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FirstCheck+ Instrument User Manual V2.1

FirstCheck+ 1000, FirstCheck+ 2000, FirstCheck+ 3000, FirstCheck+ 5000

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FirstCheck+ Instrument User Manual part number: 820256

Advanced Gas Sensing Technologies
Registered in England No. 2359038 Vat No. GB 532 2024 00
Registered office address: Lake House, Market Hill, Royston, Herts., SG8 9JN, U.K.

Ion Science Ltd, The Way, Fowlmere, Cambs., SG8 7UJ, U.K.
Tel: +44 (0) 1763 208 503 Fax: +44 (0) 1763 208 814
Email: info@ionscience.com Web: www.ionscience.com

Declaration of Conformity

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

Product: FirstCheck+ 1000, 2000, 3000 and 5000

Product description: Intrinsically safe detector comprising of a photo-ionisation detector, LEL and chemical sensors for the detection of 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, 05(c)0007
IECEx BAS 04.0033	latest revision no.5 issued 3rd July 2009 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 60079-11:2007	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 9001:2008	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:  **Date:** 20th November 2009

Contents

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.

NOTE: Ion Science Ltd can accept no responsibility for the incorrect adjustment of features that cause harm or damage to persons or property. FirstCheck+ can be used as a personal safety device. It is the user's responsibility to respond appropriately to an alarm situation.

Inadequate performance of the gas detection equipment described in this manual may not necessarily be self-evident and consequently equipment must be regularly inspected and maintained. Ion Science recommends that personnel responsible for equipment use institute a regime of regular checks to ensure it performs within calibration limits, and that a record be maintained which logs calibration check data. The equipment should be used in accordance with this manual, and in compliance with local safety standards.

! 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+.

! CAUTIONS !

It is essential that the FirstCheck+ is always used with a supplied PTFE 0.45 micron filter fitted to the front of the instrument. The FirstCheck+ internal pump draws over 200 ml/min of air into the instrument and without a filter particles of debris and dust will be drawn into the cell inhibiting the correct function of the instrument. These filters are consumable and should be changed after every 100 hours of use. The frequency of replacement should be increased for dusty or moisture laden environments. Filters are available for purchase from Ion Science; see our Accessories page for more information.

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.

Quality Assurance

FirstCheck+ has been manufactured in compliance with ISO9001:2008, which ensures that the equipment supplied to our customers has been designed and assembled reproducibly, from traceable components, and leaves Ion Science calibrated to stated standards.

Disposal

Dispose of FirstCheck+, its components and any used batteries in accordance with all local and national safety and environmental requirements. This includes the European WEEE (Waste Electrical and Electronic Equipment) directive. Ion Science Ltd offers a take back service. Please contact us for more information. The FirstCheck+ field case material is recyclable polypropylene.

Calibration Facility

Ion Science Ltd offers a calibration service including the issue of certification confirming calibration with equipment traceable to UK national standards. A FirstCheck+ Calibration Kit is available from Ion Science to allow a two-point calibration to be carried out in the field as a custom calibration, in order to maintain traceability to national standards.

Statements

Legal Notice

Whilst every attempt is made to ensure the accuracy of the information contained in this manual, Ion Science accepts no liability for errors or omissions, or any consequences deriving from the use of information contained herein. It is provided "as is" and without any representation, term, condition or warranty of any kind, either express or implied. To the extent permitted by law, Ion Science shall not be liable to any person or entity for any loss or damage which may arise from the use of this manual. We reserve the right at any time and without any notice to remove, amend or vary any of the content which appears herein.

Introduction to FirstCheck+

FirstCheck+ is a portable gas detector, suitable for the detection of a large range of Volatile Organic Compounds (VOC's), Carbon Monoxide (CO_2), Oxygen (O_2), Hydrogen Sulphide (H_2S) and LEL (Explosive) gases. These can be dangerous from both a poisoning and explosive perspective.

The FirstCheck+ range is fully upgradeable in the field; purchasing a simple upgrade key can convert a FirstCheck+ 1000 to a 5000 or a 2000 to a 3000 or any other combination.

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

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) or samples are to be monitored and readings data is to be logged. All sensor readings are real time measurements and alarm levels are set manually.

Health & Safety mode is used to check for conformity of short-term exposure levels (STEL) and 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 are continually calculated and compared to levels set in the instruments gas table.

For more information on these modes of operation please see under '1st PC Software, Application.'

FirstCheck+ versions 2000, 3000 and 5000 automatically data log the instrument readings every second. These readings are stored in the instrument's memory with a date and time stamp. For more information please see 'Instrument Menu, Data Log Memory Alarm.'

Getting started

Packing List

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

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 (rechargeable instrument only)	1
6.	Battery clip (non-rechargeable instrument only)	1
7.	Screw driver (non-rechargeable instrument only)	1
8.	Manual	1
9.	1stPC+	1
10.	IS Protective Cover	1
11.	Cal Kit Sample containing:	
	• PID lamp cleaning Kit (Includes alumina powder and 2 applicators for 1 clean)	1
	• Carbon canister	1
	• PTFE filter – 50 micron	1
	• Cal adaptor*	1
	• Lamp removal tools (neoprene sleeves)	2
	• Secondary Probe Filters	5

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.

Setting alarm levels

Ion Science Ltd recommends that alarm levels are set to user specifications before the instrument is used (see 'Instrument Menu page, Alarm' for details of how to set alarm levels).

Setting date and time

Ion Science Ltd recommends that the correct local date and time be set to the instrument as soon as possible before using for the first time (see 1^{stPC} Software for details on how to set the date and time).

Selecting a gas from the internal gas table

The Factory calibration is carried out on FirstCheck+ just before leaving Ion Science.
Isobutylene gas is used to calibrate the PID sensor and Methane gas for the LEL sensor. Many other VOC and LEL gases can be selected from the instruments internal gas table, but TVOC gas is the default on the PID sensor (TVOC has the same response factor as Isobutylene so 100ppm TVOC = 100ppm Isobutylene) and Methane gas is the default for the LEL sensor. Selecting alternative gases from the internal gas table automatically selects alternative response factors allowing the correct concentration.* (To change the selected gas please see '1st PC Software, Gas Table'.)

* Both PID and LEL sensors can detect a wide range gases however neither of these sensors are selective.

WARNING: FirstCheck+ can not identify specific VOC or LEL gases!

Getting started

Rechargeable Batteries

FirstCheck+ instruments leave the factory fully charged, however the batteries reach full storage capacity after a few charge / discharge cycles. A fully charged battery pack can completely discharge if left in storage for a prolonged period. The rate at which the batteries self discharge directly relates to the ambient temperature; the higher the ambient temperature, the quicker the discharge. Ion Science Ltd recommends charging the instrument for 12 hours before use (see the battery section of this manual 'Batteries').

Non Rechargeable Batteries (Alkaline)

Fit the battery pack supplied with the FirstCheck+. For more information please see the battery section of this manual 'Batteries' page. A removable rechargeable battery pack (part number: A-820219) is also available, which offers the flexibility to use both Alkaline and NiMH cells.

Instrument Functions

Keypad function descriptions

ON/OFF

To switch the FirstCheck+ instrument ON - Press the ON/OFF key.
To switch the FirstCheck+ instrument OFF – Firstly, ensure you are on the DISPLAY/FUNCTION Selection screen, or a DISPLAY screen. Press and hold the ON/OFF key until the line reaches the left side of the screen, at this point the instrument will switch off. This procedure has been designed to avoid accidental switch OFF.

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.

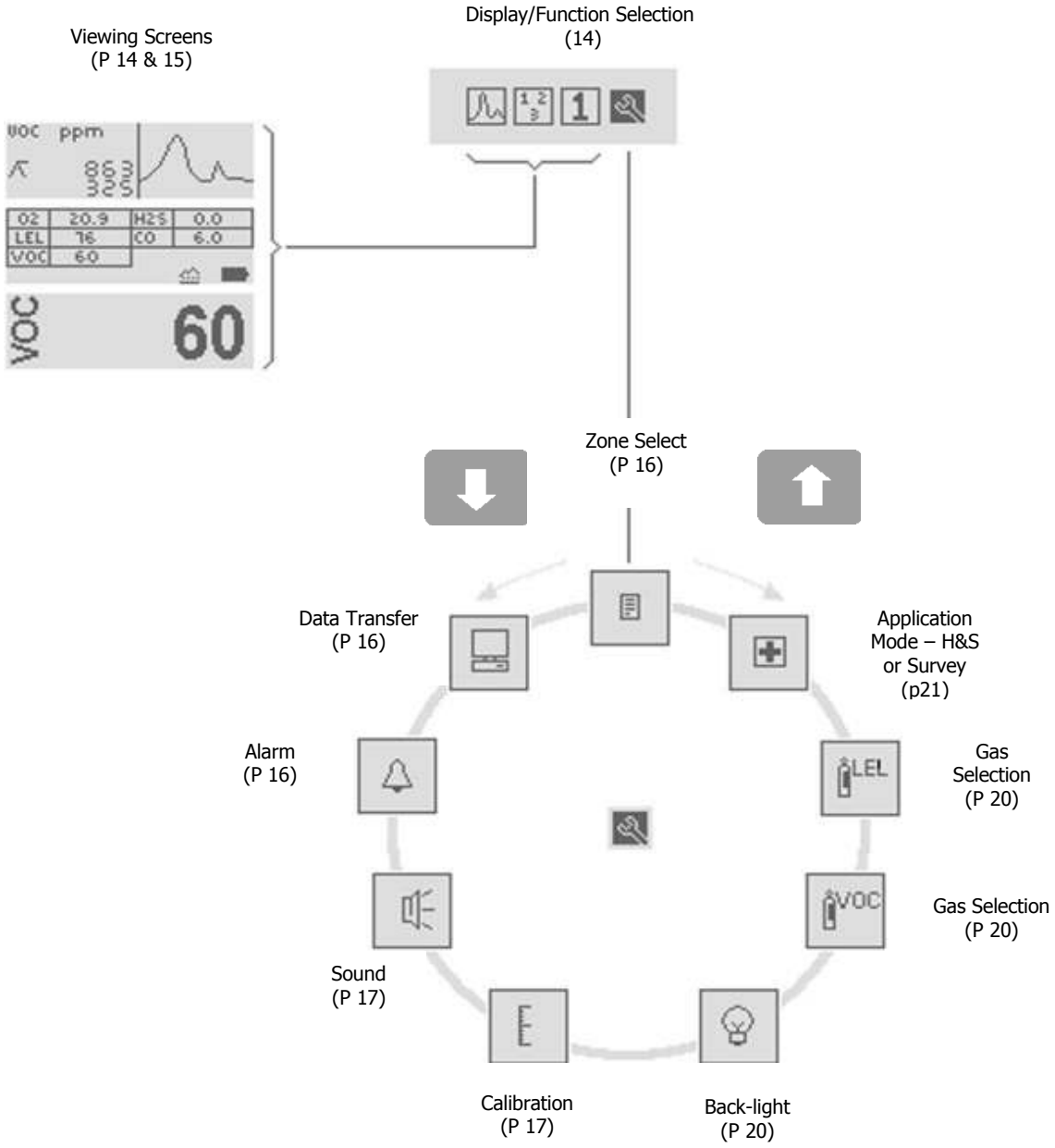
UP
Use to scroll up or change selection

DOWN
Use to scroll down or change selection

ZERO
Zeros the detector when on Display Screen (Only applicable in survey mode, see 'Instrument Menu' for more information).

CAUTION!: Should the FirstCheck+ instrument be taken from a cold to warm environment, condensation may form on internal parts of the detector cell. Under these conditions, prolonged measurement errors may appear as unusually high background levels, even in a clean air environment. To compensate for this error, press and hold the ZERO key for at least two seconds.

Instrument Functions



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 Guide

This quick reference indicates basic instrument functionality, many other functions can be adjusted or selected via the FirstCheck+ PC software (1st PC).

Display/Function Selection (see 'Instrument Displays')
FirstCheck+ 1000, 2000, 3000 & 5000

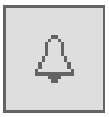
Allows the user to view detected VOC levels in either graph or number format and to adjust the instrument functions and parameters.

Zone Selection (see 'Instrument Menu')
FirstCheck+ 2000, 3000 & 5000

Allows the selection of predefined Zone names so data logged information can be referenced to an application or area.

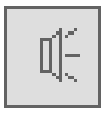
PC Communication (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allows communication between Instrument to PC software via an IRDA protocol.



Alarms (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allows the adjustment of both upper and lower alarm levels

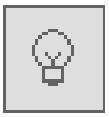


Sound (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allows communication between Instrument and PC software via an IRDA interface.

Calibration (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allows the selection of Factory and Custom calibration.
A custom calibration can be carried out after the custom calibration is set up via 1stPC software.



Backlight (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allow the selection of backlight options.

VOC Gas Selection (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allow the selection of VOC gases from the internal gas table.

LEL Gas Selection (see 'Instrument Menu')
FirstCheck+ 1000, 2000, 3000 & 5000

Allow the selection of LEL gases from the internal gas table.

Quick Reference Guide

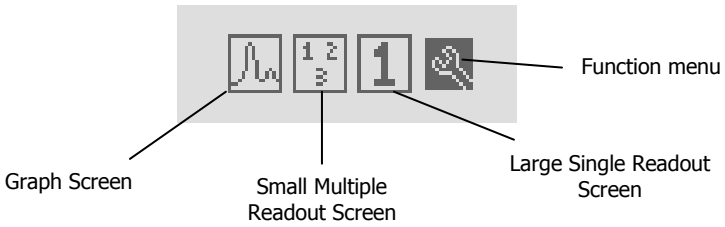
Application (see 'Instrument Menu')
Allows the selection of modes of operation, 'Health and Safety' for STEL and TWA monitoring or 'Survey' for general use.

Instrument Displays

Display Screens Explained

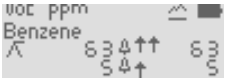
DISPLAY/FUNCTION Selection Screen

The DISPLAY/FUNCTION selection screen is shown when the FirstCheck+ is first switched on, and can always be located by repeatedly pressing the ESC (Escape) key. The DISPLAY/FUNCTION screen allows the user to view gas levels in a variety of ways and also allows access to the Function menu where settings can be adjusted. Use the UP and DOWN keys to highlight the preferred option and then press the ENTER key. Also see 'Instrument Functions.'



Graph Screen
Allows the viewing of real-time measurements in graph format relative to the set alarm levels.

When in **Survey mode** (see 'Instrument Menu') the type of gas being detected, the measured units, the peak hold and real-time readings are also displayed.



Additional information such as alarm levels and battery status can be viewed by pressing and holding the ENTER key.

When in Health & Safety mode (see '1st PC Software') 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.

Instrument Symbols Explained

FirstCheck+ uses a variety of symbols that indicate the instrument's status.

Bump test

FirstCheck can prompt the user to bump test the instrument on a weekly basis. If selected (via 1stPC) the above symbol appears on a weekly basis; pressing the ENTER key clears the symbol until the following week.

Battery Status

Charged   Discharged

Battery status indicator can be accessed by pressing and holding ENTER on the graph and the large number screens.

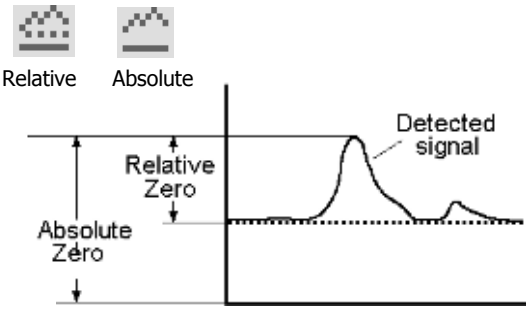
Instrument Displays

Peak Hold

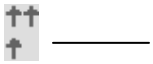
Peak Hold is a numerical measurement that indicates the peak or maximum reading of that selected gas sensor and is displayed to the right of the above symbol. The Peak reading can be reset by pressing and holding the ENTER key for 5 seconds.

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 Zero point at an artificial level.



Alarm arrows

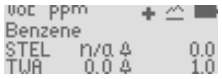


Upper and lower alarm levels

The arrows represent the importance level of the alarm. The single arrow represents the lower alarm and the two arrows represent the upper alarm.

Application

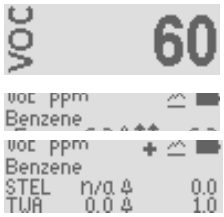
Indicates that 'Health & Safety' mode is selected



When the symbol is displayed the instrument is in Health & Safety mode. the symbols absence indicates that the instrument has reverted to Survey Mode. Please see the Application section of this manual for more information ('1st PC Software').

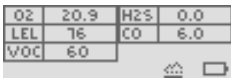
Large Number Readout Screen

Enables the viewing of real-time measurements in large numerical format for easy viewing in difficult conditions. 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.

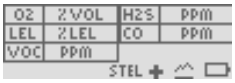


Small Multiple Readout Screen

Similar to the large single readout screen format, the small multiple readout screen enables simultaneous viewing of all 5 sensor readings as numerical results. When viewing the multiple readout 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.



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.

Instrument Menu

General Instrument navigation
In the function menu use the UP and DOWN keys to find the function you require and press the ENTER key to access that functions option.

Data Logging - Files (FirstCheck+ 2000, 3000, & 5000)
FirstCheck+ versions 2000, 3000 and 5000 automatically logs the instruments gas readings every second while the instrument displays real-time readings. Each reading is stored with a date and time stamp. An 8 Megabyte memory is set aside for data logging. However, when the memory is full the instrument will overwrite previously stored data. FirstCheck+ does contain a memory full alarm that prompts the user to download stored data (see 'Instrument Menu').

Data Logging - Zones (FirstCheck+ 2000, 3000, & 5000)
To help keep track of Data logged files, FirstCheck+ allows an 8 digit identifier called Zones that can be attached to each data file. A list of up to 199 Zones can be created on the 1stPC software and then downloaded to the FirstCheck+ instrument. Once a Zone is selected on the instrument, all data files will include that Zone name in the files header detail. To avoid long download times Ion Science recommends downloading data on a daily basis. The FirstCheck+ has a default Zone called Zone 0. Unless specified, all readings will automatically be stored in this Zone.

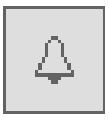
Zone Selection
Enter the FirstCheck+'s function menu and enter the ZONE SELECT icon. Use the UP & DOWN keys to change the pre-programmed Zone name, then press the ENTER key to select it. A tick will appear to confirm the selection. Press the ESC key to return to the Main Menu. Any logged data will now contain the selected Zone name.

Viewing Data (FirstCheck+ 2000, 3000 & 5000)
Data must be downloaded from FirstCheck+ to a PC to be viewed.
('1st PC Software')

PC Communication (FirstCheck+ 2000, 3000 & 5000)

To begin communication between the instrument and the computer select the Data Transfer option. When the instrument is communicating with a PC a ✓ will be displayed in the data transfer symbol and when not communicating an X will be shown. Place the instrument on its side with its infrared window a few inches from the PC's IRDA . To exit the data transfer option press the ESC key.

Alarm (FirstCheck+ 1000, 2000, 3000 & 5000)



When in Survey mode, all upper and lower sensor alarm levels can be set by the user to indicate particular levels of detection specific to the users need's. Both alarms give an audible and visible output (flashing LED) but with increased urgency with the upper alarm. An alarm state will occur when the preset alarm levels are exceeded; the alarms can be reset by pressing the ENTER key but will continue to trigger if the alarm level is still exceeded.

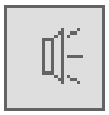
Please note: It is the user's responsibility to respond appropriately to an alarm condition.

Upper and Lower alarm levels in survey mode are easy to adjust on the instrument. Select the Alarm symbols (as above) and press the ENTER key. Use the UP and DOWN keys to select the Alarm graphic in the function menu and press ENTER. Select the alarm you wish to adjust (Upper or Lower) and press the ENTER key 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 1stPC software, that is then downloaded to the instrument via the IRDA link. Please note that for safety reasons the lower alarm cannot be set above the upper alarm.

Instrument Menu

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+ 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 '1st PC Software' for more information.)

Sound (FirstCheck+ 1000, 2000, 3000 & 5000)



A range of audible options can be selected to make the FirstCheck+ respond in different ways.

Signal response: When selected, the rate at which the instrument Beeps increases as the level of the detected gas increases.

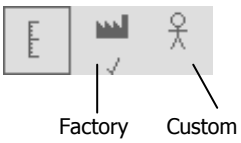
Confidence: When selected the instrument Beeps every 15 seconds to indicate it is functioning. This feature is useful if the instrument is out of sight.

Key Press: The instrument Beeps when any key on the keypad is pressed.

Alarm: This feature disables the alarm sound. For safety reasons Ion Science Ltd strongly recommends this function is never switched off unless there are specific reasons for not wanting to silence the alarms.

Calibration (FirstCheck+ 1000, 2000, 3000 & 5000)

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, FirstCheck+ instruments only require a two-point calibration. The FirstCheck+ scales its linear output across a Zero level (clean air reference) and the Span (a user defined gas concentration).

Factory Calibration

Factory calibration offers a safe set of calibration data. This should be used if the custom calibration fails and will keep the unit working until a good custom calibration is completed.

ION Science reccomends an annual service and calibration for users who require a traceable calibration. During this service the lamp and detector is brought back to factory specifications and new Factory Calibration data is stored.

Instrument Menu

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+ PID to an alternative gas (other than Isobutylene). Ion Science provide a Calibration Kit accessory (Part number A-845213) which is recommended for use with FirstCheck+, however other gases specific to your needs can also be used.

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.

In order to carry out a custom calibration the appropriate parameters need to be set via the 1stPC software and downloaded to the FirstCheck+ instrument. Please see the FirstCheck+ software calibration section (see '1st PC Software') for details on how this can be achieved. Once these parameters have been set, a custom calibration can be completed (please see 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.

Custom Calibration Procedure

Please ensure you are familiar with this entire calibration procedure before attempting to calibrate this FirstCheck+ instrument.

NOTE: The calibration of the FirstCheck+ instrument must be carried out in a clean air environment. Ensure all parts of the calibration kit are available and ready for use.

1. Open the 1stPC software package and select INSTRUMENT/ MENU SETUP / CALIBRATION. This screen allows the user to setup various parameters relating to the custom calibration routine. The FirstCheck+ can be setup so each sensor can be calibrated individually using totally separate gas supplies or any combination. By default ISL's calibration kit contains two SPAN gas cylinders. One contains Methane, H_2S and CO, as these gases are not cross sensitive; the other contains Isobutylene. Next, set up the desired settings on 1stPC and download them to the FirstCheck+ instrument.

2. Once the calibration setup has been downloaded to the instrument, select the CUSTOM CALIBRATION icon in the Calibration menu. A tick ✓ will appear to confirm the selection.

NOTE: Pressing the ENTER key allows the user to select which part of the calibration routine is carried out. Ion Science also suggest carrying out the calibration in the following sequence:-

a. ZERO - Zero's the PID, H2S, CO and LEL sensors and sets the span of the LEL sensor.
b. VOC - Sets the span level using VOC gas.
c. Mix2 - This is where the span of the remaining sensors is set, either individually or in mixtures as defined by the 1stPC software calibration tab.

3. Select the flashing ZERO option and press the ENTER key.

4. Remove the caps from both ends of the carbon filter included in the Cal Kit and remove the probe and filter from the instrument. Fit the carbon canister to the end of the instrument. **NOTE:** The carbon canister simply pushes onto the end fitting, no turning is required. Do not force.

5. Press the ENTER key to start the ZERO process. A counter will count down showing how long the canister needs to remain connected.

Instrument Menu

Custom Calibration procedure (continued)

6. At the end of the countdown a tick ✓ will appear, indicating that ZERO has been accepted. Press ESCAPE.

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

8. Scroll through the options and select the relevant gas or gas mixture and press the ENTER key.

NOTE: If you have chosen single calibration gases then all sensors will be available. If you have chosen a mix this will be available on screen or a combination of both. Ion Science recommends that if you are using single gases to calibrate the sensors then it is done in the following order: VOC, LEL, CO then the H_2S. The O_2 is calibrated automatically with the ZERO.

9. This screen shows a Gas Cylinder symbol, the gas or gas mix and gas concentration previously set up via the 1stPC software. If acceptable press the ENTER key to proceed.

10. A screen will show gas type, a gas bottle and a flashing highlighted number.

11. 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. Press ESC to go back to the calibration menu.

12. Now repeat the above gas calibration procedure for any other combinations of calibration gases, or press ESC until you are back to the first menu.

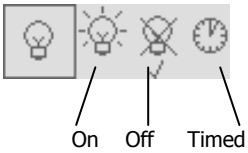
13. Replace filter and probe as necessary, Carry out a Bump Test to ensure calibration was successful. Instrument is now ready for use.

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
- Cell may need blowing out with clean air

Instrument Menu

Back-light (FirstCheck+ 1000, 2000, 3000 & 5000)
Note: only adjustable via the 1stPC Software



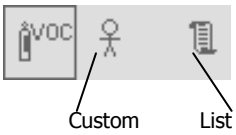
The instrument display can be illuminated when in low light conditions. When ON is selected the back-light will remain on while the instrument is switched on. When OFF is selected the back-light will remain permanently off. When TIMED is selected the back-light illuminates for a pre-set time after every key press. When TIMED is selected, pressing ENTER allows the user to adjust the on time from 1 to 60 seconds. This option is only available in the 1stPC program.

VOC Gas Selection (FirstCheck+ 1000, 2000, 3000 & 5000)

The FirstCheck+ photo-ionisation detector (PID) is non-selective. Although many VOC gases are detectable, the FirstCheck+ PID cannot differentiate between the gases. When you select the VOC gas you wish to measure from the FirstCheck+ internal gas list, the instrument will calculate the equivalent level for that selected gas against an isobutylene calibration. Please note that there may be other detectable gases present that may effect the measurement.

WARNING!: Ion Science makes every effort to ensure the gas tables held within the FirstCheck+ 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 5 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+ memory.

After selecting the LIST symbol, select the first letter of the gas you wish to select 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.

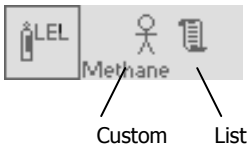
LEL Gas Selection (FirstCheck+ 1000, 2000, 3000 & 5000)

Firstcheck+'s catalytic (Pellistor) sensor is a non-specific explosive gas detector. Although a number of explosive gases are detectable, the FirstCheck+ cannot differentiate between the gases. When you select the explosive gas you wish to measure from the FirstCheck+ internal gas list, the instrument will calculate the equivalent level for that selected gas against a Methane calibration. Please note, there may be other detectable gases present that may effect the measurement.

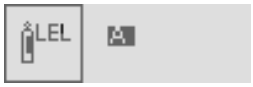
Instrument Menu

WARNING: Ion Science makes every effort to ensure the gas tables held within the FirstCheck+ 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+ memory.



After selecting the LIST symbol, select the first letter of the gas you wish to select 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.

Unit Selector (FirstCheck+ 1000, 2000, 3000 & 5000)

The FirstCheck+ photo-ionisation detector can be selected to measure VOC's in either ppm (Parts per million, by volume), ppb (Parts per billion) or mg/m^3 (Milligrams per cubic metre). NB: the ppb option is available on the FirstCheck+ 5000 and is upgradeable on the 1, 2 and 3000 versions.
This option is also available on the 1stPC program.

Cycle Screens (FirstCheck+ 1000, 2000, 3000 & 5000)

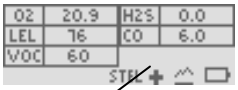
When viewing readings in the large single readoutl screen format the Firstcheck+ can be set to auto-scroll through each sensor reading in turn. This is set using the 1stPC software. When the cycle screens option is unselected the user can move between sensor readings using the UP and DOWN keys. This option is also available on the 1stPC program.

Data Log Memory Alarm (FirstCheck+ 2000, 3000 & 5000)

FirstCheck+ has been designed to continuously store data; once the memory has reached its full capacity (8 Mb) it will automatically begin to overwrite previous readings. An alarm can be set on the 1stPC software 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. This option is also available on the 1stPC program.

Application - Health & Safety Mode (FirstCheck+ 3000 & 5000)

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.
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.



When selected

When Selected

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 the 1stPC 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 27), the instrument can be locked in the Application 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+ functionality cannot be changed or adjusted.

The user can only view the display screens and switch the instrument ON and OFF. To connect the Firstcheck+ to the PC software when this mode is active, the instrument must be OFF, then switched ON while it is placed in front of the Infra-red device.

1stPC 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. Many laptops are supplied with this facility. Alternatively IRDA modules can be purchased from most computer retailers for use with your instrument.

Before connecting your FirstCheck+ to a PC for the first time, check that the PC's IRDA works correctly with another device.

Installation of 1stPC Software

1. Insert Ion Science software CD into your CD drive.
2. The CD will automatically start up.
3. Click on the Download Software button.
4. The FirstCheck+ setup wizard will start.
5. Follow the instructions on screen.
6. The installer will automatically create a folder in your C drive to save 1stPC into. If you do not want to save it there Browse for the location you would like it to be saved in and click Next.
7. Select Next again to install the software.
8. The software will take a few seconds to install, then click Finished.
9. You will now be able to open your 1stPC software from the Icon on your desk top or from your Start Menu/Programs/1stPC.

Connecting FirstCheck+ with a PC

Switch on your FirstCheck+ instrument, enter the FUNCTION MENU and select the DATA TRANSFER symbol by pressing 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 its side with the instruments infrared window approximately 40 mm from the PC IRDA, then start the FirstCheck+ software.

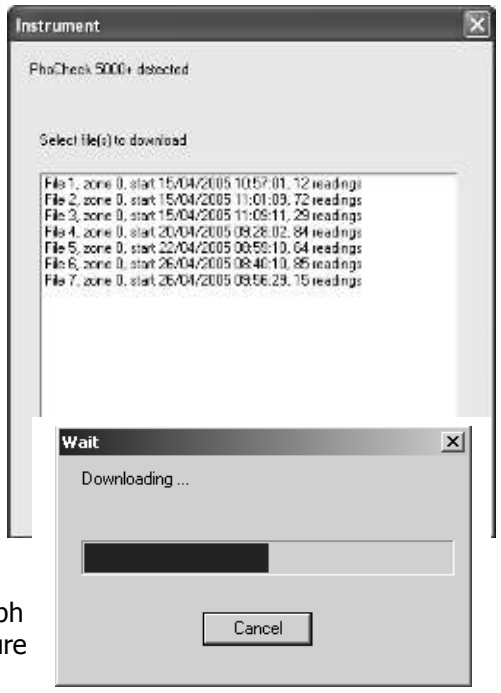
Starting FirstCheck+ Software

Start the 1stPC software either from your desktop via the shortcut or from the START/MENU/PROGRAMS/1stPC.

1stPC Software

1stPC software has many features allowing the transfer for data and function specifications to and from the instrument and the PC.

Downloading data logged readings



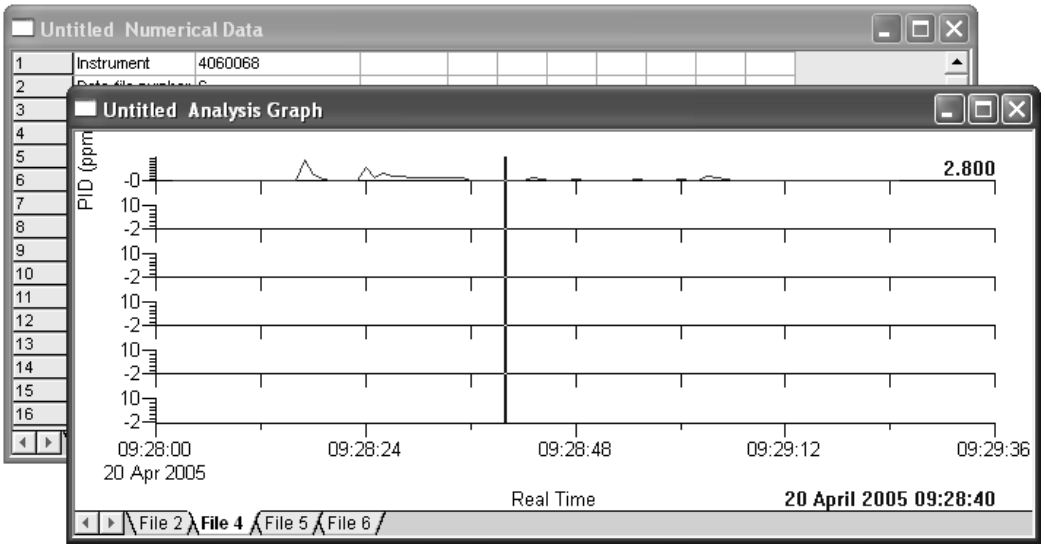
FirstCheck+ should always be presented to the IRDA port before the 1stPC software is run.

When the software is opened in this way, it will immediately begin communicating with the instrument and will give you the option to download data logged readings (as shown.)

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 screen (shown on the right) will appear.

The data will then download from your FirstCheck+ to your PC in numerical and graph format. Once the download is complete select FINISHED. You then have the ability to zoom in on the graph double clicking anywhere on the graph. You can also store the data for future



1stPC Software

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.

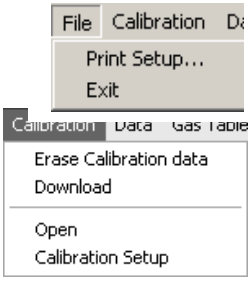
Each time the user starts data logging, a new file is created. So, for example, six data logging sessions will create six data files.

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 1stPC 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.

File

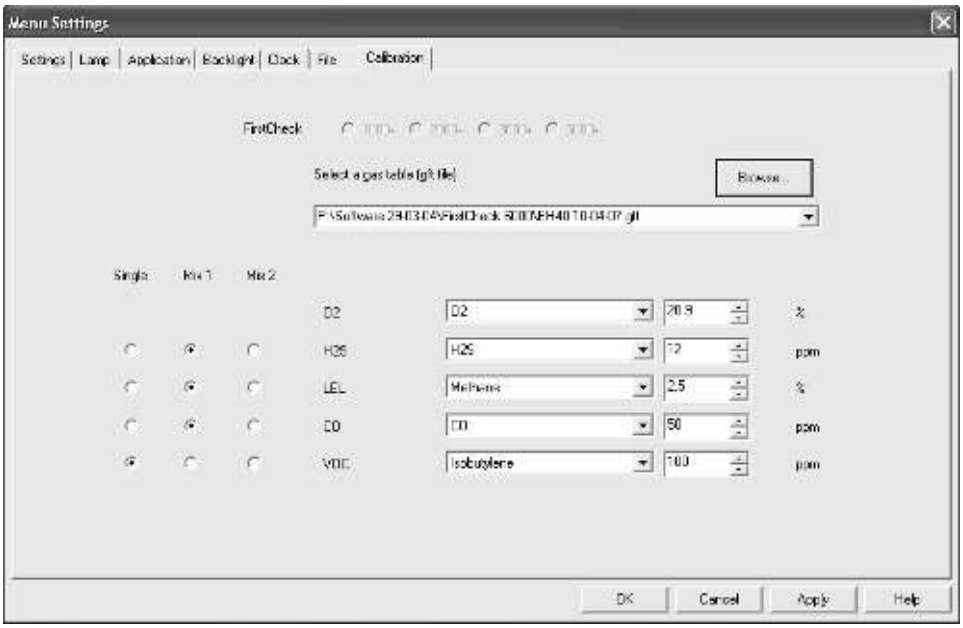
Allows the printing of files downloaded from your FirstCheck+ instrument.



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,
- the adjustment of the Custom Calibration Setup.

Calibration Setup



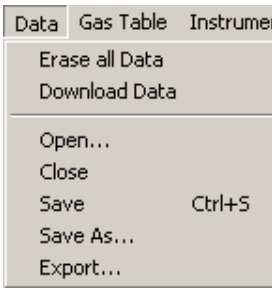
The gas table provided with the software will be shown. If however, you wish to use a different gas table, previous selections will be shown on the drop down menu, or you may click BROWSE to search for, and select the table you require.

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 'Instrument Menu' for details.) The greyed out areas apply to the FirstCheck software, only available if you choose to upgrade your instrument.

1stPC Software

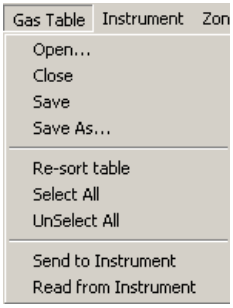
Data

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 saved for future reference and exported as CSV files.



Gas Table (Including setting alarm levels)

Select a gas table stored in the FirstCheck+ directory. You are able to modify this table and to your instrument.
If you wish to add new gases to the table, ensure you use the next available line, leaving nc shown below.)



Upper and lower alarm levels in Survey mode can be adjusted via the gas table. Type the de in the 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 Instrument from the dropdown menu shown above.

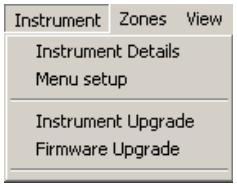
Always save modified gas tables under a different file name, keeping the original complete.

EH40 28-04-05.gt

Select	Gas Name	Abbreviation	Formula	Molecular weight	11.7eV (Ar) Factor	10.6eV (Kr) Factor	10.2eV (D2) Factor	8.4e (Xe) Fa
☑	Xylene, o-		C8H10	106	0.69	0.6	0.57	ZR
☑	Xylene, p-		C8H10	106	0.62	0.46	1	4
☑	Xylidine, all		C8H11N	121	NA	0.7	NA	ZR
☑	WMD Arsine		AsH3	78	NA	2	ZR	ZR
☑	WMD Lewsite		ClCN	62	NA	1.2	ZR	ZR
☑	WMD Mustard Gas		C2H2AsCl3	159	NA	1	ZR	ZR
☑	WMD N-Mustard Gas		C4H18SCl2	172	NA	1.1	ZR	ZR
☑	WMD Phosgene		COCl2	99	2.1	ZR	ZR	ZR
☑	WMD Sarin		C4H10PO2F	140	NA	3.1	ZR	ZR
☑	WMD Soman		C7H116P02F	182	NA	3.2	ZR	ZR
☑	WMD Tabun		C5H11PN202	162	NA	1.2	ZR	ZR
☑	WMD VX		C11H26PNS02	267	NA	1	ZR	ZR
☑	WMD GF		C7H14P02F	180	NA	3.3	ZR	ZR
☑	WMD DMMP		C3H9P03	124	NA	5	ZR	ZR
☑	WMD Triethyl phosphate		C6H15P03	182	NA	3.5	ZR	ZR
☑	WMD Methyl salicylate		C8H19O4	152	NA	1	ZR	ZR
☑	New gas	Mix	C14H12	101	1	1.2	3	10
☐								

PID

1stPC Software



Instrument
Instrument details such as serial number and data logged memory used can be downloade to your PC.

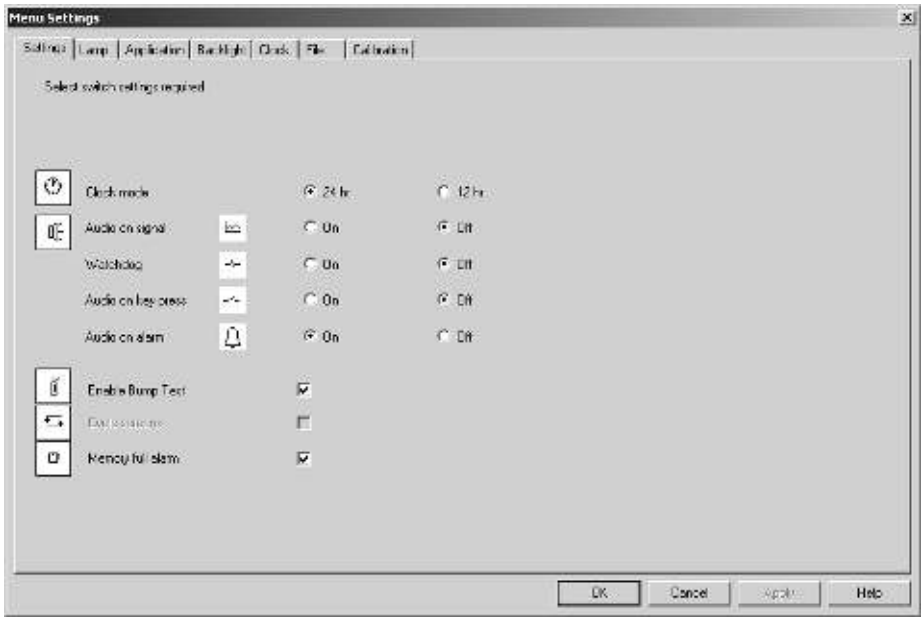
An instrument upgrade allows you to upgrade your instrument to other FirstCheck+ variants with advanced features, once you have purchased the pass code from Ion Science. A Firmware upgrade allows you to upgrade your actual instrument software directly, should an upgrade be made available.
Menu Set-up allows you to change FirstCheck+ settings from your PC. These settings can be saved for future 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, confidence (a beep sounds every 15 seconds), on key press and on alarm.

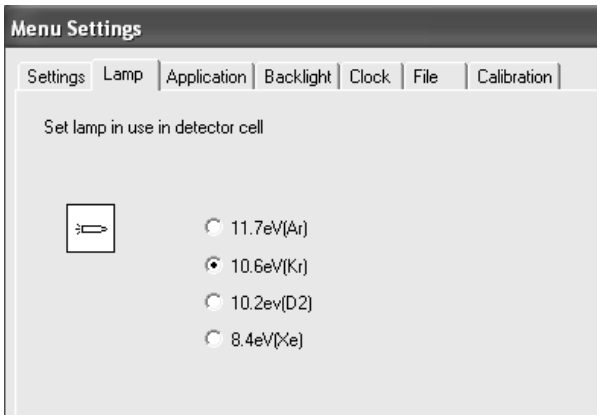
When selected, Enable Bump Test sets the instrument to show a gas bottle image once a week when the instrument is turned on. This acts as a reminder to test the instrument's response.

Memory full alarm will ensure an alarm sounds if the FirstCheck+ data log memory is full. This enables you to download the data or continue and overwrite previously saved data.



1stPC Software

Lamp



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

If you have purchased the instrument with the 11.7eV lamp, there are a number of things related to applications that you must take into consideration before using the lamp.

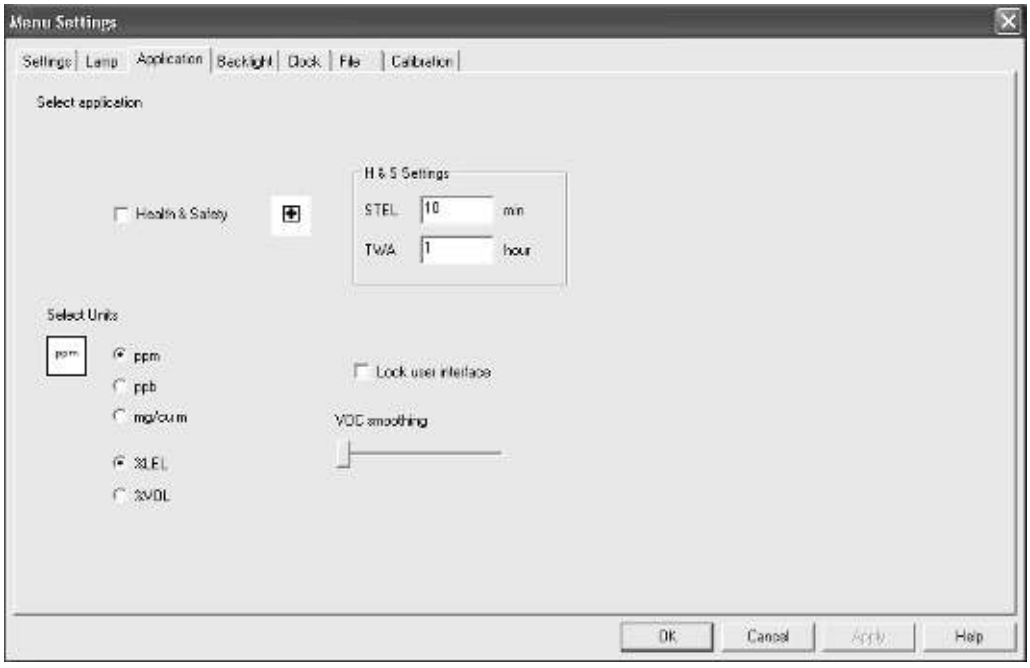
1. It is important for the lamps to be stored in their desiccated vials in cool conditions (15-25°C).
2. The lamps should *not* be used in:

- Chemically severe environments, i.e. those containing significant concentrations of acids and strong solvents such as dichloromethane.
- Conditions of condensing humidity; always dry cool air through the instrument before storage. For long storage periods, remove the lamp and return it to the desiccated vial.
- Physically severe environments: large temperature changes may initiate lamp failure.

Application

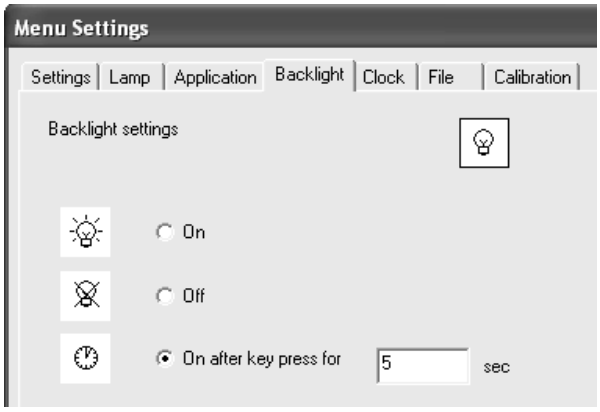
Enables the selection and de-selection of Health & Safety mode and the selection of ppm, ppb or mg/m^3. In Health & Safety mode, STEL and TWA timings can be adjusted to reflect the changes in legislation between the US and Europe.

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 PID reading 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 Mode. Lastly there's the option of choosing type of readout you get from the instrument with regard to the LEL sensor. %LEL shows the readout as a percentage of the lower explosive limit whereas %VOL shows the readout as a percentage volume of the gas in the air.

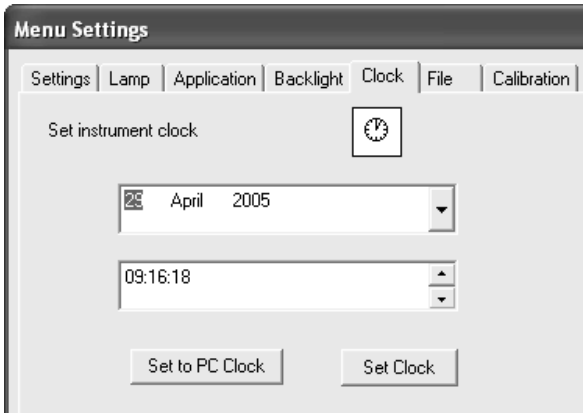


1stPC Software

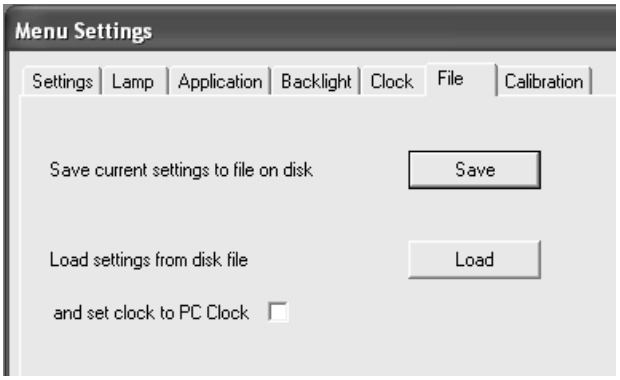
Backlight
Gives you the option of turning the back light on or off permanently, or setting it to come on for a specific time after every key press.



Clock
Set the instruments clock and date for the purposes of data logging. Either set it manually, or you can simply set your instrument to the same time as your PC clock.



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.



1stPC Software

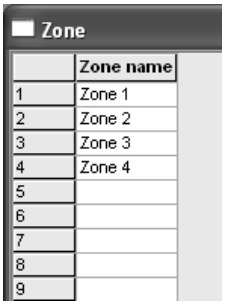
Calibration

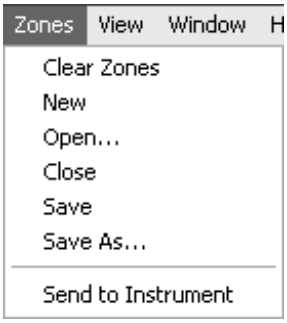
The calibration settings can also be adjusted under the Menu Settings and uses the same layout as described on the 'Instrument Menu' section.

Once you have selected all of your settings, choosing the following options will transfer them to the instrument. Either Apply them, which will download the information straight to the instrument and leave the screen open, or select OK, which will transfer the information to the instrument and close the screen automatically.

Zones

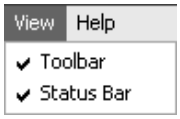
Clear / Delete existing Zones from your instrument or create new Zones for download to your FirstCheck+. Please note data files stored within a Zone to be deleted will be lost. Always download Data from your instrument before deleting Zones.





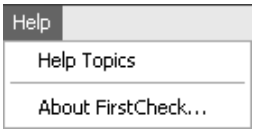
View

Select or hide the 1stPC software toolbar or status bar.



Help

Offer advice on the use of 1stPC software.



1stPC Software

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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.

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Governing Law

The laws of the United Kingdom govern this Agreement.

Batteries

Note: Ion Science recommends keeping your FirstCheck+ on charge at all times when not in use, as batteries can loose power over time. Loss of battery power can result in the instrument's charge indicator showing a non-charging status when trying to charge the unit. If this occurs, leave the charger connected for two minutes, then remove and reconnect the charger as soon the timer symbol disappears. You will now see the instrument charge as normal.

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 your PhoCheck+ instrument.

Instrument battery type identification

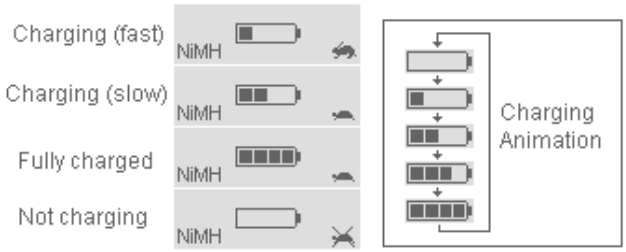
Non-rechargeable and rechargeable FirstCheck+ Instruments have a removable battery cover on the rear of the handle area/ A security tool is required to remove it.

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, or R6PP batteries. DO NOT mix old / used batteries or batteries from different manufacturers. The charger socket cannot be used while dry cell batteries are fitted. Batteries should only be changed in a non hazardous environment.

Rechargeable battery instruments*

Ensure rechargeable PhoCheck+ instruments are charged for at least 12 hours before using it for the first time. To ensure optimum charging the charger should be attached to the FirstCheck+ when the instrument is switched off. The instrument should be charged in a non hazardous environment only.



When the battery power is very low 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 may result in damage to the instrument!

NB: When loading batteries check for correct battery polarity before connecting them.

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, correct 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 failureCheck 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, filter and exhaust 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 at supply.
2. Slow charge current is low.
Check the battery settings.
3. Slow charge current is high.
Disconnect the charger immediately and contact ISL.
4. Fast charge current is low.
Check the battery settings.
5. Fast charge current is high.
Disconnect the charger immediately and contact ISL.

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

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 in the 'Maintenance Section' and use low pressure oil-free compressed air to blow out the contamination via the small pipe. 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.

Diagnostics

Health & Safety

When in Health & Safety mode the selected gas has no STEL or TWA alarm values. This provides a warning in Health & Safety mode that the change
you are making 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 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 download saved data to a PC before continuing.

Clock

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

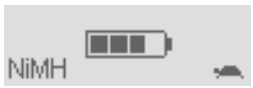
Delay

This symbol will appear during the manual adjustment and selection of functions 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.

Bump test

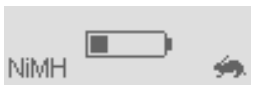
This symbol will appear on switch on if the Enable Bump Test setting has been selected via the PC software (see '1stPC Software') The symbol is a prompt that will appear once a week to remind the user to test the instrument responds accurately when supplied with gas.

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 e.g. if half charged the instrument will take around 4.5 hours to fully charge.

Maintenance

Blowing out the PID Cell will fix 99% of maintenance problems

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 lamp removal from the cleaning the lamp section below (steps 1 – 5). Using a can of computer duster, spray air down the small metal tube. Then liberally inside the detector to remove any lint and dust particles. Replace the lamp and cap and test the instrument.

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 (see 'Technical Specification' for details of parts expected life time.)

3. Secondary Probe Filter
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 an adjustable wrench.

CAUTION: 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 FirstCheck+ lamp is fragile. Handle with great care!

1. Ensure that the FirstCheck+ is switched OFF.

2. Remove the probe and filter. Unscrew the black knurled ring to expose the detector lamp.

Maintenance

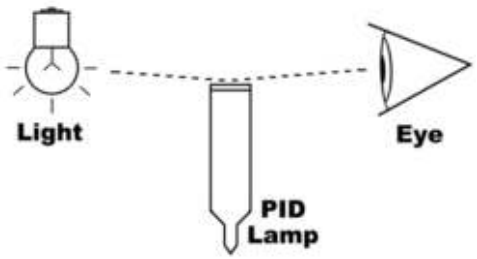
3. Push a lamp-removing sleeve over the end of the lamp. This allows the user to grip the glass.

4. Extract the lamp from its socket by pulling it in a straight 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.

5. 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.

Passed the O-ring

Move freely in a straight line



WARNING!
NEVER REFIT A DAMAGED LAMP!

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
- Wear 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 absorption and contamination.

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

Maintenance

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.

4. Continue polishing until an audible "squeaking" is made by the cotton bud 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.

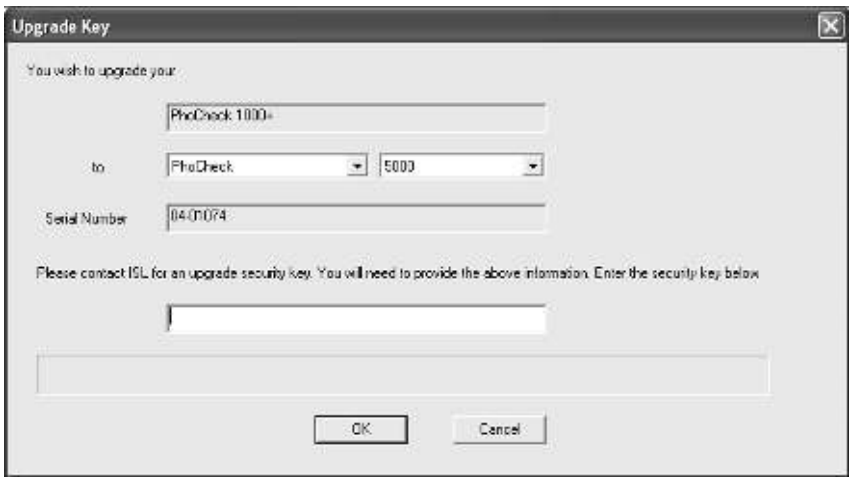
Accessories

Ion Science Ltd has developed an exclusive range of high quality accessories to compliment the FirstCheck+. Please refer to the table below for a selection of FirstCheck+ accessories.

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-845213	Calibration Kit
A-31064	25mm (1") diameter 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 Filters (pack of 5)
A-31153	Exhaust barb, Tedlar bag connector
A-31057	Carbon filter
30618	PID lamp, type 8.4 eV Xenon
30620	PID lamp, type 10.6 eV Krypton
30621	PID lamp, type 11.7 eV Argon
31052	Leather instrument jacket
40052	Leather instrument jacket with magnetic attachment
1/VS-18	Universal 9 volt power supply without plug
1/VS-20	9 V multi head universal power supply adaptor

Upgrade Options

All FirstCheck+ instruments have the ability to be upgraded in the field to higher versions. Please refer to the table below to see if your model can be upgraded.



	FirstCheck + 1000	FirstCheck + 2000	FirstCheck+ 3000	FirstCheck+ 5000
FirstCheck+ 1000		Upgrade	Upgrade	Upgrade
FirstCheck+ 2000			Upgrade	Upgrade
FirstCheck+ 3000				Upgrade
FirstCheck+ 5000				

The upgrade process is easy and the instrument does not need to be returned to the distributor or manufacturer.

After ordering the upgrade for your instrument a code will be sent to you by e-mail. Use the 1stPC software to enter the code and your instrument instantly becomes the new version.

Contact your local Ion Science distributor for pricing.

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, allowing you to choose the cover for your instrument that best suits your needs.

At Ion Science we recommend that all of our gas detection instruments be returned for service and factory calibration once every 12 months.

Contact your local distributor for service options in your area.

Find your local distributor at www.ionscience.com

Contact details :

UK Head Office
Ion Science Ltd
The Way, Fowlmere
Cambridge
SG8 7UJ, UK
Tel: +44 (0)1763 207206
Fax: +44 (0) 1763 208814
Email: info@ionscience.com
Web: www.ionscience.com

USA Office
Ion Science Americas LLC
33 Commercial Drive
Waterbury
VT 05676, USA
Tel: +1 802 244 5153
Fax: +1 802 244 8942
Email: info@ionscience-americas.com
Web: www.ionscience.com

German Office
Ion Science Messtechnik GMBH
Laubach 30
Metmann-Neandertal
40822, GERMANY
Tel: +49 2104 14480
Fax: +49 2104 144825
Email: info@ism-d.de
Web: www.ism-d.de

Technical Specifications

Detector	Range	Response Time*
PID (VOC detector)	1 ppb - 10,000 ppm (FirstCheck+ 5000) 0.1 ppm – 10,000 ppm (FirstCheck+ 3000) 0.1 ppm – 4,000 ppm (FirstCheck+ 1000 and 2000)	T90 < 1 second
O_2 - Electrochemical	0 to 28%	T90 < 10 seconds
CO - Electrochemical	0.1 - 1000 ppm	T90 < 25 seconds
H_2S - Electrochemical	0.1 - 100 ppm	T90 < 20 seconds
LEL - Pelistor	0 - 100% LEL	T90 < 15 seconds
Accuracy	+/- 5% displayed reading +/- one digit**	
Linearity	+/- 5% displayed reading +/- one digit**	
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
On the condition of normal use battery capacity will be reduced to approximately 70% after 250 full battery cycles or 1 year (whichever comes first).

New fully charged (rechargeable) batteries at 20 °C > 10 hours normal use.
Affects on battery capacity:
10% less per 10 °C drop in temperature.
As the batteries age they may 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
The back light will consume an additional 50% power and significantly reduce the instrument on time.

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

PID Lamps
10.6 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 methylene chloride in high concentrations may condense onto the walls of the cell. In the rare event that the detector cannot be cleaned it may have to be replaced.

NB: PID specifications relate to an isobutylene 100 ppm in air calibration at 20 °C and 90% RH.

Update Log

Manual Version	Amendment	Date Updated	Instrument Firmware	PC Software
FirstCheck+ V1.2	Add IS Protective Cover details to manual – updated to V1.3	18/06/08	V15	V2.04
FirstCheck+ V1.3	Add new software installation routine. Updated to V1.4	24/10/08	V15	V2.04
FirstCheck+ V1.4	• Declaration of conformity updated • Include note regarding lamp cleaning i.e. Blowing out lamp will resolve 95% of contamination issues • Additional bump test after custom calibration Updated to V1.5	24/11/08	V15	V2.04
FirstCheck+ V1.5	Log added to back of Manual. Updated to V1.6	16/12/08	V15	V2.04
FirstCheck+ V1.6	Secondary Probe Filter information added pages 8, 42 & 46. Updated to V1.7	23/03/09	V15	V2.04
FirstCheck+ V1.7	Complete rewrite of manual. Updated to V1.8	14/07/09	V15	V2.04
FirstCheck+ V1.8	Silicone message added to the Cautions section (paragraph 2 & 3) on page 5. Any mention of Deuterium or 10.2 eV lamp has been removed Manual updated to V1.9	23/02/10 19/05/10	V26 (updated Dec 09) V26	V2.04 V2.04
FirstCheck+ V1.9	Warranty added on front cover Contents page updated Warranty on page 40 updated Declaration of conformity updated	22/07/10	V26	V2.04
FirstCheck+V2.1	11.7eV lamp information and spec added to page 27 Page 3&5 updated to state correct Quality Management System Page 5 Responsibility of use updated, Legal notice added Page 40 contact details added	25/02/11 03/03/11 03/03/11	V26	V2.04