ANALYT MESSTECHNIK



OPERATING MANUAL

SKC EPAM 5000 Particulate Monitor

Set-up, zero, flow and span checks, measuring and data download with the EPAM 5000 environmental particulate air monitor for PM10, PM2.5, PM1.0 and TSP, with the DustComm Pro software, maintenance, troubleshooting and ordering information.

AMTC-MN-0024

Rev. 2 · October 2026

About this manual

The SKC EPAM 5000 is a real-time particulate monitor for ambient air and indoor air quality, built into a weather-tight carrying case. An internal pump draws air at 4 L/min through an interchangeable inlet for PM10, PM2.5, PM1.0 or total suspended particulate (TSP) and through an optical sensor. The monitor shows the dust concentration in mg/m³ every second, and can collect a 47 mm filter sample for gravimetric analysis at the same time.

This manual takes you from unpacking to a downloaded data set: power and battery, settings and inlet, the zero, flow and span checks, running a measurement, reading the results on the display and transferring them to a PC with the DustComm Pro software. Later chapters cover maintenance, troubleshooting, technical data and the order numbers of accessories and spare parts.

Read Safety (p. 6) before you use the monitor for the first time. For a first measurement, follow Commissioning (p. 12), the preparation at the start of Operation (p. 14) and Measuring (p. 17) in that order. With the factory settings — PM2.5, a 1-minute storage interval and auto zero on — you only have to fit the PM2.5 inlet, run a manual zero and start the measurement.

The manual applies to the EPAM 5000 monitor, supplied as kits Cat. No. 770-203 (PM10) and 770-202 (PM2.5). Analyt-MTC supplies, services and supports the monitor; for questions, calibration, repairs and spare parts see Service, warranty and contacts (p. 36).

Keep this manual for the lifetime of the product. The current revision is on the product page at analyt-mtc.com.

Conventions in this manual:

- Keys, buttons and menu entries are printed like this: **ENTER**, **Special Functions**.
- A menu path such as **Special Functions** › **System Options** › **Sample Rate** means that you open each entry in turn.

Abbreviations

Abbreviation	Meaning
COM	Serial communication port of the PC
EPA	US Environmental Protection Agency
LED	Light-emitting diode
PM10, PM2.5, PM1.0	Particulate matter, size fractions as defined in Appendix B
RAM	Random-access memory
STEL	Short-term exposure level, as defined in Appendix B
TWA	Time-weighted average, as defined in Appendix B

How this manual marks information

⚠ WARNING

A hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE

Practices not related to personal injury — damage to the product, the process or the sample.

Note
Information that helps understanding; never a hazard.

The four keys of the keypad are written **ON/OFF**, **ENTER**, **UP** and **DOWN**. In a menu path, move the selection arrow to each entry with **UP** or **DOWN** and confirm it with **ENTER**.

Document information

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Rev.	Date	Change
2	October 2026	Quality programme: new document type, number and identity pages.
1	October 2026	First issue.

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CHAPTER 1

Safety

Read this chapter before you use the monitor for the first time.

Intended use

Use the monitor to measure airborne particulate as described in this manual. Accessories and spare parts are listed in Ordering information (p. 35). This manual cannot cover every way the monitor might be used; the user is responsible for how the monitor is used and for the conclusions drawn from its readings.

Operate the monitor between −10 and 50 °C at up to 95 % relative humidity, non-condensing, and store it between −20 and 60 °C (see Specifications (p. 34)). The warranty terms of Analyt-MTC apply (see Service, warranty and contacts (p. 36)).

Service work

You may fit the inlets and the filter holder, run the zero, flow and span checks, adjust the flow, charge and change the battery, clean the impactors and the sensor optics, and carry out the steps in Troubleshooting (p. 31). Any other work inside the enclosure is service work for trained personnel; contact Analyt-MTC (see Service, warranty and contacts (p. 36)).

⚠ WARNING

High voltages may be present inside the instrument enclosure. Contact with live parts can cause an electric shock. Do not tamper with the hardware. Repairs may only be carried out by properly trained service personnel, following the manufacturer's service documentation. Apply the usual electrical safety precautions whenever you work on the instrument.

Battery and charger

The monitor runs on a rechargeable 6 V lead-acid battery pack. Charge it fully before every use, as described in Charging the battery (p. 12).

⚠ WARNING

A hazardous environment can contain an explosive atmosphere, and charging the battery there can ignite it. An explosion can cause death or serious injury. Do not charge the battery in a hazardous environment. Use only the charger supplied with the monitor or its approved replacement.

Stored data

Three actions erase the whole data memory of the monitor: starting a run with **Overwrite**, running a span check (p. 26) and erasing the memory (p. 19). The monitor asks you to confirm each one, but the data cannot be recovered afterwards. Pressing the internal reset switch can also lose the stored data (see Resetting the monitor (p. 32)).

NOTICE

A span check and a run with Overwrite erase the stored data, and the data cannot be recovered afterwards. Download the stored data to a PC (see Downloading data (p. 25)) before you run a span check or start a run with Overwrite.

CHAPTER 2

Product description



Figure 1. The EPAM-5000 in its open case.

How the monitor measures

The EPAM 5000 measures by near-forward light scattering. An infrared light source and a photodetector sit at 90° to each other around the sample stream. Particles passing through the beam scatter light onto the detector, and the amount of scattered light is proportional to the aerosol concentration. The electronics filter out noise and drift, and an internal temperature compensation keeps the baseline stable outdoors.

The monitor is calibrated with Arizona Road Dust (ARD) against NIOSH Method 0600 for respirable dust; the accuracy against this reference is ±10 %. Real dust differs from the calibration dust in composition and size distribution. For accurate results at a site, compare the monitor with a gravimetric filter sample and apply a correction factor (see Applying a correction factor (p. 24)).

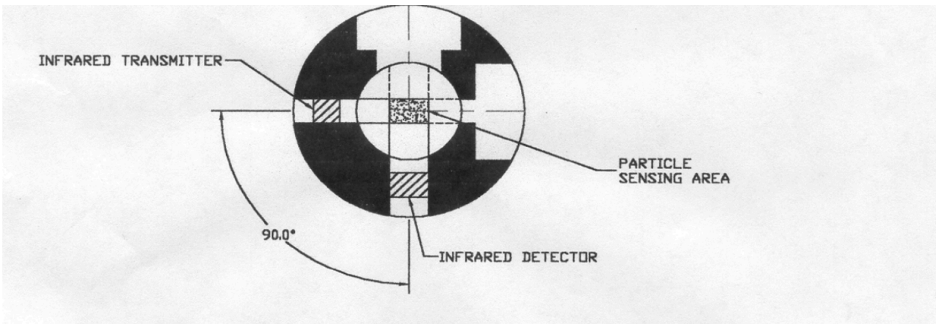


Figure 2. Principle of near-forward light scattering used in the EPAM-5000: an infrared light source, the particles in the sample air, and the photo detector at an angle to the light.

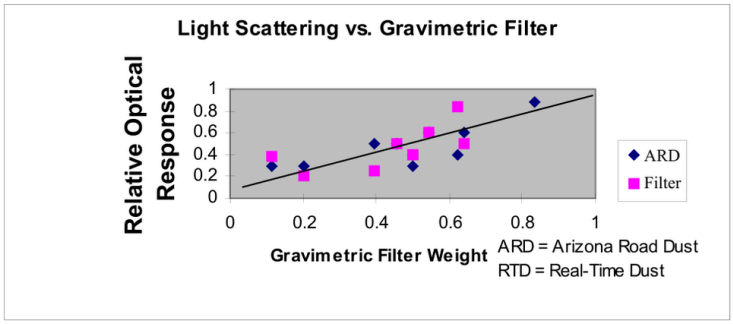


Figure 3. Light scattering against the gravimetric filter: relative optical response plotted against the gravimetric filter weight.

Real-time and filter measurement together

The reference method draws air through a 47 mm membrane filter, which is then weighed or analysed in a laboratory. The dust is collected and can be analysed chemically, but the result is available only after the laboratory work. The EPAM 5000 offers both: the optical sensor shows the concentration every second, and the same air stream can also pass through a 47 mm filter (styled on the EPA Federal Reference Method, FRM) behind the sensor, so that a gravimetric sample is collected during the same run.

The sample air enters through the inlet on the sensor head. Without an impactor the monitor measures total suspended particulate (TSP); with an impactor in the inlet it measures PM10, PM2.5 or PM1.0 (see Particle size and inlet (p. 15)). Every 30 minutes the monitor purges the sensor optics with clean, filtered air and re-establishes its zero baseline (see Auto zero (p. 16)).

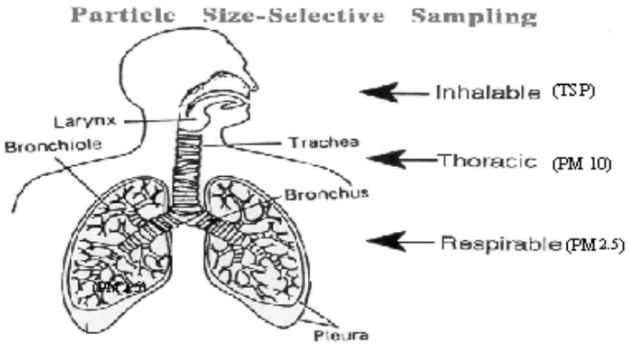


Figure 4. Where the size fractions are deposited in the airways: inhalable, thoracic (PM-10) and respirable (PM-2.5).

Checking the contents

The kits differ only in the impactor supplied: Cat. No. 770-203 with the PM10 impactor and 770-202 with the PM2.5 impactor. If anything is missing, contact Analyt-MTC.

Qty	Part
1	EPAM 5000 monitor in its weather-tight carrying case
1	Rechargeable lead-acid battery pack, 6 V
1	Battery charger, 110 V or 220 V
1	Impactor sleeve (sampling inlet), for TSP on its own or holding the impactor
1	Impactor for PM10, PM2.5 or PM1.0, depending on the kit
1	Flow audit meter (flow meter) with adapter and tubing, for the flow check
1	Trimming tool, for the flow adjustment screw
1	RS-232 serial cable, 9-pin, female to male
1	DustComm Pro software on a USB memory stick
1	Operating manual



Figure 5. Monitor and accessories. A flow audit meter is connected by tubing to the impactor sleeve on the sensor head. In front, from left: trimming tool, RS-232 cable, impactor, software medium, battery charger.

Front panel and keys



Figure 6. Front panel with the sensor lid raised. Left: sensor head with the round filter holder underneath and, at the bottom left, the **Flow Rate** adjustment screw (− / +). Centre: four-line display, here showing the main menu. Right: the keys **UP**, **DOWN**, **ENTER** (ENT) and **ON/OFF** (red), and a quick-start label.

The display has four lines of 20 characters. It shows the concentration in mg/m³, the statistics and the menus. A selection arrow (▯) on the display marks the menu entry that **ENTER** will open. The splash-proof membrane keypad has four keys:

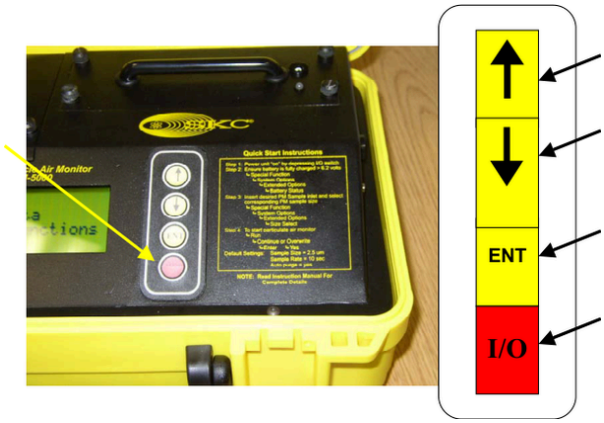


Figure 7. The keypad: up and down arrows, **ENT** (Enter) and **I/O** (on/off).

Key	What it does
ON/OFF	Switches the monitor on; press it again to switch off.
ENTER	Opens the selected menu entry. Stops a running measurement. In a number field, moves to the next digit or field.
UP	Moves the selection arrow up one line. Increases the selected digit. Steps back through the statistics screens.
DOWN	Moves the selection arrow down one line. Decreases the selected digit. Steps forward through the statistics screens. During a run, starts a sensor purge.

Switching on and the main menu

Press **ON/OFF**. The title screen shows the instrument name and the firmware version. Press **ENTER** to reach the main menu. Selecting **Cancel** in any menu backs out of the current function. The full menu tree is in Menu map (p. 37).

Entry	Leads to
Run	Starting a measurement, with or without alarm (see Starting a measurement (p. 18)).
Review Data	Statistics of the stored runs and the download to a PC (see Reviewing stored data (p. 19)).
Special Functions	Date and time, alarm level, sample rate, particle size, zero, battery status and erasing the memory.
Span Check	Checking the calibration with the span reference (see Span check (p. 26)).

CHAPTER 3

Commissioning

The monitor runs on its internal battery pack or from the battery charger. A full battery lasts approximately 24 hours; recharging it takes about 22 hours.

The battery pack

The battery pack is a rechargeable 6.0 V lead-acid battery that powers the monitor for approximately 24 hours. It sits under a metal plate next to the sensor head and can be removed and charged outside the monitor, so that a second pack can keep the monitor running. A 2 A fuse in the pack (position F1) protects the monitor. For continuous operation, run the monitor from the charger; the optional solar panel supplies power where no mains is available.

Checking the battery

Step	Action
1	Select **Special Functions** › **System Options** › **Extended Options** › **Battery Status**. The **Battery Level** screen shows the battery voltage in V DC.
2	Read the voltage:

Voltage	Battery
6.1 V or higher	Fully charged.
below 6.1 V	Recharge it before the next measurement.
5.95 V or lower	Depleted; the monitor may not respond correctly.

Step	Action
3	Press **ENTER** to return to the main menu. The internal pump runs while the Battery Level screen is shown; the flow check uses this (see Checking the flow rate (p. 17)).

Note
During a run, a battery bar at the top right of the display shows the charge relative to time. It is only a rough indication; the voltage is shown only on the Battery Level screen. If the battery runs low during a run, the monitor ends the measurement and shows the low-battery screen.

Charging the battery

Charge the battery fully before every use. You can charge it in the monitor or after removing it.

WARNING

A hazardous environment can contain an explosive atmosphere, and charging the battery there can ignite it. An explosion can cause death or serious injury. Do not charge the battery in a hazardous environment. Use only the charger supplied with the monitor or its approved replacement.

Step	Action
1	Plug the charger into a mains socket.

Step	Action
2	Plug the charger cable into the charging socket on the top of the battery pack. The LED on the battery pack lights red while the battery charges — but only while the monitor is switched off, or the battery pack is out of the monitor.
3	Leave the battery on charge until the LED turns green. This takes about 22 hours with the monitor switched off. If the monitor runs on the charger while it measures, the battery recharges in about 24 hours.

CHAPTER 4

Operation

Operation runs from preparing a measurement to the downloaded data: set the clock, alarm, sample rate and particle size, fit the inlet and filter and zero the monitor; check the flow rate; take the measurement; review the statistics on the monitor; then transfer the data to a PC with DustComm Pro.

Before a measurement, check the clock, set the alarm if you use it, choose the storage interval and the particle size, fit the matching inlet and, if you want a gravimetric sample, a 47 mm filter. Then zero the monitor.

The monitor leaves the factory set to PM2.5, a 1-minute sample rate and auto zero on. If these suit your measurement, fit the PM2.5 inlet, run a manual zero (p. 16) and start the run — useful when you need data quickly, for example in an emergency response.

Date and time

Every stored reading carries the date and time, so the clock must be right for your records. It was set at the factory to US Eastern Standard Time; set it to your local time and adjust it for daylight saving time. The time uses the 24-hour clock; the date is shown as day of the week and day-month-year, for example **MON 17-DEC-01**.

Step	Action
1	To check the clock, select **Special Functions › Date/Time › View Date/Time**. The screen shows the current date and time; press **ENTER** to go back.
2	To change them, select **Special Functions › Date/Time › Set Date/Time**.
3	Set each digit with **UP** and **DOWN**, and move to the next digit or field with **ENTER**: time, then date, then day of the week.
4	After the last field, press **ENTER**. Select **Set Date/Time** to save the new settings, or **Cancel** to leave without saving.

Alarm level

The monitor can sound an audible alarm (90 dB at 3 ft) when the concentration reaches a level you set — for example to warn workers that a limit is close. Set the level to the limit value that applies to the dust you measure and to your site.

Step	Action
1	Select **Special Functions › Set Alarm**. The screen shows the alarm concentration in mg/m³, in the format 000.00.
2	Set each digit with **UP** and **DOWN**, and move to the next digit with **ENTER**.
3	Press **ENTER** after the last digit. The alarm level is saved and the main menu appears.

The alarm is active only in runs started with **ALM - continue** or **ALM - overwrite** (see Starting a measurement (p. 18)).

Sample rate

The monitor measures every second and stores the average over the sample rate you choose. The maximum sampling time depends on the sample rate:

Sample rate	Maximum run time
1 second	6 hours
10 seconds	60 hours
1 minute (default)	15 days
30 minutes	15 months

Step	Action
1	Select **Special Functions › System Options › Sample Rate**.
2	Select the sample rate and press **ENTER**.

Particle size and inlet

The inlet decides which particle fraction reaches the sensor. An impactor consists of a jet (A in Figure 8) and an impaction cup (B); its cut size is engraved on the bottom of the jet. The impactor sleeve (C) holds one impactor and fits into the sensor head. For TSP, use the sleeve without an impactor. The size you select in the menu must match the inlet you fit; the run screen shows it as a letter in front of the concentration.

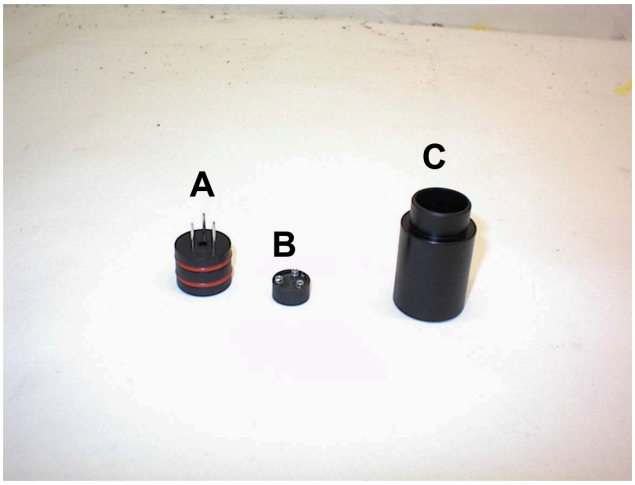


Figure 8. Inlet parts. From left to right: **A** impactor jet · **B** impaction cup · **C** impactor sleeve.

Measure	Fit in the sensor head	Select	Letter
PM1.0	Sleeve with 1.0 µm impactor	**`1.0 um - E`**	E
PM2.5	Sleeve with 2.5 µm impactor	**`2.5 um - S`** (default)	S
PM10	Sleeve with 10 µm impactor	**`10 um - M`**	M
TSP	Sleeve only	**T.S.P. - L**	L

Step	Action
1	Select **Special Functions › System Options › Extended Options › Size Select**.
2	Select the particle size and press **ENTER**. The main menu appears.
3	Fit the matching inlet into the sensor head.
4	If you also collect a gravimetric sample, fit a clean 47 mm filter (see The 47 mm filter holder (p. 16)) and check the flow (see Checking the flow rate (p. 17)).
5	Run a manual zero (p. 16).

The 47 mm filter holder

Under the sensor lid, a holder for a 47 mm filter (EPA FRM style) sits in line with the sample stream. With a filter fitted, the monitor collects a gravimetric sample alongside the real-time reading, which you can use to calculate a correction factor (see Applying a correction factor (p. 24)). Suitable filters are listed in Ordering information (p. 35).

Step	Action
1	Undo the screw on the right-hand side of the sensor lid and raise the lid (see Figure 6 (p. 10)). The filter holder is now accessible.
2	Unscrew the round bottom cover of the filter holder and take the holder out.
3	Place a clean 47 mm filter in the holder. Check that the white filter holder ring is in place.
4	**NOTICE** The screw of the sensor lid is spring-loaded. Overtightened, the spring inside can break. Do not overtighten the screw when you close the sensor lid. Screw the holder back on firmly — a loose holder leaks air — and close the sensor lid.
5	Check the flow each time you fit a new filter (see Checking the flow rate (p. 17)).

Auto zero

Strong changes in ambient temperature make the baseline drift. With auto zero on — the factory setting — the monitor purges the sensor optics with clean, filtered air every 30 minutes and re-establishes the zero baseline. While it does so, an **X** in a box appears at the top right of the display. During a run you can start a purge at any time by pressing **DOWN**.

Step	Action
1	Select **Special Functions › System Options › Extended Options › Calibration**.
2	Select **Auto Zero** to switch the function off. Select it again to switch it back on.

Manual zero

The manual zero sets the measuring baseline to 0 mg/m³. Run it before every new series of measurements, with a fully charged battery (see Checking the battery (p. 12)) and with the inlet fitted that you will measure with.

Step	Action
1	Check that the inlet matches the selected particle size (see Particle size and inlet (p. 15)).
2	Select **Special Functions › System Options › Extended Options › Calibration**. The calibration menu appears, with **Manual Zero** at the top.
3	Select **Manual Zero**, then confirm with **Manual Zero** on the next screen.
4	The monitor shows **Manual-Zeroing, Please Wait** and re-establishes the baseline on its own. This takes about 99 seconds. When it has finished, the main menu appears.

Checking the flow rate

Check the flow every time you fit a new gravimetric filter. You need the flow audit meter and adapter from the kit, or another airflow calibrator, and the inlet you will measure with.

Step	Action
1	Fit the inlet for the particle size you will measure (see Particle size and inlet (p. 15)).
2	Fit the flow adapter on the inlet and connect it with the tubing to the flow meter (Figure 9).
3	Select **Special Functions › System Options › Extended Options › Battery Status**. The internal pump starts. The battery voltage should be above 6.1 V.
4	Hold the flow meter upright and read the flow.



Figure 9. Flow check: the flow meter, held upright, is connected to the flow adapter on the inlet.

Reading	What to do
4.0 L/min	The flow is correct. Press **ENTER** to stop the pump, remove the flow meter and tubing, and continue with your preparation.
Not 4.0 L/min	Adjust the flow as described below.
No flow	See Flow of 4 L/min not reached (p. 32).

> **Note**
> A flow meter of this type reads correctly only when it is upright.

Adjusting the flow rate

Step	Action
1	With the pump running as above, turn the **Flow Rate** adjustment screw at the bottom left of the front panel with the trimming tool: clockwise to increase the flow, counter-clockwise to reduce it.
2	When the flow meter reads 4.0 L/min, note the flow in your records.
3	Remove the flow meter and the tubing.
4	Press **ENTER** to leave the Battery Level screen. The pump stops and the main menu appears.

Measuring

A measurement runs from **Run** until you press **ENTER**. The monitor stores the averaged readings under a location code, and the statistics are available as soon as the run ends.

Before you start

Check that…	See
the battery is charged, or the monitor runs from the charger	Checking the battery (p. 12)

Check that…	See
the right particle size is selected	Particle size and inlet (p. 15)
the matching inlet is fitted	Particle size and inlet (p. 15)
the date and time are correct	Date and time (p. 14)
the manual zero has been run	Manual zero (p. 16)
the alarm level is set, if you use the alarm	Alarm level (p. 14)

Starting a measurement

Step	Action
1	Switch the monitor on and press **ENTER** to reach the main menu.
2	Select **Run**, then one of the four ways to start: **Run - continue** — Keeps the stored data and stores the new run under the next location code. **Run - overwrite** — Erases all stored data in all locations and stores the new run under location 001. **ALM - continue** — As **Run - continue**, with the audible alarm active. **ALM - overwrite** — As **Run - overwrite**, with the audible alarm active.
3	**NOTICE** An overwrite erases all stored data and cannot be undone. Download the data first if you still need them. If you chose an overwrite entry, the monitor asks you to confirm the overwrite of the data. Select **Yes** to erase the data and start, or **No** to cancel without changing the memory.
4	The internal pump starts and the run screen appears. The measurement is running. How long it can run depends on the sample rate (p. 15).

The run screen

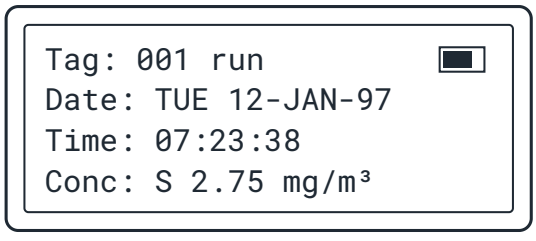


Figure 10. Run screen during a measurement (example values).

Field	Meaning
Tag	Location code of this run (see Location codes (p. 19)).
Bar	Battery charge, as a rough indication over time.
Date	Day of the week and date, dd-mmm-yy.
Time	Current time, 24-hour clock.
Conc	Particle size letter — **E** PM1.0, **S** PM2.5, **M** PM10, **L** TSP — and the current concentration in mg/m³.
X	Shown at the top right while the sensor is purged (auto zero (p. 16)).

A concentration that stays negative means that the baseline is no longer at zero. Run a manual zero (p. 16), or switch auto zero (p. 16) on.

Ending a measurement

Press **ENTER**. The pump stops, the monitor stops recording and returns to the main menu. The statistics of the run are now available (see Reviewing stored data (p. 19)).

Location codes

Every run is stored under a location code, called the tag. The memory holds 21 600 readings, shared among up to 999 location codes. A run started with **continue** gets the next free code: if tags 001 and 002 hold data, the new run is stored as 003. A run started with **overwrite** erases everything and starts again at 001. When you survey several sites, keep a list of which site belongs to which code.

Erasing the memory

The data memory is erased when you start a run with **overwrite**, when you run a span check (p. 26), or when you erase it directly. Erasing removes all readings in all locations.

Step	Action
1	Select **Special Functions › System Options › Erase Memory**.
2	The monitor asks **Erase Memory?** and warns that the data will be lost. Select **Yes** to erase, or **No** to keep the data.

Reviewing stored data

For every location code the monitor computes summary statistics, which you can read on the display. For detailed analysis, download the data to a PC (see DustComm Pro software (p. 20)).

Statistics on the display

Display	Meaning
Tag	Location code of the run.
Date	Date of the measurement.
Start / Stop	Time the run started and ended.
Time	Time at which the reported statistic occurred.
MAXIMUM	Highest concentration of the run.
MINIMUM	Lowest concentration of the run.
T.W.A.	Time-weighted average concentration.
Elapsed	Time over which the TWA was averaged.
S.T.E.L.	Short-term exposure level: the highest concentration averaged over 15 minutes.

Reading the statistics

Step	Action
1	Select **Review Data › Statistics**. If the memory is empty, the monitor shows **No Data Recorded**. Otherwise it scans the memory.
2	Select the location to review. To choose another location than the one offered, select **New Tag**.
3	Enter the location code: set each digit with **UP** and **DOWN**, move to the next digit with **ENTER**, and press **ENTER** after the last digit.
4	The first time a location is reviewed, scrolling dots show that the monitor is computing the statistics. Then the first of five statistics screens appears.
5	Press **DOWN** to move forward through the screens and **UP** to move back.

Screen	Shows
1 STATS	Tag, date, start time and stop time

Screen	Shows
2 MAXIMUM	Date, time and concentration of the highest reading
3 MINIMUM	Date, time and concentration of the lowest reading
4 T.W.A.	Date, time-weighted average and elapsed time
5 S.T.E.L.	Date, STEL and the time it occurred

To transfer the data to a PC, select **Review Data** › **Download** and continue with Downloading data (p. 25).

DustComm Pro software

DustComm Pro transfers the stored data from the monitor to a Windows PC and turns them into statistics, plots and reports. It exports the data as a comma-delimited text file for spreadsheet programs such as Microsoft Excel, and corrects them for dust that differs from the calibration dust.

Installing the software

The installation takes less than 5 minutes. The PC needs Windows ME or later, 4 MB of free disk space and 8 MB of RAM. Install the program on drive C:, in the subfolder EPAM5000.

Step	Action
1	Start Windows and close all open programs.
2	Insert the installation medium supplied with the monitor and open it in the file explorer.
3	Open the folder **DustComm V1.2** and double-click **Setup**.
4	Follow the steps of the installation wizard.

To start the program, double-click its icon on the desktop. If there is no desktop icon, open the Windows start menu, go to the DustComm Pro 1.2 program folder and select **DustComm Pro 1.2**. A sample data file (.dcm) is installed with the program, so you can try out its functions before you have data of your own.

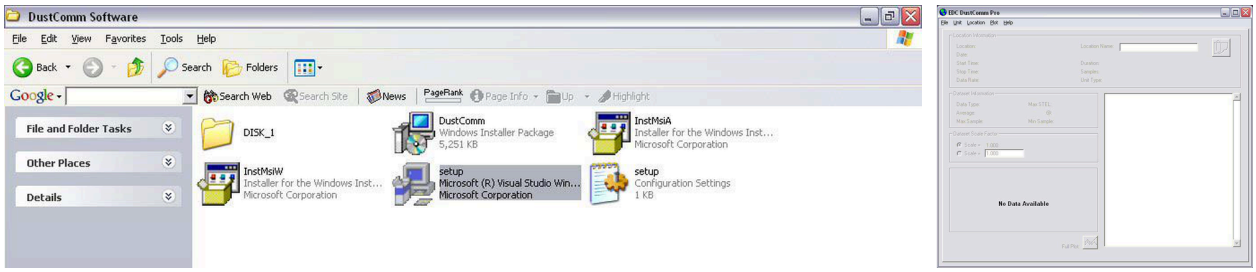


Figure 11. Left: the folder with **Setup** selected. Right: DustComm Pro just after it has started.

Menus

Menu commands shown in light type are not available for the current task.

Menu	Command	What it does
FILE		
	Open	Opens a saved project file.
	Save	Saves changes to the open file under its current name.
	Save As	Saves the open file for the first time, or under a new name or in a new place.

Menu	Command	What it does
	Close	Closes the open file.
	Export	Saves the data as a text file for a spreadsheet program.
	Exit	Closes the program.
UNIT		
	Download	Receives the data from the monitor.
	Properties	Selects the instrument and the PC's COM port.
LOCATION		
	Notes	Adds notes to the open file.
	Print	Prints the location currently shown.
PLOT		
	Review	Opens a saved plot.
HELP		
	Register	Registers the software and the instrument.
	About	Shows the program version.

Opening and saving project files

DustComm Pro keeps each download as a project file, sorted by time, with all values in mg/m³. Files are saved in the Documents folder unless you choose another folder.

To	Select
Open a file	**File** › **Open**, then double-click the file.
Save a new file, or save under a new name or location	**File** › **Save As**, type a file name and select **OK**. The title bar shows the new name.
Save changes under the same name	**File** › **Save**.
Close the program	**File** › **Exit**, or the **X** at the top right of the window.

Downloading the stored data to the PC is described under Communication (p. 25).

The project window

The project window shows one location at a time, in five sections:

Section	Content
Location Information	Date and time, start and stop time, data rate, duration, number of samples and instrument. A box for naming the location, and a shortcut for adding notes.
Dataset Information	Type of data, average, maximum and minimum sample, and maximum STEL.
Dataset Scale Factor	The scale factor applied to the data (see Applying a correction factor (p. 24)).
Quick Plot	A small preview of the plot, with the **Full Plot** button below it.
Location Data	Every stored concentration in mg/m³, with its time.

Exporting to a spreadsheet

Spreadsheet programs read the data once you have exported them as a text file. A project must be open.

Step	Action
1	Select **File** › **Export**.
2	In the **Export Locations** window, select **All**, or the range of locations to export, and select **OK**.

Step	Action
3	In the **Export To** window, type a file name and select **Save**.
4	In the spreadsheet program, choose **Open**, set the file type to **All files** and double-click the exported file.

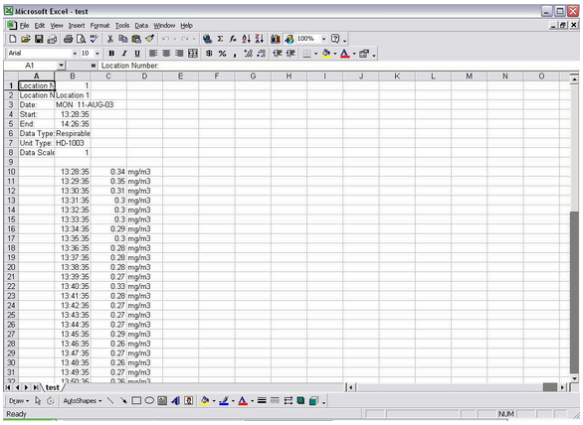


Figure 12. Exported data opened in a spreadsheet program.

Plotting the data

Select the **Full Plot** button below the Quick Plot to plot the location shown. To reopen a plot you have saved, select **Plot › Review**. The plot window has a button bar along the top:

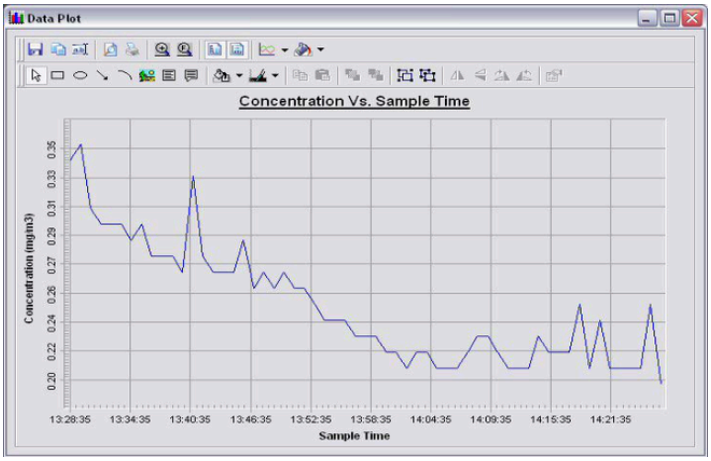


Figure 13. A full plot: concentration against sample time.

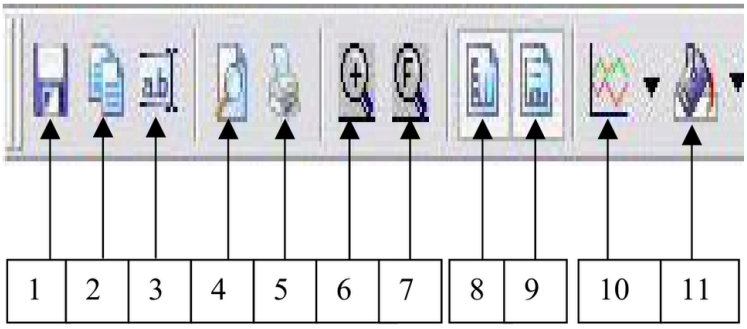


Figure 14. The button bar of the plot window, numbered as in the table.

No.	Button
1	Save the plot as a DustComm Pro chart (*.dcc)
2	Copy the plot to a bitmap

No.	Button
3	Edit the title of the plot
4	Page setup
5	Print the plot
6	Zoom: drag from point to point over the part you want to enlarge
7	Return to the full plot
8	Show or hide vertical grid lines
9	Show or hide horizontal grid lines
10	Graph type, for example bar or line
11	Graph colour

A second toolbar annotates the plot:

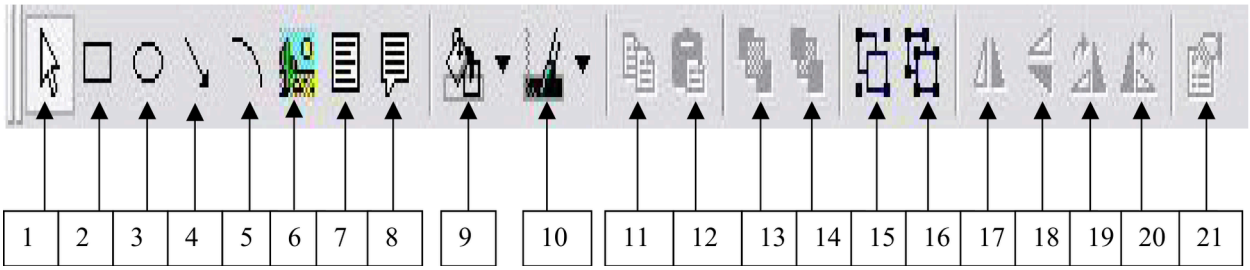


Figure 15. The annotation toolbar, numbered as in the table.

No.	Button
1	Pointer tool
2	Insert squares
3	Insert ovals
4	Insert arrows
5	Insert arched lines
6	Insert a picture: draw its box, right-click it, choose **Properties**, open the **Picture** tab and select the picture
7	Insert a text box
8	Insert a callout with text
9	Colour of squares, ovals, text boxes and callouts
10	Colour of the text in text boxes and callouts
11	Copy
12	Paste
13	Bring to front
14	Send to back
15	Group
16	Ungroup
17	Flip left to right
18	Flip upside down
19	Rotate clockwise
20	Rotate anticlockwise
21	Properties of the selected item

Editing the title

Step	Action
1	Plot the location.
2	Select the **Edit Title** button (3) on the button bar.
3	Type the title in the window that opens and select **OK**. The plot shows the new title.

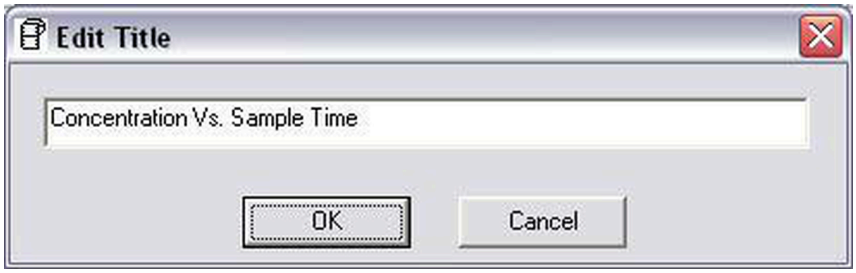


Figure 16. The **Edit Title** window.

Applying a correction factor

A correction factor adjusts the readings to a gravimetric reference, for example the 47 mm filter collected during the same run. Calculate it as:

correction factor = gravimetric concentration ÷ concentration read by the monitor

Step	Action
1	In the Dataset Scale Factor section, select the second **Scale =** box.
2	Type the correction factor and press **Enter**. All data points of the project are multiplied by the factor. To remove the correction again, select the first **Scale =** box.

CHAPTER 5

Communication

Downloading data

A download takes three steps: connect the cable, prepare the PC, then send the data from the monitor.

Connecting the cable

Step	Action
1	Connect the supplied RS-232 cable to the serial connector of the monitor.
2	Connect the other end to a COM port (9-pin serial port) of the PC. If the PC has only USB ports, use a serial-to-USB adapter.
3	Check that both connectors are tight. A loose connection can interrupt the transfer.

Preparing the PC

Step	Action
1	Start DustComm Pro.
2	Select **Unit** › **Properties**. Choose your instrument and the COM port the cable is connected to, then select **OK**.
3	Select **Unit** › **Download**. The download window appears, ready to receive.

Sending the data from the monitor

Step	Action
1	On the monitor, select **Review Data** › **Download** › **To Dust Data Collector** and press **ENTER**.
2	The PC shows the transmitting window, and its progress bars grow as the data arrive.
3	When the transfer is complete, the monitor shows its **To Dust Data Collector** screen again; you can switch it off. On the PC the data appear in a new project, one tab per location code at the bottom of the window. Save the project.

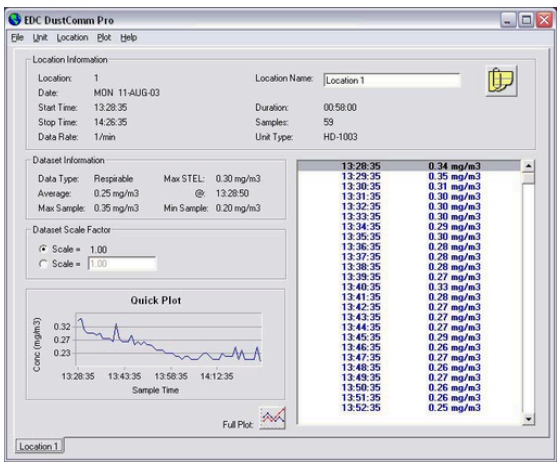


Figure 17. A project file after the data have been transmitted.

If the transfer does not start or stops, see Download fails (p. 33).

CHAPTER 6

Calibration and verification

The span check confirms the factory calibration of the optical sensor with a reference insert. The flow check belongs to the preparation of a measurement and is under Operation (see Checking the flow rate (p. 17)): the impactors separate the particle sizes correctly only at the nominal flow of 4.0 L/min.

Span check

The span reference, Cat. No. 770-207, is a light-scattering insert that gives the optical sensor a constant signal. Its value, the **k value**, is printed on it. When the insert sits in the sensor head, the monitor should display a concentration within ±10 % of the k value. Check the span:

- when you use the monitor for the first time, to confirm the factory calibration;
- once a month with normal use (about twice a week);
- after the monitor has been dropped or otherwise damaged.

Before you start, clean the sensor optics (see Cleaning the sensor optics (p. 28)), charge the battery fully and work in clean surroundings. Follow the procedure completely: skipping steps can give a wrong reading.

NOTICE

The span check erases all stored data. Download the data first (see Downloading data (p. 25)).

Step	Action
1	Switch the monitor on. Set the sample rate to 1 second (see Sample rate (p. 15)) and let the monitor measure for 5 minutes (see Starting a measurement (p. 18)).
2	While it runs, press **DOWN** to start a purge. An **X** appears at the top right of the display.
3	When the **X** has disappeared, press **ENTER** to stop the run.
4	Select **Span Check** in the main menu. Select **Yes** to continue — all stored data will be erased — or **No** to go back and download the data first.
5	The sensor calibration screen appears. The scale factor must read **1000**; if it does not, set it to 1000 with **UP** and **DOWN**.
6	Remove the zeroing filter, if fitted, and the impactor sleeve from the sensor head.
7	Insert the span reference into the sensor head (Figure 18): slide its locating pin into the locating hole of the sensor head, push the insert down so that it sits square, and turn it slightly clockwise. Its position must be exactly the same every time, or the readings will not be reproducible.
8	Wait 2 to 3 minutes until the reading on the display has settled.
9	Compare the displayed concentration with the k value printed on the span reference.
10	Remove the span reference and put it back in its protective sleeve.

Note

Keep the optical windows of the span reference free of fingerprints and dirt. Clean them with the cleaning kit (Cat. No. 770-305B) and store the reference in its protective sleeve.

Result	What to do
Within ±10 % of the k value	The monitor has passed the span check.
Outside ±10 %	Repeat the check to rule out a handling error. If the result is still outside ±10 %, contact Analyt-MTC; the monitor needs recalibration.



Figure 18. Inserting the span reference into the sensor head.

A span reference bought separately has no k value for your monitor. Carry out steps 1 to 8 and step 10 three times, note the displayed concentration each time and use the average as the k value.

In addition, have the monitor recalibrated once a year according to ISO and NIST procedures; Analyt-MTC organises this (see Service, warranty and contacts (p. 36)).

CHAPTER 7

Maintenance

Clean and grease the impactors regularly, and keep the sensor optics clean. Charging the battery is covered in Charging the battery (p. 12), the flow check in Checking the flow rate (p. 17) and the span check in Span check (p. 26).

Cleaning and greasing the impactors

Particles collect on the greased target disk of the impaction cup. Start by cleaning and re-greasing the impactors after every 30th sample or once a month, and more often if you see heavy deposits on the target disk. You need a solvent such as hexane or petroleum naphtha (white gas, lantern fuel) in a squeeze bottle, impactor grease (Cat. No. 770-211; Apiezon M, Glisseal HT or a similar grease) and a dropper bottle.

⚠ WARNING

Hexane and naphtha are highly flammable. Near a flame or another source of ignition, they can catch fire. Work in a well-ventilated place, away from flames and other sources of ignition, and follow the solvent's safety data sheet.

Step	Action
1	Push the impactor out of the impactor sleeve from below with a pen, so that it comes out through the top into your other hand.
2	Rinse the impactor from top to bottom with solvent from the squeeze bottle, paying particular attention to the target disk. Alternatively, clean it in an ultrasonic bath with mild soapy water.
3	Gently pull the impaction cup off the jet.
4	Let all parts air-dry.
5	Prepare the grease solution: in the dropper bottle, mix a strand of grease about 1 in long with 30 mL of solvent. Shake the bottle vigorously until you have an opaque, even suspension without lumps of grease.
6	Put 2 or 3 drops of the solution on the impaction cup. The drops should soak the disk and flow freely to its edge.
7	Let the solvent evaporate. A thin film of grease remains on the impaction cup.
8	Fit the impaction cup back onto the jet, and push the impactor back into the impactor sleeve.

Cleaning the sensor optics

The automatic purge keeps most dust away from the optics, but the sensor still needs regular cleaning. Check the sensor optics every 2 months, and weekly if the monitor measures at a TWA of 2 to 3 mg/m³. The cleaning kit, Cat. No. 770-305B, contains a blower bulb, swabs and lens tissue; you also need isopropyl alcohol.

The optical sensor has two covers, one on the front and one on the right-hand side, each held by thumbscrews.



Figure 19. The cleaning kit: low-pressure air, isopropyl alcohol, cotton swabs and lens tissue.

Step	Action
1	Switch the monitor off. Remove the thumbscrews and take off the sensor covers (Figure 20).
2	Look into the sensor cavities for dust. Blow it away with low-pressure air, or wipe it off with a foam-tipped swab.
3	**NOTICE** Alcohol that runs into the monitor can damage it. Do not let any alcohol run into the inside of the monitor. Inspect the glass lens covers. Blow the dust off with low-pressure air, or wipe them with a cotton swab moistened with a little isopropyl alcohol (Figure 21).
4	Fit the sensor covers again: the front cover is the one with the circular pattern on its gasket.
5	Tighten the thumbscrews firmly. If they are too loose, air leaks in and the flow is no longer correct.



Figure 20. Removing the front sensor cover. The second cover is on the right-hand side of the sensor (not visible).

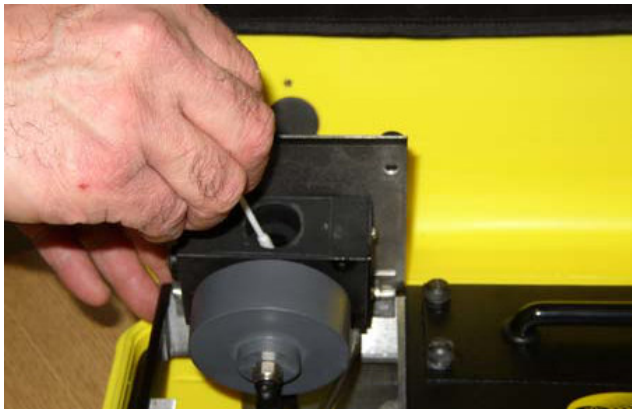


Figure 21. Cleaning the sensor with a cotton swab.



Figure 22. Left: blowing dust off with low-pressure air. Right: applying isopropyl alcohol to a cotton swab.

Removing and refitting the battery pack

Step	Action
1	Switch the monitor off.
2	**NOTICE** Pulling on the spring-loaded screws breaks the spring. The battery pack can then no longer be secured. Never pull on the spring-loaded screws. Loosen the four retaining screws of the battery plate. They are spring-loaded: turn each screw until it pops up on its spring.
3	Slide the battery plate with the battery pack out of the monitor (Figure 23).
4	To refit the pack, slide it back in, then push each screw down and turn it to tighten.



Figure 23. Removing the battery pack: the battery plate is lifted out of its slot next to the sensor head.

CHAPTER 8

Troubleshooting

Problems and remedies

Problem	Remedy
The display is incomplete, or the display and keys do not respond.	See The monitor does not respond (p. 31).
The display shows **Memory Full**.	Download the data and erase the memory (see Erasing the memory (p. 19)). If the message comes back, the internal lithium back-up battery may need replacing; contact Analyt-MTC.
The flow cannot be set to 4 L/min, or there is no flow.	See Flow of 4 L/min not reached (p. 32).
The concentration stays negative.	The baseline is off zero. Run a manual zero (p. 16), or switch auto zero (p. 16) on.
The span check is outside ±10 % of the k value.	Clean the sensor optics and repeat the span check (p. 26) carefully. If it fails again, contact Analyt-MTC for recalibration.
A run ended early and the low-battery screen is shown.	Recharge the battery (see Charging the battery (p. 12)), or run the monitor from the charger.
The data cannot be downloaded to the PC.	See Download fails (p. 33).

The monitor does not respond

Work through these checks in order if the display is incomplete or the monitor has locked up.

Step	Action
1	**The display is on:** check the battery voltage (see Checking the battery (p. 12)). At 5.95 V or lower the battery is depleted. Replace it with a fully charged battery pack (see Removing and refitting the battery pack (p. 30)), or connect the charger.
2	**NOTICE** A fuse with a different rating can damage the monitor. Replace the fuse only with an identically rated 2 A fuse. **The display stays dark:** remove the battery pack and measure the voltage between its positive pin and the case ground with a digital voltmeter. • 5.95 V or lower: recharge the battery, in or out of the monitor, until the LED on the pack changes from red to green. • Higher than 5.95 V: check the 2 A fuse in the battery pack (position F1). If it has blown, replace it with a 2 A fuse of the same rating.
3	**The monitor has locked up:** the keys have no effect, letters scroll along the bottom of the display, the display shows meaningless characters or two lines across it, or it stays on **Preparing Compensation**. Remove the battery pack and charge it as in step 2. Fit it again and check the battery status. If the Battery Level screen does not appear, reset the monitor as described below.

Resetting the monitor

NOTICE

Pressing the reset switch can lose the stored data. Use the reset switch only as a last resort.

Step	Action
1	Raise the sensor lid. The reset switch is a small push switch on the circuit board inside the monitor (Figure 25).
2	Press the switch for one second and release it.
3	If the monitor restarts, check the battery status and the date and time.
4	If it does not restart, press the switch and hold it while the pump and the solenoid valve purge — this takes 30 seconds to 1 minute. Then release the switch.
5	Remove the battery pack, fit it again and check the battery status. If the Battery Level screen still does not appear, repeat steps 4 and 5.
6	When the battery status appears, set the date and time (see Date and time (p. 14)); the monitor does not work correctly until they are set.
7	Start the next measurement with **Run - overwrite** (see Starting a measurement (p. 18)).

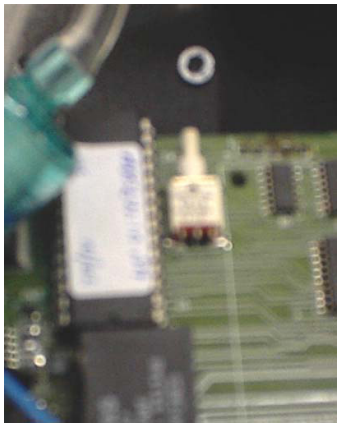


Figure 25. Reset switch on the circuit board, reached with the sensor lid raised. Push it in to reset.

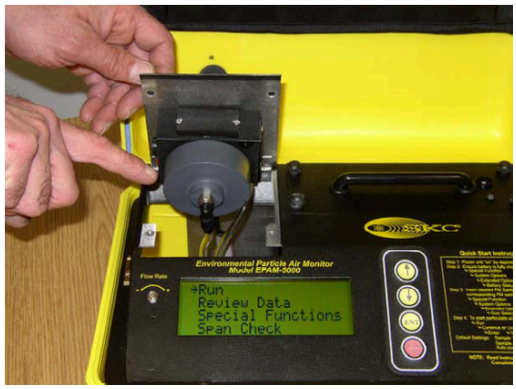


Figure 24. Lift the sensor to reach the reset switch.

Flow of 4 L/min not reached

- Hold the flow meter upright; it reads correctly only in this position. Check that the tubing is connected to the inlet and to the flow meter.
- Check for leaks at the sensor covers and the filter holder: start a run, then cover the inlet with your palm or thumb. If the pump does not noticeably labour, air is leaking in around the sensor covers or the filter holder.
- Remove the sensor covers and fit them again tightly, with the front cover — the one with the circular pattern on its gasket — on the front of the sensor (see Cleaning the sensor optics (p. 28)).

- Check that the white filter holder ring is fitted and that the filter holder is screwed on tightly (see The 47 mm filter holder (p. 16)).

Download fails

If DustComm Pro is installed but the data do not arrive on the PC, work through these checks. If none of them helps, contact Analyt-MTC (see Service, warranty and contacts (p. 36)).

- Check that the RS-232 connectors at the monitor and at the PC are firmly in place and screwed down.
- In DustComm Pro, select **Unit › Properties** and check that the COM port matches the port the cable is connected to.
- If the PC has more than one 9-pin serial port, connect the cable to another port and try again. Some PCs have up to eight; you may need to try them all. With a USB port only, use a suitable USB-to-serial adapter.
- If none of this helps, try to receive the data with a terminal program such as Windows HyperTerminal, or with other suitably configured communications software.
- If the software does not install correctly, install it on drive C: in the subfolder EPAM5000.

CHAPTER 9

Specifications

Measurement

Measuring principle	Near-forward scattering of infrared light; source and detector at 90°
Measuring range	0.001–20.0 mg/m³ (1–20 000 µg/m³) 0.01–200.0 mg/m³ optional
Particle size range	0.1–100 µm
Particle fractions	PM1.0, PM2.5, PM10 with interchangeable impactors; TSP without impactor
Precision	±0.003 mg/m³ (3 µg/m³)
Accuracy	±10 % against NIOSH Method 0600, with Arizona Road Dust (ARD)
Calibration	NIOSH gravimetric method (Method 0600, respirable dust), with ARD
Zero	Manual zero; auto zero with clean-air purge every 30 minutes (can be switched off); internal temperature compensation
Span check	In the field, with span reference Cat. No. 770-207
Flow rate	4.0 L/min nominal, internal pump; adjustable, 1.0–4.3 L/min
Gravimetric filter	47 mm, EPA FRM style holder, in line with the real-time measurement

Display and data

Display	Alphanumeric liquid crystal display (LCD), 4 lines of 20 characters
Keypad	Four keys, splash-proof membrane; menu-driven operation
Displayed values	Concentration in mg/m³; TWA, maximum, minimum, STEL; date and time
Sample rate (averaging and storage)	1 s, 10 s, 1 min or 30 min; measurement every second
Recording time	1 second–15 months
Data memory	21 600 readings, in up to 999 location codes
Data and clock retention	More than 10 years
Alarm	Audible, 90 dB at 3 ft; level set by the user
Data output	RS-232, 9-pin
Software	DustComm Pro for Windows: download, statistics, plots, export, correction factor

Power and environment

Battery	Rechargeable lead-acid battery pack, 6.0 V, removable; fuse 2 A
Operating time	Approx. 24 hours
Charging time	Approx. 22 hours (approx. 24 hours while measuring)
Mains operation	From the battery charger, 110 V or 220 V
Operating temperature	−10 to 50 °C
Storage temperature	−20 to 60 °C
Humidity	Up to 95 % RH, non-condensing
Dimensions (case)	14.0 × 6.0 × 10.0 in
Weight	12 lb

CHAPTER 10

Ordering information

Order from Analyt-MTC with the order codes.

Parts without an order code are listed with the manufacturer's code; for these, ask Analyt-MTC.

Description	Order code
MONITOR KITS	
EPAM 5000 kit: monitor, impactor of your choice, battery, battery charger, DustComm Pro software on USB memory stick, RS-232 cable, manual and weather-tight carrying case	
with PM10 impactor	770-203
with PM2.5 impactor	770-202
INLETS, IMPACTORS AND FILTERS	
Impactor PM1.0, interchangeable	770-204
Impactor PM2.5, interchangeable	770-205
Impactor PM10, interchangeable	770-206
Impactor grease	770-211
Filter holder, 47 mm, for gravimetric sampling (filters ordered separately)	770-215
Quartz (Tissuquartz) gravimetric filter, 47 mm, 432 µm thick, pack of 25	225-1823
CALIBRATION AND CLEANING	
Calibration standard (span reference), for checking the span and the optical sensor	770-207
Cleaning kit: blower bulb, swabs and lens tissue (no compressed-air can)	770-305B
POWER, INSTALLATION AND DATA TRANSFER	
Replacement lead-acid battery pack	770-229
OTHER PARTS (MANUFACTURER'S CODE)	
Battery charger, 110 V (BC-105-110)	Ask Analyt-MTC
Battery charger, 220 V (BC-105-220)	Ask Analyt-MTC
RS-232 computer interface cable (CC-102)	Ask Analyt-MTC
Flowmeter (FM-102)	Ask Analyt-MTC
Media CD-ROM: DustComm Pro software and the manual (CD-105)	Ask Analyt-MTC
Shoulder strap (SS-101)	Ask Analyt-MTC
Impactor sleeve (IMS-105)	Ask Analyt-MTC
Strobe light (SL-105)	Ask Analyt-MTC
Solar panel (SP-105)	Ask Analyt-MTC
Sub-zero heating element (HA-105)	Ask Analyt-MTC
Remote hand-held sampling probe (RSP-105)	Ask Analyt-MTC

CHAPTER 11

Service, warranty and contacts

Analyt-MTC is your contact for everything concerning the EPAM 5000: technical questions, spare parts and accessories, recalibration, repairs and warranty claims. Any work beyond the user tasks described in this manual — including the replacement of the internal lithium back-up battery — is service work; contact Analyt-MTC.

Contact

ANALYT-MTC Messtechnik GmbH

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Germany

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info@analyt-mtc.de

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France

+33 3 89 41 47 78

info@analyt-mtc.fr

www.analyt-mtc.com

Before you contact Analyt-MTC

Have the following at hand so Analyt-MTC can help you quickly:

- the serial number of the monitor;
- the firmware version from the title screen (see Switching on and the main menu (p. 11));
- the battery voltage from the Battery Level screen;
- what happened, and the results of the checks in Troubleshooting (p. 31).

Annual recalibration

Have the monitor recalibrated once a year according to ISO and NIST procedures, and in addition whenever the span check (p. 26) fails twice. Ask Analyt-MTC how to send the monitor in and what to include.

Warranty

Make warranty claims to Analyt-MTC. The warranty terms of Analyt-MTC apply.

Disposal

Do not dispose of the monitor with household waste. Dispose of it as electrical and electronic equipment under local regulations (WEEE). Remove batteries first where fitted and dispose of them separately.

APPENDIX A

Menu map

The title screen appears when you switch the monitor on; **ENTER** opens the main menu. **Cancel** backs out of the current menu.

Menu	Entry	Function
MAIN MENU		
Run	Run - continue Run - overwrite ALM - continue ALM - overwrite	Start a measurement, keeping or erasing the stored data, with or without the alarm (Starting a measurement (p. 18))
Review Data	Statistics	Statistics per location code (Reading the statistics (p. 19))
	Download	Send the data to DustComm Pro (Downloading data (p. 25))
Special Functions	System Options	See below
	Date/Time	View Date/Time, Set Date/Time (Date and time (p. 14))
	Set Alarm	Alarm level in mg/m³ (Alarm level (p. 14))
Span Check		Check the calibration with the span reference (Span check (p. 26))
SPECIAL FUNCTIONS › SYSTEM OPTIONS		
Extended Options	Size Select	**`1.0 um - E`**, **`2.5 um - S`**, **`10 um - M`**, T.S.P. - L (Particle size and inlet (p. 15))
	Calibration	Manual Zero (Manual zero (p. 16)); Auto Zero (Auto zero (p. 16)); Sensor Calibrate — service use only
	Battery Status	Battery voltage; runs the pump (Checking the battery (p. 12), Checking the flow rate (p. 17))
Sample Rate	1 s, 10 s, 1 min, 30 min	Averaging and storage interval (Sample rate (p. 15))
Erase Memory	Yes / No	Erase all stored data (Erasing the memory (p. 19))

APPENDIX B

Glossary and US reference values

Term	Meaning
ARD	Arizona Road Dust, the test dust the monitor is calibrated with.
Inhalable particulate	Particles with a 50 % cut point at 100 µm.
Thoracic particulate	Particles with a 50 % cut point at 10 µm.
Respirable particulate	Particles with a 50 % cut point at 3.5 µm.
PM1.0, PM2.5, PM10	Particulate matter passing an inlet with a 50 % cut point at 1.0, 2.5 or 10 µm; selected with the matching impactor.
TSP	Total suspended particulate: all airborne particles, measured without an impactor.
k value	The concentration value printed on the span reference; the monitor should read within ±10 % of it.
Location code (tag)	The number under which the monitor stores a run, 001 to 999.
L/min	Litres per minute.
mg/m³	Milligrams per cubic metre; 1 mg/m³ = 1000 µg/m³.
µm	Micrometre (micron), one millionth of a metre.
NIOSH	US National Institute for Occupational Safety and Health.
OSHA	US Occupational Safety and Health Administration.
CIM	OSHA Chemical Information Manual: the Reference column points to the OSHA method it gives.
HF	Hydrogen fluoride.
mppcf	Million particles per cubic foot of air, a particle-count limit.
STEL	Short-term exposure level: the highest concentration averaged over a 15-minute period.
TWA	Time-weighted average: the average concentration over a period of time.

US reference values (NIOSH and OSHA)

The source lists the US agency methods and limit values below for dusts the monitor is used on. They are US values, printed for reference only: set the alarms to the limit values that apply where you measure (see Alarm level (p. 14)). An asterisk means: refer to the agency method.

Dust or hazard	Agency	Reference	TWA	STEL
alpha-Alumina (Respirable fraction)	OSHA	CIM	5 mg/m³	
alpha-Alumina (Total dust)	OSHA	CIM	15 mg/m³	
Aluminum, Pyro powders	OSHA	CIM	*	
Aluminum (Respirable fraction)			5 mg/m³	
Ammonium nitrate	OSHA	CIM	*	
Ammonium sulfamate (Respirable dust)	OSHA	CIM	5 mg/m³	
Ammonium sulfamate (Total dust)	OSHA	CIM	15 mg/m³	
Ammonium sulfamate (Total dust)	OSHA	ID 188	15 mg/m³	
Bismuth telluride, Se-Doped	OSHA	ID 121	5 mg/m³	
Bismuth telluride, Undoped (Respirable dust)	OSHA	ID 121	5 mg/m³	
Bismuth telluride, Undoped (Total dust)	OSHA	CIM	15 mg/m³	
Boron oxide (Total dust)	OSHA	ID 125G	15 mg/m³	
Boron oxide (Total dust) (Particulates, Total)	NIOSH	0500	10 mg/m³	

Dust or hazard	Agency	Reference	TWA	STEL
Carbon black	NIOSH	5000	3.5 mg/m³	
Carbon black	OSHA	ID 196	3.5 mg/m³	
Chromium, Metal & Insol cpds	OSHA	ID 121	1 mg/m³	
Chromium, Metal & Insol cpds	OSHA	ID 125	1 mg/m³	
Chrysene	OSHA	58	0.2 mg/m³	
Coal dust (<than 5 % SiO2)	OSHA	CIM	2.4 mg/m³	
Coal dust (>than 5 % SiO2)	OSHA	ID 142	10 mg/m³	
Coal tar pitch volatiles	OSHA	58	0.2 mg/m³	
Copper dust	NIOSH	7029	1 mg/m³	
Copper, Dusts & Mists	OSHA	ID 125G	1 mg/m³	
Copper, Dusts & Mists	OSHA	ID 121	1 mg/m³	
Copper (Elements)	NIOSH	7300	1 mg/m³	
Copper fume	NIOSH	7029	0.1 mg/m³	
Copper fume	OSHA	ID 121	0.1 mg/m³	
Copper fume	OSHA	ID 125G	0.1 mg/m³	
Cotton dust (Raw)	OSHA	CIM	1 mg/m³	
Crag herbicide (Respirable dust)	OSHA	CIM	5 mg/m³	
Crag herbicide (Total dust)	NIOSH	5(S356)	10 mg/m³	
Crag herbicide (Total dust)	OSHA	CIM	15 mg/m³	
Cresol, All isomers	NIOSH	2546	10 mg/m³	
Cresol, All isomers	OSHA	32	15 mg/m³	
Cyanide (as Cn)	OSHA	ID 120	5 mg/m³	
Fluorides (Aerosol & Gas)	NIOSH	7902	2.5 mg/m³	5.0 (HF)
Glass, Fibrous dust	OSHA	CIM	*	
Glycerin mist (Particulates)	NIOSH	0600	*	
Glycerin mist (Respirable)	OSHA	CIM	5 mg/m³	
Glycerin mist (Total dust)	OSHA	CIM	15 mg/m³	
Grain dust (Oats, Wheat & Barely)	OSHA	CIM	10 mg/m³	
Graphite, Synthetic (Respirable dust)	OSHA	CIM	5 mg/m³	
Graphite, Synthetic (Total dust)	OSHA	CIM	15 mg/m³	
Iodine (Particulates)	OSHA	ID 212	*	0.1
Kaolin (Respirable dust)	OSHA	CIM	5 mg/m³	
Kaolin (Total dust)	OSHA	CIM	15 mg/m³	
Lead	NIOSH	7082	<0.1 mg/m³	
Lead	NIOSH	7105	<0.1 mg/m³	
Lead	NIOSH	7700	<0.1 mg/m³	
Lead (Elements)	NIOSH	7300	<0.1 mg/m³	
Lead, Inorganic fumes & dusts (as Pb)	OSHA	ID 121	0.05 mg/m³	
Lithium (Elements)	NIOSH	7300	*	
Lithium hydride	OSHA	CIM	25 µg/m³	
Magnesium oxide fume (Total dust)	OSHA	ID 121	15 mg/m³	
Manganese (Elements)	NIOSH	7300	1 mg/m³	3 mg/m³
Manganese fume (as Mn)	OSHA	ID 121	*	5 mg/m³

Dust or hazard	Agency	Reference	TWA	STEL
Methoxychlor (Total Dust)	OSHA	CIM	15 mg/m³	
Oil mist (Mineral)	OSHA	ID 128	5 mg/m³	
Oil mist (Mineral)	OSHA	ID 178SG	5 mg/m³	
Oil mist (Vegetable) (see Dust, Total and Respirable nuisance)				
Pentaerythritol (Total dust)	OSHA	CIM	15 mg/m³	
Pentaerytritol (Respirable dust)	OSHA	CIM	5 mg/m³	
Picloram (Tordon), Respirable dust	OSHA	CIM	5 mg/m³	
Picloram (Tordon), Total dust	OSHA	CIM	15 mg/m³	
Plaster of Paris (see Dust, Respirable nuisance)	OSHA	CIM		
Portland cement (Respirable dust)	OSHA	ID 142	5 mg/m³	
Portland cement (Total dust)	OSHA	ID 142	15 mg/m³	
Respirable nuisance	OSHA	CIM	5.0 mg/m³	
Respirable nuisance (Particulates)	NIOSH	0600	*	
Total nuisance	OSHA	CIM	15 mg/m³	
Total nuisance (Particulates)	NIOSH	0500	10 mg/m³	
Rouge (Respirable dust)	OSHA	CIM	5 mg/m³	
Rouge (Total dust)	OSHA	CIM	15 mg/m³	
Silica, Amorphous	OSHA	CIM	20 mppcf	
Silica, Crystalline tripoli, Respirable dust	OSHA	ID 142	0.05 mg/m³	
Silicon carbide (Respirable dust)	OSHA	CIM	5 mg/m³	
Silicon carbide (Total dust)	OSHA	CIM	15 mg/m³	
Silicon (Respirable dust)	OSHA	CIM	5 mg/m³	
Silicon (Total dust)	OSHA	CIM	15 mg/m³	
Soapstone (Respirable dust)	OSHA	CIM	20 mppcf	
Soapstone (Total dust)	OSHA	CIM	6 mg/m³	
Wood dust (except Western red cedar)	OSHA	CIM	*	
Wood dust (Western red cedar)	OSHA	CIM	2.5 mg/m³	
Zinc bromide (see Dust, Total and Nuisance)			*	
Zinc oxide dust (see Dust, Total & Respirable)	OSHA	CIM		
Zinc oxide fume	OSHA	ID 121	5 mg/m³	
Zinc oxide fume	OSHA	ID 125	5 mg/m³	
Zinc oxide fume	OSHA	ID 143	5 mg/m³	
Zinc stearate (Respirable dust)	OSHA	CIM	5 mg/m³	
Zinc stearate (Total dust)	OSHA	ID 121	15 mg/m³	
Zinc stearate (Total dust)	OSHA	ID 125	15 mg/m³	
Zirconium cpds (as Zr)	OSHA	ID 121	5 mg/m³	

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