FirstCheck 4000 & 6000 Ex User Manual V2.7

Register your instrument online to receive your Extended 2 Year Warranty. See page 52 for details.

FirstCheck Instrument Manual Part Number820221

Advanced Gas Sensing Technologies
Registered in England No. 2359038 Vat No. GB 532 2024 00
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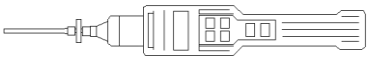
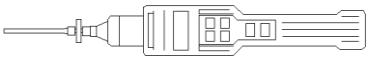




Declaration of conformity

Manufacturer: Ion Science Ltd, The Way, Fowlmere, Cambridge, England. SG8 7UJ

Product: FirstCheck 4000 and 6000

Product description: intrinsically safe detector comprising of a photo-ionisation detector, LEL and chemical Sensors for detecting a range of potentially harmful gases

Directive 94/9/EC **ATEX**

Identification: ⟨Ex⟩ II 2 G Ex iad IIC T4 (-20°C ≤ Ta ≤ +60°C)

Notified Body: Baseefa Ltd, 1180, Buxton, UK

EC Type Examination Certificate(s)

Baseefa03ATEX742	latest supplement Baseefa03ATEX742/8X issued 1st July 2009 Ref Baseefa cert report 03(c)0400, 04(c)0007, 08(c)0633
IECEx BAS 04.0033	latest revision no.4 issued 20th November 2006 Ref IECEx Test Report UK/Bas 04/0642 05/0007 GB/BAS/EX TR09.0116/00

Standards

BS EN 60079-0:2006	Electrical Apparatus for Potentially Explosive Atmospheres – General Requirements
BS EN 60079-1:2007	Explosive Atmospheres – Equipment Protection by Flameproof Enclosures 'd'
BS EN 6079-11:2007	Explosive Atmospheres – Equipment Protection by Intrinsic Safety 'i'
BS EN 61010-1:2001	Safety requirements for electrical equipment for measurement, control and laboratory use – General Requirements

Directive 2004/108EC **Electrical Equipment – Electromagnetic Compatibility (EMC)**

BS EN 61326-1:2006	Electrical equipment for measurement, control and laboratory use – EMC Requirements (Class B and General Immunity)

Other Standards

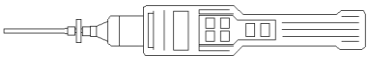
BS EN ISO 9001:2000 Quality Management Systems – requirements

BS EN 13980:2002 Potentially Explosive Atmospheres – Application of Quality Systems

On behalf of Ion Science Ltd, I declare that, on the date this product accompanied by this declaration is placed on the market, the product conforms to all technical and regulatory requirements of the above listed directives.

Name: Mark Stockdale **Position:** Technical Director

Signature:  **Position:** Technical Director
Date: 20th November 2009



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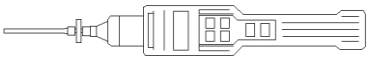
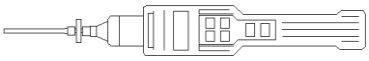


Contents Page



Statements

Responsibility For Use
FirstCheck instruments detect a large range of gases, which are potentially dangerous from both a poisoning and/or an explosive perspective. FirstCheck instruments have many adjustable and selectable features allowing the detector to be used in a variety of ways.
Ion Science Ltd can accept no responsibility for the incorrect adjustment of features that cause harm or damage to persons or property.

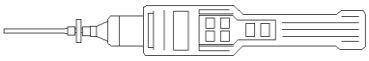
Warnings

1. For reasons of Intrinsic Safety, batteries MUST NOT be charged or replaced within potentially flammable areas. Ensure you are in a SAFE area before carrying out any type of maintenance on the FirstCheck Instrument.
2. Substitution of components may impair intrinsic safety and result in unsafe conditions.
3. For safety reasons, the FirstCheck must only be operated and serviced by qualified personnel.
4. Please read and understand this User Manual fully before operating or servicing the FirstCheck.
5. Oxygen deficient atmospheres can affect the combustible gas sensor making the instrument read lower than the actual concentration.
6. Oxygen enriched atmospheres can also affect the combustible gas sensor making the instrument read higher than the actual concentration.
7. If the instrument is used in an application where the combustible gas sensor is involved in a incident causing it to display and over-range symbol ensure that the calibration is verified before the instrument is used again.
8. Silicone vapours or other known contaminants may have an affect on the combustible gas sensor causing readings to be lower than actual gas concentrations. If the instrument is exposed to these vapours ensure that the instrument is calibrated before it is used again.
9. Changes in the atmospheric pressure can have an affect on the oxygen sensor causing small fluctuations in the reading.

CAUTION
It is essential that the FirstCheck is always used with a supplied PTFE 0.5 micron filter fitted to the front of the instrument. FirstCheck's internal pump draws over 200 ml/min of air into the instrument and without a filter particle of debris and dust will be drawn into the cell inhibiting the correct function of the instrument.

Note on Silicones
Users of instrumentation incorporating pellistor type flammable sensors should be aware that these sensors are very susceptible to poisoning by silicones. Silicones are commonly used in aerosol cleaning products such as furniture polish, in sealants, in furnishings, and in adhesives and adhesive labels. The culprit is often a compound called hexamethyldisiloxane or HMDS for short.

A few parts per million in air for an hour or two causes serious permanent damage to the sensor, to the extent that it will NOT work. Therefore any instrument such as Ion's Firstcheck+ should be kept well away from facilities where silicones are used.



Statements

Quality Assurance

FirstCheck has been designed in compliance with ISO9001:2000, which ensures that the equipment supplied to our customers has been designed and assembled reproducibly, and from traceable components.

Disposal

Dispose of FirstCheck, its components and any used batteries in accordance with all local and national safety and environmental requirements.
The FirstCheck field case material is recyclable polypropylene.

Calibration Facility

Ion Science Ltd offer a calibration service including the issue of certification using equipment which are themselves traceable to UK national standards.
Alternatively, using the Calibration Kit that is available from Ion Science, a two-point calibration can be carried out on the 5 sensors on-site.

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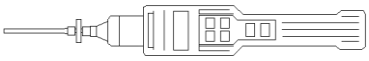


Introduction to FirstCheck

FirstCheck is a portable multi-gas detector, suitable for the detection of VOC's (Volatile Organic Compound), Hydrogen Sulphide (H_2S), Carbon Monoxide (CO), Explosive gases (LEL levels) and Oxygen (O_2). VOC's are detected using PID (Photo Ionisation Detection) technology. Explosive gases (LEL levels) are detected using a pellistor sensor and the other gas sensors (O_2, CO and H_2S) are based on semiconductor technology.

FirstCheck has two principle modes of operation, Health & Safety and Survey mode.

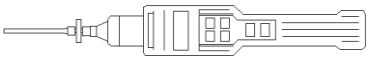
Health & Safety mode is used to check for conformity of short-term exposure levels (STEL) or time-weighted averages (TWA) that are specific for particular hazardous environments (for example EH40 in the UK and OSHA in the USA). In this mode of operation STEL's and TWA's on the VOC, H_2S and CO sensors are continually calculated and compared to levels set in the instruments gas table.

Survey is the default mode of operation whenever the Health & Safety mode is NOT selected. This mode is often used in applications where several areas (or Zones) are to be monitored and readings data logged. All sensor readings are real time measurements and alarm levels are set manually.

For more information on these modes of operation please see pages 27 & 28.

FirstCheck is available in two version. The FirstCheck 4000 has a PID VOC detection range of 0.1 ppm – 10,000 ppm and the FirstCheck 6000 with a detection range from 1 ppb – 10,000 ppm.

FirstCheck instruments automatically data log readings from all five sensors every second. These readings are stored in the instruments internal memory with a date and time stamp. For more information please see page 18.



Getting started

Packing List

Please take a little time to check the contents in the FirstCheck case before removal.

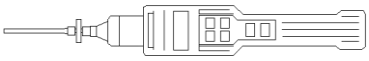
Item	Description	Qty.
1.	FirstCheck instrument	1
2.	PID lamp (fitted)	1
3.	Probe - 100mm (fitted)	1
4.	PTFE filter - 50 micron (fitted)	1
5.	Battery charger (if rechargeable type)	1
6.	Battery clip (if non-rechargeable)	1
7.	Screw driver (if non-rechargeable)	1
8.	Manual	1
9.	FirstCheck PC Software CD	1
10.	IS Protective Cover	1
11.	Cal Kit Sample containing:	
	• PID lamp cleaning kit (includes alumina powder and two applicators for 1 clean)	1
	• Carbon canister	1
	• PTFE filter – 50 micron	1
	• Cal adaptor*	1
	• Lamp removal tools (neoprene sleeves)	2
	• Secondary Probe Filter	5

* Please note that the Cal adaptor is to be used in conjunction with a FirstCheck Calibration Kit accessory (part number A-820213). **WARNING:** when fitting the Cal adaptor onto the gas tube (part of the Calibration kit) ensure that the small breather hole of the Cal adaptor is not covered as this will cause the instruments internal pump to be damaged beyond repair. Failure to adhere to this warning will invalidate your warranty should your instrument pump become damaged.

Removing the FirstCheck from its case

Carefully remove the FirstCheck instrument from its case being careful not to damage the filter and probe assembly. 'Luer' type connectors are used to connect the FirstCheck, filter and probe together and require a quarter-turn ONLY to connect / disconnect them. Do not over tighten.

To avoid drawing dust or particulate matter into the detector cell we suggest always fitting the filter with the Ion Science logo facing away from the instrument, therefore dust only collects on the same one side of the filter and is not inadvertently drawn into the instrument if the filter is attached the other way round.



Getting started

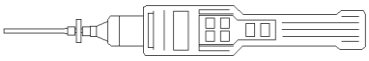
Setting alarm levels
We recommend that alarm levels are set to user specifications as soon as possible before being used for the first time. Please see page 20 for details of how to set alarm levels.

Setting date and time
We recommend that the correct local date and time are set to the instrument as soon as possible before being used for the first time. Please see page 24 for details on how to set the date and time.

Selecting gases from the VOC and LEL internal gas tables
FirstCheck instruments leave Ion Science pre-set for gas type TVOC (total volatile organic compounds) for the PID sensor and Methane for the LEL sensor. Instruments are factory calibrated against isobutylene and methane with all response factors being equivalent to these two gases. By changing the gases in the gas tables all readings will be given using that gases response factor. To change the selected gases please see pages 25 and 26.

Rechargeable Batteries
Although FirstCheck instruments leave the factory fully charged, prolonged periods of storage may result in the battery pack discharging. We suggest charging the instrument for 12 hours before use. See the battery section of this manual page 40.

Alkaline Batteries
Fit the battery pack supplied with the FirstCheck. For more information please see the battery section of this manual page 40.



Instrument Functions

Keypad function descriptions

On/Off.

To switch the FirstCheck instrument 'ON' - Press the 'ON/OFF' key.
To switch the FirstCheck instrument 'OFF' - Ensure you are on the 'Display/Function Selection screen' or a Display screen. Press and hold the 'ON/OFF' key. A 'Timer' symbol will appear and a line will travel across the bottom on the screen release the 'ON/OFF' button once the line has travelled the length of the screen. The 'Delay' symbol will briefly appear before the instrument turns 'OFF' completely. This procedure has been designed to avoid accidental switch OFF.

Delay Symbol

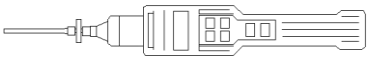
ENTER
This key selects options and confirms settings.

ESCAPE
This key is used to return the display to the previous screen and to abort an adjustment. Repeated pressing of this key will return the display to the 'Display/Function Selection screen'.

UP
Use to scroll up or changes selection

DOWN
Use to scroll down or changes selection

ZERO
Zero's the detector when on 'Display Screen'.



Instrument Functions

How the FirstCheck Menu Works

Once in the function menu with the function-symbol you require on the screen press the 'Enter' key to select it. (See Figure 1.)

Fig 1

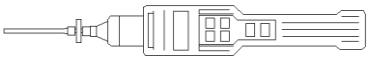
A cursor (inverted symbol or number) can be moved from one selection to another by using the 'UP' and 'DOWN' keys. (See Figure 2.) Pressing 'Enter' will cause the selection to flash.
When flashing use the 'UP' and 'DOWN' keys to adjust it.

Fig 2

When you have adjusted the parameter to an acceptable level press the 'Enter' key. The adjusted parameter will be stored. In many cases a tick (✓) will appear to confirm the action.

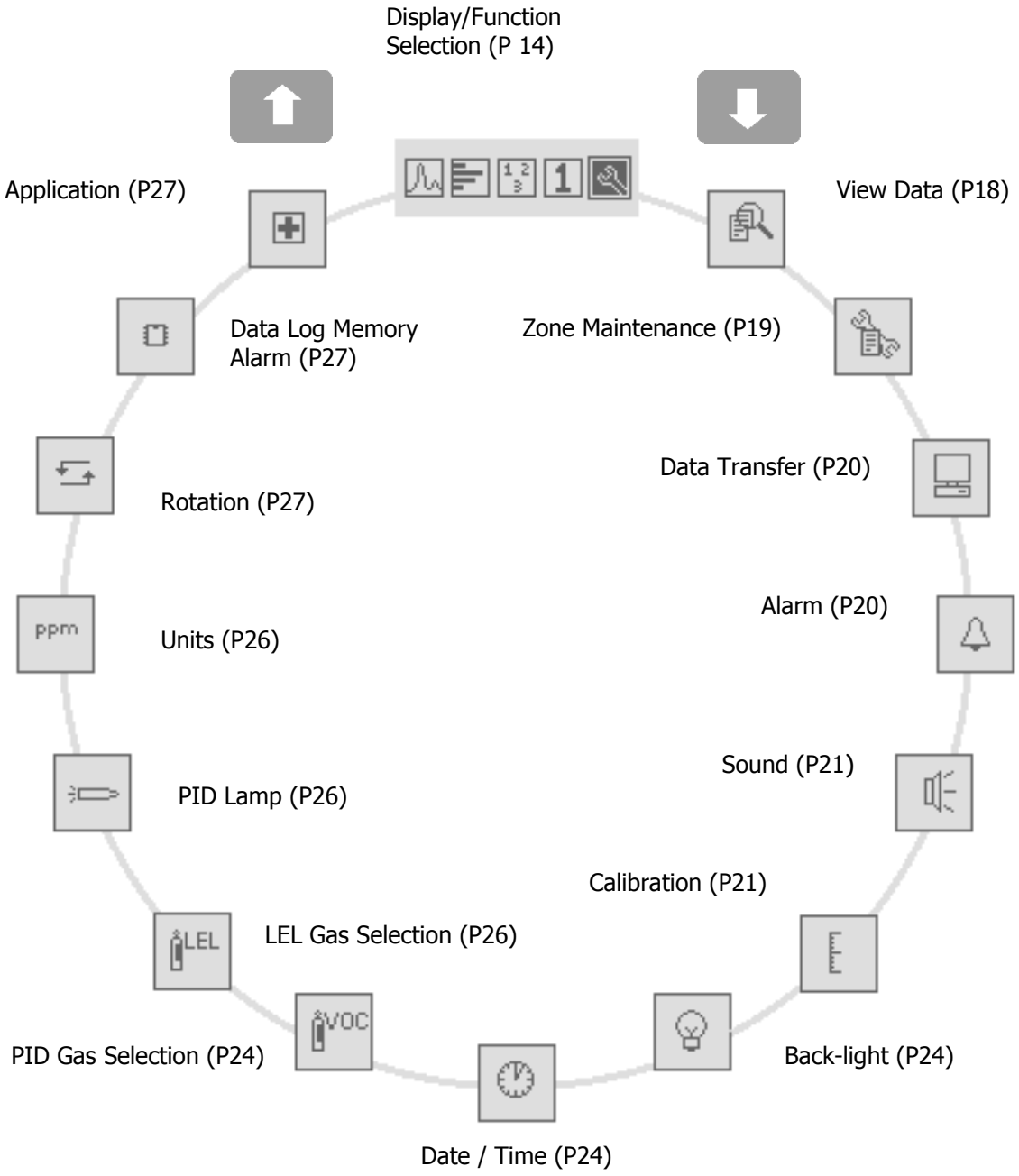
Although there is a variation in complexity of some functions, this basic concept of selection, adjustment and confirmation is common throughout this instrument.

You can abort a selection by pressing the 'Escape' (Esc) key.

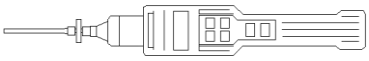


Instrument Functions

Function locations



From the 'Display/Function Selection' screen highlight the function menu icon then press 'Enter', use the 'Up/Down' keys to view the available functions then press 'Enter' to select the function options



Quick Reference

All instrument functions are the same on both the 4000 and 6000 variants with the exception of ppb on the units of the 4000.

Display/Function Selection **(Page 14)**
Allows the user to view detected gas levels in a variety of formats or to adjust the instrument functions and parameters.

View Data **(Page 18)**
Allows viewing of stored data in the instruments internal memory.

Zone Maintenance **(Page 19)**
Allows the creation selection and deletion of Zone names.

Data Transfer **(Page 20)**
Allows data transfer between instrument and PC.

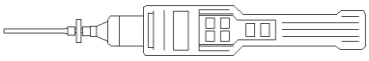
Alarm **(Page 20)**
Allows adjustment of upper and lower Alarm levels

Sound **(Page 21)**
Allows the selection of audible indicators including a confidence beep.

Calibration **(Page 21)**
Allows the selection of different types of calibration, Factory and Custom.

Back-light **(Page 24)**

Allows the selection of back-light options.



Quick Reference

Date / Time **(Page 24)**
Allows the adjustment of the date and time.

PID Gas Selection **(Page 25)**
Allows the selection of gases from the internal gas table.

LEL Gas Selection **(Page 26)**
Allows the selection of gases from the internal gas table.

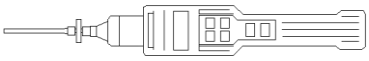
PID Lamp **(Page 26)**
Allows the selection of different PID lamps.

Units **(Page 26)**
Allows the selection of ppb (FirstCheck 6000 only), ppm or mg/m^3 as measurement units.

Rotation **(Page 27)**
Allows the rotation of real time readings when in the large numerical screen.

Data log Memory Alarm **(Page 27)**
Allows the setting of an alarm to warn the user when the data logging memory is full.

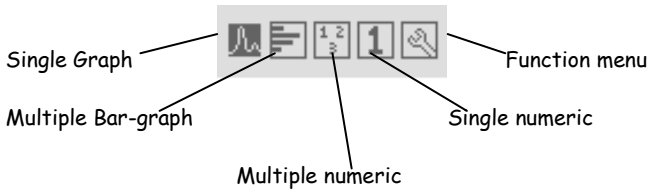
Application **(Page 27)**
Allows the selection of modes of operation, 'Health and Safety' for STEL and TWA monitoring or 'Survey' for general use.



Instrument Displays

Display/Function Selection Screen

The 'Display/Function Selection screen' is shown when the FirstCheck is switched on can always be located by repeatedly pressing the 'Esc' (Escape) key. The 'Display/Function screen' allows the user to view detected gas levels in a variety of formats or to adjust the instruments functions and parameters. The symbols shown on this screen can be selected using the UP and DOWN keys. When the symbol is highlighted it appears inverted (Example: single graph symbol).



Symbols Explained

A number of symbols are used to indicate various features when in the viewing screens. Please see an explanation of each below.

Bump test

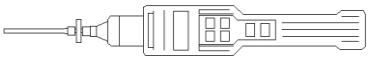
A symbol of a gas bottle can be set via the FirstCheck software to shown every time the instrument is turned on to remind the user to test the instruments response. See page 34 of the software section for more information.

Battery Status

The battery status indicator is present on the multiple bar-graph and multiple numeric screens at all times and can be accessed by pressing and holding Enter on the single graph and large numerical screens.

Peak Hold

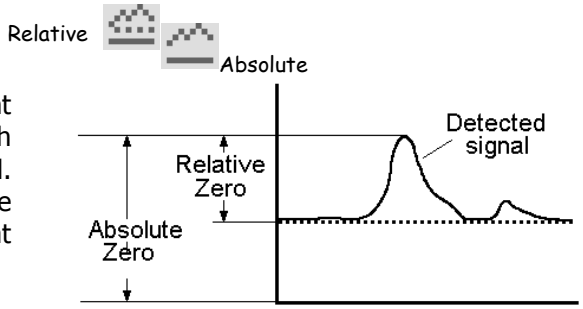
The numerical measurement to the right of this symbol indicates the highest level reached by the instrument since being switched ON. This 'Peak' reading can be reset by pressing and holding the 'Enter' key for 5 seconds.



Instrument Displays

Background Zero Reference

When in 'Survey' mode pressing the 'Zero' key alternates between 'Relative' and 'Absolute' modes. There is a constant level of detectable gas in ambient air, which is detectable with FirstCheck. 'Absolute mode' displays the entire sensor signal. 'Relative' mode 'removes' the background signal and sets the First Check's 'Zero' point at an artificial level. Please note that the oxygen sensor's 'Zero' is always set at 20.9%.



Alarm arrows


Upper and lower alarm levels


Oxygen sensor upper and lower

The arrows represent the importance level of the alarm. The single arrow represents the lower alarm and the two arrows represent the upper alarm. In the case of the oxygen sensor the upper and lower alarms are represented slightly differently as both are equally important representing either an oxygen deficient or oxygen enriched environment.

Application

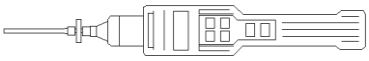

Indicates that 'Health & Safety' mode is selected

When the symbol is present the instrument is in 'Health & Safety' mode. When it is absent the instrument reverts to 'Survey' mode. Please see Application section of this manual for more information (page 27).

Display Screens Explained

Single Graph Screen

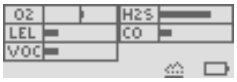
Allows the viewing of real-time measurements in graph format relative to the set alarm levels.
When in 'Survey' mode (see page 28) the type of gas being detected, the measured units, the peak hold and real-time readings are all also displayed.
Use the UP and DOWN keys to view the other detectable gases.
Additional information such as alarm levels and battery status can be viewed by pressing and holding the Enter key.

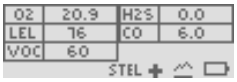


Instrument Displays

When in 'Health & Safety' mode (see page 27) the on screen information is slightly different as STEL and TWA calculations are displayed in figures and the graph remains in real time. Again additional information can be viewed by pressing and holding
the Enter Key.

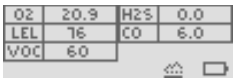
Multiple Bar-Graph Screen
Allows the simultaneous viewing of all sensor readings in a Bar-Graph format. When viewing the bar-graph screen, pressing and holding the ENTER key reveals additional data including numerical readings and units i.e. ppm or %.



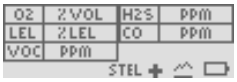


When in 'Survey' mode readings are real time and the bar graphs are relative to the set alarm levels. When in 'Health & Safety' mode use the Up and Down keys to move between real time, STEL and TWA values. In the STEL and TWA screens the VOC, H_2S and CO bar graphs are proportional to the STEL and TWA alarms and the O_2 and LEL screens are blank as they have no STEL and TWA values. If a VOC gas is selected that does not have a STEL or TWA value n/a will appear.

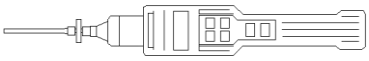
Multiple Numeric Screen
Similar to the Bar Graph format the multiple numeric screen enables the simultaneous viewing of all 5 sensor readings as numerical results. When viewing the multiple numeric screen pressing and holding the ENTER key reveals additional data such as
the measurement units i.e. ppm or %.



When in 'Survey' mode readings are real time. When in 'Health & Safety' mode the VOC, H_2S and CO readings are the calculated STEL and TWA values. Use the Up and Down keys to move between the STEL and TWA values.

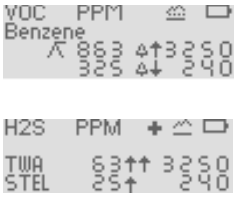


Large Numeric Screen
Enables the viewing of real time measurements in large numerical format for easy viewing in difficult conditions. Use the UP and DOWN keys to view the other detectable gases. A rotate function can also be selected from the function menu to allow the constant rotation of the measurements of each detectable gas (see pg 27).



Instrument Displays

Additional information such as alarm levels, battery status and a peak hold reading can be viewed by pressing and holding the ENTER key.
When in 'Health & Safety' mode the STEL and TWA alarm
levels and calculated values are shown when holding the Enter key.



Function Menu

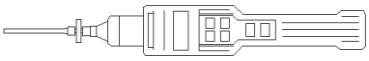
Once selected use the 'UP' and 'DOWN' keys to highlight the function you require and press 'ENTER' to select. Many features can be adjusted in this section including gas selection, zone maintenance, data transfer and alarm levels. Details of these and other functions are to be found on the following pages.

The instrument has 8Mb of memory, which is divided into 1Mb segments. When a segment becomes full, data is then stored in the next segment.

Each time the user starts data logging, a new file is created. So for example, six data logging sessions will create six data files.

When a data logging session records data which spans across two or more 1Mb segments, a corresponding number of files will be created and stored within the instrument and will apply to that particular data logging session only. So, for example, two 1Mb segments spanned will result in two files created.

When the data is to be downloaded via the IonPC software, any files that have spanned two or more 1Mb segments (i.e. two or more files) will be recognised and downloaded as a single file.



Instrument Menu

General

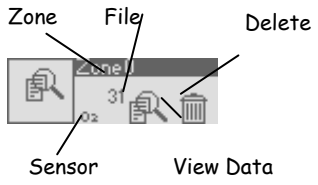
In the functions menu use the 'Up' and 'Down' keys to find the function you require. To enter the function press the 'Enter' key.

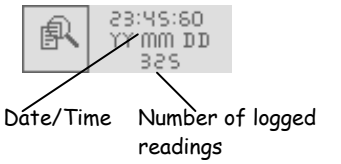
Data Logging, Zones & Files

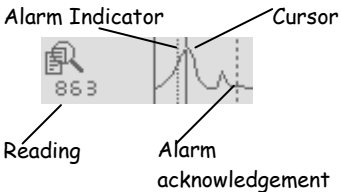
FirstCheck automatically data logs all five sensor readings every second. These readings are stored in the instrument's memory with a date and time stamp. The instrument has been designed to continuously store data, once the memory has reached its full capacity (8 Mb) it will automatically begin to over write previous readings. An alarm can be set (see page 27) to inform the user that this is due to happen giving time to download any data that may be over written.
Data logged measurements are stored in files created automatically and issued a number that is incremented each time a new file is opened. Stored data can be viewed on the FirstCheck instrument or it can be downloaded to a PC for analysis and to be archived.
In some applications readings need to be recorded in many different locations leading to many hundreds of stored files. FirstCheck was designed with these requirements in mind and has the facility to store files into 'Zones'. The FirstCheck has a default Zone called Zone 0 (which can not be deleted), unless specified all readings will automatically be stored under this Zone. The FirstCheck has an additional 199 Zones which the user can name themselves, either direct via the instrument or by using the FirstCheck PC software.

View Data

This function allows the viewing and deletion of Data Logged Files within the FirstCheck's memory. First select the zone of interest by moving the cursor using the 'up' and 'down' keys, press 'enter' to select it. Then select the file in the same way and finally select the sensor you wish to see. Now select the View Data symbol this will show the first reading logged with a date and time stamp and the number of logged readings within the selected file. To view the stored data in a graphical form press the 'enter' key. A graph representing the stored readings within the selected file will be displayed. The flashing cursor can be moved along the graph to a reading of interest. When the cursor stops the reading will be displayed in the units selected, press the enter key to see the date and time stamp of that reading if required.







The instrument has 8Mb of memory, which is divided into 1Mb segments. When a segment becomes full, data is then stored in the next segment.

Each time the user starts data logging, a new file is created. So, for example, six data logging sessions will create six data files.

When a data logging session records data which spans across two or more 1Mb segments, a corresponding number of files will be created and stored within the instrument and will apply to that particular data logging session only. So, for example, two 1Mb segments spanned will result in two files created.

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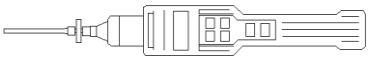


Instrument Menu

View Data (Continued)
The Alarm Indicator dotted line is present on a graph to show that this is the exact point at which an alarm was set off. The instrument will continue to alarm until the alarm is acknowledged by the user by pressing the 'Enter' key, this is shown on the graph as a dashed line (Alarm acknowledgement).

Deleting a File
Should you wish to delete a File, select the Zone and file to be deleted as if you were about to view the data. Now select the delete symbol (Trash can) in the View Data screen. Options are given to delete the currently selected File or All Files. Please note that when deleting a file all five sensor readings in that file will be deleted together. *WARNING: Selecting All Files will delete all files stored in all Zones.* A tick '✓' confirms the function has been carried out.

Zone Maintenance

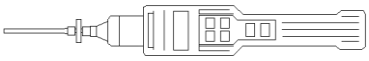
Zones can be created, selected or deleted in this function. Select the 'New' symbol to create a new zone name, the 'List' symbol to select an existing 'Zone' and the Delete symbol to delete an existing zone name.

Selecting the 'New' symbol allows the creation of Zone names made up of 8 characters consisting of letters, numbers and symbols. Use the up and down keys to choose the characters and press enter to confirm your selection.

Selecting the 'List' symbol allows you to view existing Zone names, and to select the zone under which you wish to save data.

Selecting the 'Delete' symbol allows the previously created Zone names to be deleted. A tick '✓' confirms a Zone has been deleted.

Please note that when deleting a zone all data saved under this zone will be deleted. If you wish to keep the data ensure you download it to a PC before it is deleted.



Instrument Menu

Data Transfer

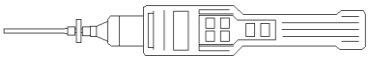
Allows the transfer of data between a FirstCheck instrument and a FirstCheck software enabled PC.To begin communication between the instrument and the computer select the Data Transfer option. When the instrument is communication with a PC a '✓' will be displayed in the data transfer symbol and when not communication a 'X' will be shown. Place the instrument on its side with its infrared window approximately 40 mm from the PC's IRDA link. To exit the data transfer option press 'Esc', the delay symbol will appear for a few seconds before returning to the function menu.

Alarm

When in 'Survey' mode, upper and lower alarm levels can be set to indicate particular levels of detection for all five sensors. Both alarms give an audible and visible output (flashing LED) but with increased urgency with the upper alarm. An alarm state indicates that FirstCheck has detected that one or more of the alarm levels has been exceeded. The alarm will continue to sound and flash until the user acknowledges the alarm by pressing Enter.

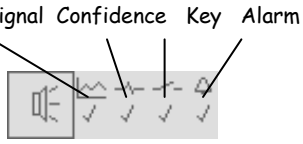
Upper and lower alarm levels in survey mode are simple to set via the instrument. Use the up and down keys to move the cursor to the sensor name (eg H_2S as above) press enter and use the up and down keys to select the sensor you require. Then select the alarm you wish to adjust, press enter then again use the up and down keys to change the alarm setting. These alarms can also be easily adjusted on a PC via the Gas Table in the FirstCheck software that is then downloaded to the instrument via the IRDA link (see page 33 for more details). Please note that for safety reasons the lower alarm cannot be set above the upper alarm and the upper alarm cannot be set below the lower alarm.

When in Health and Safety mode, alarms are triggered by STEL and TWA alarm levels pre-programmed into the instruments gas table. An Alarm in Health & Safety mode indicates the user has been exposed to levels exceeding those set within the FirstCheck's gas table. When FirstCheck alarms in Health and Safety mode the relevant TWA or STEL figure shown on the display will flash. These values cannot be changed either via the instrument or the FirstCheck software. However additional entries can be entered into the gas table via the FirstCheck software with their own STEL and TWA values see page 33 for more information.



Instrument Menu

Sound



Audible outputs can be selected to indicate functions. When Signal is selected, the rate at which the instrument 'Beeps' increases with the detected gas. When Confidence is selected the instrument 'Beeps' every 15 seconds to indicate it is functioning. This feature can be useful if the instrument is out of sight. When Key is selected the instrument 'Beeps' when a key on the keypad is pressed. Alarm can only be adjusted using the FirstCheck software.

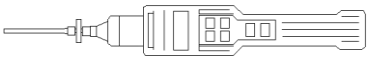
Calibration

'Factory calibration' is set by Ion Science during instrument manufacture. 'Custom calibration' can be set by the instrument user.

General description
Due to the linear output of the Ion Science PID detector cell, FirstCheck instruments only require a two-point calibration. The FirstCheck scales its linear output across a 'Zero' level (clean air reference) and the 'Span' (know gas concentration).

Factory Calibration
When 'Factory' calibration is selected the FirstCheck will measure according to the factory set fixed points and display the selected signal reading according to this reference.
'Factory' calibration offers a constantly repeatable reference, however prolonged use may mean these reference points become less accurate with use. It is recommended that the FirstCheck be returned to Ion Science once a year for an annual calibration and service.

Custom calibration
When 'Custom Calibration' is selected a 'Zero' and 'Span' can be set by the user. This allows the user to calibrate the FirstCheck's PID and LEL sensors to alternative gases (other than Isobutylene and Methane). Ion Science provide a Calibration kit accessory (Part number A-820213) which is recommended for use with FirstCheck, however other gas mixtures and various combinations specific to your needs can also be used.



Instrument Menu

Calibration (continued)

If performing a custom calibration using the Ion Science Calibration Kit accessory you will need you use the Cal Adaptor supplied with your FirstCheck in the Cal Kit sample box. **WARNING:** when fitting the Cal adaptor onto the gas tube (part of the Calibration kit) ensure that the small breather hole of the Cal adaptor is not covered as this will cause the instruments internal pump to be damaged beyond repair. Failure to adhere to this warning will invalidate your warranty should your instrument pump become damaged.

In order to carry out a custom calibration the appropriate parameters need to be set up via the FirstCheck PC software and downloaded to the instrument. Please see the FirstCheck software calibration section (pg 33) for details on how this can be achieved. Once these parameters have been set a custom calibration can be completed, please see the recommended procedure below.

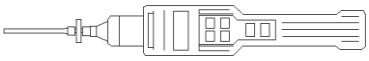
Ion Science suggests Custom calibrating when detection in ppb is required or when high accuracy is needed for a specific gas other than Isobutylene (PID) or Methane (LEL).

Custom Calibration Procedure
Please read ALL of this procedure before attempting a custom calibration and ensure this procedure is carried out in a clean air environment.

1. Select Custom Calibration procedure - a tick '✓' will appear to confirm the selection. Pressing Enter allows the user to enter the Custom calibration menu.

2. Select the flashing 'ZERO'.

3. Remove the caps from both ends of the carbon canister included in the Cal Kit Sample supplied with your FirstCheck and remove the probe and filter from the instrument and fit the carbon canister. Alternatively a known clean air supply can be used. Note – the carbon canister simply pushes onto end fitting - do not force and no turning is required.



Instrument Menu

4. Press the Enter key to start the 'Zero' process. A counter will count down showing how long the canister needs to remain connected.

5. At the end of the count down a tick '✓' will appear, indicating that the Zero has been accepted. Press enter to confirm your acceptance.

6. Disconnect the carbon canister and replace the cap ends. The useful life of the carbon canister will be shortened if the canister is open to atmosphere for prolonged periods.

7. Use Esc to revert back to the calibration menu . Use the up and down keys to select the relevant gas or gas mixture previously set up via the FirstCheck PC software. If you have chosen single gas calibration all sensors will be available and if you have selected a mix this will be available or a combination. Ion Science recommends that if you are using a single gas calibration you calibrate the sensors in the following order, VOC, LEL, CO then the H_2S, the O_2 is calibrated automatically with the Zero.

8. Once selected if you have single gases the details will be shown, or if you are using a mix only this will be shown. The gas bottle will be highlighted, press enter.

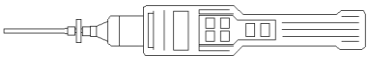
9. A screen will show the selected gas (or gas mix) a gas bottle and a number which is highlighted.

10. Present the instrument with the calibration gas and press enter, the number will begin to count down showing how long the instrument needs to be presented with the gas. A tick '✓' will appear indicating that the calibration has been accepted.

11. Repeat this for each gas if doing a single gas calibration and if using more than one gas mixture.

12. Now replace the instruments filter and probe ready for use.

13. Carry out a Bump Test to ensure calibration was successful. Instrument is now ready for use.



Instrument Menu

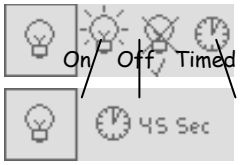
Custom calibration (continued)

If you are not successful in calibrating the instrument check the following points:-

- The carbon canister may be contaminated
- The calibration gas canister may be low or empty
- If using a connector pipe there may be a kink restricting the flow of gas
- PID lamp may require cleaning
- PID lamp may need replacing

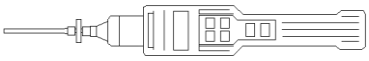
Back-light

The instrument display can be illuminated when in low light conditions. When On is selected the back-light is on when ever the instrument is switched on. When Off is selected the back-light is permanently off. When Timed is selected the back-light illuminates for a pre-set time after every key press. When timed is selected pressing enter allows the user to adjust the on time from 1 to 60 seconds.



Date / Time

The Date / Time function allows the adjustment of the time and date used within FirstCheck's internal clock. The internal clock is used for the data logging date / time stamp. When readings are being stored for download and future use and record keeping ensure that the clock and date are accurately set. The 12 / 24 hour time format is also adjustable.



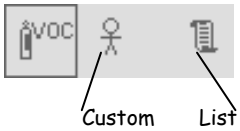
Instrument Menu

VOC Gas Selection

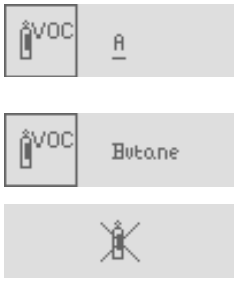
FirstCheck's photo-ionisation detector (PID) is a non-selective gas sensor. Although many VOC gases are detectable, the FirstCheck's PID can not diffentiate between the gases. When you select the VOC gas you wish to measure from FirstCheck's internal gas list, the FirstCheck will calculate the equivalent level for that selected gas. Please note that there may be other detectable gases present that may effect the measurement.

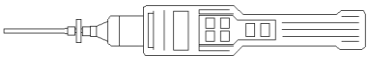
WARNING: Ion Science Ltd makes every effort to ensure the gas tables held within the FirstCheck's memory and supplied on CD are accurate at the time of manufacture. In critical applications alarm levels must be checked, compared and adjusted to local legislation before use.

Custom offers a quick route to the last 10 selected gases. When selected, use the UP and DOWN keys to change the gas then press ENTER to select.



List allows selection of any gas from within the gas table held in the FirstCheck's memory.
After selecting the List symbol, select the first letter of the gas you wish to detect and press ENTER. The FirstCheck will then list all gases starting with that letter. WMD gases are prefixed with the letters WMD.
Alarm levels that are set in the Gas table will be automatically selected. Should a gas be selected that is not compatible with the selected lamp the following symbol will appear to highlight the incompatibility.





Instrument Menu

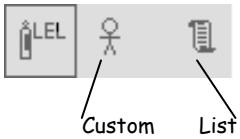
LEL Gas Selection

FirstCheck's catalytic (Pellistor) sensor is a non-specific explosive ; detector. Although a number of explosive gases are detectable, the FirstCheck cannot the gases.

When you select the explosive gas you wish to measure from FirstCheck's internal gas list, the FirstCheck will calculate the equivalent level for that selected gas. Please note that there may be other detectable gases present that may effect the measurement.

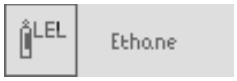
WARNING: Ion Science Ltd make every effort to ensure the gas tables held within the FirstCheck's memory and supplied on CD are accurate at the time of manufacture. In critical applications alarm levels must be checked, compared and adjusted to local legislation before use.

Custom offers a quick route to the last 10 selected gases. When selected, use the UP and DOWN keys to change the gas then press ENTER to select.



List allows selection of any gas from within the gas table held in the FirstCheck's memory.

After selecting the List symbol, select the first letter of the gas you wish to detect and press ENTER. The FirstCheck will then list all gases starting with that letter.

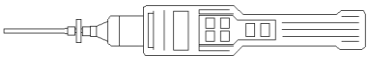


PID Lamp

An alternative lamp to the Krypton 10.6eV (standard) can be purchased, fitted and selected. A tick '✓' confirms the selection Should a Lamp be selected that is not compatible with the selected gas the following symbol will appear to highlight the incompatibility.

Unit Selector

FirstCheck's photoionisation detector can be selected to measure VOC's in either ppm (Parts per million), ppb (Parts per billion FirstCheck 6000 only) or mg/m^3 (Milligrams per meter cubed).



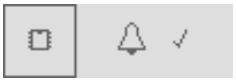
Instrument Menu

Rotation

When viewing readings in the Large Numerical Screen format FirstCheck can be set to 'rotate' where each Sensor reading is displayed in turn. When set to 'no rotate' the user can move between sensor readings using the up and down keys.

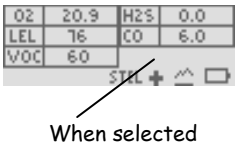
Data Log Memory Alarm

FirstCheck has been designed to continuously store data, once the memory has reached its full capacity (8 Mb) it will automatically begin to over write previous readings. An alarm can be set to inform the user that this is due to happen giving the user time to download any data that may be over written if they wish to do so.



Application - Health & Safety Mode

Modes of operation are selected to suit how the instrument is being used. Health & Safety mode is used to check for conformity of short-term exposure levels (STEL) or time-weighted averages (TWA) that are specific for particular hazardous environments (for example EH40 in the UK and OSHA in the USA). In this mode of operation STEL's and TWA's on the VOC, H_2S and CO sensors are continually calculated and compared to levels set in the instruments gas table.



When selected

You cannot adjust settings or parameters of the instrument while in Health & Safety mode as these could effect the ongoing calculations. Should you want to proceed with an adjustment a WARNING screen will appear. You have the option to continue with the adjustment by pressing Enter or abort and continue monitoring by pressing the 'Esc' key.

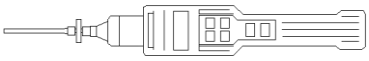
Instrument Menu

Application - Survey Mode

'Survey' is the default mode of operation whenever the 'Health & Safety' mode is NOT selected. All functions can be adjusted or selected in this mode unless the 'Security mode' is set via FirstCheck software. 'Survey' mode is often used in applications where several areas (or Zones) can be monitored and readings data logged. Saved data can then be downloaded to a PC for long-term storage and review. High and low alarm levels can be set.

Security

When the FirstCheck is connected to a PC via the FirstCheck software package (see pg 34), the instrument can be locked in the Menu Settings area of the software package. This facility allows the instrument to be set-up by a qualified or competent person locked and then handed to an operator for use. When in secure mode the FirstCheck's functionality cannot be changed or adjusted. The user can only view the display screens and switch the instrument On and Off.



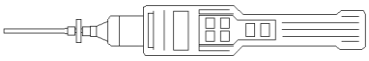
FirstCheck Software

PC Requirements

FirstCheck Software must be used in conjunction with a PC/laptop using Windows XP. An IRDA port is required for communication with the instrument. Most lap tops are now supplied with this facility as standard.

Installation of FirstCheck Software

1. Insert Ion Science FirstCheck software CD into your CD rom drive
2. From the Start menu go to Programs and open Windows Explorer
3. Open the CD from your CD drive (normally the D drive)
4. Open the folder named software
5. Inside is a zip file called FirstCheck software, double click this file
6. A WinZip pop up window will appear
7. Select I Agree
8. Select Extract from the menu
9. Another window will open
10. Select the drive you wish the software to be saved to (typically your C drive)
11. Select a new folder
12. Name the folder FirstCheck
13. Select Extract and the software will be extracted into the new FirstCheck folder.
14. Close the WinZip window
15. From the start menu open Windows Explorer and open the new FirstCheck file you have just created.
16. In the folder you will see a number of files. Right click on the file named FirstCheck and create a short cut.
17. Drag the short cut on to your desk top
18. Now go to the start menu and select Run
19. Select Browse and find the folder where you originally saved the software and select the file called installpho6.bat
20. Click on open. This file will run momentarily and then close
21. Go to the start menu, select Browse and go to the FirstCheck folder and select the FirstCheck file.
22. Click open and the FirstCheck software will open. It will now also be accessible form the short cut created on our desktop.



FirstCheck Software Features

Connecting FirstCheck with a PC

Switch on your FirstCheck instrument, select the Data Transfer symbol from the menu and press the enter key. When communicating with a computer the FirstCheck displays a '✓' within the data transfer symbol, when not communicating an 'X' will appear.

Place the FirstCheck on it side with the instruments infrared window approximately 40 mm from the PC IRDA, then start the FirstCheck software.

Starting FirstCheck Software

Start the FirstCheck software either from your desktop via the previously created shortcut or from the start menu select Run then browse for the FirstCheck software in the previously created FirstCheck directory.

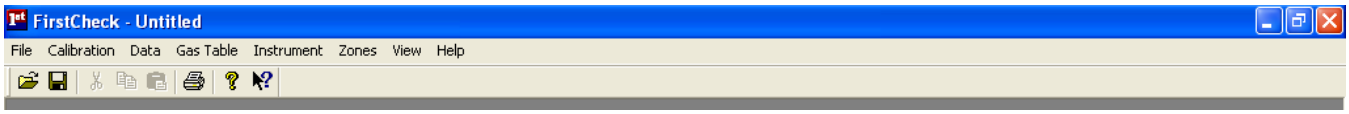
The instrument has 8Mb of memory, which is divided into 1Mb segments. When a segment becomes full, data is then stored in the next segment.

Each time the user starts data logging, a new file is created. So, for example, six data logging sessions will create six data files.

When a data logging session records data which spans across two or more 1Mb segments, a corresponding number of files will be created and stored within the instrument and will apply to that particular data logging session only. So, for example, two 1Mb segments spanned will result in two files created.

When the data is to be downloaded via the IonPC software, any files that have spanned two or more 1Mb segments (i.e. two or more files) will be recognised and downloaded as a single file.

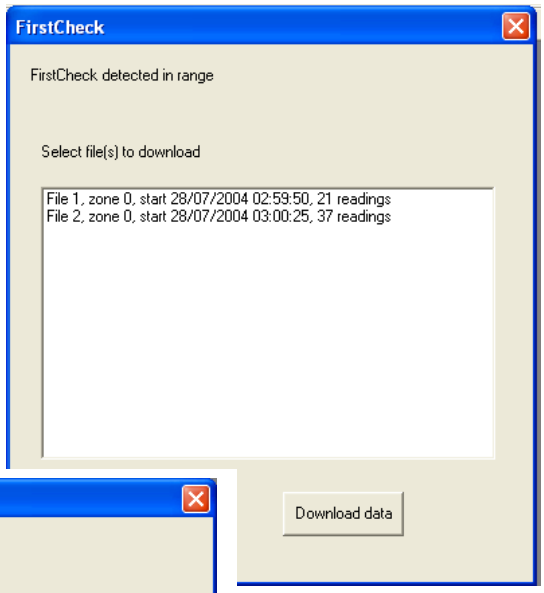
FirstCheck Software Features



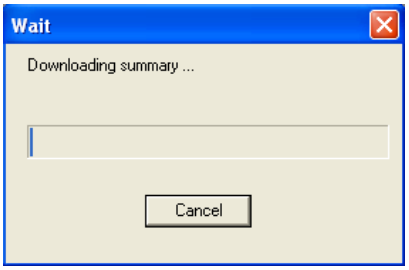
FirstCheck software has many features allowing the transfer for data and function specifications to and from the instrument and the PC.

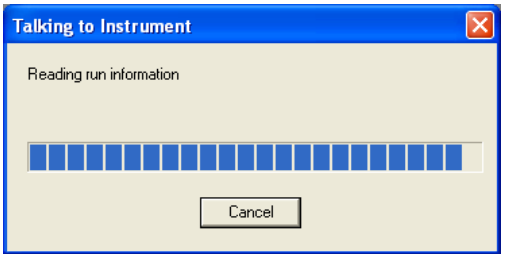
Downloading data logged readings

FirstCheck should always be presented to the IRDA port before the FirstCheck software is run. When the software is opened like this it will immediately begin communicating with the instrument and will give you the option to download data logged readings, as shown here. Select 'Finished' if you do not wish to download the data.

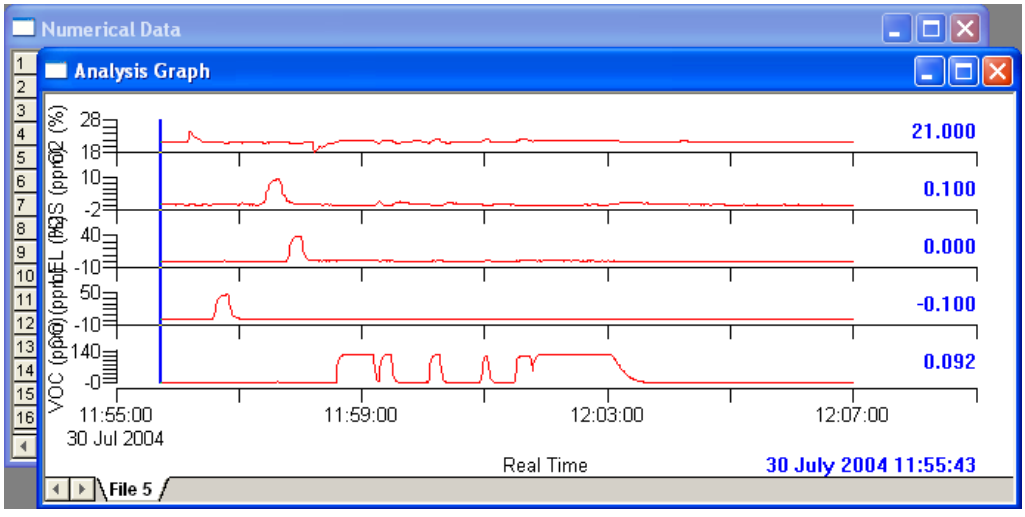


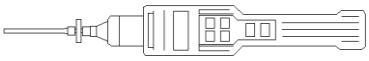
If you do wish to download data highlight the files you require then select Download data. The following screens will appear.





The data will then download from FirstCheck to your PC in numerical and graph format.

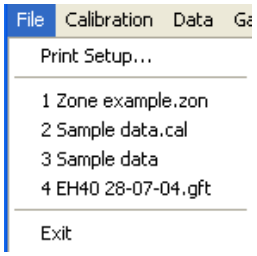


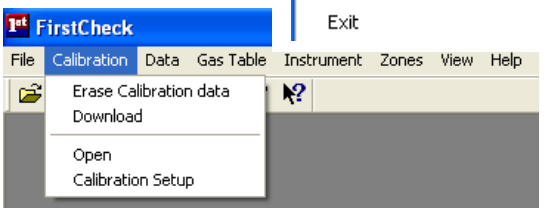


FirstCheck Software Features

File

Allows the printing of files downloaded from your FirstCheck instrument.
Previously used files are also listed for quick reference.

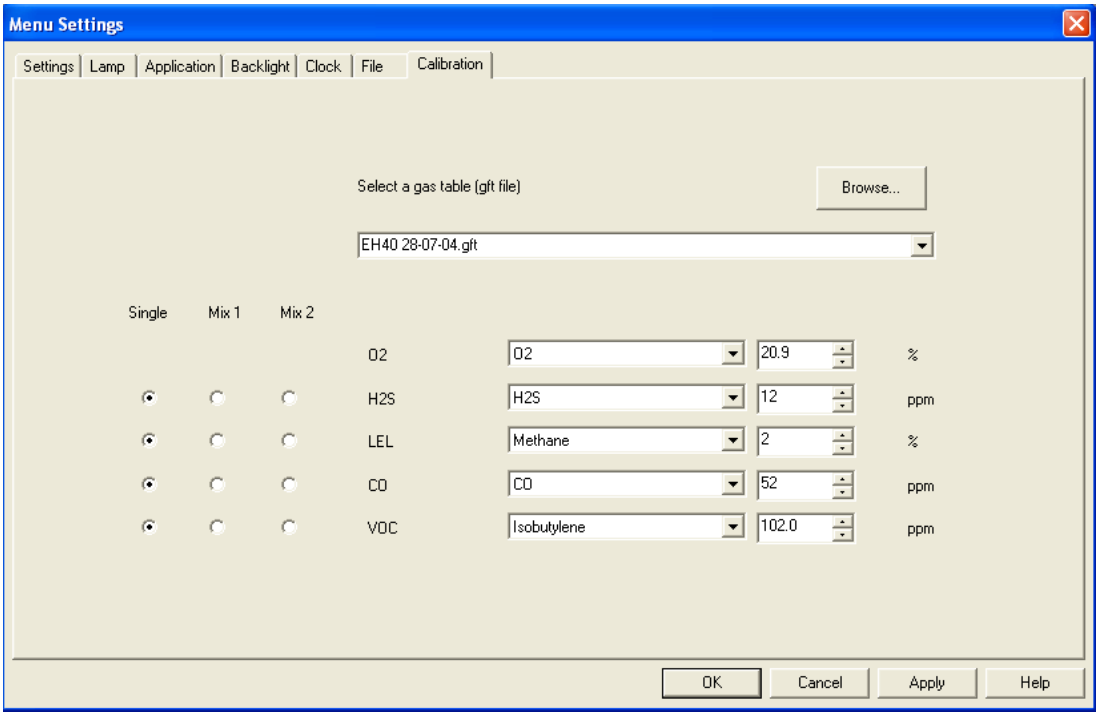




Calibration

Refers to the 'Custom' calibration of FirstCheck.
Enables the download of calibration data from the instrument to a PC, the erasing of the Custom calibration settings, the opening of previously saved calibration settings and the adjustment of the 'Custom' Calibration Setup.

Calibration Setup



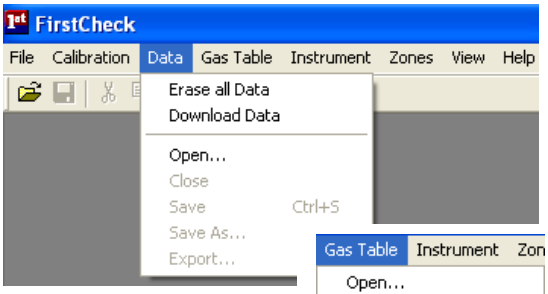
The gas table provided with the software will be shown, however if you wish to use a different gas table previous selections will be shown on the drop down menu or click 'Browse' and search for and select the table you require.

You can now choose to set up your Custom calibration to your specific gas and concentration requirements. Click 'Apply' to send your specifications to the instrument. You are now ready to calibrate your FirstCheck, see pg 21 for details.

FirstCheck Software Features

Data

Data logged information can be cleared from your instrument or downloaded from the instrument to your PC.
Once downloaded to your PC files can be stored for future reference.



Gas Table (Including setting alarm levels)

Select a gas table stored in the FirstCheck directory. You are able to modify this table and then download it to your instrument.

If you wish to add new gases to the table ensure you use the next available line, leaving no spaces.

Upper and lower alarm levels in Survey mode can be adjusted via the gas table. Type the de
appropriate column (either high or low alarm) against the gas you wish to change.

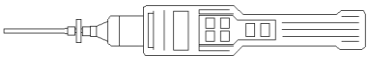
Use the tick boxes beside each gas to select / deselect the gases to be downloaded to your FirstCheck then select 'Send to FirstCheck' from the dropdown menu shown above.

Always save modified gas tables under a different file name, keeping the original complete.

Untitled

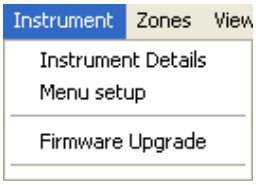
Select	Gas Name	Abbreviation	Formula	Molecular weight	11.7eV (Ar) Factor	10.6eV (Kr) Factor	10.2eV (D2) Factor	8.4eV (Xe) Factor	High alarm ppm	Low alarm ppm
Enter custom data on the next available line at the bottom of the table										
☑	28/07/04									
☑	Acetaldehyde		C2H4O	44.0	0.00	4.86	1.00	0.00	M	M
☑	Acetic Acid		C2H4O2	60.0	0.00	36.15	0.00	0.00	M	M
☑	Acetone		C3H6O	58.0	0.00	0.71	1.00	1.20	M	M
☑	Acrolein		C3H4O	56.0	0.00	4.00	1.00	0.00	M	M
☑	Acrylic Acid		C3H4O2	72.0	0.00	2.74	0.00	0.00	M	M
☑	Allyl alcohol		C3H6O	58.0	0.00	2.07	2.00	0.00	M	M
☑	Allyl chloride		C3H5Cl	77.0	0.00	4.50	0.00	0.00	M	M
☑	Ammonia		H3N	17.0	0.00	8.49	8.00	0.00	M	M
☑	Amyl acetate, n-		C7H14O2	130.0	0.00	1.80	0.00	0.00	M	M
☑	Amyl alcohol		C5H12O	88.0	0.00	3.20	5.00	0.00	M	M
☑	Anisole		C7H8O	108.0	0.00	0.47	1.00	1.00	M	M
☑	Arsine		AsH3	78.0	0.00	0.00	2.00	0.00	M	M
☑	Asphalt, petroleum fumes	Asphalt fumes		150.0	0.00	1.00	0.00	0.00	M	M
☑	Benzaldehyde		C7H6O	106.0	0.00	0.85	1.00	0.00	M	M
☑	Benzonitrile		C7H5N	103.0	0.00	0.70	1.00	0.00	M	M
☑	Benzyl alcohol		C7H8O	108.0	0.00	1.25	1.20	1.40	M	M
☑	Benzyl chloride		C7H7Cl	127.0	0.00	0.55	1.00	0.00	M	M
☑	Benzyl formate		C8H8O2	136.0	0.00	0.77	1.00	0.00	M	M
☑	Bis(2,3-epoxypropyl) ether	2,3-epoxy-Pr ether	C6H10O3	130.0	0.00	3.00	0.00	0.00	M	M
☑	Bromobenzene		C6H5Br	157.0	0.00	0.70	1.00	0.00	M	M

VOC LEL H2S O2 CO



FirstCheck Software Features

Instrument



Instrument details can be downloaded from your FirstCheck to your PC.

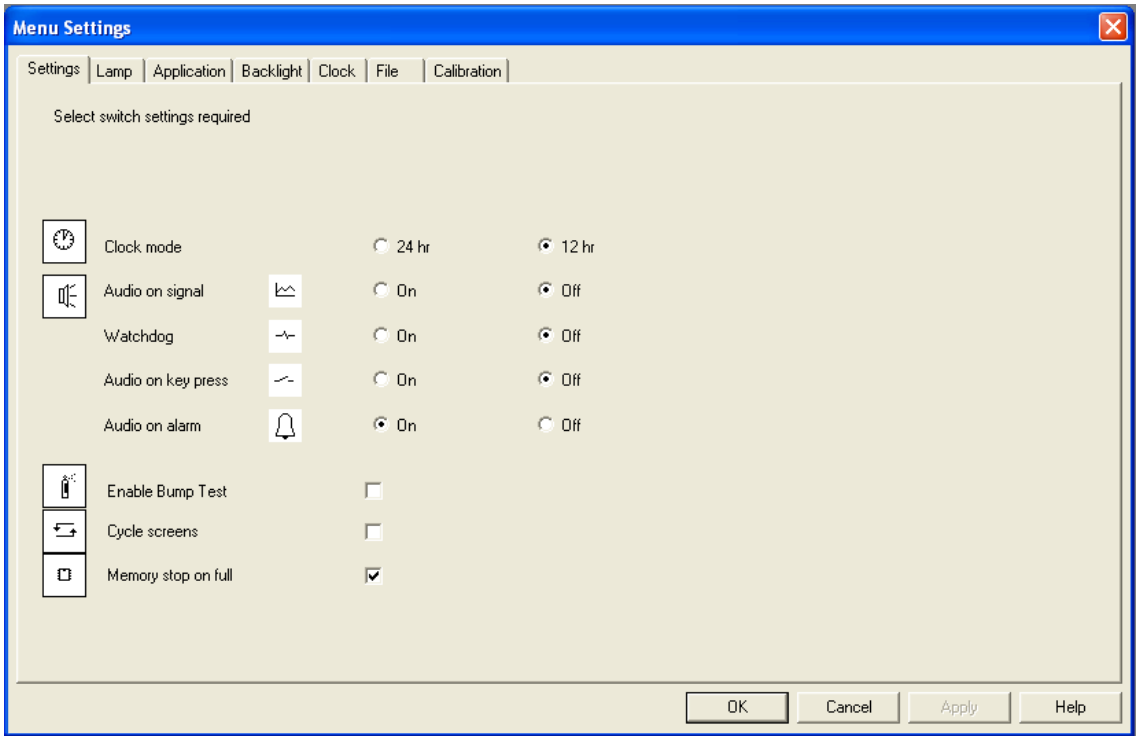
'Menu Set-up' allows you to change FirstCheck settings from your PC. These settings can be saved for future re-use.

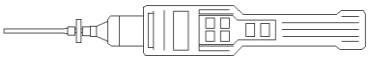
Menu Set-up

Adjustable features found on your FirstCheck instrument can also be changed via your PC along with some additional features. These features can be adjusted and then downloaded to your instrument by selecting Apply.

Settings

Within this tab there are a number of additional features including the clock (24 hr or 12 hr), sound controls on signal, watchdog (sounds every 15 seconds), on key press and on alarm. When selected the bump test sets the instrument to show a gas bottle image every time the instrument is turned on as a reminder to test the instruments response.
When selected cycle screens enables the rotate function for the large screen display.
Memory stop on full will ensure an alarm sounds if the FirstCheck data log memory is full to enable you to download the data or continue and overwrite previously saved data.

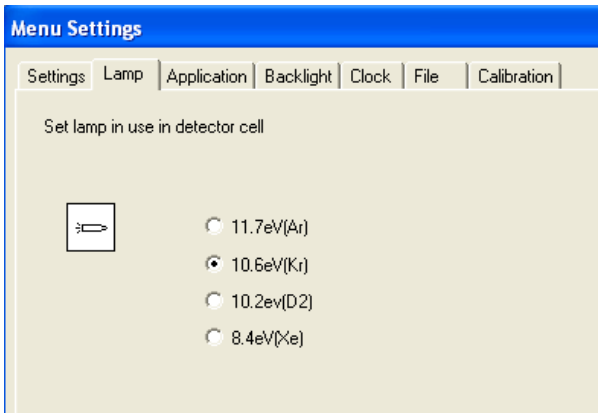




FirstCheck Software

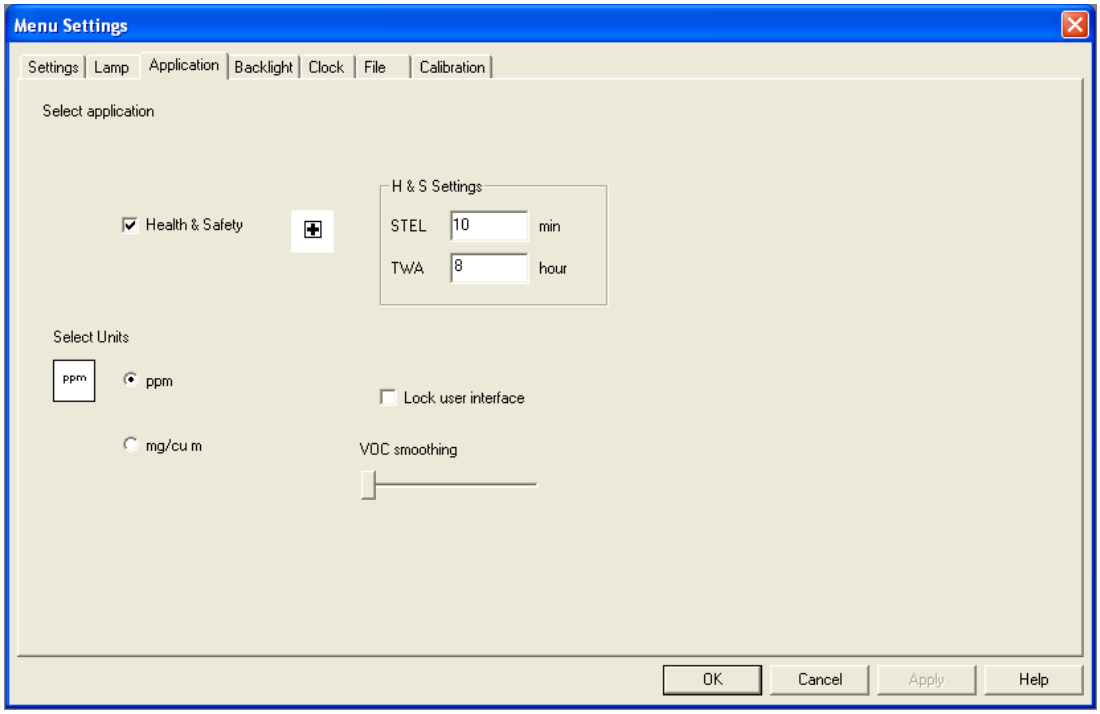
Lamp

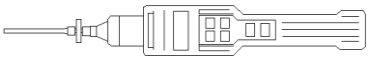
Enables the selection of different lamp types you may have purchased to use with your instrument.



Applications

Enables the selection and de-selection of Health & Safety mode and the selection of ppm or mg/cu m. In Health & Safety mode STEL and TWA timings can be adjusted to reflect the changes in legislation between the US and Europe. The instrument can be set to security mode which enables the locking of the user interface so that the instrument functions can not be changed manually. To de-select security mode, switch the instrument Off then On, you then have 2 minutes from 'switch on' to connect your instrument to a PC and select Instrument / Menu set up. This will automatically place your instrument in PC mode ready for download or further adjustment. VOC smoothing relates to the reading from the PID VOC detector only and is used to have a dampening affect on the measurements for high gain factor gases. In effect increasing the T90 time to create a smoother graph. This affect can only be applied when in 'Survey' mode it does not apply in Heath & Safety.

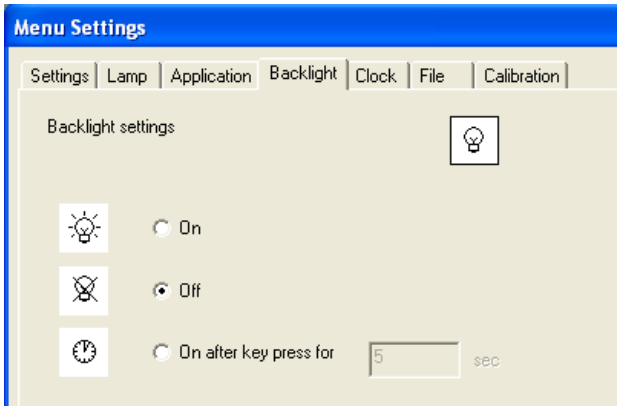




FirstCheck Software

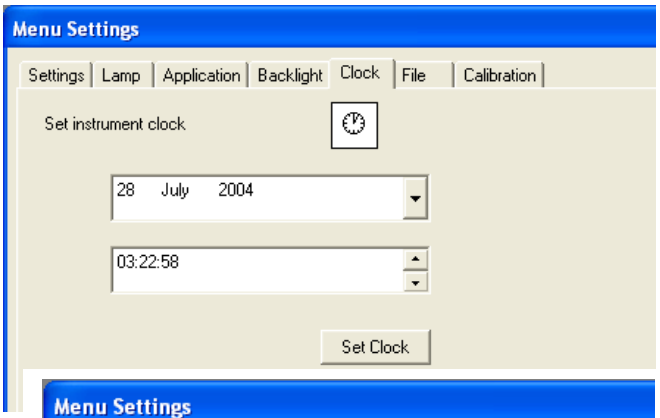
Backlight

Gives you the option of turning the back light on or off permanently or setting it on a timer after every key press.



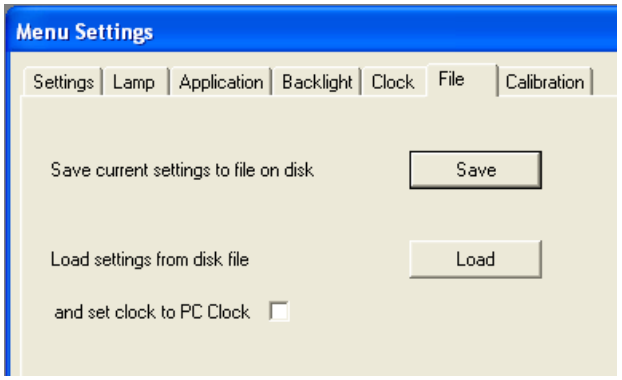
Clock

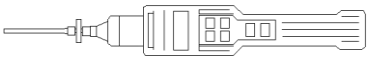
Set the instruments clock and date for the purposes of data logging.



File

Allows you to save the settings you have created to your PC for future use. It also enables you to open previously saved settings to then download to your instrument.





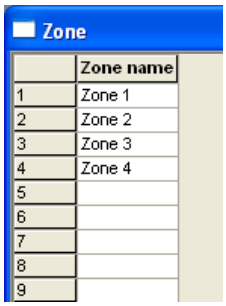
FirstCheck Software

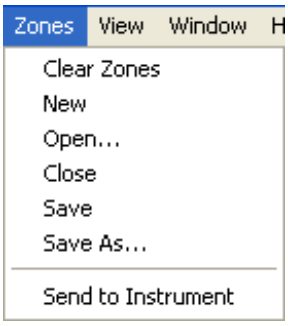
The calibration settings can also be adjusted under the Menu Settings and it is the same layout as described on page 32.

Once you have selected all of your settings you can either choose to 'Apply' them, which will download the information straight to the instrument and leave the screen open or select OK and they will be transferred to the instrument and the screen will close automatically.

Zones

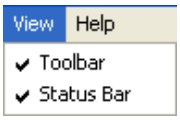
Clear / Delete existing Zones from your instrument or create new Zones for download to your FirstCheck. Please note data files stored within a Zone to be deleted will be lost. Always download Data from your instrument before deleting Zones.





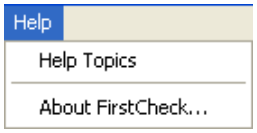
View

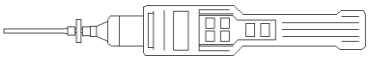
Select or hide the FirstCheck software toolbar or status bar.



Help

Offer advice on the use of FirstCheck software.





FirstCheck Software

Software Disclaimers

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FirstCheck is a portable gas-detector suitable for the detection of; volatile organic compounds (VOC's) using PID (Photo Ionisation Detection) technology; the detection of oxygen, carbon monoxide and hydrogen sulphide using electrochemical sensors and the detection of combustible gases using a catalytic (Pelistor) sensor.

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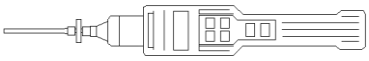

FirstCheck Software

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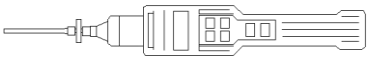
The laws of the United Kingdom govern this Agreement.



Batteries

WARNING:
For reasons of Intrinsic Safety, batteries MUST NOT be charged or replaced within potentially flammable areas. Ensure you are in a SAFE area before carrying out any type of maintenance on the FirstCheck Instrument.

Instrument battery type identification

Non-rechargeable FirstCheck instruments have a removable battery cover on the rear of the handle area. A security tool is required to remove it.

Rechargeable FirstCheck instruments have no removable battery cover but have a charging socket on the instruments end.

Non-rechargeable battery types to be used

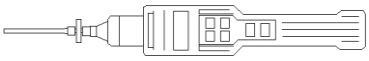
For Intrinsic Safety of T4 rating and reduced risk of explosion you must only use Duracell Standard, Procell Alkaline, Zinc Carbon R6, R6B, R6PP or an ION SCIENCE APPROVED battery pack. DO NOT mix old / used batteries or batteries from different manufacturers.

Rechargeable battery instruments

Ensure rechargeable FirstCheck instruments are charged for at least 12 hours before using it for the first time. When the instrument is on charge a screen will display the instruments charging status.

The FirstCheck may be left on charge permanently with no detrimental effects.
When the battery power is very low the FirstCheck may not be able to continue data logging. If this is the case the following symbol will appear.

NB: Only use the charger supplied with your FirstCheck to charge your instrument.



Batteries

Replacement of Non-rechargeable batteries

1. Ensure the FirstCheck is switched Off.

2. Using the battery cover removal tool provided, remove the battery cover at the rear of the instrument casing. This reveals a set of 4 x AA cells contained in a removable battery clip.

Removable
battery clip

3. Remove the battery clip.

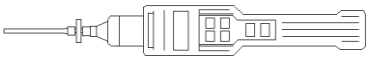
4. Replace the exhausted batteries using the guidelines stated above.

5. Check all batteries have the correct polarity before reconnecting the clip to the instrument.

WARNING: Fitting batteries or connecting the clip with the wrong polarity will result in damage to the instrument!

General notes:

*Only use the Ion Science battery charger provided
*When loading batteries check for correct battery polarity when inserting batteries



Diagnostics

Basic faults or diagnostics are presented as symbols with a more detailed description of the fault indicated by the number in the top right hand corner of the display. Should a fault occur address the issue and then press 'Enter' or 'Esc' to clear the fault message.

General fault

1. Main PCB failure.
Return the instrument to manufacturer.

Pump

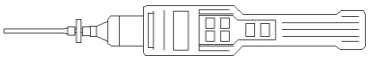
1. Pump failure
Check the probe, filter and cell cap are fitted.
If the error persists return the instrument to the manufacturer.
2 & 3. Sample gas flow is low.
Check the probe and filter for signs of blockage.
If the error persists return the instrument to the manufacturer.

Battery

Battery is low or:

1. Not charging.
Check charger is connected and switched ON.
2. Slow charge current is low.
Check the battery settings.
3. Slow charge current is high.
Disconnect the charger immediately.
4. Fast charge current is low
Check the battery settings.
5. Fast charge current is high.
Disconnect the charger immediately.

With all battery related faults, if the fault persists return the instrument to the manufacturer.



Diagnostics

Sensor

1. Detector cell fuse failure
If the error persists return the instrument to the manufacturer.
2. Contaminated detector cell
If the FirstCheck is used without its filter or filters are not replaced on a regular basis, particles of dust or dirt can cause a range of effects.
Remove the detector lamp as shown and use low pressure oil-free compressed air to blow out the contamination. Replace cleaned lamp and try again.
If the error persists return the instrument to the manufacturer.

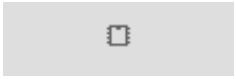
Gas Selection

The gas being selected is not compatible with the selected lamp.
The lamp being selected is not compatible with the selected gas.
Press Esc and select a compatible gas and lamp.

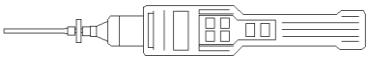
Health & Safety

When in Health & Safety mode the selected gas has no STEL or TWA alarm values.
A warning in Health & Safety mode when you enter the function menu to adjust parameters that this could effect the ongoing calculations. You can proceed with the adjustment by pressing enter or return to the display screens by pressing Esc.

Memory Alarm



The data logging memory is full and will begin to write over write previous readings.
Will only show if the data logging memory alarm has been set to ON (see pg 27).
Press Esc and either continue and previous readings will be over written or down load saved data to a PC before continuing.



Diagnostics

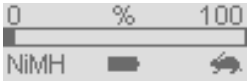
Clock

The internal clock has failed.
Return the instrument to the manufacturer.

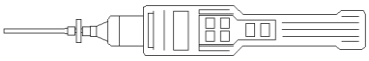
Delay

This symbol will appear during the manual adjustment and selection of function's of the instrument. It indicates that data within the memory is being moved. Please wait and the symbol will disappear after a few seconds depending on the change being made.

Slow charge. The instrument can be left connected to the charger indefinitely in this mode of charge.



Fast charge. If fully discharged the instrument will take 9 hours to charge in this mode and pro rata for other initial states eg if half charged the instrument will take around 4.5 hours to fully charge.



Maintenance

1. Keep the PID detector lamp window clean.

2. Replace the sample filters on a regular basis.
   Frequency of cleaning the detector lamp and replacement of the filter depends on the type of gas being detected and the quality of the background air.

3. The secondary probe filter is designed to strengthen the instrument response, even in condensing environments.

   If the instrument background reading is high, change the main probe filter first. If the readings remain high it will be necessary to change the secondary probe filter as follows;

   a) Using an 11mm (7/16") spanner unscrew the probe fitting from the end of the PID detector nozzle.

   b) Remove and discard the secondary probe filter

   c) Insert a new secondary probe filter into the probe fitting

   d) Screw the probe fitting back onto the nozzle and tighten using the 11mm (7/16") spanner

   <u>CAUTION</u>: DO NOT OVERTIGHTEN THE PROBE FITTING

Cleaning the FirstCheck Lamp

The FirstCheck PID relies on an ultraviolet light source ionising VOC gases as they pass across the lamp window. This process may result in a very fine layer of contamination appearing on the detector window that must be removed on a regular basis.

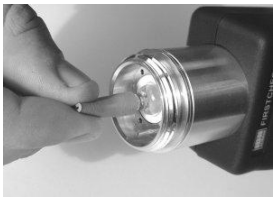
CAUTION!

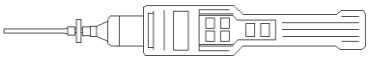
The FirstCheck is a sensitive detector. Internal components must be handled with clean hands and clean tools. The instrument lamp is fragile. Handle with great care!

1. Ensure that the FirstCheck is switched OFF.

2. Remove the probe and filter.

3. Unscrew the black knurled ring to expose the detector lamp.



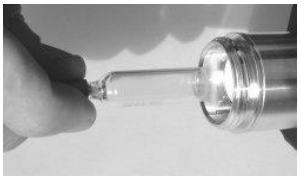


Maintenance

4. Push a lamp-removing sleeve over the end of the lamp. This allows the user to grip the glass.

Passed the O-ring

5. Extract the lamp from its socket by pulling it in a straight line away from the PID cell. Force is only required when pulling the lamp past the O ring. Once past the O ring the lamp will move freely.



Move freely in a straight line

WARNING!
NEVER REFIT A DAMAGED LAMP!

6. Inspection of the lamp may reveal a layer of contamination on the detection window that presents itself as a 'blue hue.' To check for contamination, hold the lamp in front of a light source and look across the window surface.

USE of PID lamp cleaning kit A-31063

1. The vial of cleaning compound contains Aluminium Oxide as a very fine power (CAS Number 1344-28-1). A full material safety data sheet MSDS is available on request from Ion science ltd. The key issues are listed below:

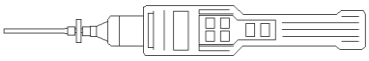
Hazard identification:
- May cause irritation of respiratory tract and eyes.

Handling:
- Do not breathe vapour/dust. Avoid contact with skin, eyes and clothing
- Ware suitable protective clothing
- Follow industrial hygiene practices: Wash face and hands thoroughly with soap and water after use and before eating, drinking, smoking or applying cosmetics.
- The Compound has A TVL(TWA) of 10 mg/m^3

Storage:
- Keep container closed to prevent water adsorption and contamination.

2. Open the vial of Aluminium Oxide polishing compound.
With a clean cotton bud collect a small amount of compound.

3. Use this cotton bud to polish the PID lamp window. Use a circular action applying light pressure to clean the lamp window. Never touch the lamp window with fingers.



Maintenance

4. Continue polishing until an audible "squeaking" is made by the cotton but with compound moving over the window surface. (usually within 15 seconds)

5. Remove the residual powder with a clean cotton bud. Care must be taken not to touch the tips of cotton buds that are to be used to clean the lamps as this may contaminate them with finger oil.

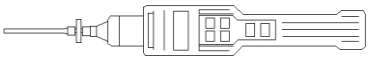
6. Ensure the lamp is completely dry and any visible signs of contamination are removed before refitting.

7. The instrument MUST now be re-calibrated.

Blowing out the PID Cell

When using the PID instrument in conditions of high ambient humidity, the PID may show unexpected readings appearing to increase. This occurs due to dust or other small particles within the detector becoming hydrated with humidity. This causes these particles to conduct a signal between the electrodes. This issue can be resolved by the user in the field using the following procedure and a can of computer duster air.

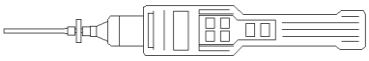
First remove the lamp following the instructions on the lamp removal from the cleaning the lamp section above (steps 1 – 5). Using a can of computer duster, spray air down the small metal tube. Replace the lamp and cap and test the instrument.



Accessories

Ion Science Ltd has developed an exclusive range of high quality accessories to compliment the Firstcheck. Please see a selection of these below.

Part Number	Accessory Description
A-830206	IS Protective Cover ☐ II 1 G EEx ia IIC T4/ ☐II 2 G EEx iad IIC T4 Baseefa 02ATEX0093X, Baseefa 03ATEX0742X PK of 10
A-820213	Calibration Kit
A-31064	25mm (1") diamiter 0.5 micron probe filter PK of 5
A-31066	Std probe attachment PK of 5
A-31063	PID Lamp Cleaning Kit (20 cleans)
A-30555	5 m (16 ft) flexible extension hose
A-30556	10 m (33 ft) flexible extension hose
A-31146	Secondary Probe Filter (pack of 5)
A-31153	Exhaust barb, Tedlar bag commector
A-31057	Carbon filter
30618	Photec lamp, type 8.4 eV Xenon
30619	Photec lamp, type 10.2 eV Deuterium
30620	Photec lamp, type 10.6 eV Krypton
30621	Photec lamp, type 11.7 eV Argon
31052	Leather instrument jacket
40052	Leather instrument jacket with magnetic attachment
4/VH-01	Instrument chest harness for hands free operation
1/VS-18	Universal 9 volt power supply without plug
1/VS-16	9 V power supply UK moulded plug
1/VS-17	9 V power supply Euro moulded plug
1/VS-19	9 V power supply US moulded plug



IS Protective Cover

Fitting Instructions

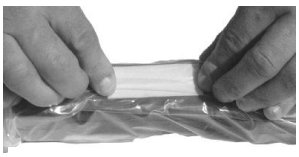
1. Insert instrument into the IS protective cover ensuring that the probe tip exits through the small slit at the top of the cover and that the cover labelling and stickers are on the reverse of the instrument.

2. Seal the cover at its base and lay the instrument on a flat surface with the label and stickers facing upwards.

3. Peel off the backing to the large section of double-sided tape in the middle of the instrument.

4. Gather the excess plastic on one side of the instrument and stick it on the midway point of the double-sided tape.

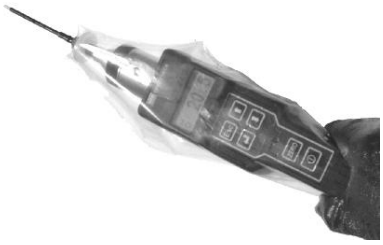
5. Gather the excess plastic on the other side of the instrument and stick it to the remainder of the double-sided tape.

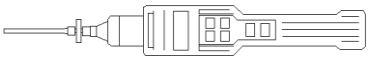


6. Now remove the backing from one of the small pieces of tape and secure it to the side of the instrument.

7. Remove the final piece of backing and secure it to the other side of the instrument.

8. The instrument is now ready to use in applications where it is likely to get dirty and wet.





Instrument Warranty and Service

Warranty

Standard Warranty can be extended to up to 2 years on the FirstCheck+ when registering your instrument via our website: www.ionscience.com/instrument-registration

To receive your Extended Warranty, you need to register within one month of purchase (Terms and Conditions apply). You will then receive a confirmation email that your Extended Warranty Period has been activated and processed.

Full details, along with a copy of our Warranty Statement can be found by visiting: www.ionscience.com/instrument-registration

Service

Ion Science is pleased to offer a number of service options on our FirstCheck product range. The options below allow you to choose the cover provided for your instrument that best suits your needs.

At Ion Science we recommend that all of our gas detection instruments be returned for recalibration on an annual basis to ensure optimal performance. For your convenience re-calibration has been built into both service options. Choose between our Gold and Platinum Service levels giving you piece of mind in a fixed cost solution.

Gold Service

- Includes annual calibration after 12 months
- Includes all repair costs and required spare parts
- All calibrations and repairs will be carried out in 3 working days – if not a replacement instrument will be sent out of equal or greater specification.
- Instrument will be upgraded to the latest software versions upon return to Ion Science.

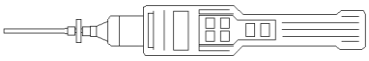
Platinum Service

- Never be without your instrument!
- Should your instrument fail or need to be returned for annual re-calibration Ion Science will first ship you a replacement instrument, of equal or greater specification with the latest software, by courier who will also collect your returning instrument.
- Includes your annual calibration and any required spare parts.

Both Gold and Platinum options can be purchased on a yearly basis or on a 5 year service contract option. By entering into either service contract, this will entitle you to various accessories, discounts and promotions.

For more information please contact our service department:

Telephone:	+44 (0) 1763 207228
Fax:	+44 (0) 1763 208814
Email:	calibration@ionscience.com



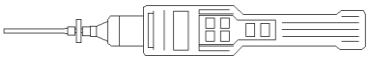
Technical Specifications

Detector	**Range**	**Response Time***
PID (VOC detector)	1 ppb - 10,000 ppm (FirstCheck 6000 0.1 ppm – 10,000 ppm (FirstCheck 4000)	T90 < 1 second
O_2 - Electrochemical	0 to 28%	T90 < 15 seconds
CO - Electrochemical	1 - 1000 ppm	T90 < 25 seconds
H2S - Electrochemical	0.1 - 100 ppm	T90 < 20 seconds
LEL – Pelistor	0 - 100% LEL	T90 < 15 seconds
Accuracy	+/- 5% displayed reading**	
Linearity	+/- 5%**	
Battery	4 x AA size	Specified Alkaline or 1.2V Rechargeable NiMH
Alarm	Flashing LED and 90 dBA (10 cm) audible sounder	
Flow Rate (Approx)	220 ml/min or 220 cc/min	
Temperature	Operating Storage	-20 to 60 °C (-4 to 140 °F) -25 to 60 °C (-13 to 140 °F)
Dimensions	Instrument Standard Carry Case:	340 x 60 x 50 mm 420 x 320 x 97 mm
Weight	Instrument Packed in case	0.640 kg (1.4 lb) 3.1 kg (6.8 lb)
Materials	Instrument Standard Carry Case	Conductive carbon-loaded polypropylene-based resin casing. Polypropylene, with a polyester foam insert

*Response time of the instrument is affected by the use of a length of tubing in applications such as confined space entry. The following response times show the affect on the PID detector based on 213 ml/min with a filter attached with a tube internal diameter of 1.6 mm at 20 °C:

Length of tube	**Flow ml/min**	**Response time in seconds**
Standard probe	213	0.1
1 m	212	0.8
2 m	212	1.7
3 m	211	2.6
5 m	209	4.3
10 m	199	9.0
20 m	190	19.0
30 m	172	32.0

** Assumes constant environmental conditions



Technical Specifications

Expected lifetime of parts

Batteries
New fully charged (rechargeable) batteries at 20 °C > 10 hours normal use.
Affects on battery capacity:
10% less per 10 °C drop in temperature.
Self discharge to half capacity from fully charged state.
At 25 °C – 50 days
37 °C – 25 days
48 °C – 5 days
60 °C – 1 day
As the batteries age the back light will consume an additional 50% power and therefore half capacity.

Filter
The filter should be changed every 100 hours of use. This frequency should be reduced for dusty or moisture laden environments.

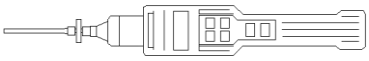
PID Lamps
10.6 eV, 10.2 eV and 8.4 eV expected life of 3 years and 11.7 eV 1 month. Lamps are very fragile please handle with care at all times, never touch the window and do not drop!
Lamp cleaning for normal use is every 100 hours of use (based on 30 ppm for 100 hours). Reduce this if used in heavily gas contaminated environments. Please note that some esters, amines and halogenated compounds may accelerate window fouling cleaning may be required for every 20 hours of use. Cleaning frequency will also depend upon alarm levels set and prevailing environmental conditions.

PID Cell
Electronic cell has an indefinite life however it may suffer contamination problems – it is essential that a clean filter is attached during use. Some gases such as methelene chloride in high concentrations may condense on to the walls of the cell. If condensing is severe and cannot be cleaned, then a replacement may be required.

LEL sensor
The LEL sensor's life expectancy is dependent on the atmosphere to which it is exposed. Volatile silicone compounds are extremely aggressive towards the sensor will adversely affect its operation.

O_2 Electrochemical
The oxygen sensor has an expected lifetime of 2yrs based on conditions at 20 °C, 50% RH and 1013 mBar.

CO Electrochemical
The carbon monoxide sensor has an expected lifetime of 2yrs based on conditions at 20 °C, 50% RH and 1013 mBar.



Technical Specifications

Expected lifetime of parts (continued)

H_2S Electrochemical
The hydrogen sulfide sensor has an expected lifetime of 2yrs based on conditions at 20 °C, 50% RH and 1013 mBar.

NB: PID specifications relate to an isobutylene 100 ppm in air calibration at 20 °C and 90% RH.
LEL specifications relate to a methane (CH4) calibration, other gases are available upon request.
Other gas sensors as specified at appropriate international alarm standards.