ANALYT MESSTECHNIK



OPERATING MANUAL

SKC AIR-AIDE Particulate Monitor

Set-up, zero and span checks, sampling and data download with the AIR-AIDE real-time particulate monitor, model AA-3500, with the DustComm Pro software, troubleshooting and ordering information.

AMTC-MN-0017

Rev. 2 · October 2026

About this manual

The SKC AIR-AIDE® is a real-time particulate monitor, model AA-3500. An internal pump draws air at 2 L/min through an interchangeable inlet and an optical sensor, and the monitor shows the dust concentration in mg/m³ every second. Use it as a portable survey instrument or leave it at a fixed point for long runs on mains power.

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

Read Safety (p. 6) before you use the monitor for the first time, and the chapters on preparation and checks before you use it routinely. For a first measurement, follow Preparing for a measurement (p. 13), Manual zero check (p. 26) and Measuring (p. 15) in that order.

The manual applies to the AIR-AIDE monitor, model AA-3500, supplied as the kit. Analyt-MTC supplies, services and supports the monitor; for questions, calibration, repairs and spare parts see Service, warranty and contacts (p. 32).

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**.
- A menu path such as **Special Functions › System Options › Battery Status** means that you open each entry in turn.

Abbreviations

Abbreviation	Meaning
LED	Light-emitting diode
PC	Personal computer
RAM	Random-access memory
RH	Relative humidity
RS-232	Serial interface (Recommended Standard 232)

How this manual marks information

⚠ WARNING

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

⚠ CAUTION

A hazardous situation which, if not avoided, could result in minor or moderate 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.

Tip
A shortcut or recommendation; never a hazard.

The four keys on the front panel are **ON/OFF**, **ENTER**, **UP** and **DOWN**; menu entries are written in bold. In a menu path, select each entry with **UP** or **DOWN** and confirm it with **ENTER**.

Document information

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Revision history

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. The AIR-AIDE is a mains- and battery-powered instrument for measuring dust in air. The rules in this chapter protect the people working with it, the monitor itself and the quality of your data.

Intended use

Use the monitor only to measure airborne particulate, as described in this manual, and only with the accessories listed in Ordering information (p. 31). Other uses have not been evaluated for this instrument.

⚠ CAUTION

Using the monitor in a way this manual does not describe defeats the safety protection the equipment provides. This can damage the monitor and injure the user. Use the monitor only to measure airborne particulate as described in this manual, and only with the accessories listed in Accessories and spare parts.

Service work

You may change the inlet configuration, check and adjust the flow, run the zero, span and performance checks and charge the battery. Everything inside the enclosure — the optical sensor, the internal filter, the pump and the electronics — is service work for trained personnel; contact Analyt-MTC (see Service, warranty and contacts (p. 32)). The warranty terms of Analyt-MTC apply.

⚠ WARNING

High voltages may be present inside the instrument enclosure. Contact with them can cause an electric shock. Do not open the monitor or tamper with its hardware. Leave repairs to properly trained service personnel, through Analyt-MTC. Apply the usual electrical safety precautions when working on the instrument.

Weather and environment

Operate the monitor between 0 and 50 °C at up to 95 % relative humidity, non-condensing. Store it between −20 and 60 °C. The full operating conditions are in Specifications (p. 30).

NOTICE

Water, rain, snow and condensed moisture can damage the monitor. Never immerse the monitor in water, and do not expose it to rain, snow or other precipitation. If you must measure while it rains or snows, put the monitor under shelter. Do not let moisture condense in the sample path. A monitor brought from an air-conditioned room into a warm, humid place needs time to adjust to the new temperature before you use it.

Stored data

Three actions erase the whole data memory of the monitor: starting a run with storage type **Overwrite**, running a span check (p. 26), and erasing the memory (p. 16). The monitor asks you to confirm each one, but the data cannot be recovered afterwards.

NOTICE

A span check and an Overwrite run erase all stored data. The data cannot be recovered afterwards. Download the stored data to a PC (see Downloading data (p. 24)) before a span check or an Overwrite run.

CHAPTER 2

Product description

How the monitor measures

The AIR-AIDE 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 signal processing compensates for noise, drift and temperature changes, which gives a fine resolution, a low detection limit and a stable baseline.

The monitor is calibrated with Arizona Road Dust (ARD) against NIOSH Method 0600 for respirable dust, whose particles are around 3.5 µm in diameter; the accuracy against this reference is approximately ±10 %. Because the optical sensor responds more strongly to particles of about 2.5 µm than to particles of 5 to 10 µm, the monitor has a coarse range (see Particle size range (p. 14)) for dust whose mass lies mostly in particles larger than 5 µm. For dust that differs from the calibration dust in density or refractive index, apply a correction factor — in the monitor through the span check (p. 26), or afterwards on the PC (see Applying a correction factor (p. 23)).

The sample path

An internal brushless pump draws the sample at 2 L/min — the flow for which the impactors are designed. The air enters through the inlet on top of the monitor, passes the optical sensor, then an in-line filter that keeps the dust away from the pump, and leaves the monitor at the end opposite the inlet so that the exhaust cannot contaminate the sample. Without an impactor the monitor measures total suspended particulate (TSP); with an impactor in the inlet it measures PM1.0, PM2.5 or PM10 (see Fitting the inlet (p. 13)).

During the automatic zero (see Auto zero (p. 15)), two solenoid valves switch the path: the pump pushes filtered, particle-free air back through the sensor and out of the inlet. The monitor measures its baseline in this clean air.

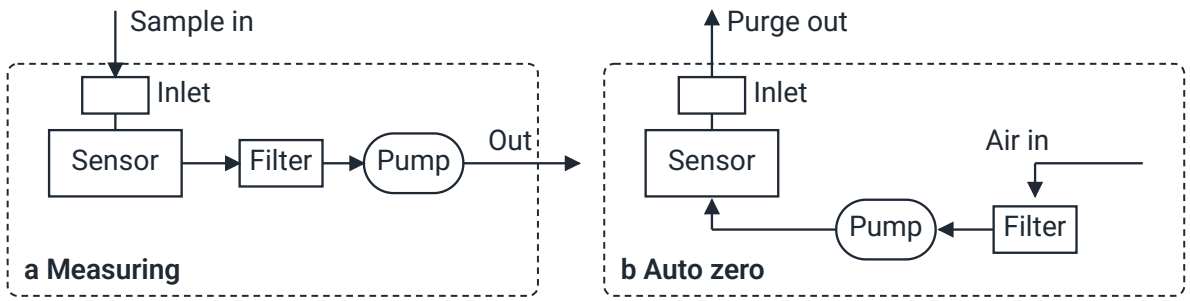


Figure 1. Sample path, simplified. **a** Measuring: the pump draws the sample through the inlet and the sensor. **b** Auto zero: two solenoid valves (not drawn) reverse the path, and filtered air purges the sensor and leaves through the inlet.

Checking the contents

The kit contains the parts below. If anything is missing, contact Analyt-MTC. Impactors are not included; order them separately (see Ordering information (p. 31)).

Qty	Part
1	AIR-AIDE monitor, model AA-3500, with built-in rechargeable battery
1	Universal mains transformer (charger) for 110 V and 220 V AC, with interchangeable plugs
1	Impactor sleeve, the inlet holder for TSP and for the impactors
1	Adjustment tool for the flow rate
1	Flow audit meter with adapter and tube, for the flow check
1	DustComm Pro software for Windows
1	RS-232 cable, 9-pin to 9-pin, for the PC connection
1	Operating manual



Figure 2. Left: the kit — battery charger, computer cable and DustComm Pro software, flow meter and adjustment tool, impactor sleeve and manual. Right: universal transformer for 110 V and 220 V.

Front panel and keys



Figure 3. Front of the monitor: four-line display, **ON/OFF** key at the bottom left, **UP**, **DOWN** and **ENTER** on the right.

The backlit display has four lines of 20 characters. It shows the concentration in mg/m³, updated every second, and the menus. All operation uses the four keys:

Key	What it does
ON/OFF	Switches the monitor on, and off again from most screens.
ENTER	Selects the menu entry at the cursor. Leaves screens and processes that have no **Cancel** entry — this also stops a running measurement. In a number field, moves the cursor one digit to the right.
UP	Moves the cursor up in menus and steps through statistics and stored data. Increases the digit in a number field.
DOWN	Moves the cursor down in menus and steps through statistics and stored data. Decreases the digit in a number field.

Back panel



Figure 4. Back panel. Left: rating plate (model number, serial number, calibration date) above the ventilation grille. Right, from top to bottom: **WIRELESS SERIAL RS-232** 9-pin connector for the PC cable or the optional wireless data link · **ANALOG OUTPUT** jack, 0–2 V (the panel marking reads **`0–2 VAC`**) · **FLOW RATE** adjuster (− / +) · **FUSE** 2 A · charge **LED**, green when the battery is full · **`BATTERY CHARGE 9VDC`** power input.

The analogue output carries the measuring signal; connect a voltmeter or another analogue device to it if you want to record the signal outside the monitor. The socket for an external alarm device is on the side of the monitor (see Alarm level (p. 14)).

CHAPTER 3

Installation

The monitor runs for about 8 hours on its built-in battery and indefinitely on the mains transformer. Charge a new monitor before its first run on battery.

Store the monitor between −20 and 60 °C (see Specifications (p. 30)). Do not open the monitor or tamper with its hardware: high voltages inside can cause an electric shock (see Service work (p. 6)). To fit the inlet and the impactor sleeve, see Fitting the inlet (p. 13).

Power sources

The monitor takes its power from one of three sources:

- **Built-in battery** — a rechargeable 6 V DC lead-acid battery of 3.6 Ah. Fully charged and new, it runs the monitor for 8 hours at room temperature.
- **Mains transformer** — the supplied transformer connects to the **BATTERY CHARGE 9VDC** input on the back panel (see Back panel (p. 10)). This input is part of the battery pack and takes 9 V DC at 1 A, both to run the monitor and to charge the battery. It runs the monitor even with a low battery — use it for long runs at a fixed point.
- **Vehicle battery** — with the auxiliary power attachment for the back plate (manufacturer's code 38-005553), the monitor runs from a car or other vehicle battery.

> **Note**
> Switching between battery and transformer operation can shift the zero baseline slightly. For consistent results, run a manual zero check (p. 26) each time you change the power source.

Checking the battery

While the monitor measures, a bar at the top right of the run screen shows the battery charge; it gets shorter as the battery discharges. For the exact value, select **Special Functions › System Options › Battery Status**. The Battery Level screen shows the battery voltage:

Battery voltage	Meaning
6.50 V DC or higher	Fully charged
5.95 V DC or lower	Depleted — charge the battery

Charging the battery

The battery stays in the monitor for charging. Charging takes about 20 hours. You do not need to run the battery flat before you charge it, and charging does not affect the stored data.

> **Note**
> Do not measure while charging: during a measurement the transformer powers the monitor, and the battery only keeps its charge.

1. Connect the transformer to the mains and its plug to the **BATTERY CHARGE 9VDC** input on the back panel.

2. Charge for about 20 hours, until the charge LED next to the input turns green.

NOTICE

A lead-acid battery that is rarely used loses capacity. If you do not use the monitor every day, switch it on and let it run for 10 to 15 minutes every 3 to 4 weeks.

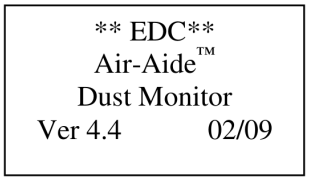
CHAPTER 4

Operation

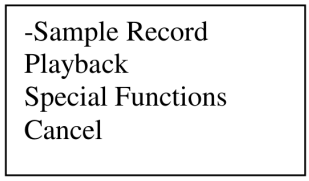
Switching on and the main menu

Press **ON/OFF**. The title screen appears with the firmware version; press **ENTER** to reach the main menu. It has three branches, mapped in full in Menu map (p. 34):

Entry	Leads to
Sample/Record	Starting a measurement: averaging interval, storage type, alarm (see Starting a measurement (p. 15)).
Playback	Statistics and stored records on the display, and download to a PC (see Reviewing stored data (p. 16)).
Special Functions	Date and time, alarm level, battery status, memory, particle size range, zero and span calibration, auto zero.



Title screen with the firmware version.



Main menu.

Press **ON/OFF** again to switch the monitor off; this works from most screens.

Preparing for a measurement

Before a series of measurements, check the five settings below. Each has its own section below.

Setting	Why it matters
Fitting the inlet (p. 13)	The impactor sleeve must be on the inlet for TSP; for PM1.0, PM2.5 or PM10 the matching impactor must sit in the sleeve.
Date and time (p. 14)	Every stored record carries them; wrong values make the records hard to trace.
Alarm level (p. 14)	Needed only if you will use the audible alarm; set it before you start.
Particle size range (p. 14)	Fine or coarse, chosen to match where the mass of your dust lies.
Auto zero (p. 15)	On by default: the monitor re-zeroes every 15 minutes to remove baseline shifts caused by temperature changes of the sample air.

Fitting the inlet

The inlet on top of the monitor takes the impactor sleeve, and the sleeve takes an impactor. Choose the configuration for the particle fraction you want to measure:

Fraction	Measures	Inlet configuration
TSP	As much of the suspended particulate as possible (total suspended particulate)	Impactor sleeve on the inlet, no impactor
PM1.0	Particles smaller than approx. 1.0 µm	Impactor sleeve on the inlet, PM1.0 impactor inserted in the sleeve
PM2.5	Particles smaller than approx. 2.5 µm	Impactor sleeve on the inlet, PM2.5 impactor inserted in the sleeve
PM10	Particles smaller than approx. 10 µm	Impactor sleeve on the inlet, PM10 impactor inserted in the sleeve

Note
Without the impactor sleeve, light enters the open inlet and reaches the optical sensor. The readings are then biased. Never measure without the impactor sleeve, and make sure it sits properly on the inlet.

Note
The impactors are designed for 2 L/min. Check the flow regularly (see Flow rate check (p. 25)), and run a manual zero check (p. 26) each time you have changed the inlet configuration, before you measure.

Date and time

1. To check the clock, select **Special Functions › Date/Time › View Date/Time**. The screen shows the current day, date and time.
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 day, press **ENTER**. Select **Set Date/Time** to save the entry, or **Cancel** to discard it.

Alarm level

The monitor can sound an alarm while it measures whenever the concentration rises above a level you set. Set the level before the measurement, then start the run with the alarm switched on (**Sample/Rec – ALM**, see Starting a measurement (p. 15)).

1. Select **Special Functions › Set Alarm**. The screen shows the alarm concentration in mg/m³, in the format **00.000**.
2. Set each digit with **UP** and **DOWN**, and move to the next digit with **ENTER**.

External alarm device

The alarm can be hard to hear over the noise of the pump. To make it more visible, connect a flashing light or another device to the alarm output: wire your device to a jack plug and insert it into the alarm socket on the side of the monitor. The output can also signal the alarm to a computer.

The socket supplies 5 V DC at 50 to 75 mA for the external circuit. It carries a signal only when the alarm is in use; without an alarm set, it stays dead.

Particle size range

In most places the bulk of the airborne dust mass lies in particles smaller than 5 µm. Where much of it lies in larger particles, the monitor under-reads, because its sensor is more sensitive to small particles. The coarse range corrects this: the monitor multiplies its readings by 1.75.

1. Select **Special Functions › System Options › Extended Options › Size Select**.
2. Select **Fine, < 5.0 µm** or **Coarse, < 10.0 µm** and press **ENTER**. The run screen shows the range in use as **F** or **C** in front of the concentration.

For dust that differs from the calibration dust in other ways, there are two more adjustments: a factor entered in the span check (p. 26) corrects the readings continuously while you measure, and a correction factor in DustComm Pro (see Applying a correction factor (p. 23)) corrects downloaded data afterwards.

Auto zero

While it measures, the monitor re-zeroes itself every 15 minutes by purging the sensor with filtered air (see The sample path (p. 8)). This removes baseline shifts caused by temperature changes of the sample air. You can switch auto zero off; the temperature compensation at the start of each run stays active.

1. Select **Special Functions › System Options › Extended Options › Auto Zero**.
2. Select **No** and press **ENTER** to switch auto zero off, or **Yes** to switch it on again.

Measuring

A measurement runs from **Sample/Record** 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

- The ambient temperature must be between 0 and 50 °C (32 and 120 °F), and the relative humidity up to 95 %, non-condensing. A monitor stored in an air-conditioned room needs time to adjust before it measures in a warm, humid place.
- If the measuring site is much warmer or colder than where the monitor was stored, calibrate it in the new conditions and then run a manual zero check (p. 26) there.
- Check that the inlet, date and time, alarm level and particle size range are set (see Preparing for a measurement (p. 13)).
- Let the monitor run in the measuring environment for 5 minutes, then run a manual zero check (p. 26). Check the baseline periodically with the performance check (p. 27).

Starting a measurement

Select **Sample/Record** in the main menu, then make one choice on each of the following screens:

NOTICE

Overwrite erases all stored data and cannot be undone. Download the data first if you still need them.

Screen	Choices	Effect
Data averaging	**Short Term** or **Long Term**	Selects the group of averaging and storage intervals.
Interval	Short term: **2**, **4** or **10 Second** Long term: **1**, **10** or **30 Minute**	The monitor averages the readings over this interval and stores one record per interval.
Memory storage	**Overwrite** or **Continuation**	**Overwrite** erases all stored data first (the monitor asks you to confirm with **Yes**) and starts again at location 001. **Continuation** keeps the stored data and stores the new run under the next location code.
Alarm	**Sample/Rec** or **Sample/Rec – ALM**	Starts the run without or with the audible alarm. With the alarm, it sounds whenever the concentration exceeds the alarm level (p. 14).

The monitor shows **Preparing Compensation** for a moment: it compensates for the temperature of the sample air, so that the zero baseline does not shift. This step is automatic and cannot be switched off. The run screen then appears, and the measurement starts.

The run screen

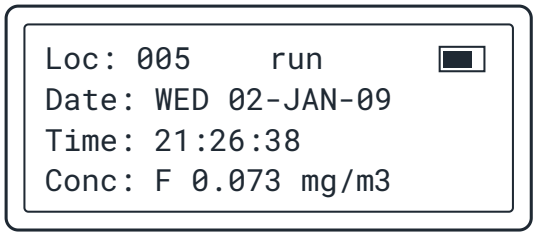


Figure 5. Run screen during a measurement.

Field	Meaning
Loc	Location code of this run (see Location codes (p. 16)).
Bar	Battery charge; the bar shortens as the battery discharges.
Date	Day of the week and date, dd-mmm-yy.
Time	Current time, 24-hour clock.
Conc	Particle size range (**F** fine, **C** coarse) and the current concentration in mg/m³. The monitor computes a new value every second, with a three-second time constant.

At very low concentrations, baseline drift can make the computed concentration slightly negative. The monitor then shows a minus sign in front of 0.000 mg/m³. If this happens, a manual zero check (p. 26) may be needed.

Ending a measurement

Press **ENTER**. The monitor stops measuring and returns to the main menu. The statistics of the run are now available (see Reviewing stored data (p. 16)).

Location codes

Every run is stored under a location code. After the memory has been erased, the first run gets code 001. Each run started with **Continuation** gets the next code. 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. Afterwards the location code starts again at 001.

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.

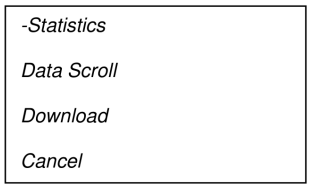
Reviewing stored data

The monitor shows the stored data on its display in two forms: summary statistics per location code, and the individual records one by one.

Statistics per location

For each location code the monitor keeps the start and end time of the run, the maximum and minimum concentration, the time-weighted average (TWA) and the short-term exposure limit value (STEL). The STEL is the highest 30-minute time-weighted average found in the run.

1. Select **Playback › Statistics**.
2. The Location Select screen shows the range of stored codes, for example **Range: 001 thru 015**. Enter the location code: **UP** and **DOWN** set a digit, **ENTER** moves to the next. If you enter a code that is not stored, the monitor asks for it again.
3. The first statistics screen appears. Step forward through the screens with **DOWN** and back with **UP**:



Playback menu.

Screen	Shows
STATS	Location code, day and date, start and stop time of the run
MAXIMUM	Highest concentration, with date and time
MINIMUM	Lowest concentration, with date and time
T.W.A.	Time-weighted average over the run, with date and elapsed time
S.T.E.L.	Highest 30-minute average, with date and the time it occurred

To look at another location, keep pressing **DOWN** until the Playback screen returns, select **Statistics**, then **New Location** (or **Review Loc** to see the same location again). Alternatively, press **ENTER** on any statistics screen to return to the main menu, and select **Playback › Statistics › New Location**.

Individual records

Each stored record holds the location code, day, date, time and concentration in mg/m³.

1. Select **Playback › Data Scroll**. The first record of location 001 appears.
2. Press **DOWN** for the next record and **UP** for the previous one.
3. Hold the key down to scroll faster. Fast scrolling stops at the first record of the next location, or at the last record of the previous one.

For plots, reports and spreadsheets, download the data to a PC (see DustComm Pro software (p. 17)).

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 XP or later, 4 MB of free disk space and 8 MB of RAM.

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.

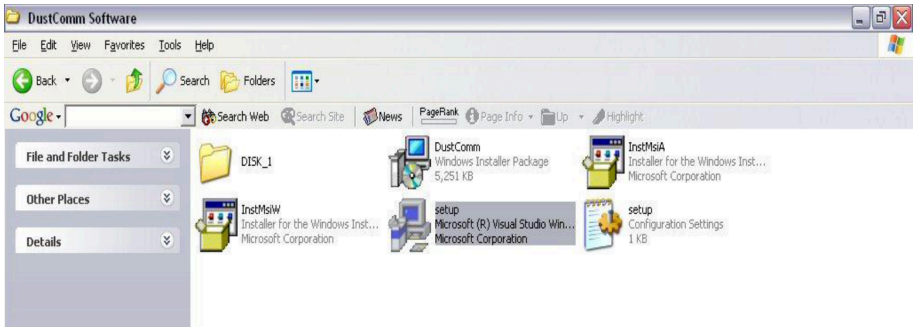


Figure 6. DustComm software folder with **Setup** selected.

To start the program, double-click its icon on the desktop. A sample data file (.dcm) is installed with it, so you can try out the functions before you have data of your own.

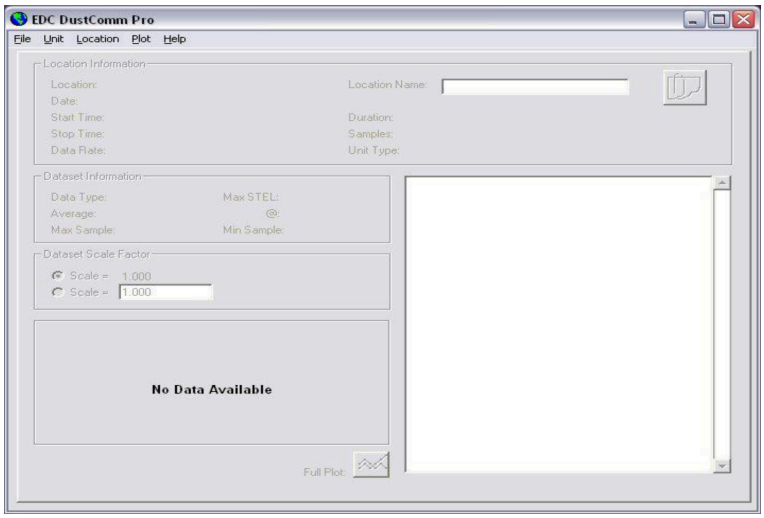


Figure 7. DustComm Pro window after starting the program.

Menus

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

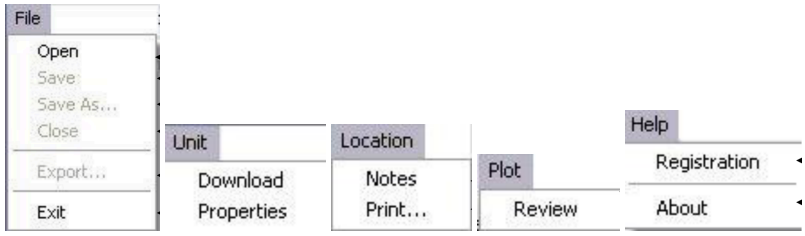


Figure 8. The menus File, Unit, Location, Plot and Help.

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.
	Close	Closes the open file.
	Export	Saves the data as a text file for a spreadsheet program.
	Exit	Closes the program.

Menu	Command	What it does
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		
	Registration	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.

Task	Do this
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.

The project window

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

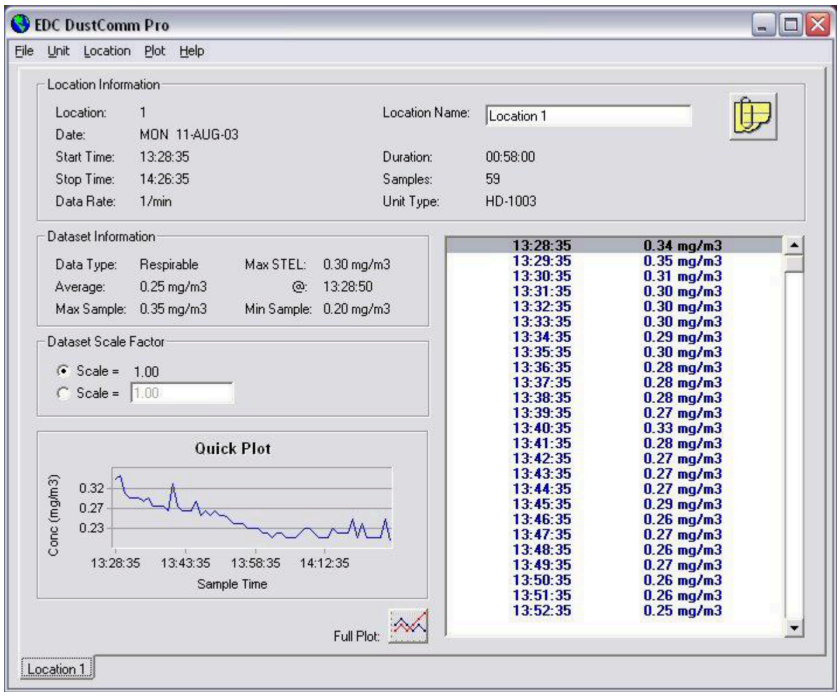
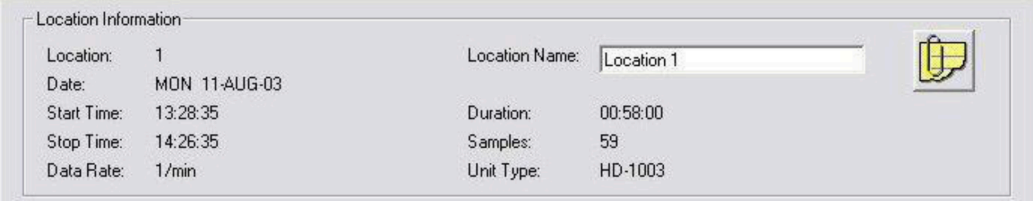
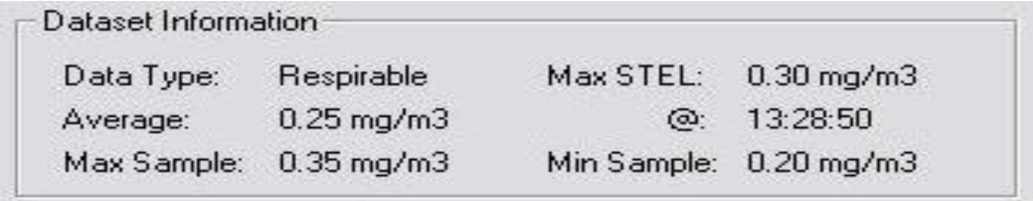
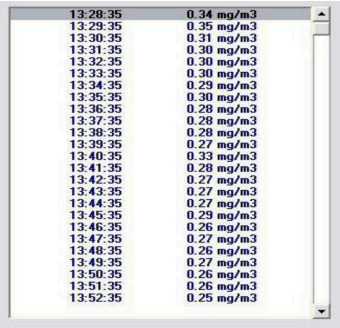


Figure 9. Project after the data have been transmitted.

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. 23)). 
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**.

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

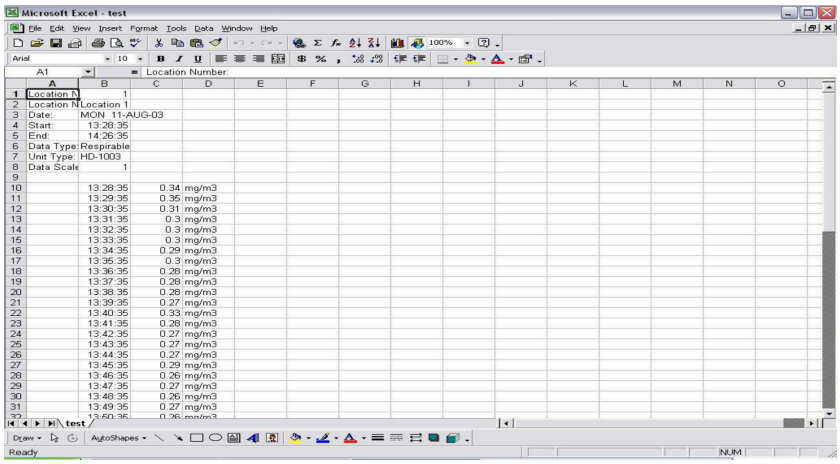


Figure 10. Exported data opened in a spreadsheet program.

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:

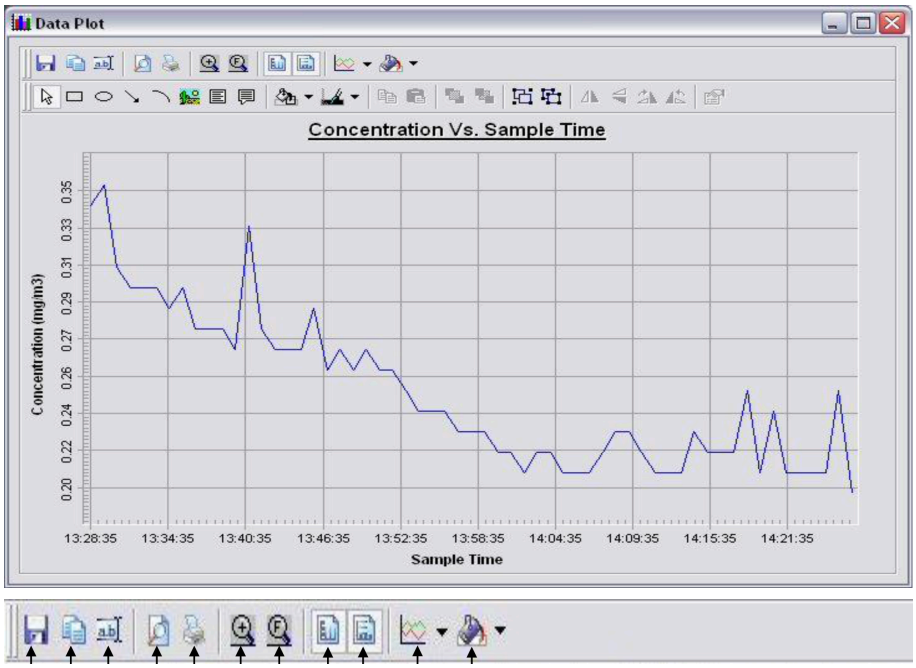


Figure 11. Plot window and its button bar; the buttons are numbered from left to right in the table below.

No.	Button
1	Save the plot as a DustComm Pro chart (*.dcc)
2	Copy the plot to a bitmap
3	Edit the title of the plot
4	Page setup
5	Print the plot

No.	Button
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; its buttons, from left to right:



No.	Function
1	Pointer tool
2	Insert squares
3	Insert ovals
4	Insert arrows
5	Insert arched lines
6	Insert a picture: draw the box, right-click it, select **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 squares, ovals, text boxes and callouts
12	Paste squares, ovals, text boxes and callouts
13	Bring squares, ovals, text boxes and callouts to the front
14	Send squares, ovals, text boxes and callouts to the back
15	Group squares, ovals, text boxes and callouts
16	Ungroup squares, ovals, text boxes and callouts
17	Flip left to right
18	Flip upside down
19	Rotate clockwise
20	Rotate counter-clockwise
21	Properties of the selected squares, ovals, text boxes and callouts

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 12. Edit Title window.

Applying a correction factor

A correction factor adjusts the readings to a gravimetric reference measured at the same place and time. 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 **RS-232** connector on the back 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 and install its driver.
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 **Playback › Download › PC**. The monitor asks you to connect the cable; press **ENTER**.
2	The monitor shows **Transmitting, Please Wait**, and the progress bar on the PC grows as the data arrive.
3	When the transfer is complete, the monitor returns to its selection screen; 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.

The downloaded data open in a new project: see The project window (p. 19). To erase the data in the monitor after the download, see Erasing the memory (p. 16); starting a run with **Overwrite** also erases them (see Starting a measurement (p. 15)).

CHAPTER 6

Calibration and verification

Four user checks keep the readings trustworthy: the flow rate, the zero baseline, the span against the calibration insert, and an overnight performance check. Cleaning the optics, replacing the internal filter and the annual calibration are factory service.

Check	When
Flow rate check (p. 25)	Regularly; the impactors need 2 L/min.
Manual zero check (p. 26)	Before each new series of measurements; after a large change in ambient temperature; after changing the inlet or the power source; before and after every span check.
Auto zero (p. 26)	Automatic, every 15 minutes during a measurement.
Span check (p. 26)	Weekly where concentrations exceed 1 mg/m³; monthly or less often in cleaner air.
Performance check (p. 27)	Periodically, on the bench.
Factory calibration and optics cleaning	Once a year — contact Analyt-MTC (see Service, warranty and contacts (p. 32)).

Flow rate check

The flow is set to 2 L/min at the factory. Check from time to time that it is still close to 2 L/min, the flow at which the impactors separate at their rated cut points. You need the flow audit meter with its adapter and tube, and the adjustment tool, all included in the kit.

1. Connect the flow meter to the inlet of the monitor with the flow audit adapter and tube, as in Figure 13 (p. 25).
2. Start the pump: select **Sample/Record › Short Term › 2 Second › Continuation › Sample/Rec**.
3. Read the flow meter. If it does not show about 2 L/min, insert the adjustment tool into the **FLOW RATE** adjuster on the back panel (Figure 4 (p. 10)). Turn it to the left to decrease the flow, to the right to increase it, until the meter shows approximately 2 L/min.
4. Press **ENTER** to stop the pump and return to the main menu, and remove the flow meter.



Figure 13. Flow rate check. Left: flow meter connected with the flow audit adapter and tube. Centre: flow adjuster. Right: adjusting the flow with the adjustment tool.

Note
If you cannot reach 2 L/min with the adjuster, the in-line pump filter inside the monitor probably needs replacing. This is service work; contact Analyt-MTC.

Tip
Step 2 starts a normal measurement and adds a new location code to the memory. Note it, so that you can tell the flow-check data from your measurement data later.

Manual zero check

The manual zero re-establishes the measuring baseline. It takes 100 seconds and runs automatically once started. Run it often: before each new series of measurements, whenever the monitor has been through a large change in ambient temperature, and each time you switch between battery and transformer.

1. If the monitor has not been used for some time, let it run for 1 to 2 minutes first (start and stop a measurement as described in Measuring (p. 15)).
2. Fit the inlet configuration you will measure with (see Fitting the inlet (p. 13)).
3. Select **Special Functions › System Options › Extended Options › Calibration › Manual-Zero**, and confirm with **Manual-Zero**.
4. The screen shows **Manual-Zeroing, Please Wait** and counts down. Wait until the monitor has finished.

Auto zero

During every measurement the monitor checks its baseline automatically every 15 minutes, unless you have switched this off (see Auto zero (p. 15) in Chapter 4). Auto zero does not replace the manual zero check before a series of measurements.

Span check

The span check compares the monitor's reading with the span calibration insert (Calibration Standard, Cat. No. 770-207), an optical reference that fits into the inlet. Its calibration value is marked on its flat end, typically between 1 and 16 mg/m³. Each insert is matched to one instrument: two monitors do not give exactly the same value with the same insert.

NOTICE

The span check erases all stored data. The data cannot be recovered afterwards. Download the data to a PC first (see Downloading data (p. 24)).

NOTICE

Careless handling can damage the span calibration insert. Handle the insert with care, and put it back into its protective plastic tube immediately after each use.

1. Run a manual zero check (p. 26).
2. Insert the span calibration insert into the inlet. Its positioning pin fits into the small hole at the edge of the opening: check that the pin is in the hole and the insert sits firmly.

3. Select **Special Functions › System Options › Extended Options › Calibration › Sensor Calibrate**. The monitor asks **Sensor Calibrate?** and warns that the data will be lost; select **Yes**.
4. The Calibrate Sensor screen shows a scale value (for example 1000) and the measured concentration. Compare the concentration with the value on the insert; they should agree within 10 %. If necessary, change the scale value: **UP** increases it and raises the displayed concentration, **DOWN** lowers both.
5. Note the displayed concentration. The reading fluctuates a little — the monitor measures scattered light, and mechanical noise and vibration affect it.
6. Repeat the reading two more times and average the three values. The average should be within 10 % of the insert's calibration value.
7. Remove the insert, return it to its tube, and run a manual zero check (p. 26) again.



Figure 14. Fitting the span calibration insert into the inlet.

> **Note**
> If the reading differs markedly from the insert value, run another manual zero check and repeat the span check.

If you find that the monitor consistently over- or under-reads the dust at a particular site — for example against a gravimetric sample — multiply the scale value by the corresponding factor. The monitor then corrects its readings continuously at that site.

Performance check

The performance check tests the baseline over a long run on the bench, with particle-free air. You need the optional zeroing filter with its zero filter adapter (see Ordering information (p. 31)).

1. Mount the zeroing filter and its adapter over the inlet configuration you measure with.
2. Connect the mains transformer, and set the particle size range to **Fine** (see Particle size range (p. 14)).
3. Start a measurement with a long-term interval of 1 minute (see Starting a measurement (p. 15)) and let it run for 8 hours.
4. Download the data to a PC with DustComm Pro (see Downloading data (p. 24)) and plot them. With 1-minute averages, all values should lie between 0 and 0.015 mg/m³.



Figure 15. Zeroing filter and zero filter adapter on the inlet.

Optics cleaning and internal filter

The optical sensor and the in-line pump filter are inside the enclosure. Have the monitor calibrated at the factory once a year; the optics are cleaned and the internal filter replaced at the same time. Analyt-MTC arranges this service (see Service, warranty and contacts (p. 32)).

CHAPTER 7

Troubleshooting

Most problems have a cause you can remove yourself. If the remedy below does not help, or the remedy is service work, contact Analyt-MTC (see Service, warranty and contacts (p. 32)).

Monitor and readings

Problem	Likely cause	Remedy
The flow cannot be adjusted to 2 L/min	The in-line pump filter is loaded	Have the filter replaced by service; contact Analyt-MTC (see Optics cleaning and internal filter (p. 28)).
The run screen shows a minus sign before 0.000 mg/m³	Baseline drift at very low concentration	Run a manual zero check (p. 26).
Span check: the reading differs markedly from the insert value	Baseline not up to date	Run a manual zero check and repeat the span check (p. 26).
Readings shift after a move to a warmer or colder place, or a change between battery and transformer	Baseline shift with temperature or power source	Run a manual zero check; after a temperature change, let the monitor adjust and calibrate it first (see Before you start (p. 15)).
Readings consistently higher or lower than a gravimetric reference at a site	The dust differs from the calibration dust	Select the coarse range for coarse dust (see Particle size range (p. 14)); adjust the scale in the span check (p. 26); or apply a correction factor in DustComm Pro (see Applying a correction factor (p. 23)).
The battery runs down quickly; Battery Status shows 5.95 V DC or less	Battery discharged, or lost capacity through long storage	Charge for about 20 hours (see Charging the battery (p. 11)); run the monitor regularly, as described in the notice under Charging the battery (p. 11). Use the transformer for long runs.
The alarm cannot be heard, or the external alarm device stays dead	Pump noise; alarm not in use	Connect a flashing light to the alarm output (see External alarm device (p. 14)); set an alarm level (p. 14) and start with **Sample/Rec – ALM**.
The monitor asks for the location code again	The code entered is not stored	Enter a code within the range shown on the Location Select screen.

Download to the PC fails

If DustComm Pro is installed but the download does not work, check the following in turn:

1. Screw both connectors of the RS-232 cable tightly into place.
2. In DustComm Pro, select **Unit › Properties** and check that the COM port is the one the cable is connected to.
3. If the PC has more than one 9-pin serial port, move the cable to another port and try again. You may have to try every port.
4. With a USB connection, check that you are using a suitable USB-to-serial adapter and that its driver is installed.
5. If the steps above are in order, try receiving the data with another suitably configured terminal program, for example HyperTerminal on older Windows versions.
6. On a Chinese or Korean version of Windows, the language settings must be changed; contact Analyt-MTC.

CHAPTER 8

Specifications

MEASUREMENT	
Principle	Near-forward scattering of infrared light; source and detector at 90°
Calibration	Arizona Road Dust (ARD) against NIOSH Method 0600, respirable dust
Accuracy	Approx. ±10 % against the calibration reference
Display resolution	0.001 mg/m³
Stability at constant temperature (1σ)	±0.005 mg/m³ per hour, with automatic re-zeroing
Temperature stability (1σ)	±0.0025 mg/m³ per °C, with automatic re-zeroing
Particle fractions	TSP (impactor sleeve only); PM1.0, PM2.5, PM10 with impactors
Particle size range setting	Fine (< 5.0 µm), or coarse (< 10.0 µm) with factor 1.75
Zero	Manual zero, 100 s; auto zero every 15 minutes (can be switched off)
Performance check criterion	0–0.015 mg/m³ (1-minute averages, 8 hours, zeroing filter)
SAMPLING	
Sample flow rate	2 L/min, set at the factory; adjustable on the back panel
Pump	Internal, brushless, long-life
DISPLAY AND DATA	
Display	Liquid crystal display (LCD), 4 lines × 20 characters, backlit
Reading	Concentration in mg/m³, new value every second, three-second time constant
Averaging and storage intervals	Short term: 2, 4 or 10 s; long term: 1, 10 or 30 min
Statistics per location	Start and stop time, maximum, minimum, TWA, STEL (highest 30-minute average)
Data output	RS-232, 9-pin; optional wireless data transfer
Analogue output	Jack, 0–2 V (panel marking)
Alarm	Audible, adjustable level; alarm output socket 5 V DC, 50–75 mA
PC software	DustComm Pro 1.2; Windows XP or later, 4 MB disk, 8 MB RAM
POWER	
Battery	Rechargeable lead-acid, 6 V DC, 3.6 Ah, built in
Operating time on battery	8 h (new battery, fully charged, room temperature)
Charging time	Approx. 20 h
Power input	9 V DC, 1 A, from the supplied mains transformer (110 V / 220 V AC) or a vehicle battery with auxiliary power attachment
Fuse	2 A
Battery voltage	Full ≥ 6.50 V DC; depleted ≤ 5.95 V DC
PHYSICAL AND ENVIRONMENT	
Dimensions	3 × 6 × 9 in
Weight	5 lb with battery
Operating temperature	0–50 °C
Operating humidity	Up to 95 % RH, non-condensing
Storage temperature	−20 to 60 °C
Protection	Not for use in rain or snow without shelter; do not immerse

CHAPTER 9

Ordering information

Order from Analyt-MTC with the order codes.

Monitor and field use

Description	Order code	Manufacturer's code
AIR-AIDE kit, contents as in Checking the contents (p. 9)	Ask Analyt-MTC	AA-3500

Inlet and impactors

Description	Order code	Manufacturer's code
Impactor, 1.0 µm particle size cut point (PM1.0)	Ask Analyt-MTC	AA-1.0
Impactor, 2.5 µm particle size cut point (PM2.5)	Ask Analyt-MTC	AA-2.5
Impactor, 10 µm particle size cut point (PM10)	Ask Analyt-MTC	AA-10
Impactor sleeve	Ask Analyt-MTC	IMS-105
Impactor grease	770-211	IG-105

Checking and calibration

Description	Order code	Manufacturer's code
Calibration Standard (span calibration insert), for checking the span and the optical sensor	770-207	—
Flow audit meter with adapter, for checking and adjusting the flow	Ask Analyt-MTC	FWM-105
Zeroing filter, for the performance check	Ask Analyt-MTC	ZF-105
Cleaning kit: bulb, swabs and lens tissue (no compressed-air canister)	770-305B	KK-101

Power and data

Description	Order code	Manufacturer's code
Battery charger, 110 V AC	Ask Analyt-MTC	BC-2.5-110
Battery charger, 220 V AC	Ask Analyt-MTC	BC-2.5-220
Auxiliary power attachment for the back plate, for operation from a vehicle battery	Ask Analyt-MTC	38-005553
RS-232 computer cable, 9-pin to 9-pin	Ask Analyt-MTC	CC-102
DustComm Pro software upgrade	Ask Analyt-MTC	DC-103

CHAPTER 10

Service, warranty and contacts

Analyt-MTC is your contact for everything concerning the AIR-AIDE: technical questions, the annual factory calibration, spare parts and accessories, repairs and warranty claims. Any work inside the enclosure — cleaning the optics, replacing the in-line pump filter, repairs — is service work for trained personnel (see Service work (p. 6)).

Contact

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Before you contact Analyt-MTC

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

- the model and serial number from the rating plate on the back panel, and the date of the last calibration;
- the firmware version shown on the title screen when you switch the monitor on;
- what happened, with the location codes concerned — or the downloaded project file.

Annual calibration

Have the monitor calibrated at the factory once a year. During this service the optics are cleaned and the internal filter is replaced. Ask Analyt-MTC to arrange it, and plan the time without the monitor accordingly.

Returning a monitor

Before you send the monitor for calibration, repair or under warranty, ask Analyt-MTC how to return it and what to include. Download any data you still need to a PC first.

Warranty

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

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

All menus of the monitor, starting from the main menu (press **ENTER** on the title screen). Each menu also has a **Cancel** entry, not listed here. The right-hand column shows where each function is described.

Menu	Entry	Next screens	See
Main menu	**Sample/Record**	Menu Sample/Record	Sample/Record (p. 34)
	Playback	Menu Playback	Playback (p. 34)
	Special Functions	Menu Special Functions	Special Functions (p. 34)

Sample/Record

Menu	Entry	Next screens	See
Sample/Record	**Short Term**	**2 Second**, **4 Second** or **10 Second**	Starting a measurement (p. 15)
	Long Term	**1 Minute**, **10 Minute** or **30 Minute**	
Memory storage	**Overwrite** / **Continuation**	Overwrite: confirm **No** / **Yes**	
Alarm	**Sample/Rec** / **Sample/Rec – ALM**	Preparing Compensation, then the run screen	

Playback

Menu	Entry	Next screens	See
Playback	**Statistics**	Location Select (range shown, enter code) or **Review Loc** / **New Location**; then STATS, MAXIMUM, MINIMUM, T.W.A., S.T.E.L.	Statistics per location (p. 16)
	Data Scroll	Records one by one, from location 001	Individual records (p. 17)
	Download	**PC** › Please Connect PC/Unit Cable › Transmitting, Please Wait	Downloading data (p. 24)

Special Functions

Menu	Entry	Next screens	See
Special Functions	**Date/Time**	**View Date/Time**; **Set Date/Time** › time, date, day › confirm **Set Date/Time**	Date and time (p. 14)
	Set Alarm	Alarm concentration, `00.000 mg/m³`	Alarm level (p. 14)
	System Options	Menu below	
System Options	**Battery Status**	Battery Level, in volts	Checking the battery (p. 11)
	Erase Memory	Erase Memory? Data will be lost — **No** / **Yes**	Erasing the memory (p. 16)
	Extended Options	Menu below	
Extended Options	**Size Select**	`Fine, < 5.0 µm` / `Coarse, < 10.0 µm`	Particle size range (p. 14)

Menu	Entry	Next screens	See
	Calibration › **Manual-Zero**	Confirm **Manual-Zero** › Manual-Zeroing, Please Wait (countdown)	Manual zero check (p. 26)
	Calibration › **Sensor Calibrate**	Sensor Calibrate? Data will be lost — **No** / **Yes** › Calibrate Sensor (scale, concentration)	Span check (p. 26)
	Auto Zero	**Yes** / **No**	Auto zero (p. 15)

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