECK	NONE, EVEN, ODD	EVEN
SELECT HARDWARE MODE	Three-wire, Switched-line Leased-line	Leased-line
SELECT HANDSHAKE TYPE	None, X-ON/X-OFF Hard-wired	Hard-wired

Chapter 5 — Displaying Measurement Data – Stand-alone Use

Setting-up Communication Parameters

REMEMBER to partially reset your 1312 if any of the above parameters are changed! See the WARNING at the beginning of Section 5.8.

From the top of the **Communication** branch of the Set-up Tree

SELECT COMMUNICATION SET-UP BRANCH ?		
RS 232	IEEE 488	CONNECTIONS

1. Press **S1**.
2. Use the direction and select push-buttons to select the correct values for the parameters.
If you are in doubt about any of the settings, refer to your printer manual.
3. When you have been through all the parameters, the monitor returns to the top of the **Communication** branch.
4. Press **S3** **S1** and then **SET-UP**. This selects the RS-232 port as the communication port for the printer.
5. Press **RESET** and **S1** to partially reset your 1312.

5.8.2 IEEE Interface

The parameters in this branch decide how the 1312 communicates via the IEEE 488 interface bus.

1312'S ADDRESS 14 This enables the 1312 to be addressed via the IEEE 488 interface. The range of acceptable values and the default value of the 1312's address are shown in Table 5.2.

Table 5.2 The range of acceptable values and the default value of the 1312's address

Display Text	Acceptable Values	Default Value
1312 ADDRESS	from 0 to 100	14

Chapter 5 — Displaying Measurement Data – Stand-alone Use Setting-up Communication Parameters

The other IEEE 488 communication parameters which need to be selected in this branch of the set-up “tree” are shown in Table 5.3 together with available choices and default values of each parameter.

Table 5.3 The acceptable values and the default value of the IEEE 488 communication parameters

Display Text	Acceptable Choices	Default Value
IS 1312 SYSTEM CONTROLLER ?	NO, YES	YES

IS 1312 SYSTEM CONTROLLER? The user chooses whether or not the 1312 will be the system controller on the IEEE 488 interface bus.

REMEMBER to partially reset your 1312 if any of the above parameters have been changed! See the WARNING at the beginning of Section 5.8.

From the top of the **Communication** branch of the Set-up Tree:

SELECT COMMUNICATION SET-UP BRANCH ?
RS 232 IEEE 488 CONNECTIONS

1. Press **S2**.
2. Use the direction push-buttons to select the correct values for the parameters.
3. If you are in doubt about any of the settings, refer to your printer manual.
4. When you have been through all the parameters, the monitor returns to the top of the **Communication** branch.
5. Press **S3 S3** and then **SET-UP**. This selects the IEEE port as the communication port for the printer.
6. Press **RESET** and **S1** to partially reset your 1312.

Chapter 5 — Displaying Measurement Data – Stand-alone Use

Setting-up Communication Parameters

5.8.3 Additional Parameters Required

The other output parameters which determine the format of print-outs are shown in Table 5.4 together with available choices and default values.

Table 5.4 Parameters which determine the format of print-outs from the monitor

Display Text	Acceptable Choices	Default Value
PRINT EACH GAS?	No, Yes	Yes
(if print each gas is no) PRINT GAS n*?	No, Yes	No
SELECT TEXT LINE TERMINATOR	CR, LF, CR-LF	CR-LF

If one chooses to **PRINT EACH GAS**, then all gases which have been measured will be printed out. If one does not choose to **PRINT EACH GAS** then the user is then given the chance to choose which of the gases (A-E) and water (W) should be printed out – **PRINT GAS A?** and so on.

SELECT TEXT LINE TERMINATOR The user chooses which character the 1312 should use as “end of text line” when data is transmitted from the 1312.

Chapter 6

Data Transfer

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Chapter 6 – Data Transfer

Uploading Measurement Data from the Monitor

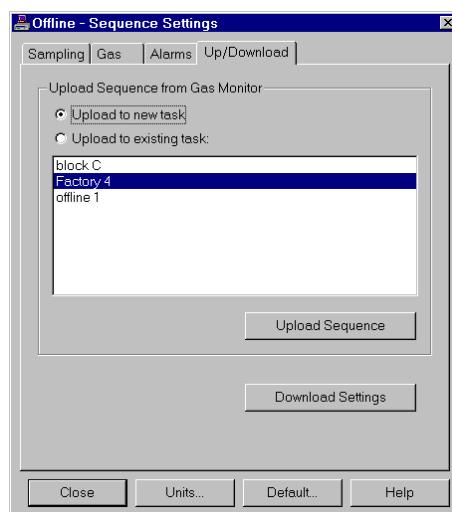
6.1 Uploading Measurement Data from the Monitor

Any measurement data that is stored in the monitor's *Display Memory* can be uploaded to a PC. Measurement data can be uploaded either as a new measurement task, which is given a unique name, or it can be uploaded so that it becomes a sequence in an existing measurement task. If **EVENT** was pressed or something happened while monitoring, the uploaded data retains these marks, which can be displayed using the Presentation program.

With the monitor and the PC connected as described in section 1.2 and the Offline program running:

1. Click on Up/Download index card, see Fig.6.1.

Fig 6.1 The Up/Download dialogue



2. Click on the radio-button to either Upload to a new task or Upload to an existing task.

If you are adding data to an Existing Task, select the monitoring task from the list displayed.

3. Click on the **Upload Sequence** softkey.

If you are uploading measurement to a New Task, a New Measurement Task dialogue opens, type in the desired monitoring task name now, and click on **OK**.

The measurement data is uploaded to the PC, where it can be viewed using the Presentation program.

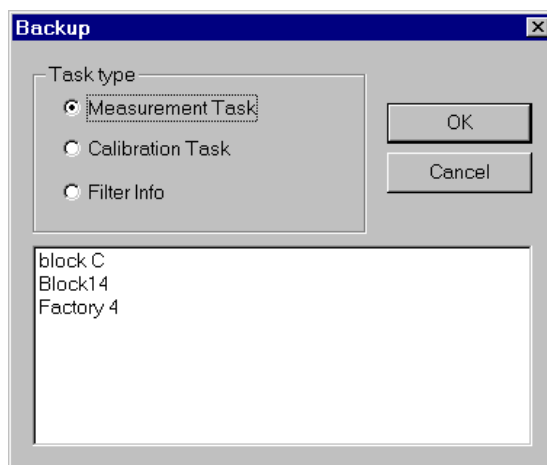
6.2 Backup Databases

This option enables you to make a backup copy of your existing databases. There are three types of files that can be backed up here: Measurement Tasks; Calibration Tasks; and Filter Information.

With the Database Administration program running:

1. Click on **Backup** and the dialogue shown in Fig. 6.2 is displayed.

Fig. 6.2 The Backup dialogue



Chapter 6 – Data Transfer

Restore Databases

2. Click on the radio-button to select the type of data to be backed up.
3. Select the correct name from the list displayed and click on **OK**.
4. Now define the destination where the backup should be stored and click on **OK**.

A copy of the selected database is now made. If you want to use this database again, use the Restore option.

6.3 Restore Databases

This option enables you to restore backup copies of databases, so that they may be used again in the 1312PC Software. All backup files, made using the Backup option, can be restored.

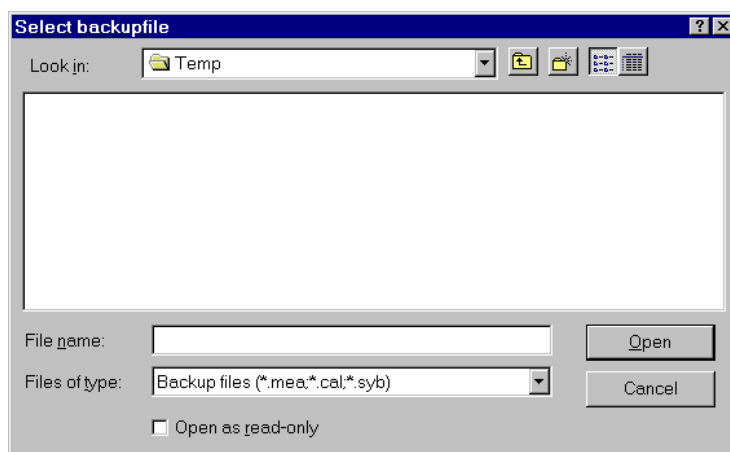
Restored databases can be restored as “read-only” files. This prevents you from adding additional measurement data to the database, or corrupting the existing data. This is of particular use when restoring Calibration databases that must not be changed.

With the Database Administration program running:

Chapter 6 – Data Transfer
Restore Databases

1. Click on **Restore** and the dialogue shown in Fig.6.3 is displayed.

Fig 6.3 The Select Backup File dialogue



2. Use the standard Windows®95 browser procedures to select the databases to be restored.
3. If you want to restore the database(s) as a read-only file(s), click in the Open as read-only check box.
4. Click on **Open**. The selected files are restored to the 1312PC Software working directory.

Click on **Cancel** to exit the Restore dialogue when all the desired databases have been restored.

Chapter 6 – Data Transfer
Restore Databases

Chapter 7

Storing Data in the 1312

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Chapter 7 – Storing Data in the 1312 Storage of Measurement Results

7.1 Storage of Measurement Results

While a monitoring task is being performed measurement data is stored in the 1312's *Display Memory*. When the monitoring task is complete the data in *Display Memory* is normally copied into the 1312's *Background Memory* to prevent it from being overwritten (and therefore lost) by measurement data stored during the next monitoring task. The same amount of data can be stored in both the *Background Memory* and the *Display Memory*.

7.2 Storage Space in the Display Memory

Table 7.1 illustrates the space which is required to store individual measurement results. If 5 gases and water vapour are being measured, then 35 bytes of space are required to store measurement results from one measurement cycle, whereas only 22 bytes of space are required if 3 gases (for example, gas A, E and water vapour (W) are measured. If only one gas (for example, gas A) is being measured, then only 13 bytes of space are required to store measurement results from one measurement cycle.

The total space available in *Display Memory* to store data is 64 000 bytes. If only one gas (for example, gas A) and water vapour are measured, then data from up to $64\,000/17 = 3764$ measurement cycles can be stored in *Display Memory*, whereas if 5 gases and water vapour were measured, data from up to only $64\,000/35 = 1828$ measurement cycles can be stored in *Display Memory*.

The time required to perform a measurement cycle is dependent upon the number of gases/water vapour being measured. Table 7.2 lists the minimum time required to perform different measurement cycles.

If we take the examples given above, we can work out approximately how long the data from a monitoring task can be stored in *Display Memory*.

A measurement cycle in which gas A and water vapour are measured takes at least 15s, and if sampling is continuous this

Chapter 7 – Storing Data in the 1312 Storage Space in the Display Memory

Table 7.1 Space occupied by results from one measurement cycle when a different number of gases is monitored

Data being stored	Bytes	
Measurement times	4	
Event numbers	2	
Common flags	1	
CRC sum	1	
Flags for gases 1 & 2	1	
Results for gas 1	4	13 bytes
Results for gas 2	4	17 bytes
Flags for gases 3 & 4	1	
Results for gas 3	4	22 bytes
Results for gas 4	4	26 bytes
Flags for gases 5 & 6	1	
Results for gas 5	4	31 bytes
Results for gas 6	4	35 bytes

Table 7.2 Minimum time taken to complete various gas measurement cycles

No. of gases measured with water vapour	Minimum time for a measurement cycle
1	13 s
2	17 s
3	21 s
4	23 s
5	27 s

means that 3764 cycles will take $3764 \times 15 = 48932s = 13.6$ hours. If, however this measurement cycle is only performed

Chapter 7 – Storing Data in the 1312 Management of Data in Background Memory

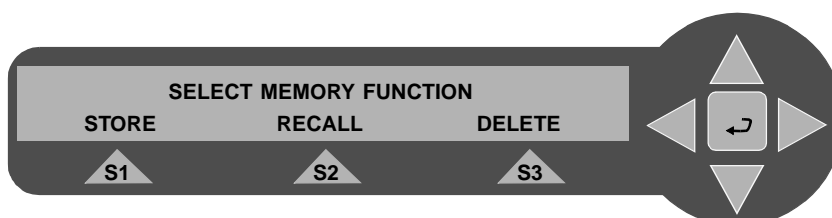
every 10 mins then data can be stored for $3\,764 \times 10 = 37\,640$ mins = 26 days.

A measurement cycle where 5 gases and water vapour are measured takes at least 27s, and if sampling is continuous this means that 1 828 cycles will take $1\,828 \times 27 = 49\,356\text{s} = 13.7$ hours. If, however this measurement cycle is only performed every 10 mins, then data can be stored for $1\,828 \times 10 = 18\,280$ mins = 12.6 days.

The maximum time you can set a monitoring period to be is 7 days. If you try to enter a greater number of days, the 1312 will automatically change the period to 7 days. However, if you do not set a pre-defined monitoring period, the 1312 will just store as much data as possible before starting to overwrite the “oldest” stored measurement results.

7.3 Management of Data in Background Memory

The 1312 has to be operated in Memory **mode** by pressing the **MEMORY** push-button. The following text appears on the screen:

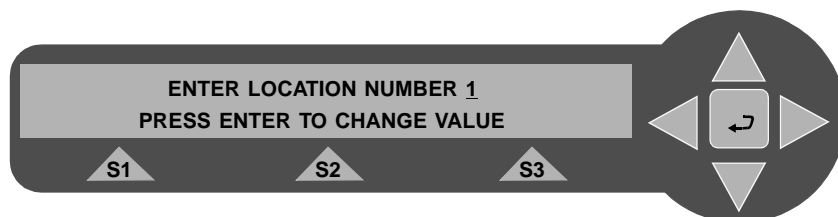


7.3.1 Storing Data in Background Memory

When data is to be copied from *Display Memory* into *Background Memory*:

Chapter 7 – Storing Data in the 1312 Management of Data in Background Memory

Press **S1**.

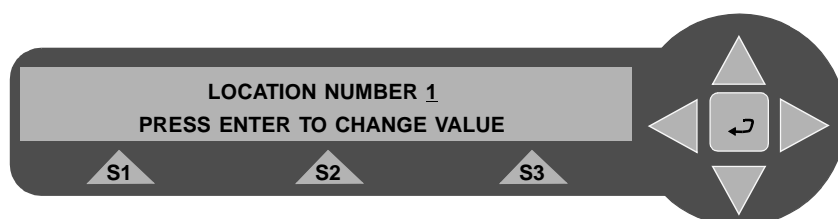


If some data has already been stored in the *Background Memory* and you cannot remember which locations have been occupied (used), press the **INFO** push-button to find out which locations are occupied and what percentage of the *Background Memory* has been used. Use the direction push-buttons to select the desired location number. When the chosen location number is on the screen, press **S2** to accept the position.

7.3.2 Recalling Data from Background Memory

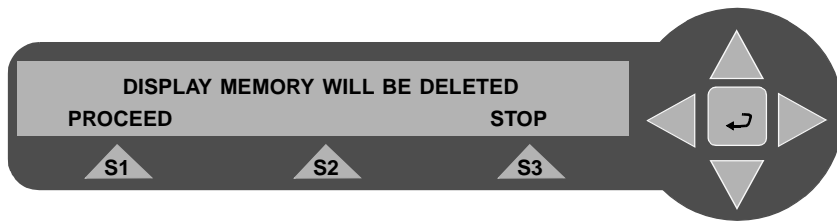
To recall data stored in *Background Memory* to *Display Memory*:

1. Press **MEMORY** **S2**

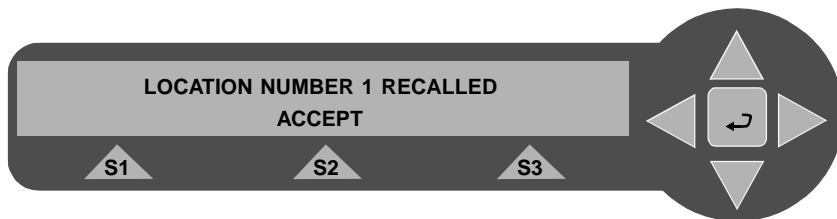


Chapter 7 – Storing Data in the 1312 Management of Data in Background Memory

2. Use the direction keys to select the correct location number.
The following text is displayed.



3. If you want to continue, press **S1** and the following text is displayed.



If you want to Stop, press **S3** this returns you to the original display showing **SELECT MEMORY FUNCTION** so that you can **STORE** any data which is stored in *Display Memory* as explained in section 7.3.1.

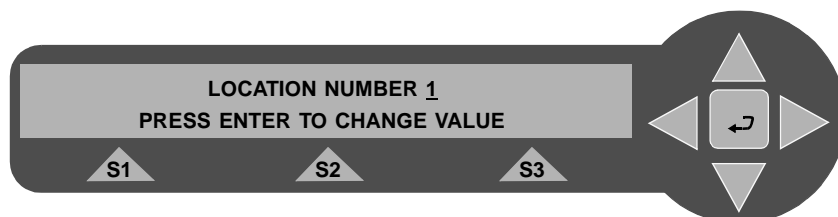
4. Press **S2**. If the data has not been stored in the chosen location, a message will appear on the 1312's display to inform the user. Otherwise, the data from the chosen location in *Background Memory* will be copied into *Display Memory*.

7.3.3 Deleting Data from Background Memory

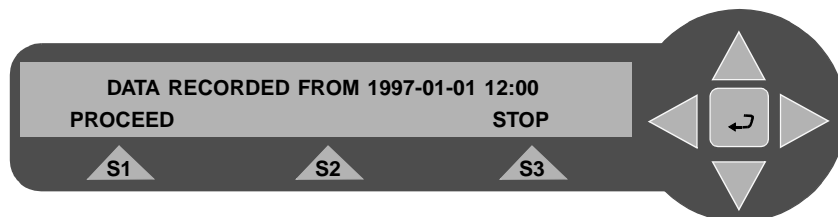
To delete data which has been stored in *Background Memory*.

Chapter 7 – Storing Data in the 1312 Management of Data in Background Memory

Press **MEMORY** **S3**.



Use the direction keys to select the location number. After selecting the chosen location number, the display will show the starting-time of the oldest data stored in the *Background Memory*:



If the starting-time of the oldest stored data to be deleted corresponds with the starting-time shown on the display screen, then press **S1** and then **S2** to accept that the data will be deleted from *Background Memory*.

Chapter 7 – Storing Data in the 1312
Management of Data in Background Memory

Chapter 8

Error Messages and Warnings

Chapter 8 – Error Messages and Warnings

When the 1312 is switched on, and while it is being operated, the 1312 regularly performs a series of self-tests which check that the various mechanical, electrical and electronic components of the 1312 are functioning correctly. If any component is found to be functioning outside of its specifications, either a “Warning” or a “Operating-error” message will appear on the gas monitor’s screen.

Please note: A “Warning” and/or “Operating-error” message will only be displayed **once**. If the fault is still found to be present during the next regular self-test, the message will **not** be displayed again. Messages are only displayed when a fault is first detected. If the fault corrects itself and then is later found to be faulty the message will be displayed again. It is therefore important to note the message before pressing the **INFO** button, which will cause the error message to be removed from the display.

Although the message is removed from the screen, any gas measurements performed while the fault is still present will be marked with an asterisk (*). By pressing **INFO** when such a measurement is displayed, the **Common mark “O”** and/or **“W”**, and in some cases, the **Gas Mark “F”** and **Gas Mark “A”** will be shown on the display.

On the following pages, all possible “Warning” messages are listed; all possible “Operating-errors” messages are listed; and all possible “Interface-error” messages are listed. There is a description of each fault as well as the possible cause(s) of each fault. The user must evaluate the significance of each message. As long as the fault is detected, all measurements will be marked by an asterisk. Some “faults” are easily corrected, for example, the error:

INTERNAL TEMPERATURE OUT OF RANGE

If you switch the 1312 off and let its internal temperature fall to the ambient temperature, the error will not be detected when the 1312 is switched on and operated again.

Chapter 8 – Error Messages and Warnings

Warning Messages		
Displayed Text	Description of Fault	Possible Cause(s)
AIRFLOW TOO LOW	The air pressure difference created by the pump in the pneumatic (airway) system (tubes and/or analysis cell) is too low. This means that the tubing and/or analysis cell cannot be properly flushed out and the sample in the analysis cell is therefore not necessarily "new".	1. The length of the sampling tube attached to the 1312's air inlet has been incorrectly entered. 2. Either the external or internal pneumatic system is not air-tight. 3. The pump is defective
AIRWAY SYSTEM BLOCKED	The air pressure difference created by the pump in the pneumatic (airway) system (tubes and/or analysis cell) is too high.	1. The length of the sampling tube attached to the 1312's air inlet has been incorrectly entered. 2. Either the external or internal pneumatic system is not air-tight.
ALARM LIMIT EXCEEDED	The 1312 has measured a concentration of gas greater than the alarm limit concentration entered.	
BACK-UP BATTERY TOO LOW	The potential difference measured across the terminals of the battery providing the back-up power supply to the 1312, to run the internal clock and protect the Working Memory, is too low.	1. The back-up battery is either defective or flat (no longer providing sufficient power). 2. The 1312's back-up battery has been disconnected. Under no circumstances must the battery be removed or replaced as there is a danger of explosion. See Explosion Hazard under Safety Considerations at the front of this Field Guide.
INTERNAL PROGRAM ERROR FOUND	There is a fault in the software.	

Chapter 8 – Error Messages and Warnings

Warning Messages		
Displayed Text	Description of Fault	Possible Cause(s)
NO INDEX MARK FROM FILTER CAROUSEL	The 1312 cannot determine the position of its filter carousel.	<ol style="list-style-type: none"> 1. The motor that drives the filter carousel is not working. 2. The belt that drives the carousel motor is defective. 3. The optical detector that checks the movement of the carousel is not working.
POWER SUPPLY VOLTAGE OUT OF RANGE	The DC voltage supplied internally to the 1312 is either too high or too low (it lies outside the specified operating range).	<ol style="list-style-type: none"> 1. The 1312 power supply (AC/DC converter) is defective 2. The AC mains supply is operating outside the specified range.
CLOCK SET TO DEFAULT ERROR DETECTED IN CLOCK SETTINGS	The 1312's internal clock was found to be incorrectly set so these values have been set to their default values.	A new battery has been installed.
FACTORS SET TO DEFAULT ERROR DETECTED IN CALIBRATION FACTORS	An error has been found in the data stored in the Calibration Factors part of the 1312's memory, so these factors have been set to their default values	<ol style="list-style-type: none"> 1. A defective back-up battery. 2. A defective Working Memory (RAM) or Source Memory (EEPROM). 3. A software fault.
MEMORY SET TO DEFAULT ERROR DETECTED IN BACKGROUND MEMORY	An error has been detected in the 1312's Background Memory, so the 1312 automatically deletes all data stored in this memory.	<ol style="list-style-type: none"> 1. A defective back-up battery. 2. A defective Working Memory (RAM). 3. A software fault.
MEMORY SET TO DEFAULT ERROR DETECTED IN DISPLAY MEMORY	An error has been detected in the 1312's Display Memory, so the 1312 automatically deletes all data stored in this memory.	<ol style="list-style-type: none"> 1. A defective back-up battery. 2. A defective Working Memory (RAM). 3. A software fault.
MEMORY SET TO DEFAULT ERROR DETECTED IN INTERNAL MEMORY	An error has been found in the data stored in the 1312's internal memory. Data stored in this memory cannot be read or altered by the user, so the 1312 automatically corrects any errors found in this memory.	<ol style="list-style-type: none"> 1. A defective back-up battery. 2. A defective Working Memory (RAM). 3. A software fault.

Chapter 8 – Error Messages and Warnings

Warning Messages		
Displayed Text	Description of Fault	Possible Cause(s)
MEMORY SET TO DEFAULT ERROR DETECTED IN SOURCE MEMORY	An error has been found in the data stored in the 1312's source memory, so the 1312 automatically gives the stored parameters default values.	1. A defective back-up battery. 2. A defective Source Memory (EEPROM). 3. A software fault.
PARAMETERS SET TO DEFAULT ERROR DETECTED IN CONFIG./FORMAT PARAM.	An error has been found in the value parameters stored in the Configuration and/or Format branches of the 1312's set-up tree, and therefore, the 1312 has automatically given these parameters default values.	1. A defective back-up battery. 2. A defective Working Memory (RAM). 3. A software fault.
PARAMETERS SET TO DEFAULT ERROR DETECTED IN TASK SET-UP PARAM.	An error has been found in the value parameters stored in the Monitoring Task branch of the 1312's set-up tree, and therefore, the 1312 has automatically given these parameters default values.	1. A defective back-up battery. 2. A defective Working Memory (RAM). 3. A software fault.

Chapter 8 – Error Messages and Warnings

General Operating Error Messages		
Displayed Text	Description of Fault	Possible Cause(s)
A/D INTERRUPT FAILED	A/D converter was not able to collect the necessary number of signal measurements to ensure an accurate concentration measurement.	The analogue card is defective.
AIR SHUNT BLOCKED. SAMPLE ABORTED	The pressure of air in the analysis cell is too high. The microphones risk being damaged by being exposed to such high pressures.	The air-shunt valve is either defective or blocked
CHOPPER FAILED	The A/D converter was not able to collect the necessary number of measurements to ensure an accurate concentration measurement.	1. The chopper motor is not working. 2. The belt which drives the chopper is defective. 3. The optical sensor which checks the chopper's movement is not working.
INTERNAL TEMPERATURE OUT OF RANGE	The temperature in the analysis cell is either too high or too low. As the 1312 is operating outside its temperature specifications, accurate measurements can not be guaranteed.	1. The ventilating fan is defective. 2. The ambient air temperature is either too high or too low. 3. The temperature sensor is defective
IR-SOURCE TEMPERATURE OUT OF RANGE	The temperature of the infra-red light source is either too high or too low. As the IR-source is operating outside its temperature specifications, accurate measurements cannot be guaranteed.	The infra-red light source is defective
MICROPHONE TEST FAILED	The signal received from the microphone during the self-testing procedures is out of range.	1. The analogue card is defective. 2. A microphone(s) is defective.

Chapter 8 – Error Messages and Warnings

General Operating Error Messages		
Displayed Text	Description of Fault	Possible Cause(s)
PUMP TEST FAILED	The pump cannot build up the necessary pressure during the self-testing procedure.	<ol style="list-style-type: none"> 1. The pump is defective 2. The internal pneumatic system is not air-tight.
VIBRATION LEVEL TOO HIGH	The signal measured in the analysis cell when the IR-source and the chopper are both switched off is too high. The 1312 is likely to interpret the signal as being due to the presence of gas and therefore gas concentrations measured by the 1312 will be higher than they are in reality	<ol style="list-style-type: none"> 1. A microphone(s) is defective. 2. The analogue card is defective. 3. The 1312 is being exposed to external vibrations (around 20 Hz).

Chapter 8 – Error Messages and Warnings

Warnings connected with Printing, Data-logging and Error-logging		
Displayed Text	Description of Fault	Possible Cause(s)
IEEE CONTROL TIMEOUT	The 1312 wishes to send data to a printer via the IEEE interface, but the 1312 is not the system controller.	There are no other "controllers" on the IEEE bus, so the 1312 should be made the system controller.
WARNING: CTS HANDSHAKE CONFLICT	The 1312 receives the handshake signal from the RS232 CTS (clear to send) line, but it has not been set-up to use this CTS line.	The 1312 and the RS232 device (printer) do not agree about which handshake signal they should use. Perhaps the wrong interface cable has been used.
WARNING: DSR HANDSHAKE CONFLICT	The 1312 receives the handshake signal on the RS232 DSR (data send ready) line, but has not been set-up to use this signal.	The 1312 and the RS232 device (printer) do not agree about which handshake signal they should use. For example, if the device uses DSR line and you have selected either "switched-line" or "leased line" as a hard-wire mode and not selected "hard-wired" as the handshake type.
WARNING: X-ON/X-OFF HANDSHAKE CONFLICT	The 1312 receives the X-On/X-Off handshake signal via the RS232 interface, but it has not been set-up to use this signal.	The 1312 receives the handshake signal on the RS232 interface, but it has not been set-up to use this signal
WARNING: TIMEOUT. DEVICE NOT CONNECTED	1312 wishes to send data (print, data-log or error-log) via the IEEE interface, but there is no response from the device with the address entered in the 1312 set-up.	1. No device is connected to the 1312. 2. The device address has been entered incorrectly in the 1312's set-up.
WARNING: TIMEOUT. DEVICE NOT READY	1312 wishes to send data (print, data-log or error-log), but after the start of data transmission, the device stops receiving data.	1. The device is "off-line" (it can not receive data). 2. The device is not able to receive data fast enough. 3. The device is no longer connected to the 1312.