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Operating Instructions

Split 2 Real Time Dust Monitor

This manual covers the following model:
770-300A

Thank you for choosing an SKC product. Your purchase is covered by our warranty, details of which can be found inside the rear cover of this manual.

Product Model Number	Product Serial Number	Date of Purchase
770-300A		

SKC recommends a minimum service interval of one year for this product. The first service is due one year from the date of purchase, and then at yearly intervals on this date. However, it is the responsibility of the user to perform a risk assessment to determine the necessary frequency of servicing that is required.

Service	Date	Service	Date	Service	Date
1		5		9	
2		6		10	
3		7		11	
4		8		12	

Please note that SKC Ltd are the only authorised service centre in the UK, guaranteeing you access to the full range of genuine SKC replacement parts. For all other areas a full list of SKC approved distributors and service centres can be found at www.skcltd.com

SKC UK service centre -
Tel: +44 (0)1258 480188 Fax: +44 (0)1258 480184 Email: info@skcltd.com

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1) Specifications

- Calibration: NIOSH method 0600 using ISO 12103-1 A2 Fine Test Dust
- Accuracy: ±10%
- Precision: 0.02 mg/m³
- Sensing range: 0.01 to 200 mg/m³
- Particle size ranges:
  0.1 to 10 µm Respirable
  0.1 to 50 µm Thoracic*
  0.1 to 100 µm Inhalable
- Recording time: 1 second, 1 minute and 10 minute averages
- Memory: 21,500 data points
- Locations: 999 storage locations
- Data display: 20 character, 4 line backlit LCD
- Output: RS-232
- Operating temperature: 0°C to +50°C
- Humidity range: 95% non-condensing
- Casing IP rating: IP20 (Finger proof - Split 2 is not designated as waterproof)
- Battery: 7.2V 1.15Ah NiMH rechargeable battery
- Run time: 8 hours minimum (with fully charged battery)
- Size: 180 x 80 x 45 mm (protruding sockets and belt clip excluded from measurements)
- Weight: 780 g
- Flow rate: 2 l/min using external pump (not included)

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2) Kit Contents

- Carry Case
- Split2 monitor in carry pouch with detachable shoulder strap
- Sensor head assembly with spiral cable and locking plug
- Sensor mounting bracket with spring clip
- Battery charger complete with interchangeable plugs for UK / EU / US / AUS mains outlets
- Calibration span accessory
- Zeroing accessory
- I.O.M. cassette clip
- RS232 9-pin serial cable (female to male)
- Factory calibration certificate
- CD containing instruction manual and DustComm Pro software

3) Features

Real-Time Display	• Particulate exposure levels. • TWA, STEL, Minimum and Maximum levels. • Inhalable particulate mass in active mode with I.O.M. inlet fitted to sensor head. • Thoracic* particulate mass in active mode with I.O.M. inlet and (optional) Thoracic size selective inlet. • Respirable particulate mass in passive mode and in active mode with I.O.M. inlet and size selective foam plug fitted to sensor head. • Stored data by location code.
Functional Features	• Calibration to NIOSH methods for lung damaging particles. • In-line concurrent filter samples for gravimetric analysis (when used in active mode with a suitable air sample pump). • High sensitivity of 0.01 to 200 mg/m^3. • Passive and Active operating modes. Active mode requires an optional air sampling pump set to 2 l/min flow rate. • Belt clip on monitor or removable shoulder strap on carry pouch for mounting on worker and lapel clip on sensor head for attachment within the worker's breathing zone for personal sampling. • Simple cleaning of sensor hardware.
Operational Features	• On screen programming of sampling and data storage parameters. • Real-time clock. • User selectable audible alarm. • In-field zero and span check of instrument calibration.
Data Management	Choice of 1 second, 1 minute, or 10 minute averaging / storage intervals. Up to 21 weeks of sample/record time. Memory storage of up to 21,500 data points that can be distributed into a maximum of 999 location files. DustComm Pro software supplied with RS-232 cable for downloading data to a PC. Note that some PC's may require a USB to RS-232 adapter (not SKC supply) to enable this feature. Data translation to ASCII text files, importable into Microsoft Excel and other spreadsheet applications.

***** Note that Thoracic particulate measurement is outside the scope of this instruction manual.

1) Care of the Split2 Monitor

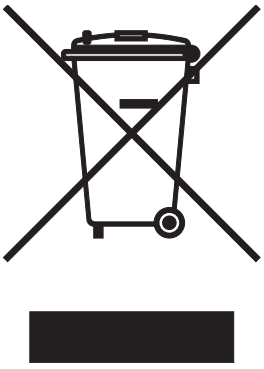
- Always use the correct SKC battery pack and battery charger designated for the Split2 monitor.
- Ensure that the battery pack is fully charged before use. Refer also to Care of the Battery Pack on page 29.
- It is recommended to switch the Split2 monitor off via the push button on/off switch prior to charging. This will result in the shortest possible charging time.
- Internal surfaces of the sensor head are coated with a matt, light absorbing finish. Failure to observe the correct cleaning method for the sensor head as detailed in Cleaning the Optics on pages 30/31 will cause damage to the sensor head and will impact on the accuracy of the Split2 monitor.

Warning - Failure to follow these guidelines will void the product warranty.

2) Sampling Methods

This instruction manual provides the necessary information to set up and operate the Split2 monitor. For more detailed information on air sampling terminology, theory and sampling methods please refer to SKC's Step-By-Step Guide to Air Sampling (Part No. 224-G1). To obtain a free copy please contact SKC Ltd customer services on +44 (0) 1258 480188 or download at www.skcltd.com.

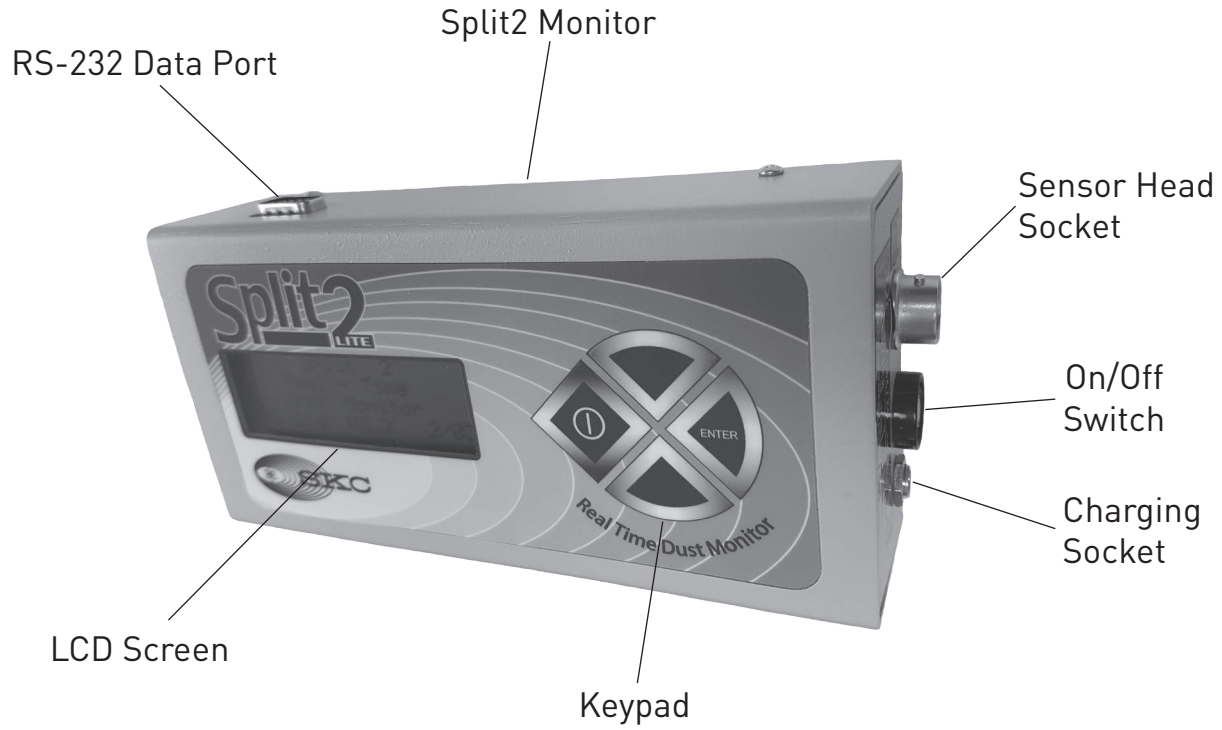
3) The WEEE Directive

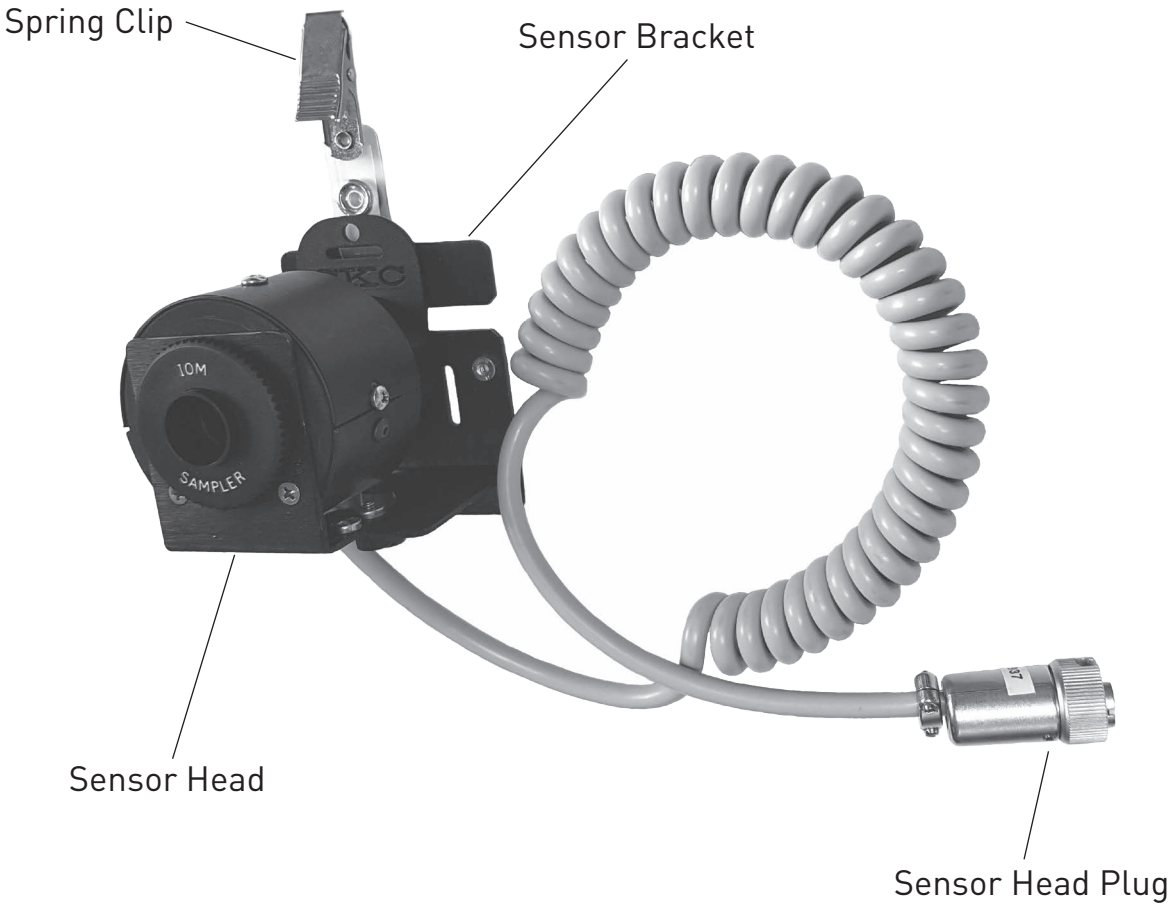


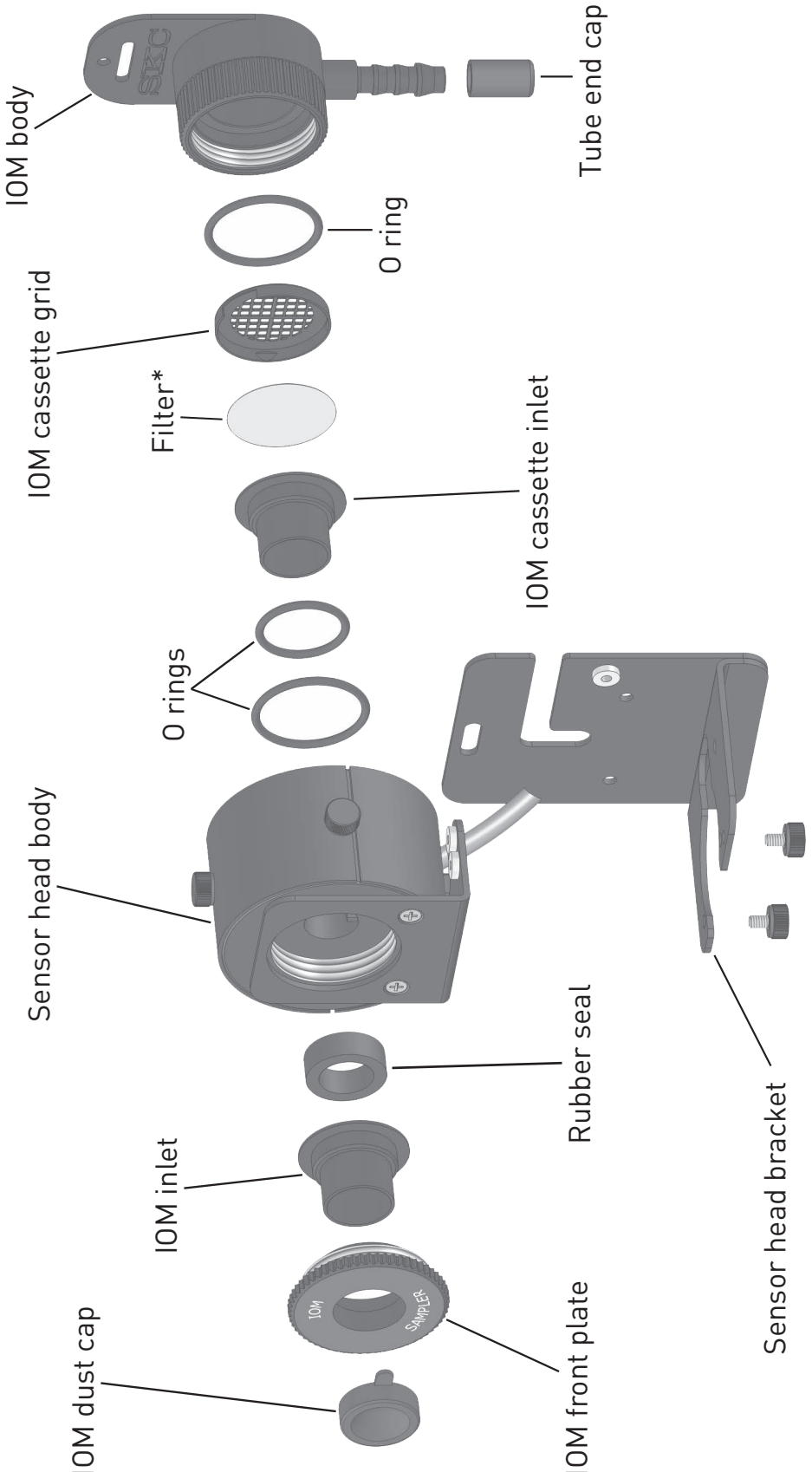
This product is marked with the crossed out wheelie bin symbol, which identifies that it falls within the scope of the EU Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). At the end of it's useful life, this product must be disposed of in an environmentally sound way as detailed in the Directive. Note that the battery pack must be separated from the Split2 monitor and disposed of as detailed in the Batteries Directive (see below). Please contact your local distributor or SKC Ltd for further details on how to comply with the requirements of the WEEE Directive. SKC Ltd's producer registration number is WEE/KH0054TQ.

4) The Batteries Directive

The NiMH battery pack supplied with this instrument and any spare battery packs purchased for it, fall within the scope of the EU Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators. At the end of the battery pack's life it must be disposed of in an environmentally sound way as detailed in the Directive. Please contact your local distributor or SKC Ltd for further details on how to comply with the requirements of the Batteries Directive. SKC Ltd's batteries producer registration number is BPRN00454.


Split2 Monitor
RS-232 Data Port
Sensor Head Socket
On/Off Switch
Charging Socket
LCD Screen
Keypad
Split2
LITE
ENTER
SKC
Real Time Dust Monitor


Spring Clip
Sensor Bracket
Sensor Head
Sensor Head Plug
10M
SAMPLER


IOM body
Tube end cap
O ring
IOM cassette grid
Filter*
IOM cassette inlet
O rings
Sensor head body
Rubber seal
IOM inlet
Sensor head bracket
IOM dust cap
IOM front plate
*For gravimetric analysis

1) Charging the Battery Pack

Prior to first use the battery pack should be fully charged, ideally overnight. Note that a new battery pack may require 2 - 3 charge / discharge cycles to achieve full capacity.

The Split2 monitor must only be charged using the correct SKC charger (Part No. 770-320).

The charger is supplied with mains input plugs suitable for use in the UK, Europe, USA and Australia / New Zealand. Select the correct mains input plug and fit it to the charger.

Plug the charger output jack plug into the matching charging socket on the side of the Split2 monitor. Plug the charger into the electrical mains supply and switch on the power.

When fully charged disconnect the charger plug from the Split2 monitor.

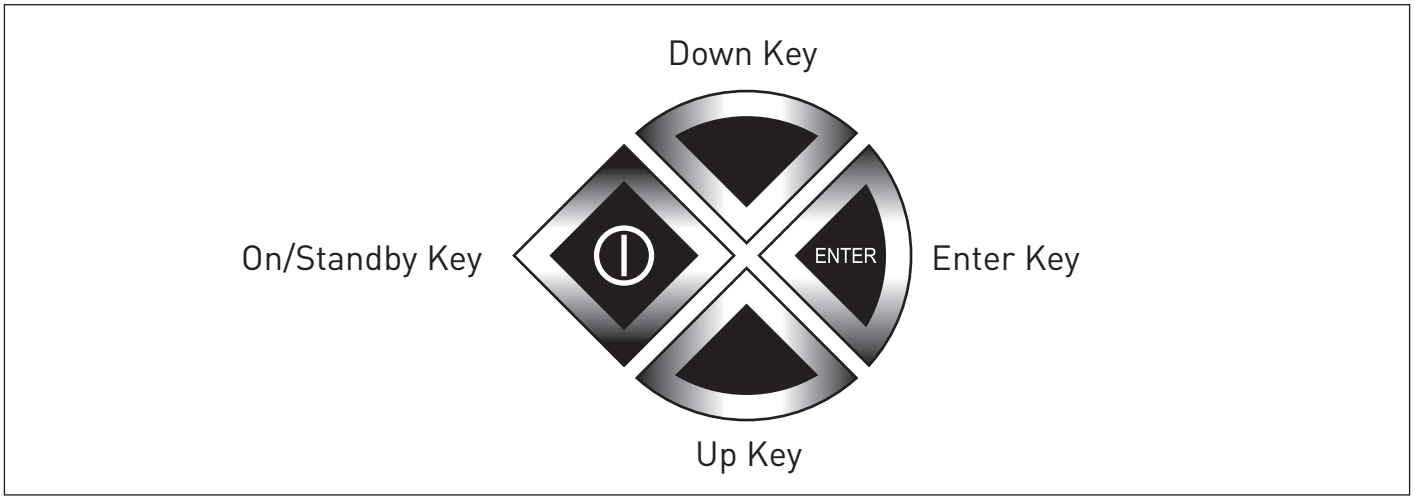
2) The On/Off Push Button

Power can be supplied to the Split2 either from its internal battery or from a mains power source by leaving the charger connected.

Press the on/off push button switch on the side of the Split2 monitor to turn it on. The LCD screen will operate showing the welcome screen.

Press the on/off push button switch on the side of the Split2 monitor to turn it off.

3) The Keypad



Keypad Operation	
	Use the On/Standby key to switch the Split2 monitor to standby and to wake the monitor from standby.

Keypad Operation	
	The enter key activates the selected option on the LCD screen.
	The up key scrolls the selection arrow upwards through a menu list on the LCD screen or increases the selected setting value.
	The down key scrolls the selection arrow downwards through a menu list on the LCD screen or decreases the selected setting value.

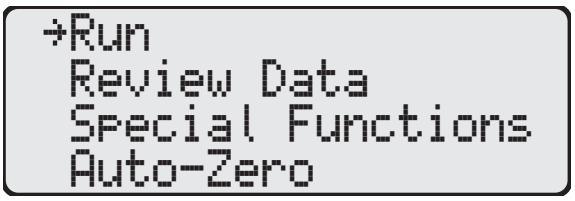
4) Standby Mode

To place the Split2 monitor in standby mode press the I/O button. To wake the monitor from standby mode press the I/O button again.

If the Split2 monitor will not wake from standby check that it is on by pressing the on/off push button on the side of the monitor. If the monitor will still not wake from standby mode charge it fully.

When first switched on, the Split2 unit monitor will display the welcome screen as shown.

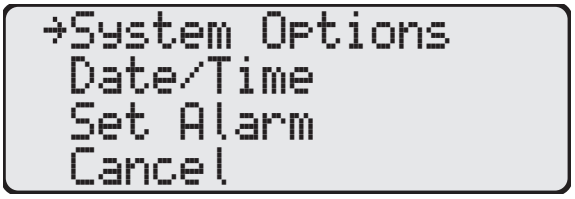
To clear the welcome screen and display the main menu screen press the enter key.



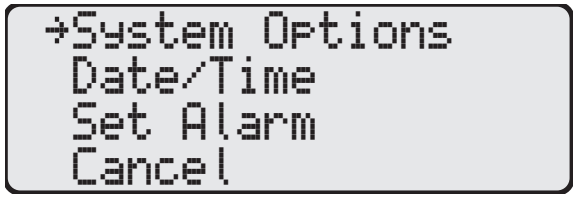
5) Navigating the Menu Options

Press the up and down keys to highlight the required menu option, indicated by the selection arrow on the screen.

Press the enter key to select the required menu option and the new screen will be displayed.

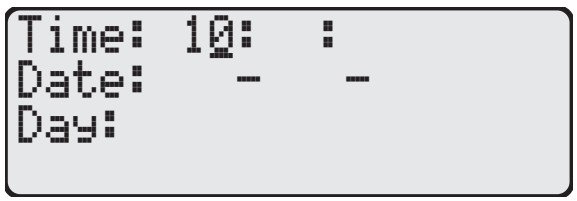


Press the enter key to select the required menu option and the new screen will be displayed.



In some screens, such as the Set Date/Time screen, use the up and down keys to adjust the underlined value.

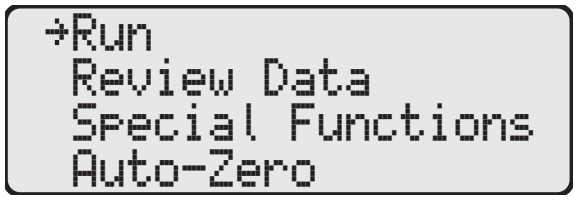
Press the enter key to enter the selected value and adjust the next digit of the setting.



Attach the sensor head plug to the socket on the side of the Split2 monitor. Switch on the Split2 monitor using the push button on/off switch on the side. The LCD screen will show the welcome screen and a beep will sound.

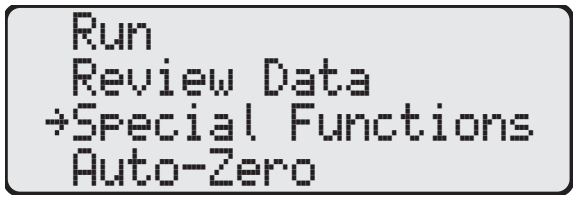
It is recommended to allow at least 10 minutes for the electronics to stabilise to ensure a stable base line reading.

After stabilisation, to clear the welcome screen and display the main menu screen press the enter key.

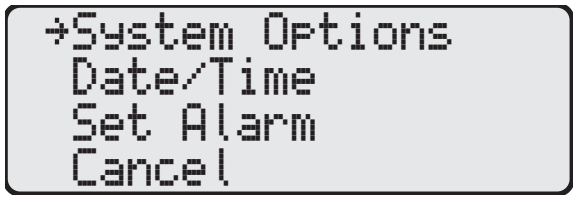


1) Setting the Time and Date

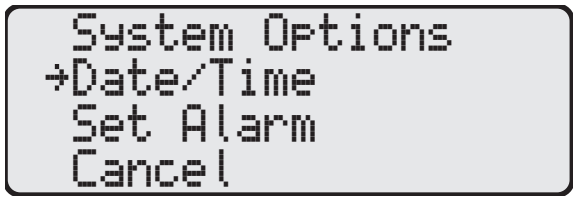
On the main menu screen press the up and down keys to highlight the Special Functions menu item, indicated by the selection arrow on the screen.



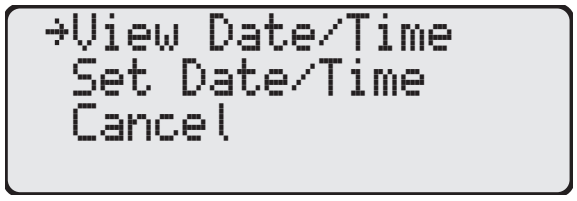
Press the enter key to select the menu item and the Special Functions menu screen will be displayed.



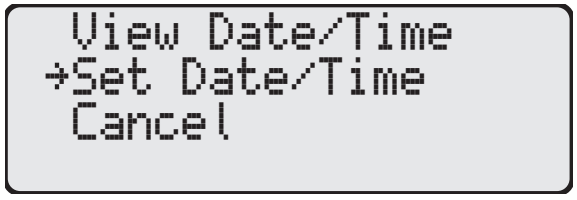
Press the up and down keys to highlight the Date/Time menu item on the Special Functions menu screen.



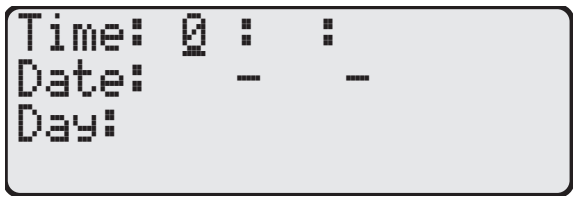
Press the enter key to select the menu item and the Date/Time menu screen will be displayed.



Press the up and down keys to highlight the Set Date/Time menu item on the Date/Time menu screen.

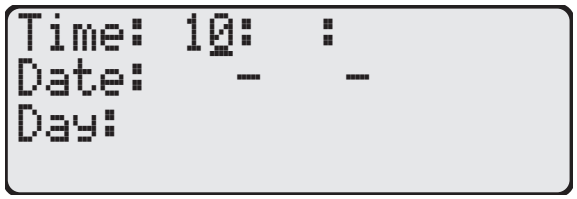


Press the enter key to select the menu option and the Set Date/Time menu screen will be displayed. On this screen each digit of the time and date is set individually. The current digit to be set is highlighted by an underline cursor.

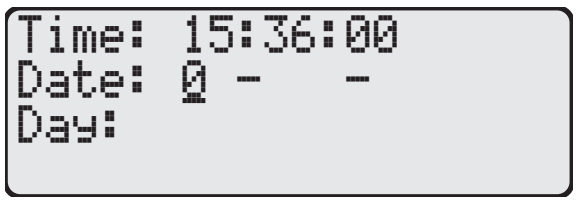


Use the up and down keys to adjust the underlined value.

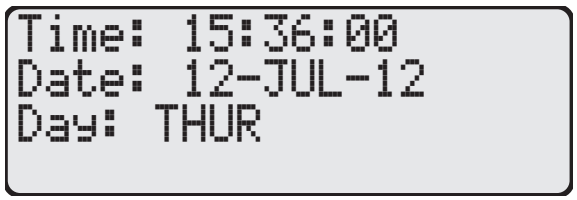
Press the enter key to enter the selected value and the next digit is highlighted by the underlined cursor.



Enter the hours, minutes and seconds of the time in 24 hour clock format.

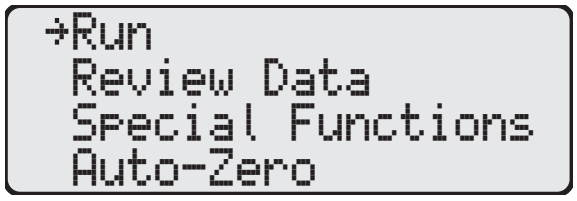


Enter the date in dd-MMM-yy format and the day of the week.



On pressing the enter key after setting the day of the week a confirmation screen is displayed.

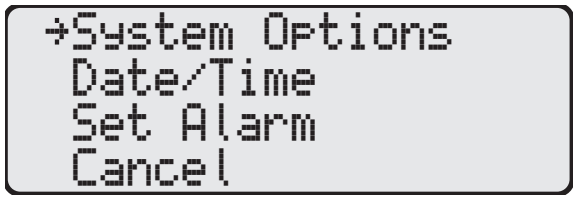
Select the Set Date/Time menu item and press the enter key to save the date and time just entered, or select the Cancel menu item to retain the existing time and date. The main menu screen is then displayed.



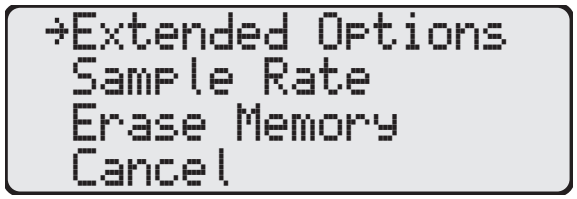
2) Clearing the Data Logging Memory

The memory of the Split2 monitor can be cleared at any time. Note that this operation will clear all data points in all locations from the memory.

On the main menu screen use the up and down keys to highlight the Special Functions menu item and press enter to show the new screen.

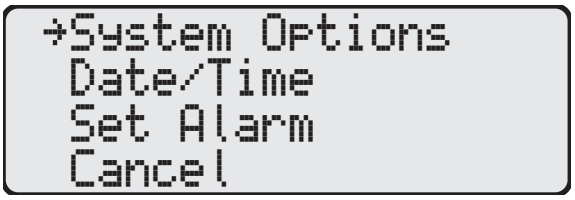


On the System Options menu screen press enter to select the System Options menu item and show the new screen.



On the System Options menu screen use the up and down keys to highlight the Erase Memory menu item and press enter to show the new screen.

Select the Yes option and press enter to erase the memory, or select the No option to retain the existing logged data in memory. The Special Functions menu screen is then displayed.

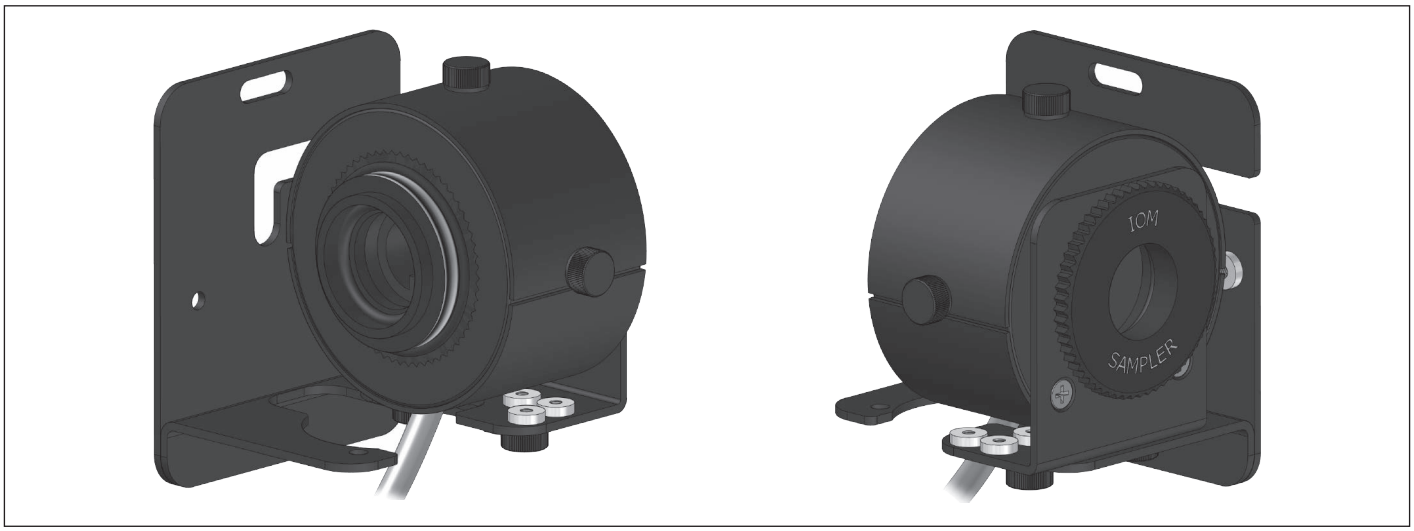


The Split2 monitor can be used in two operating modes, Passive or Active (with optional air sample pump). The choice of which operating mode to use will depend on the dust fraction of interest - Respirable or Inhalable fractions, and whether a filter sample is required for subsequent gravimetric and/or chemical analysis.

A different configuration of the Split2 monitor sensor head is requried for the various options as detailed below.

1) Passive Sampling

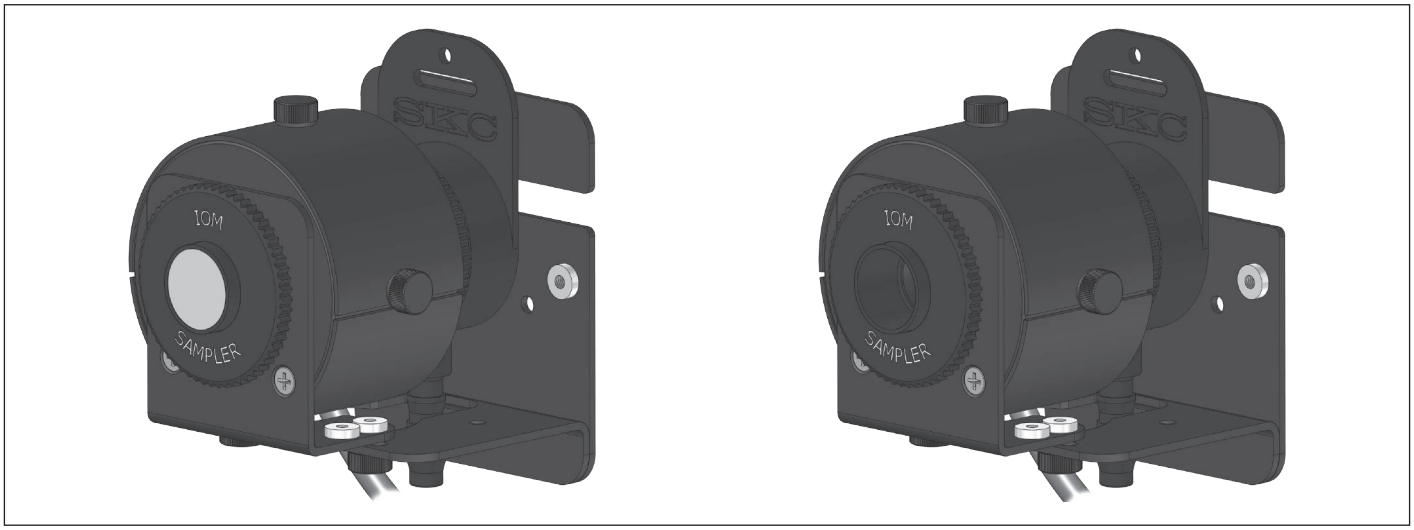
In Passive mode the sensor head is configured as shown below, with only the IOM front plate fitted to the front of the sensor head and the sensor head mounted onto the bracket in the orientation shown below. Secure the sensor head to the bracket with the two thumb screws supplied.



In Passive mode the Split2 monitor is calibrated to respond to the respirable fraction only and cannot be used to measure the inhalable fraction. Also, it is not possible to take a filter sample for subsequent analysis in this operating mode.

2) Active (Pumped) Sampling

In Active mode the sensor head is configured as shown below and with the sensor head mounted onto the bracket in the orientation shown. Refer also to the exploded diagram of the sensor head on page 6 for component identification and assembly positions. Secure the sensor head to the bracket with the two thumb screws supplied.



Connect the outlet hosetail of the IOM sampler body at the rear of the sensor head to the inlet hosetail of the air sample pump using a suitable length of 1/4" bore flexible tubing (such as Tygon tubing). The tubing can be passed through the coiled sensor cable which will help prevent snagging of the tubing on the worker's clothing.

The pump flow rate must be adjusted to 2 l/min using a suitable air flow calibrator such as the SKC chek-mate and a calibration adapter for the IOM sampler (SKC part number 391-01).

In Active mode with a size selective foam plug fitted to the IOM inlet at the front of the sensor head the Split2 monitor will respond to the respirable fraction. Without a size selective foam fitted to the IOM inlet the Split2 monitor will respond to the inhalable fraction.

If a filter sample is to be taken for subsequent gravimetric and/or chemical analysis, place a 25mm diameter filter into the supplied IOM cassette (part of the sensor head assembly). Pre-weigh the filter and cassette and then fit it into the IOM body at the rear of the sensor head. Ensure that all of the sealing O rings are in place (refer to Sensor Head Exploded Diagram on page 6). The sensor head must be removed from the bracket to enable this.

Set up the sensor head assembly as detailed on pages 13 & 14 dependent on whether Passive or Active (Pumped) sampling is to be performed and which particle size is to be sampled.

Ensure that the correct time and date have been set as detailed in on page 10.

Ensure that the Split2 monitor and sensor head assembly are allowed sufficient time to stabilise to the ambient temperature of the sampling location. A minimum of 20 minutes is recommended to achieve this.

Then perform the following steps:

1) Set the Flow Rate When Performing Active (Pumped) Sampling

The Split2 monitor does not need to be switched on when setting the flow rate.

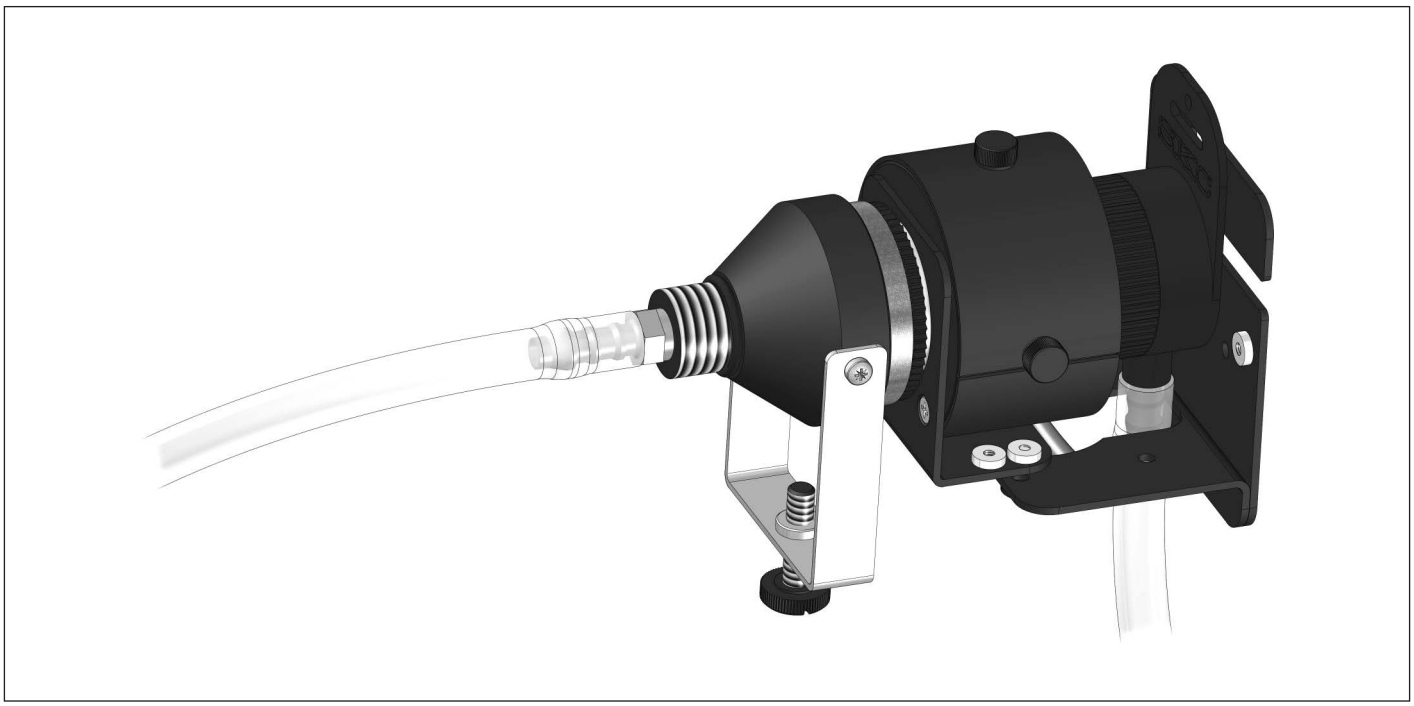
The required flow rate is 2 l/min.

The required equipment is a flow meter with traceable calibration such as the SKC chek-mate, a calibration adapter for the IOM sampler (SKC part number 391-01) and a length of 1/4" bore flexible tubing.

Connect the outlet hosetail of the flow meter to the hosetail on the calibration adapter with the length of flexible tubing.

Switch on the air sample pump and allow to run for at least 5 minutes to stabilise before proceeding.

Press the foam pad of the calibration adapter firmly against the IOM front plate on the sensor head assembly. Maintain the pressure to keep the calibration adapter in place and ensure a consistent seal throughout the calibration process.



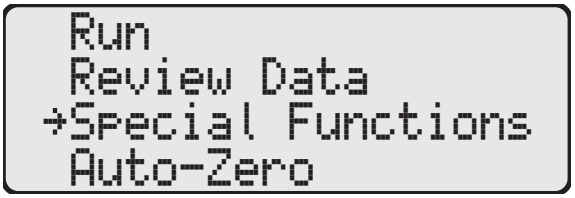
Observe the reading of the flow meter and adjust the pump flow rate as detailed in the pump instruction manual until the required flow rate of 2 l/min is achieved. Switch off the air sample pump.

If performing a concurrent filter sample for gravimetric analysis note the flow rate reading for use in calculating the dust concentration. The filter in place during calibration should be replaced after the calibration with a clean filter and the filter and IOM cassette pre-weighed.

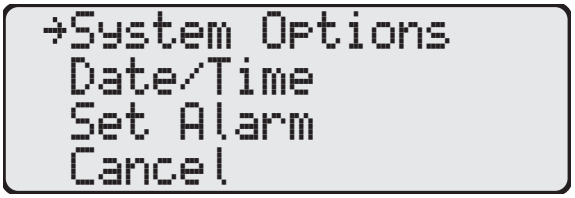
2) Check the Battery Status

Always ensure that the battery is fully charged before commencing sampling. The Split2 battery pack has a nominal voltage of 7.2V. A fully charged battery pack will have a voltage of 8.0V or higher. If the battery voltage is below 7.4V it is recommended to recharge the battery before commencing sampling. Check the battery status as follows:

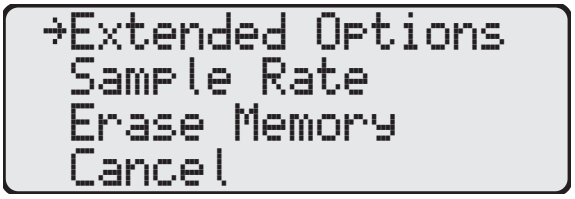
On the main menu screen press the up and down keys to highlight the Special Functions menu item, and press enter to show the new screen.



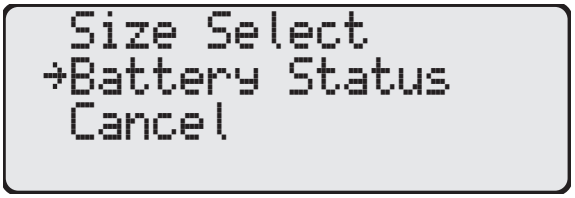
On the Special Functions menu screen press enter to select the System Options menu item and show the new screen.



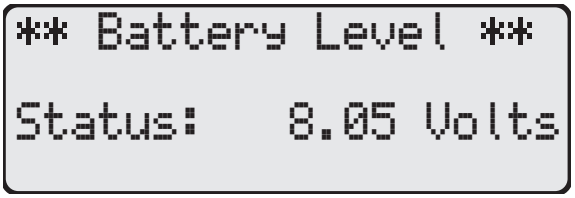
On the System Options menu screen press enter to select the Extended Options menu item and show the new screen.



On the Extended Options menu screen press the up and down keys to highlight the Battery Status menu item and press enter to select and show the new screen.

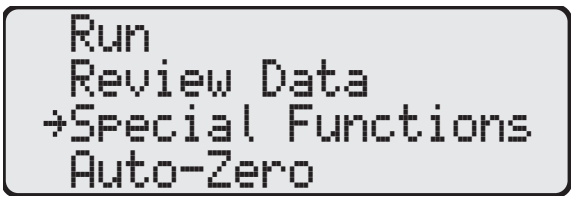


The Battery Status screen displays the current battery voltage. Press enter to return to the main menu screen.

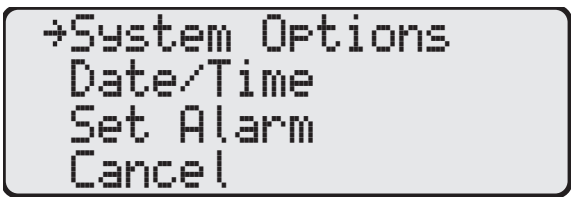


3) Set the Particle Size

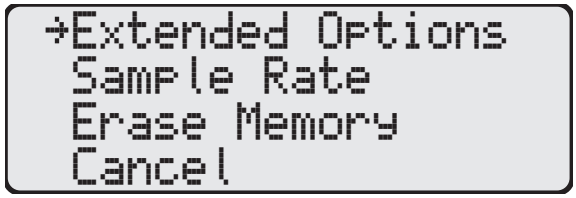
To set the particle size, on the main menu screen press the up and down keys to highlight the Special Functions menu item and press enter to show the new screen.



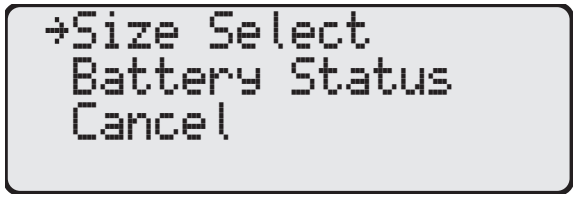
On the Special Functions menu screen use the up and down keys to highlight the System Options menu item and press enter to show the new screen.



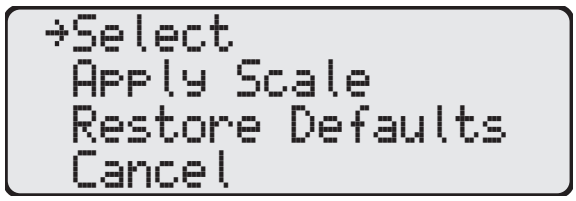
On the System Options menu screen press enter to select the Extended Options menu item and show the new screen.



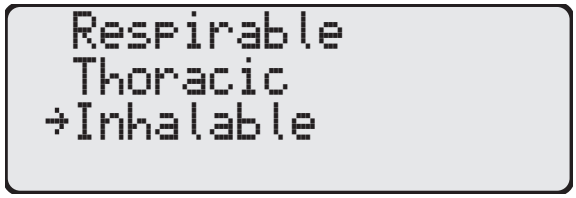
On the Extended Options menu screen press enter to select the Size Select menu item and show the new screen.



On the Size Select menu screen press enter to select the Select menu item and show the new screen.

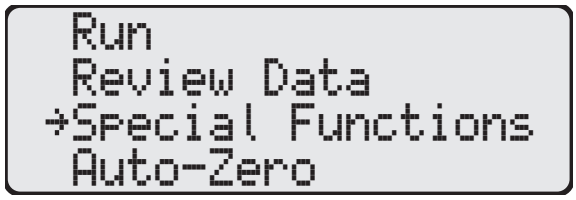


On the Select screen press the up and down keys to highlight the required particle size and press enter to select it and return to the main menu screen.

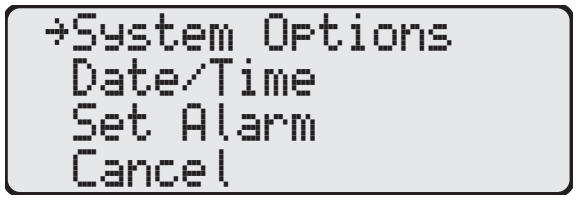


4) Set the Sample Rate

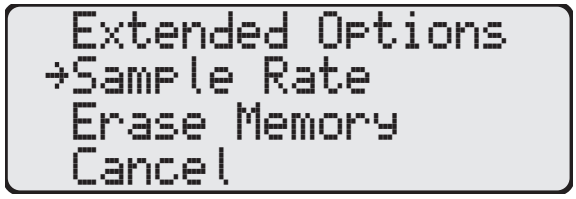
To set the sample rate, on the main menu screen press the up and down keys to highlight the Special Functions menu item and press enter to show the new screen.



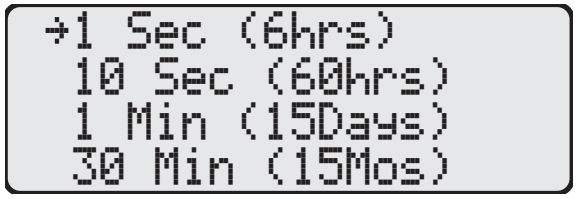
On the Special Functions menu screen use the up and down keys to highlight the System Options menu item and press enter to show the new screen.



Press the up and down keys to highlight the Sample Rate menu item and press enter to show the new screen.



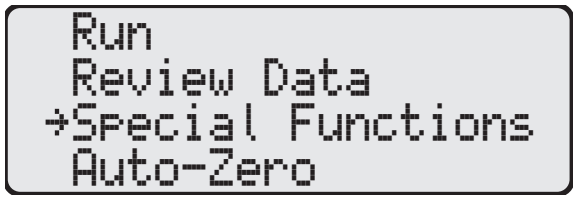
On the Sample Rate screen use the up and down keys to highlight the required sample rate. The options state the sample interval time and also the maximum sample duration for each option. Press enter to save the setting and return to the main menu screen.



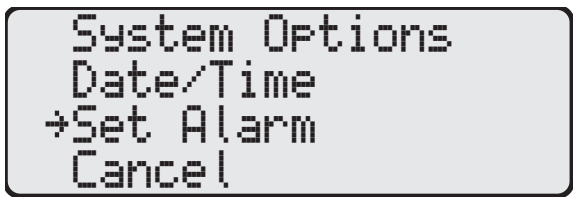
5) Set the Alarm Concentration Level

An audible alarm can be set to alert the worker that the dust concentration level is approaching a threshold limit. As a starting point it is recommended to set the alarm concentration level to 80% of the WEL (Worker Exposure Limit) for the particulate type being sampled.

To set the alarm concentration level, on the main menu screen press the up and down keys to highlight the Special Functions menu item and press enter to show the new screen.

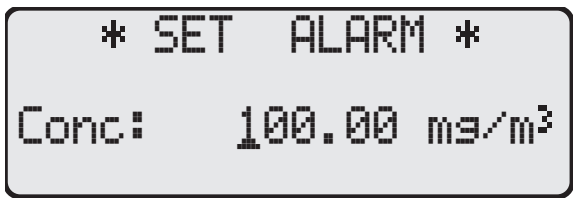


On the Special Options menu screen press the up and down keys to highlight the Set Alarm menu item.

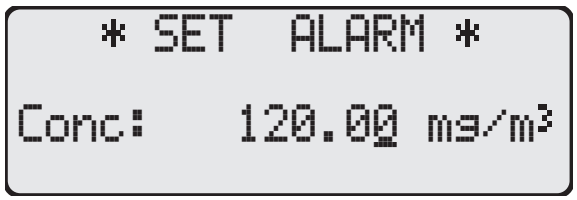


Press the enter key to select the menu option and the Set Alarm screen will be displayed.

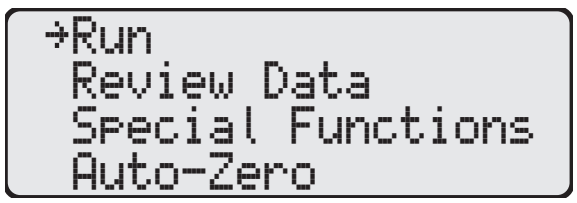
Use the up and down keys to adjust the value of the digit highlighted by the underlined cursor.



Press the enter key to enter the selected digit value and the next digit is highlighted by the underlined cursor. Use the up, down and enter keys to enter the required alarm concentration.



On pressing the enter key after adjusting the value of the last digit of the alarm concentration the setting is saved and the main menu screen is displayed.



6) Perform an Auto-Zero

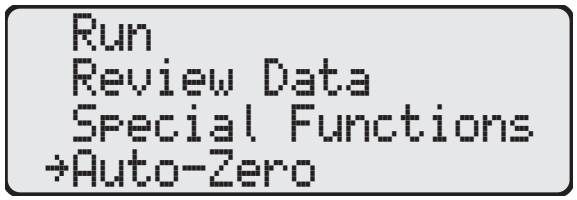
The auto-zero function sets the measurement baseline of the Split2 monitor to zero mg/m³ and should be performed prior to beginning a new set of measurements. The battery should be fully charged and the unit switched on for at least 10 minutes prior to performing the auto-zero.

If performing respirable sampling in Passive mode ensure that the auto-zero is performed in a clean, dust free environment as in this mode the auto-zero is performed without using the zeroing accessory.

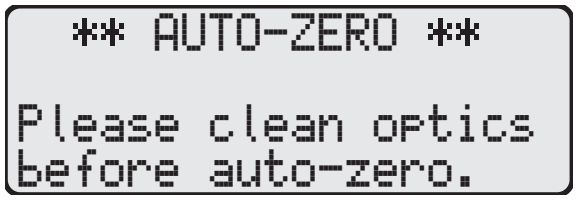
If performing sampling in Active mode insert the zeroing accessory supplied with the Split2 monitor into the IOM inlet on the sensor head and ensure the air sample pump is running.

Note: If performing respirable sampling in Active (pumped) mode perform the auto-zero prior to fitting the size-selective foam to the IOM inlet on the sensor head.

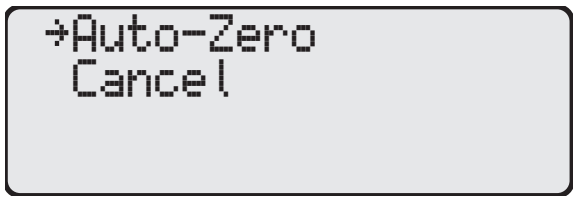
On the main menu screen press the up and down keys to highlight the Auto-Zero menu item.



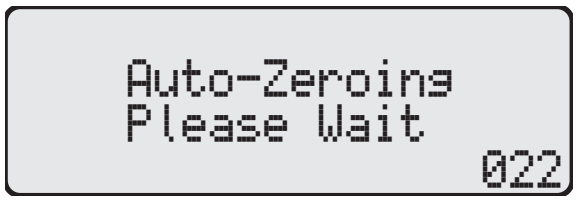
Press enter and an information screen will briefly be displayed before the Auto-Zero menu screen is displayed. Refer to Cleaning the Optics on page 30 for more information.



The Auto-Zero menu screen is then displayed. Press enter to select the Auto-Zero menu item and initiate the Auto-Zero sequence. The Auto-Zero status screen is then displayed.



The sequence takes 25 seconds and an on-screen countdown timer indicates progress. At the end of the sequence the display will automatically return to the main menu screen.



On completion of the auto-zero, if performing Active sampling switch off the air sample pump and disconnect the zeroing accessory from the IOM inlet on the sensor head.

Once the setup procedure has been completed as detailed in the previous section the Split2 monitor is ready to begin sampling.

1) Mounting the Split2 Monitor on the Worker

Mount the Split2 monitor onto the worker using the belt clip to secure it to the worker's belt. If using the Split2 monitor in Active (Pumped) mode mount the air sample pump adjacent to the Split2 monitor securing with the pump's belt clip.

Attach the sensor head to the worker's clothing using the spring clip. The sensor head should be mounted within the worker's breathing zone, which is defined as a hemisphere of 30cm radius extending in front of the face and centred on the mid point of a line joining the ears.

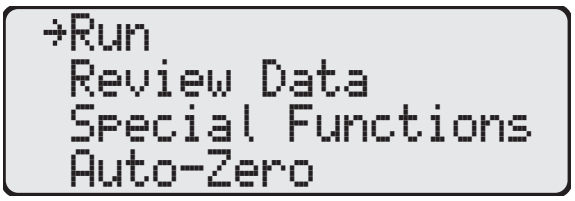
Ensure that the sensor cable (and tubing if using the Split2 monitor in Active mode) are adequately secured to the worker's clothing to prevent them from obstructing the worker's movements.

Note: It is recommended to mount the equipment on the worker's left hand side for right handed workers and vice versa for left handed workers.

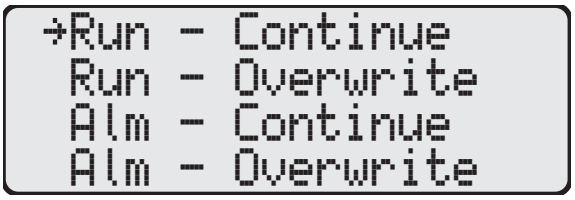
2) Initiating Sampling

If using the Split2 monitor in Active mode start the air sample pump running.

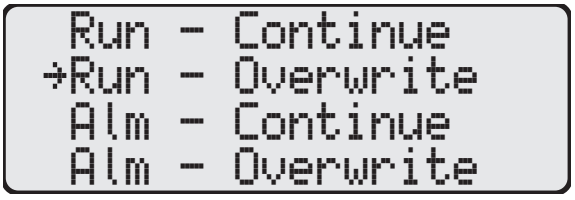
On the main menu screen press the up and down keys to highlight the Run menu item and press enter to display the new screen.



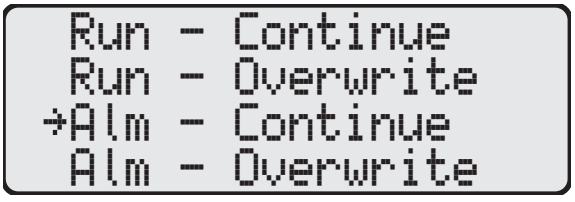
On the Run menu screen select the Run - Continue option to begin sampling with the alarm function disabled, retain the existing data and store the new data in the next available memory location.



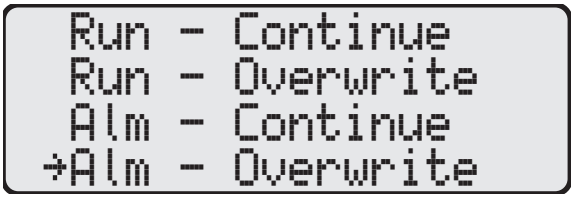
Alternatively select the Run - Overwrite option to begin sampling with the alarm function disabled, delete the existing data and store the new data in memory location 001.



Alternatively select the Alm - Continue option to begin sampling with the alarm function enabled, retain the existing data and store the new data in the next available memory location.



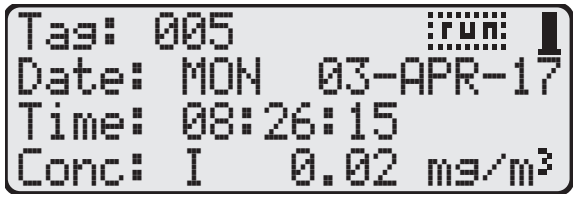
Alternatively select the Alm - Overwrite option to begin sampling with the alarm function enabled, delete the existing data and store the new data in memory location 001.

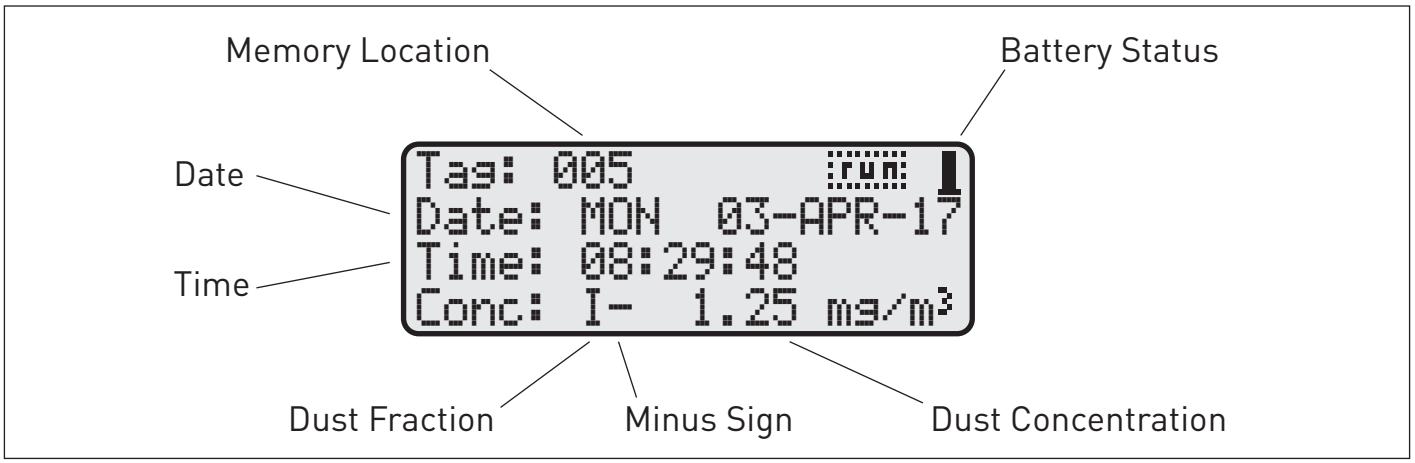


Press enter to initiate sampling with the required alarm and data options. If either of the overwrite options were selected an overwrite confirmation screen is displayed.

Press the up and down keys to select Yes to overwrite the data or No to return to the main menu screen.

Press enter and the Data Record Screen will be displayed.





The memory location displayed is the current location that data is being saved into. Selecting either of the two Continue sampling options will cause data to be stored in the next available empty location. Selecting either of the two Overwrite sampling options will cause the existing data to be deleted and the new data to be stored in location 001.

The dust fraction display indicates the particle fraction setting, I for inhalable, T for thoracic and R for respirable.

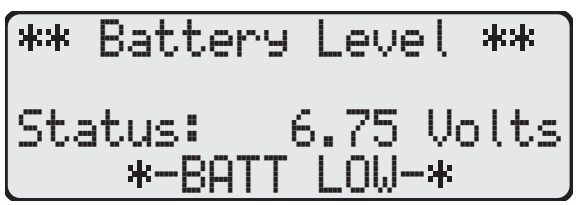
The minus sign indicates that the Split2 monitor is measuring a negative dust concentration value. If this occurs for any reasonable length of time then it is recommended to perform an auto-zero before continuing with the sample.

The dust concentration is the instantaneous reading of the Split2 monitor sensor. It is this value that is recorded into memory at intervals determined by the sample rate setting.

The battery status icon indicates full charge and low battery conditions.

3) Low Battery Function

When the battery voltage drops below the level required for accurate reading of the Split2 monitor sensor, approximately 6.8V, sampling is automatically stopped and the battery status screen is displayed.



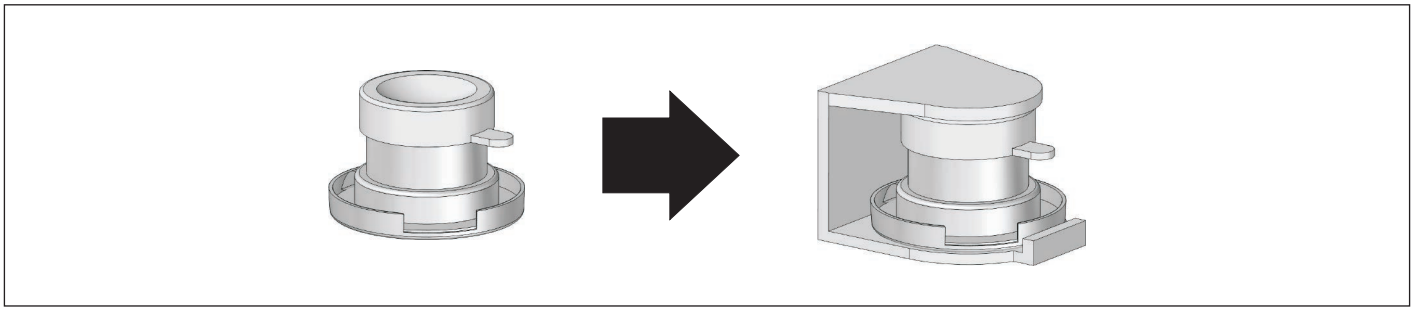
To clear the low battery screen press enter and the display will return the main menu screen. When the battery voltage drops below approximately 6.5V the Split2 monitor will automatically switch to Standby mode.

4) Finish Sampling

At the end of the sample period press the enter key to stop sampling and the display will return to the main menu screen. If sampling in Active (pumped) mode stop the air sample pump.

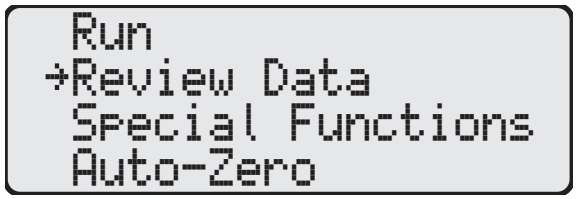
Remove the equipment from the worker.

If taking a concurrent filter sample transfer the equipment to a clean, dust free environment. Check the flow rate (refer to page 15 for details) and note the flow meter reading for use in the calculation of the dust concentration. Remove the sensor head from the bracket. Unscrew the IOM sampler body from the rear of the sensor head and remove the filter cassette from the IOM body for post-weighing. If the filter sample is to be sent for subsequent analysis fit the red cassette cap to the cassette inlet and place the cassette into the red cassette clip supplied in the Split2 monitor kit.



On completion of the sample the stored data can be reviewed on the Split2 monitor screen.

On the main menu screen press the up and down keys to highlight the Review Data menu item. Press enter to display the Review Data menu screen.

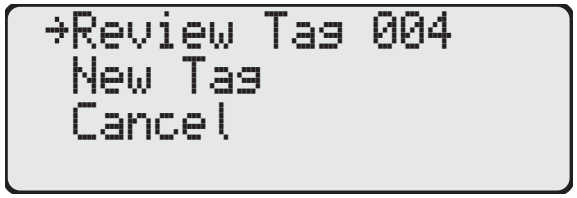


Press the up and down keys to highlight the Statistics menu item and press enter.

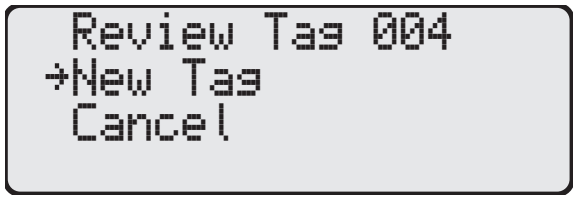
Note: If no data locations have previously been reviewed this screen is not displayed and the Tag Select screen is displayed instead (see below).

The Tag Select Menu screen will be displayed. The screen will indicate the data location that was previously reviewed. To view the previously reviewed data press the up and down keys to highlight the Review Tag XXX option and press enter.

Note: If there is data only in location 001 then the Tag Select Menu screen is not displayed.

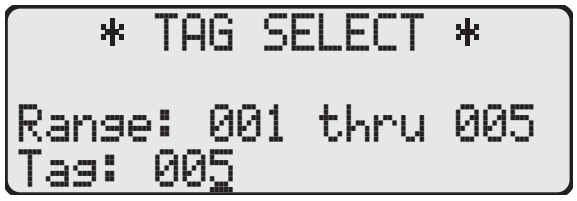


To review a different data location use the up and down keys to highlight the New Tag menu item and press enter.

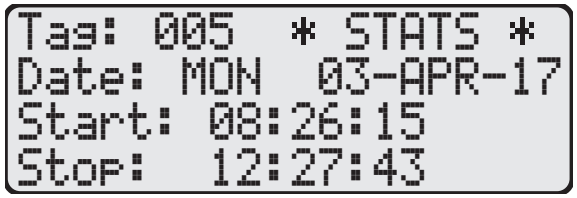


The Tag Select screen is displayed. This is the location tag of the data to be reviewed. The range listing indicates the range of data location tags that have data recorded in them.

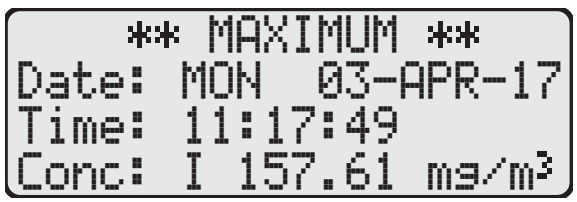
Press the up and down keys to enter the first digit of the required location tag and press the enter key. Repeat the process to enter the remaining two digits of the required location tag.



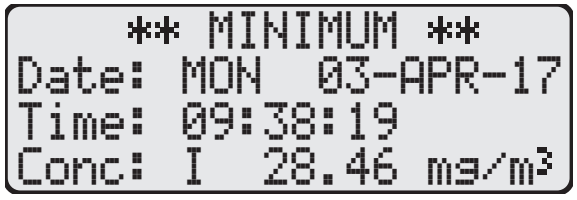
The first Statistics screen will be displayed. This screen identifies the data location tag number being reviewed and the date and start and stop times of the sample. Press the down key to display the next Statistics screen or press enter to return to the main menu screen.



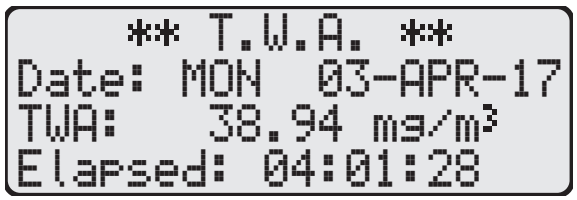
The next Statistics screen indicates the highest recorded dust concentration and the date and time it occurred. It also indicates which fraction was sampled - I for inhabable, R for respirable. Press the down key to display the next Statistics screen or press enter to return to the main menu screen.



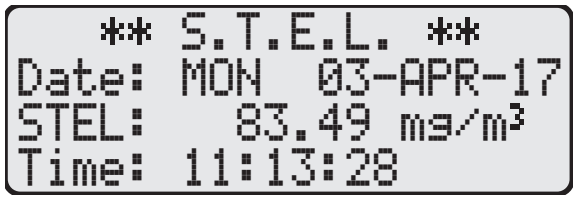
The next Statistics screen indicates the lowest recorded dust concentration and the date and time it occurred. It also indicates which fraction was sampled - I for inhabable, R for respirable. Press the down key to display the next Statistics screen or press enter to return to the main menu screen.



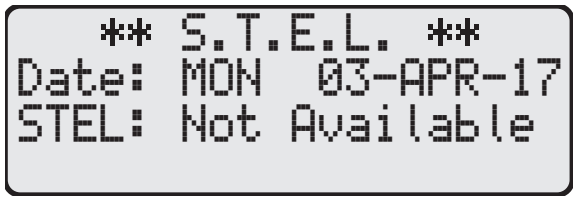
The next Statistics screen indicates the T.W.A. (Time Weighted Average) dust concentration and the date and duration of the sample. Press the down key to display the next Statistics screen or press enter to return to the main menu screen.



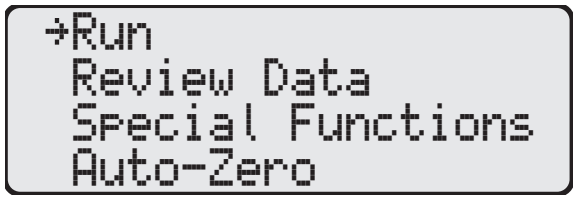
The final Statistics screen indicates the S.T.E.L. (Short Term Exposure Level) dust concentration and the date and time it occured. Press the down key to display the next Statistics screen or press enter to return to the main menu screen.



The S.T.E.L. indicated is the highest average level over a 15 minute period recorded during the sample. An S.T.E.L. figure can only be displayed if the total sample duration is in excess of 15 minutes. If the sample period was less than 15 minutes a "Not Available" message is displayed.



Press the down or enter keys to return to the main menu screen.



The Split2 monitor is calibrated using ISO 12103-1 A2 Fine Test Dust. The different dust types present in actual workplace locations will have different reflection and refraction properties from those of the test dust and will therefore have different light scattering properties within the Split2 monitor sensor head.

If sampling is to be performed regularly in the same workplace locations a custom scale factor can be set on the Split2 monitor so that it's reading more closely correlates with the actual dust concentration in that environment. Note that different custom scale factors may be required for different workplace locations.

In order to calculate a custom scale factor a sample must first be taken with the Split2 monitor in the workplace location, along with a concurrent filter sample for gravimetric analysis.

The filter and IOM cassette must be pre and post weighed and a T.W.A. (Time Weighted Average) concentration calculated for the filter sample.

The filter T.W.A. and the T.W.A. from the Split2 monitor review data (see page 23/24) are then used to calculate the custom scale factor as follows -

$$\text{Custom Scale Factor} = \frac{\text{Filter T.W.A. Result}}{\text{Split2 T.W.A. Result}}$$

Example -

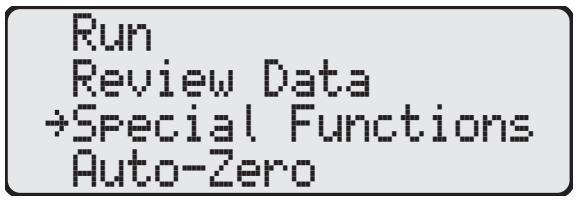
Filter T.W.A. = 5 mg/m³

Split2 T.W.A.= 4 mg/m³

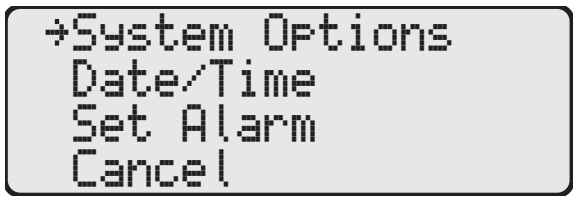
$$\text{Custom Scale Factor} = \frac{5\ \text{mg/m}^3}{4\ \text{mg/m}^3} = 1.25$$

Important Note: Applying a custom scale factor to the Split2 monitor should not be done using only a single filter sample result. It is strongly recommended that a minimum of 10 filter samples should be undertaken and the calculated scale factors averaged to obtain a typical scale factor for that workplace location.

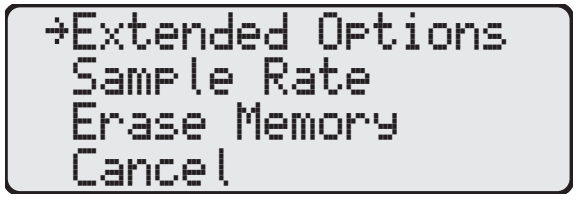
To set the custom scale factor, on the main menu screen press the up and down keys to highlight the Special Functions menu item and press enter to show the new screen.



On the Special Functions menu screen press enter to select the System Options menu item and show the new screen.



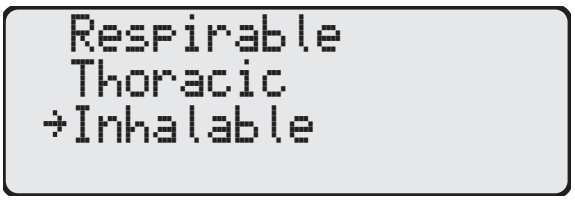
On the System Options menu screen press enter to select the Extended Options menu item and show the new screen.



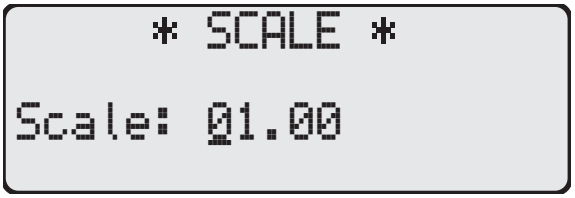
On the Extended Options menu screen press enter to select the Size Select menu item and show the new screen.

On the Size Select menu screen press the up and down keys to highlight the Apply Scale menu item and press enter to show the new screen.

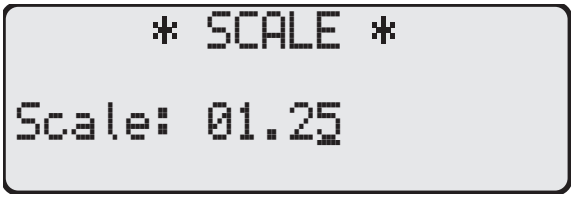
Press the up and down keys to highlight the required particle size.



Press the enter key to select the particle size and display the new screen.



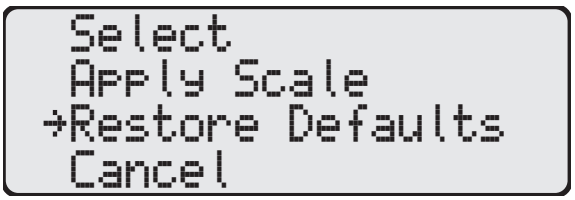
Press the up and down keys to enter the first digit of the custom scale factor and press the enter key. Repeat the process to enter the remaining three digits of the required location tag.



When the last digit is entered the display will return to the Size Select menu screen.

The custom scale factor will then be applied to the Split2 monitor reading on subsequent samples.

To quickly revert to the standard scale factor of 01.00, from the Size Select menu screen use the up and down keys to highlight the Restore Defaults menu item.



Press the enter key and the scale factor setting will be restored to 01.00 and the display will return to the main menu screen.

Refer also to the DustComm Pro software manual for detailed instructions on the installation and use of the software.

The following is a summary of the process of downloading the sample data.

Connect the Split2 monitor to the serial port on the PC using the supplied RS-232 data cable. Ensure that both connections are secure as an intermittent connection will disrupt the data transmission.

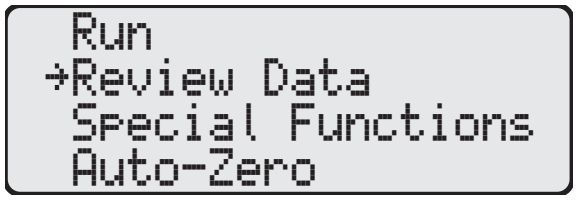
A USB to serial adapter cable (not SKC supply) is required if the PC does not have a serial interface port. The USB to serial adapter must be configured in Windows Device Manager such that its COM port number is set to an available number in the range COM1 to COM4.

Run the DustComm Pro software. Select the Unit menu option on the DustComm Pro window and select Properties.

On the Properties window ensure that the Unit Type is set to "Split 2" from the drop down list. Ensure that the Download Port is set to the correct COM port number on the PC from the drop down list. Click the OK button to close the Properties window.

Select the Unit menu option on the DustComm Pro window and select Download. A progress window will open with the message "Awaiting connection...".

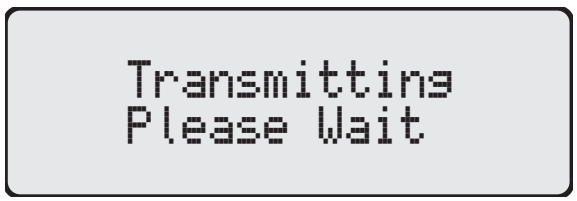
On the Split2 monitor, from the main menu screen press the up and down keys to highlight the Review Data menu item. Press enter to display the Review Data menu screen.



On the Review Data screen press the up and down keys to highlight the Download menu item. Press enter to display the Download menu screen.

On the Download menu screen press enter to select the To Data Collector menu item and initiate the data download.

The screen will show a Transmitting message and then revert to the Download menu screen indicating that the data transfer is complete.



On the DustComm Pro software progress window the message "Connection established, downloading data..." will be displayed and a progress bar will show the data transfer proceeding.

On completion of the data transfer the progress window will show the message "The download was successful!". Press the OK button on the window to close it.

Refer to the DustComm Pro software manual for details of working with the downloaded data.

1) Checking the Calibration Span

The calibration span accessory is a light scattering device that provides a constant value (termed a "k" factor).

The calibration span accessory should be used as a reference to check the factory calibration span of the Split2 monitor.

The calibration span should be checked under the following conditions:

- Once a month with normal usage.
- If the Split2 monitor or sensor head is dropped or otherwise damaged.
- The first time the unit is used to double check the factory calibration.

Note: SKC recommend annual servicing of the Split2 monitor.

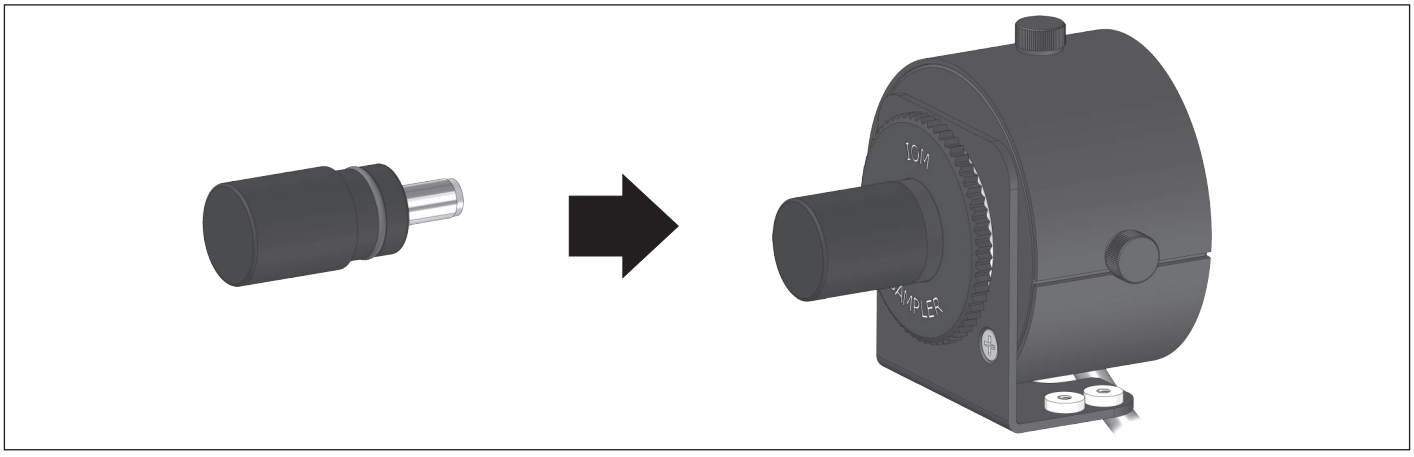
Prior to checking the calibration span ensure the following:

1. The sensor optics must be clean (refer to Cleaning the Sensor Optics on page 30).
2. The environment must be clean, i.e. dust free.
3. The battery must be fully charged (refer to page 16).
4. The particle size setting must be set to Respirable (refer to page 16/17).
5. The custom scale factor must be reset to the default value of 01.00 (refer to Setting a Custom Scale Factor on page 25/26).

Assemble the sensor head as shown below with the IOM inlet, rubber seal and IOM front plate only fitted.

Perform an auto-zero (refer to page 19).

Insert the calibration span accessory into the sensor head inlet ensuring that it is pressed in fully.



Run the Split2 monitor for at least two minutes in Run - Continue mode and then note the dust concentration reading on the Split2 monitor.

Compare the indicated reading with the K Factor value printed on the calibration span accessory. The reading should be within ±10% of the K Factor value. If the difference is greater than ±10% repeat the calibration span check procedure.

If the difference between the Split2 monitor reading and the K factor value is still greater than ±10% then the Split2 monitor should be returned to SKC for service and recalibration.

2) Care of the Battery Pack

Battery charging

- Charge the battery pack fully before first use to ensure optimum performance.
- Full battery capacity will be achieved after 2 to 3 full charge / discharge cycles.
- Use only the SKC approved charger designated for this battery pack. Use of a non-SKC approved charger may impair battery performance or even cause irrepairable damage, and will invalidate the battery pack warranty.
- Always check the battery status before use (refer to page 16) and charge as required.

Battery performance

- Charging temperature - For optimum performance charge NiMH batteries between 0 and +40°C.
- Do not overcharge - For optimum performance disconnect battery pack from charger after 24 hours.
- Discharge temperature - For optimum performance discharge NiMH batteries between -10 and +45°C (refer also to the Split2 monitor specifications on page 2 for limitations on operating temperature specific to this instrument).

Battery maintenance

- Battery cycling during regular use - To maintain optimum capacity during regular battery use, cycle the battery once a month. Run the Split2 monitor until low battery shutdown occurs, then fully charge battery.
- Long term storage and highly infrequent use -
  1. Charge battery fully prior to long term storage.
  2. Store in a cool, dry place at temperature between 0 and 30°C. Ensure that the Split2 monitor is switched off during storage.
  3. Recharge battery at least once a year (or more frequently if stored at temperature above 30°C).
  4. Cycle battery 2 to 3 times after long term storage to restore optimum capacity.

Battery testing

1. Connect an SKC approved charger to the Split2 monitor and leave to fully charge.
2. If the Split2 monitor does not function at all after a full charge of the battery pack, the battery cells have failed or are at end of life - Replace the battery pack. Also check the output of the charger.
3. If the Split2 monitor functions after a full charge of the battery pack but gives significantly reduced run times before low battery shutdown, the battery cells are failing or are at end of life - Replace the battery pack.

Battery replacement

To remove the battery pack unscrew the two battery cover screws at the left hand side of the Split2 monitor case using a size PH1 Phillips screwdriver and remove the battery cover.

Disconnect the battery plug / socket connectors and remove the battery pack from the battery compartment noting the orientation of the battery pack.

Fit the new battery pack into the battery compartment in the correct orientation and reconnect the battery plug / socket connectors.

Fit the battery cover in the correct orientation ensuring the foam pad on the rear of the cover is pressed against the battery pack to secure it in place. Secure the battery cover with the two screws. Do not apply excessive force when tightening the screws.

Charge the new battery pack fully before use.

Battery disposal

- The EU Battery Directive and equivalent legislation in other countries requires that all batteries and battery packs are disposed of correctly at the end of their working life. This means that they must be collected and treated separately from other waste.
- Please ensure that any end-of-life SKC battery packs are collected and recycled or disposed of correctly.

3) Cleaning the Sensor Optics

It is important to keep the sensor optics of the Split2 monitor clean to ensure the integrity of the optical sensor.

The condition of the sensor optics should be checked every 48 hours when the Split2 monitor is used in a 2 to 3 mg/m^3 T.W.A. environment, and on a weekly or monthly basis when used in less contaminated locations.

The required items to clean the sensor optics are as follows -

- Pre-moistened camera lens cleaning wipes.
- Foam tipped swabs.
- Low pressure compressed dry air.

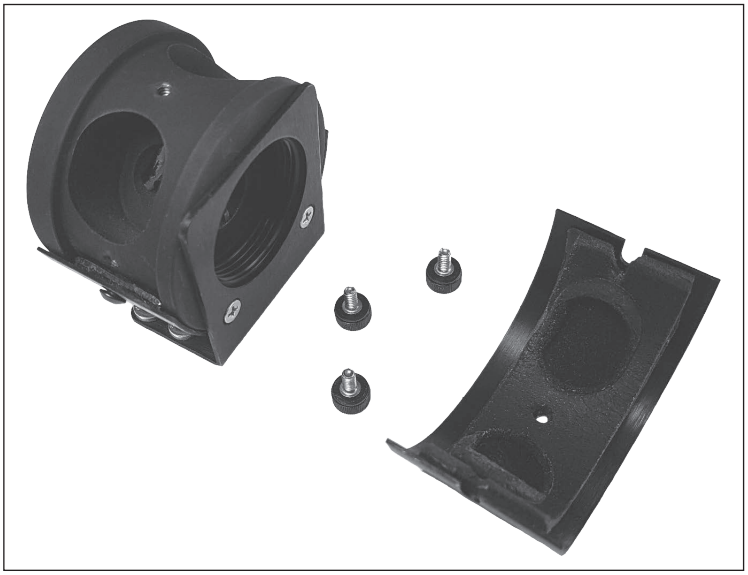
The procedure to clean the sensor optics is as follows -

Switch off the Split2 monitor and disconnect the sensor head cable from the monitor.

Remove the sensor head from its bracket by unfastening the two thumb screws.

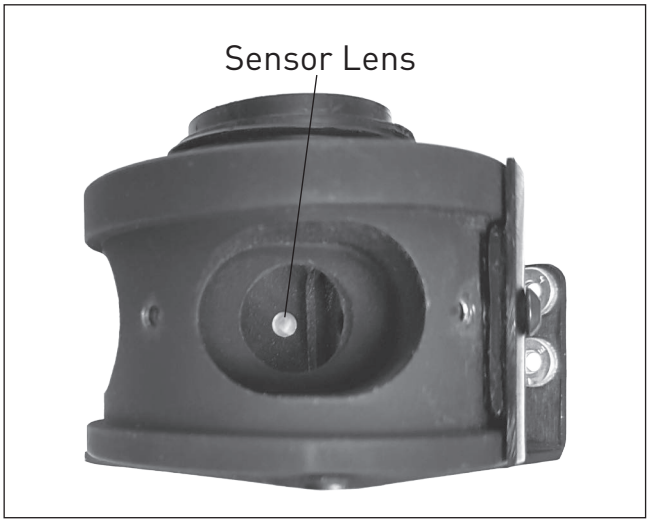
Remove all components from the front and rear of the sensor head.

Unfasten the three thumb screws securing the curved cover plate on the top of the sensor head body and carefully remove the cover from the sensor head body.



Inspect the internal face of the curved cover plate and internal surfaces of the sensor head for dust. If required remove the dust by blowing off with low pressure compressed air.

Inspect the glass lenses of the sensor for dust. If required clean the dust from the lenses using a dry foam tipped swab.



Warning: Do not use a liquid cleaning solution. Excessive use of cleaning solutions will damage the matt black paint finish on the inside surfaces of the sensor head and could penetrate behind the optical lenses. Failure to comply with this warning notice will void the product warranty.

Clean external surfaces of the sensor head and the instrument if required using pre-moistened lens wipes.

Refit the curved cover plate noting that the foam pad affixed to the underside of the cover plate is closer to the front edge of the cover plate than the rear edge so that it fits into the recess in the sensor head body. Secure the cover plate with the three thumb screws, fitting the top screw first and then the two side screws. Fasten the thumb screws securely to ensure the sealing of the cover plate to the sensor body.

Refit the components to the front and rear of the sensor head (refer to the exploded diagram on page 6).

Refit the sensor head to the bracket and secure with the two thumb screws.

Reconnect the sensor head cable to the instrument and perform an auto-zero (refer to page 19) before using the Split2 monitor.

1) Replacement Parts

Part No.	Description
770-303	Battery pack 7.2V 1.15Ah NiMH for Split2 monitor
770-320	Single battery charger 100-240V ~ 50/60Hz supply with UK/EU/US/AUS mains plugs for Split2 monitor
770-322	Calibration span accessory for Split2 monitor
770-4202A	Zeroing accessory for Split2 monitor
770-225	DustComm Pro software CD
770-114	RS-232 serial computer interface cable
225-70A	I.O.M. sampler in plastic complete with two part plastic filter cassette and clip
225-71A	I.O.M. two part plastic filter cassette with cap and clip
P22570	O rings for I.O.M. sampler (set of 4)
P2257001	Spring clip with strap
P2257002	Plastic grid for I.O.M. cassette
P2257003	Plastic spout for I.O.M. cassette
P2257004	Plastic body for I.O.M. sampler
P2257005	Dust cap for I.O.M. sampler

2) Accessories

Part No.	Description
224-52MTX	Sidekick deluxe sample pump with timer 5 - 3000 ml/min ATEX approved
210-3311	AirChek 3000 fully programmable sample pump 5 - 3250 ml/min ATEX and IECEx approved
223-203A	Single battery charger 100-240V ~ 50/60Hz supply with UK/EU/US/AUS mains plugs for Sidekick pump
223-240A	Single fast battery charger 100-240V ~ 50/60Hz supply with UK/EU/US/AUS mains plugs for AirChek 3000 pump
375-07750	chek-mate flowmeter 750 - 5000 ml/min accuracy ±1% of reading
393-0334	Rotameter 0.3 - 3.4 litre/min accuracy ±2.5% VDI/VDE 3513-2:2008
391-01	Flow calibration adapter for I.O.M. sampler
225-13-4A	Tygon tubing 1/4" I/D x 3/8" O/D x 1 metre length
225-772	I.O.M. foam plug for respirable and multi-dust sampling (pack of 10)
770-306	Hand held sampling wand for Split2 monitor
770-307	Tripod stand for Split2 monitor

If the required item is not listed, contact your supplier or SKC sales on +44 (0) 1258 480188

The full range can be found in the current SKC catalogue and at www.skcltd.com

Limited One Year Warranty

1. SKC warrants that this instrument, and each of its component parts, provided for occupational health and safety applications is free from defects in workmanship and materials under normal use for a period of one (1) year. This warranty DOES NOT cover any claims due to abuse, misuse, neglect, alteration, or accident, or use in application for which the instrument was either not designed or not approved by SKC, or, due to the buyer's failure to maintain normal maintenance, improper selection or misapplication. The warranty also DOES NOT cover any claims due to the use of a non-SKC approved charger to charge the battery pack. This warranty shall further be void if changes or adjustments to the instrument are made by a person other than an employee of the seller or, if the operating instructions furnished at the time of installation are not complied with.

2. SKC hereby expressly disclaims all warranties either expressed or implied, including any implied warranties of merchantability or fitness for a particular purpose and neither assumes nor authorises any person to assume for it any liability in connection with the sale of these instruments. No description of the goods being sold has been made a part of the basis of the bargain or has created or amounted to an express warranty that the goods will conform to any such description. Buyer shall not be entitled to recover from SKC any consequential damages; damages to property, damages for loss of use, loss of time, loss of profits or income or any other incidental damages. Nor shall the Buyer be entitled to recover from SKC any consequential damages resulting from defect of the instrument.

3. This warranty extends only to the original purchaser of the warranted instrument during the term of the warranty, the buyer may be required to present proof of purchase in the form of a paid receipt for the instrument.

4. In the event of a defect, malfunction, or other failure of the instrument not caused by any misuse or damage to the instrument while in the possession of the Buyer, SKC will remedy the failure or defect without charge to the buyer. The remedy will consist of service or replacement of the instrument, or refund of the purchase price, at the option of SKC. However, SKC will not elect refund unless it is unable to provide replacement and repair is not commercially practicable.

5. The terms of this warranty begin on the date the instrument is delivered to the Buyer and continue for a period of one (1) year.

6(a) To obtain performance of any obligation under this warranty, the buyer shall return the instrument, freight prepaid to SKC at the following address:-

SKC Limited
11 Sunrise Park
Higher Shaftesbury Road
Blandford Forum
Dorset DT11 8ST
t: 44 (0) 1258 480188
f: 44 (0) 1258 480184

6(b) To obtain further information on the warranty performance contact SKC.

7. This warranty is provided under English law.

8. No other warranty is given by SKC in conjunction with this sale.

The disclaimers and limitations shall not affect the statutory rights of a consumer.

770-300M Issue E April 2020

SKC Limited, 11 Sunrise Park, Higher Shaftesbury Road, Blandford Forum, Dorset, DT11 8ST, **United Kingdom**

Phone: +44 (0) 1258 480188 **Fax:** +44 (0) 1258 480184 **Email:** info@skcltd.com **Web:** www.skcltd.com