

Instruction Manual

Stand Alone Multipoint System

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1.0 Introduction

The Stand Alone Multipoint System is a system comprising a Gas Monitor (Innova Type 1314i, 1412i, 3434i or 1512) and a Multipoint Sampler Innova Type 1409.

In some situations, it may be an advantage to have the system to perform measurements without having the instrument online connected and controlled from a PC.

In the Stand Alone Multipoint System, the Gas Monitor is the system-controlling device.

The System can be set-up either from the Gas Monitor's front panel or by using the Remote and Offline Software BZ7007. The BZ7007 Remote and Offline Software can be used to retrieve data from the system either directly connected via a USB cable or through a LAN network via the Ethernet connection.

For further information and guidance in how to use the BZ7007 Remote and Offline Software, please consult the User manual BE6042 supplied with the Software.

The present manual describes how to set-up the Stand Alone Multipoint System Using the Gas Monitors front panel.

2.0 Connecting the 1409 to the Gas Monitor

Cable connection:

The 1409 is connected to the Gas Monitor by the USB interface, over which the 1409 receives the commands and data, which control it (see Figure 1). For further information about the cables available from LumaSense to connect the 1409 to the Gas Monitor and about the USB interface of the 1409, Please refer to User Manual BE6037 supplied with the Type 1409.

Tube connection

The 1409 is connected via tubing to:

The sampling points;

Examples are shown in <u>Figure 1</u> and <u>Figure 2</u>.

Note: the performance of the 1409's sampling system is dependent on the type of external pump (optional) used and the length and diameter of the sampling tubing.

Tubing for use with the 1409 is available from LumaSense: polytetrafluoroethylene (PTFE), 50m roll, accessory number AF0614.

Using this tubing material minimizes the risk of gases being adsorbed onto the tube's surface, which would result in inaccurate measurements.

To prevent dust from entering the tubing and instruments it is recommended to use external filters at the sampling points. LumaSense have the following filter options DS2306 or UD5023 (see Figure 2).

WARNING! Avoid water condensation in the instrument.

Liquids must be prevented from entering the instrument. It is therefore important that warm humid gases are not drawn into a cold instrument because condensation will take place. If such a situation is likely to occur, you must ensure that the gases are drawn through water-trap filters before they enter the sampler channels of the 1409. The In-line Genie Membrane Separator (LumaSense order no. UA1365 see Figure 2) avoids condensation in the measuring instruments. For further information please consult BE6037 supplied with the Type 1409.

to the Gas Monitor being used to analyse the gases that are sampled;

This connection uses the same tubing (PTFE, LumaSense No. AF0614) as for the sampling tubes. The tubing is connected to the Outlet to Analyzer stub on the rear panel of the 1409, and to the Air Inlet stub on the rear panel of the Gas Monitor (see Figure 1).

For further information, please consult BE6037 supplied with the Type 1409.

to the external pump (optional).

The Waste Air Outlet stub, next to the Outlet to Analyzer stub, on the rear panel of the 1409, connects the external pump (optional) to the 1409's sampler system see Figure 1. If you do not wish the waste air from the pump to mix with the air in the room where the 1409 is positioned, connect a length of PTFE tubing (LumaSense no. AF0614) to the waste air outlet stub on the external pump and direct the tubing to a suitable exhaust-point.

Figure 1. Tube and Cable connection with connection to an external pump.



Figure 2. Tube connection with: Dust filter DS2306, UD5023 and Genie Membrane Separator UA1365.



3.0 Set-up from the Gas Monitor Front Panel

3.1. Introduction

The set-up from the front panel is schematically described in the Quick Set-up Guide see Figure 3.

The Gas-Monitor Set-up branch and all functions available in this part of the Setup Guide is described in details in the Gas Monitor Instruction Manual (BE6030 for Type 1314i, BE6025 for Type 1412i, BE6028 for Type 3434i and BE6049 for Type 1512) supplied with the Gas Monitor. Please consult the Gas Monitor User manual for further description and guidance in the use of the Gas Monitor Set-up, start and stop measurements, store data in Memories etc. The Gas Monitor User Manual also gives an in depth description of all front panel keys. It is recommended to get familiar with these keys and set-up menu in the Gas Monitor branch using the Gas Monitor manual before starting setting up a Stand Alone Multipoint System.

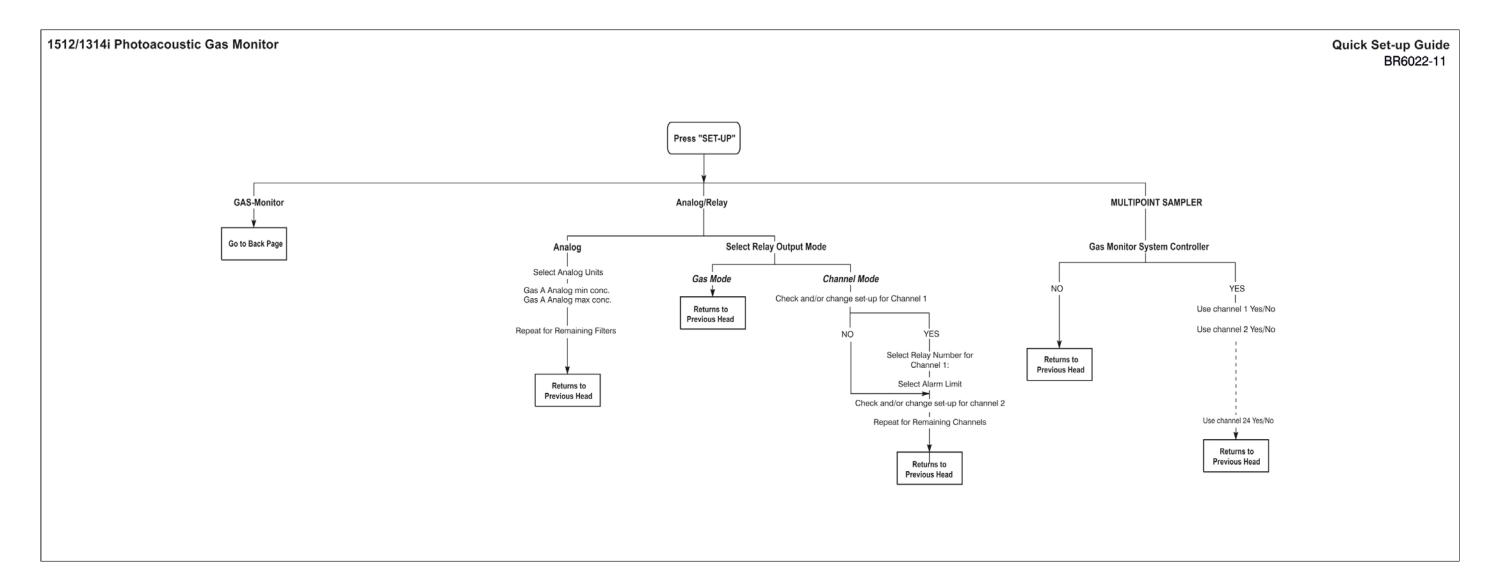
The Analog/Relay branch is only available for Type 1314i and 1512 with an Analog/Relay Module UA1373 for 1314i and UA1374 for 1512 installed in the Monitor from the factory. If a UA1373 (1314i) or UA1374 (1512) Module is not installed this branch will not be visible in the Set-up Menu on the Gas Monitor.

The **Multipoint Sampler** branch becomes available in the Gas Monitor's set-up menu when a Type 1409 is connected to the Gas Monitor via the USB Host interface.

Please Notice: When the Gas Monitor is set-up to be the system controller in the Stand Alone system with a Type 1409 the print functionality as described in the Gas Monitor User manual Chapter 10 is disabled.

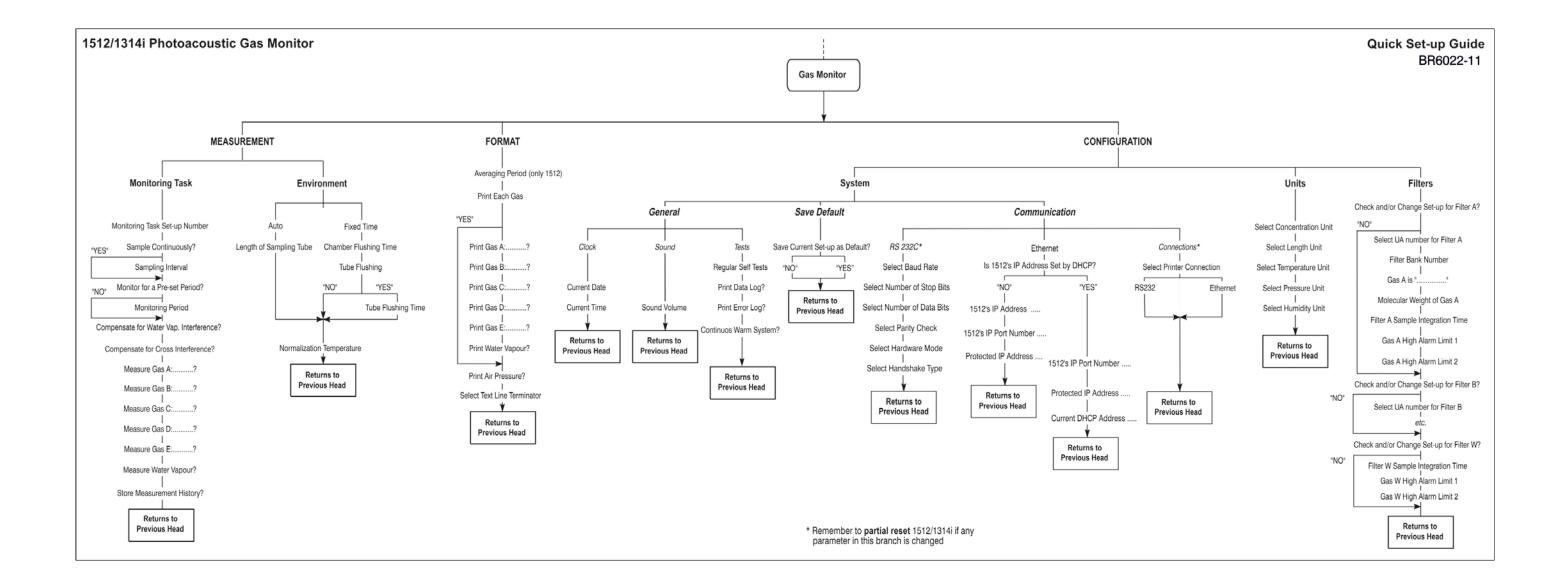
Data logging is still available.

Figure 3. Quick Set-up Guide



Please Note:

The Analog/Relay branch is only available when an Analog/Relay Module is installed in a Type 1314i (UA1373) or in a Type 1512(UA1374). The Multipoint Sampler branch is only available if a Type 1409 is attached to a Gas Monitor (Type 1412i, 3434i, 1314i or 1512)



4.0 Set-up the Gas Monitor.

Before any measurements can be performed, the Gas Monitor is to be set-up.

For detailed descriptions, please consult the User Manual Supplied with the Gas Monitor. The monitor is to be equipped with optical filters and calibrated with the preselected SIT (sample Integration Time) to be used for all the gases to be measured before a measurement set-up can be performed.

4.1 Set up a monitoring task

To set up a Monitoring Task press the SET-UP key on the front panel now follow the branches in the Quick Set-up Guide in Figure 3 the text on screen indicating which of the push-buttons can and should be pressed. For a more detailed description of these keys than given below, please consult the Gas Monitor's User Manual.

In general, the push-buttons shown below are used to navigate through the various modes possible within the Set-up menu.



These select push-buttons enable you to select one of the options displayed.



This group of 5 push-buttons on the Monitor's front panel are referred to as the direction keys.

- **▲** & **▼** enable you to increase & decrease numbers, respectively, or to go to the Previous & Next Displays, respectively.
- & ▶ enable you to move across number fields or go to the Previous & Next gases, respectively.
- key.

By using the keys described above follow the path:

- 1) Press the SET-UP key on the front panel
- 2) Select *Gas Monitor*
- 3) Select *Measurement*
- 4) Select *Monitoring Task*

Now You are in the Monitoring task set-up menu. By following this path select Gases to be measured, if Water Vapor Interference and/or cross interference compensation is to be performed.

In the Monitoring task menu it is also possible to select whether the sampling should run continuously (as fast as possible) or with a defined sequence interval. The sequence interval is the time between the end of one sequence and the start of the next one. Please be aware to set-up the Monitor to Store Measurement History if all measurement values are to be stored in the Memory. If the Store History it set to NO only the last measured, value is stored.

4.2 Set-up concentration units

The default units are:

Humidity: mg/m³
 Pressure: kPa
 Gas Concentration: mg/m³
 Length: m
 Temperature: K

These units can be changed:

- 1) Press the SET-UP key on the front plate.
- 2) Following the Quick Set-up guide (Figure 3) and the text on the display select **Gas Monitor...Configuration...Units**.

Now You are in the unit set-up menu. Select the desired units for the measurement task.

If mg/m^3 is to be used remember to select the Normalization Temperature in the *Environment* branch see <u>section 4.3</u>.

4.3 Set-up Environment

In the Environment set-up menu the tube flush set-up can be defined.

- 1) Press the SET-UP key on the front plate.
- 2) Following the Quick Set-up guide (<u>Figure 3</u>) and the text on the display select *Gas Monitor...Measurement...Environment*.
- 3) In the Environment set-up menu. Select the desired Flushing mode.

Auto: the tube length is to be define

Fixed time: the chamber- and tube-flush times are to be defined.

The minimum and maximum values for the tube flush settings are:

		Default	Minimum	Maximum
Flushing		Auto		
Auto	Tube Length	1 meter	0 meter	99 meter
Fixed Time	Chamber flush	8 seconds	2 seconds	60 seconds
	time			
	Tube flush time	3 seconds	3 seconds	120 seconds

4) Select the Normalization temperature The default Normalization temperature is 20°C. You can select between 0°C, 20°C and 25°C.

4.4 Set-up Alarm Limits

4.4.1. Alarm limits for a monitor without the Analog/Relay Module UA1373 or UA1374

The alarm limits of a gas are those concentrations of gas which should activate any alarm relay connected to the Monitor via its back panel "Alarm Relay" socket. There are two different alarm relays, which function slightly differently. Details of these relays and the way in which they function is described in Chapter 4.4.2. The alarm level parameters are found in the Gas Monitor... *Configuration... *Filters branch of the Set-Up Tree (see Figure 3).

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.

Follow the Set-up tree in <u>Figure 3</u> until the following is displayed:

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

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

GAS A HIGH ALARM LIMIT 1 _____mg/m³ PRESS ENTER TO CHANGE VALUE

3. 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.

mg/m³ **GAS A HIGH ALARM LIMIT 2** PRESS ENTER TO CHANGE VALUE

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

4.4.2. Alarm Relay

Two alarm relays are built into the **alarm relay** socket on the back panel of the Gas Monitor. The Alarm signals are given by opening and closing the relay contacts. Both relays are closed when the Monitor is measuring. This means that there is a direct electrical connection between the defined pins during measurement except when the Monitor measures a gas concentration which is greater than the corresponding alarm limit for the gas. When this concentration is measured, the Monitor breaks the connection between the pins. The monitor will furthermore activate the internal beeper and write the following message on the display:

> WARNING: ALARM LIMIT EXCEEDED CH(no) GAS (Filter A,B...W) **Meas.concentration**

The user can switch off the beeper and the message by pressing INFO or RESET push-button on the front-panel of the Gas Monitor.

The alarm relays will continue being activated until all measured gas concentrations fall below their user-defined alarm limit(s).

Alarm Relay 1:

Alarm Relay 1: correspond to High Alarm Limit 1.

Pin 1 and 2 are Normally closed Pin 1 and 3 are normally open, see Fig. 4

Whenever one or more gases exceed the corresponding high alarm limit 1, the Monitor breaks the electrical connection between pins 1 & 2 and make electrical connection between pins 1 and 3. See Fig.5

Alarm Relay 2:

Alarm Relay 2: correspond to High Alarm Limit 2.

Pin 4 and 6 are normally closed

Pin 4 and 5 are normally open, see Fig.4

Whenever one or more gases exceed the corresponding high alarm limit 2, the Monitor breaks the electrical connection between pins 4 & 6 and make electrical connection between pins 4 and 5. See Fig.5

The alarm relay is furthermore activated during the following conditions:

- Power off.
- If a measurement task is not running.
- During calibration.

LumaSense supplies a 6-pin DIN plug (male) with a locking collar JP0600 for connecting external alarm devices to the alarm relay.

Caution:

The DC voltage across the relay contacts must not exceed 25V. The potential on the relay contacts must not be more than 25VDC above chassis potential, as this will cause an excessive leakage current. The current through the contacts must not exceed 100mA. AC voltages must not be connected to the Alarm Relay socket.

Fig.4 Configuration of the pins in the alarm relay socket

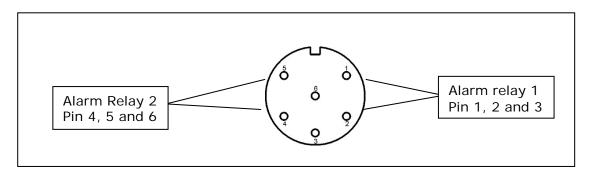


Figure 5 Function of the alarm relays

Condition	pin 1 - 2	pin 1 - 3
Power off	1	0
initializing	1	0
Ready for use	1	0
Calibration	1	0
Measurement running	1	0
Alarm limit 1 exceeded	0	1
Alarm limit 2 exceeded	0	1

pin 4 - 5	pin 4 - 6
1	0
1	0
1	0
1	0
0	1
0	1
1	0

1 = closed and 0 = open

4.4.3. Alarm limits for 1314 with the Analog/Relay Module UA1373 and for 1512 with Analog/Relay Module UA1374

The Analog/Relay Module UA1373/UA1374 is installed in the Gas Monitor from the factory.

The Analog/Relay Branch will now appear in the Set-up structure as shown in Figure 3.

Following the set-up guide in **Analog/Relay** Output Mode there are two possibilities.

Gas Mode: the behaviour of the relays will be according to the one shown in Figure 6 below.

Figure 6 Gas Mode Alarm Relay Settings

Gas	Relay	Alarm Limit
A	1	1
A	2	2
В	3	1
В	4	2
C C	5	1
C	6	2
D	7	1
D	8	2
Е	9	1
Е	10	2
W	11	1
W	12	2

Channel Mode: In this part of the set-up structure, it is possible to select the Alarm setting (Alarm limit 1 or 2) for each Multipoint Sampler Channel and combine with appropriate Relay or select "none" not to have a relay activated at that Channel.

5.0 Setting up the Analog/Relay interface module

When the UA1373 is installed in the 1314i or the UA1374 is installed in the 1512, the following additions will be available in the Set-up menu: Units for analog output, analog output scaling and selection of Relay output mode and limits for Relay output.

Before the UA1373/UA1374 can be used, the Analog output units, Analog concentration limits and the relay output limits parameters must be entered.

Please note that these set-up menus only are available, when the UA1373/UA1374 is installed in the instrument.

The set-up of the Analog/Relay interface Module can be performed either from the Front Panel of the Gas Monitor or by using the BZ7007 Remote and Offline SW. Please consult the BZ7007 User

Manual (BE6042) for guidance in using the Remote and Offline Software to set-up the Analog/Relay Module.

Consult the User Manual for UA1373 and UA1374 (BE6032) when set-up using the Front Panel of the Gas Monitor is performed. For further instructions in the use of the front panel for set-up, please consult the Gas Monitor user manual.

5.1 Analog output connector.

Analog outpu	it connector.	
D-sub pin	Description	
No.		
32	R13 COMMON	Error/Warning
33	R13 NO	Detected
34	R13 NC	# Background information in display
35	R14 COMMON	Watch Dog detected
36	R14 NO	# Background information
37	R14 NC	in display
20	Analog GND	Filter A
21	CO1	
22	Analog GND	Filter B
23	CO2	
24	Analog GND	Filter C
25	CO3	
26	Analog GND	Filter D
27	CO4	
28	Analog GND	Filter E
29	CO5	
30	Analog GND	Filter W
31	CO6	
1	Analog GND	Filter A
2	VO1	
3	Analog GND	Filter B
4	VO2	
5	Analog GND	Filter C
6	VO3	
7	Analog GND	Filter D
8	VO4	
9	Analog GND	Filter E
10	VO5	
11	Analog GND	Filter W
12	V06	
13	CO7	Channel information
14	Analog GND	
15	VO7	
16	CO8	Barometric Pressure
17	Analog GND	
18	VO8	

5.2 Relay output connector Gas Mode.

Relay output Mode.		
D-sub pin No.	Description	
1	R1 COMMON	Filter A limit 1
2	R1 NO	
3	R1 NC	
4	R2 COMMON	Filter A limit 2
5	R2 NO	
6	R2 NC	
7	R3 COMMON	Filter B limit 1
8	R3 NO	
9	R3 NC	
10	R4 COMMON	Filter B limit 2
11	R4 NO	
12	R4 NC	
13	R5 COMMON	Filter C limit 1
14	R5 NO	
15	R5 NC	
16	R6 COMMON	Filter C limit 2
17	R6 NO	
18	R6 NC	
19	Not used	Not used
20	R7 COMMON	Filter D limit 1
21	R7 NO	
22	R7 NC	
23	R8 COMMON	Filter D limit 2
24	R8 NO	
25	R8 NC	
26	R9 COMMON	Filter E limit 1
27	R9 NO	
28	R9 NC	
29	R10 COMMON	Filter E limit 2
30	R10 NO	
31	R10 NC	
32	R11 COMMON	Filter W limit 1
33	R11 NO	
34	R11 NC	
35	R12 COMMON	Filter W limit 2
36	R12 NO	
37	R12 NC	

VO: Voltage output.CO: Current output.NO: Normally opened.NC: Normally closed.

5.3 Relay output connector Channel Mode.

In Channel Mode the Channel-Relay-Alarm Limits are to be correlated.

Number of Channels is dependent on the Type 1409 (from 6 to 24 Channels).

For each Channel, a Relay can be selected or it can be set to **None** Meaning no relay will be ticked. For the selected Channel relay combination it is then to be determined if the Alarm limit 1 or Alarm limit 2 is to be used. Be aware that any Gas in the Gas Monitor Setup with a 1 or 2 alarm limit will ticker the alarm relay.

6.0 Set-up the Multipoint Sampler Type 1409

When a Multipoint Sampler Type 1409 is connected via USB the *Multipoint Sampler* set-up branch (see <u>Figure 3</u>) becomes active on the Monitor display.

Go to the *Multipoint Sampler* branch. Select **YES** meaning that the Gas Monitor is to be the System controller for the Stand Alone System. If **NO** is selected the system is to be controlled using the 7880 Application Software.

After selecting YES the menu now allows You to decide which of the Multipoint Sampler Channels are to be active (connected to a sampling point via tubing's).

7.0 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.

There is a limit to the duration of a monitoring task. There is only a finite amount of memory in the monitor.

The total space available in the *Display Memory* to store data is 131072 measurement cycles.

7.1 Stand-alone Use – using the Front Panel Pushbuttons

Before a monitoring task is started, the set-up must be completed:

Before any monitoring task is started, all data stored in the Monitor's *Display Memory* is removed (cleared). The *Display Memory* is where the Monitor 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 Monitor's *Background Memory*. For further details on the Gas Monitor Memories and handling please refer to the User Manual supplied with the Gas Monitor.

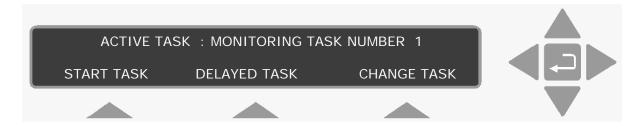
Please be aware that the finite memory capacity includes both the Display and Background Memory.

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*, any data already stored in *Display Memory* will be deleted when a monitoring task is started.

Press **MEASURE** on the Front Panel and follow the text that appears on the screen to start the measurement.



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



5. To start the measurement immediately, press **S1**. To delay the start, press **S2**. The following warning then appears on the display:



1. Press **S1**.

Delayed Start

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



Use the direction push-buttons to enter the desired date and start time, e.g. 10 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:

MEASUREMENT IN PROGRESS RESULTS NOT YET AVAILABLE

8.0 Viewing data using the Gas Monitor.

8.1 Viewing Measurement Data

When the first measurement cycle is complete the Monitor 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 on the displayed Channel (CH) number (no) – CH (no) will be from 1-24 depending on the configuration and set-up.

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

From above screen (main screen) press ▼ twice. Now by using

▶ & Using these push-buttons users can scroll "horizontally" through any vertical level of data. For example, if the statistical analysis of the measurement results for water-vapour are displayed on the screen, then by using ▶ you can read the statistical analysis of the measurement results for gas A, B, C etc. and then proceeding to the next channel number.

- ▼ This push-button allows the user to scroll "vertically" downwards through the list of measurement results for the selected Gas at the Selected Channel.
- This push-button allows the user to scroll "vertically" upwards through the list. The measurement list is a closed loop. This loop also have information on the measurement set-up as an example the sample sequence showing the active channels.

The push-buttons \triangle and ∇ have a repetitive function, which means that if they are pressed continuously they will allow the user to scroll very quickly through a list.

8.2 Viewing Alarm log Data

Alarm limit 1 and/or 2 can be set-up for any gas in the Filters set-up branch see the Gas Monitor User Manual for further description. Whenever an alarm limit is exceeded, the following pop-up is displayed.

Warning: Alarm Limit EXCEEDED:

CH(no):Gas (A...W):Gas Name Meas. Concentration

If more than one Gas/ Filter is set-up with an alarm limit and more than one of these are exceeded in the same measurement the pop-up as described above will show the first in the sequence A,B,C,D,E,W for which the alarm limit is exceeded.

The instrument beeper will be activated.

1) Press **INFO** to acknowledge the alarm and press **I** to stop the beeper.

After Acknowledgement, it is possible to enter, the Alarm Log:

- 2) Go to the main screen by pressing 4
- 3) Press ◀
- 4) If any alarm limit have been exceeded the following is displayed on the screen.

Date and Time	Alarm	Channel (no)
Gas (AW)Gas Name		Meas. Concentration

- 5) Use the direction keys ▲ and ▼ to scroll up and down in the Alarm log sorted by the date and time stamp. The alarm log list is a closed loop.
- 6) Press ▶ or ↓ to return to the main screen.

9.0 Display the Homepage of the gas monitor

The homepage of the gas monitor can be displayed if the gas monitor is connected to an Ethernet network.

Any web browser can be used to display the homepage of the gas monitor. The IP address obtained from the Ethernet set-up of the gas monitor can be entered in the address field of the web browser in order to display the homepage. For further information regarding how to set-up the Ethernet parameters in the gas monitor please consult the gas monitor instruction manual supplied with the gas monitor.

The last measured gas values from the last active channel are displayed together with information about the gas monitor, like the device serial number, if water- and cross-compensation is performed.

Error and warning messages will also be displayed on the homepage.

The grey "Update Measurements" link can be used to update the homepage with the last measurement results.

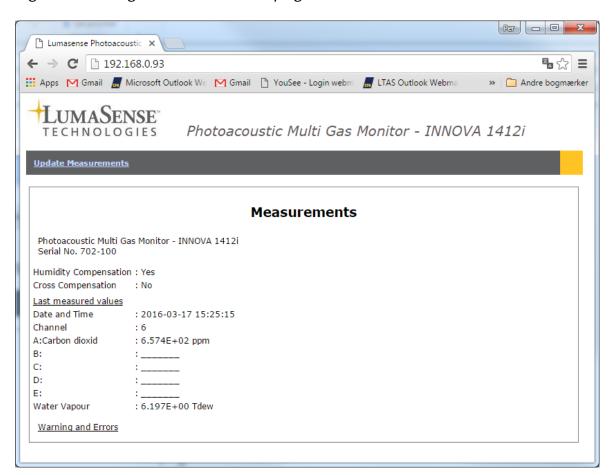


Figure 7. The gas monitor homepage

10.0 Use BZ7007 to Upload data to a PC.

The BZ7007 Remote and Offline SW can be used during set-up of the Stand Alone System and to retrieve data from the system. The BZ7007 can be used either directly connected via a USB cable or through a LAN network via the Ethernet connection.

The procedure to use the BZ7007 SW with a Stand Alone Multipoint System is covered in the User Manual BE6042 for the Remote and Offline Software.

Please consult the User Manual BE6042 for guidance in how to use the Remote and Offline Software, to Set-up the system and to upload data to a PC in excel or cvs file format.

It is recommended to upload data with a regular timespan to prevent data to be overwritten by new measurement data due to the finite data storage capacity in the Monitor.

Please Notice: When the Gas Monitor is set-up to be the system controller in the Stand Alone system with a Type 1409 the print functionality as described in the Gas Monitor User manual Chapter 10 is disabled.

Data logging is still available.

Stand Alone Multipoint System



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