

# GRIMM Software for Optical Particle Counter

## Portable Aerosol Spectrometer 1.108/1.109





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### General information

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### Annotation

Do not operate the hardware and software until you have carefully read these operating instructions! The manufacturer cannot be held liable for damages caused by improper operation, use, cleaning, or operating errors!

Many software and hardware designations mentioned in this manual are registered trademarks and are to be treated accordingly. The author's intention is to provide you with as complete and accurate information on the described hardware and software as possible. However, Grimm Aerosol Technik do not guarantee absolute completeness and accuracy of the following information thus foreclosing any entitlement to damages, neither direct nor consequential, resulting from the use of this manual and / or the use of the software and hardware. Moreover, we do not guarantee the full functionality of this software under Windows Vista. Grimm Aerosol Technik will not be held responsible for damages resulting from patent infringements or abuse of a third party's rights.

Due to continuous improvements to our hardware and software, minor discrepancies may occur with respect to the instructions and illustrations of this manual as compared to the actual hardware and software. If this is the case, please ask for the latest version of this manual.

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### Meaning of the used symbols:

In this manual the following pictograms are employed to indicate important hints, advice, and warnings.



This pictogram indicates useful hints to facilitate and optimize your working process.



This pictogram indicates potential dangers that may lead to malfunctions or even damage to the software and / or hardware and offers advice as to how such dangers can be avoided.



### System requirements

To successfully install and use the GRIMM software the minimum system requirements are as follows:

- operating system: Windows 2000, Windows XP, Windows Vista, or Windows 7
- LabVIEW 8.6.1 development system <<u>Grimm Software</u>>
- 5MB free disk space (200MB if LabVIEW 8.6.1 development system is not installed yet)
- USB-RS232 driver if you use the USB-to-RS232 cable < Grimm Software>
- license file according to the serial number of the spectrometer (provided with the USB flash drive).

#### Demo mode / licence file

To use all program features without limitation, you need a licence file for each hardware device. This licence file must be in the same folder as the installed program executable. If the program does not find such a licence file, it will run in **Demo Mode**. You can still test all program features, but there are two limitations:

- max 25 measurements/scans can be stored in one file
- the program will stop after 1h.

A licence file can be purchased at:

GRIMM Aerosol Technik GmbH & Co. KG Dorfstrasse 9 83404 Ainring Germany Phone: ++49 / 86 54 / 5 78 – 0 Fax: ++49 / 86 54 / 5 78 – 35 Email: <u>software@grimm-aerosol.com</u> Homepage: <u>www.grimm-aerosol.com</u>



### 2 Introduction

This manual provides you with all necessary information on how to obtain accurate measurements, how to store the measurement results, and how to convert the data to your favored form for subsequent analysis of the particles measured in ambient air.

With this state-of-the-art software you will be able to easily conduct your measurements as it is almost selfexplanatory. This software was specifically designed to simplify your measurements and to safely store this valuable data. There is no need for complicated settings – just follow the instructions step by step. The following chapters will guide you through the use of the software and show you how to set it to your personal demands.



Make sure to carefully read this manual to be able to conduct reliable measurements and to properly use the purchased software.

Should you require any assistance with regards to this software where this manual does not provide appropriate troubleshooting, please contact:

GRIMM Aeroso Dorfstrasse 9 83404 Ainring Germany	ol Technik GmbH & Co. KG
Phone:	+49 / 86 54 / 5 78 – 0
Fax:	+49 / 86 54 / 5 78 – 35
E-Mail:	<u>software@grimm-aerosol.com</u>
Homepage:	www.grimm-aerosol.com



### **3** Software Installation

This chapter guides you through the installation process of the new developed GRIMM Spectrometer Software 1178 in order to run the spectrometers 1108, 1109, 1129, 1209, and 1320 (even EDM models within "Count-Mode") as well as to evaluate all measured data.



Please note: This guidance uses screenshots of the software version 2-2-3. For later versions, all installation steps have to been done accordingly.

The provided USB flash drive contains four folders; the content of each folder has to be installed sequentially.



Figure 3-1: USB flash drive folders

Name and content of the folders:

- Step\_1\_LabView-Runtime-Environment-and-VISA
- Step\_2\_Grimm-Spektrometer-Software
- Step\_3\_License-File-for-Software
- Step\_4\_USB-Driver-for-Grimm-Data-Cable

#### Step\_1\_LabView-Runtime-Environment-and-VISA

The packed zip-file **runtime\_environment.zip** contains three modules: LabView Runtime Engine 2011, its previous version 8.60, and the so-called VISA module. The first two files are necessary that the LabView programs are executable on a PC, and the VISA module enables the interface communication (USB cable, RS-232, COM ports, etc.).

🖉 🛃 « Removable Disk (F:)	Step_1_LabView-Runtime-Environment	-and VISA 🕨 runtime_env	ironment 🕨	<b>▼ 49</b> Se	arch runtim	ne_environment
nize 🔻 Extract all files						= -
Name	Туре	Compressed size	Password 9	Size	Ratio	Date modified
\mu bin	File folder					
license	File folder					
📃 🔋 supportfiles	File folder					
nidist.id	ID File	1 KB	No	1 KB	25%	01.12.2010 13:2
🗿 setup	Configuration settings	5 KB	No	16 KB	74%	01.12.2010 13:2
setup	Application	1.212 KB	No	1.250 KB	4%	22.06.2010 09:3

Open the folder Step\_1\_LabView-Runtime-Environment-and-VISA and execute the file setup.exe

Please follow the instructions; all three modules described above will be installed onto your PC.

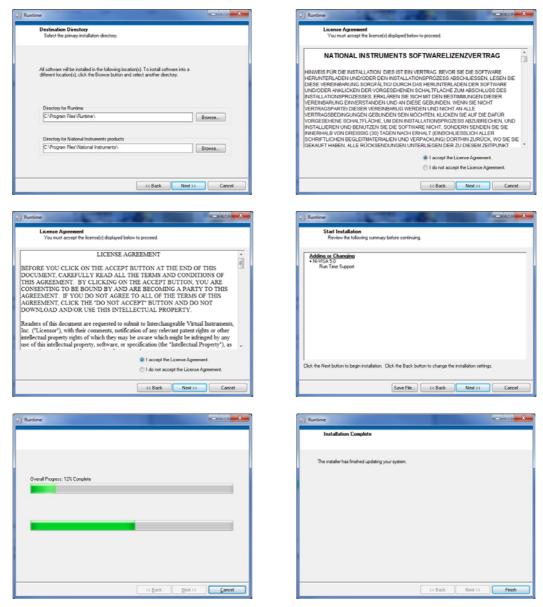


Figure 3-2: Installation process of the LabView Runtime

After installation you will be asked for restarting your PC. Restart your PC LATER after "Step 2".



### Step\_2\_Grimm-Spectrometer-Software

After you have installed the LabView Environment, please proceed with the installation of the actual software. This is the Grimm Spectrometer Software 1178, e.g. version **Install\_Spectrometer\_V\_2\_2\_3.zip**.

Execute the setup file.

		_						x
Computer ► G	rimm (F:)   Install_Spectrometer_V2_2_2			<b>▼</b> 49	Search Install_Spect	ometer_V.	2_2_2	9
Organize 🔻 Extract all files						•== •		0
🔆 Favorites	Name	Туре	Compressed size	Password	Size	Ratio		Date m
	Setup	Application	3.898 KB	No	3.914 KB	1%		25.07.20
🧊 Libraries								
🖳 Computer								
🙀 Network								
	•							F
Setup Compressed siz		tio: 1% ed: 25.07.2011 10:34	Type: Application					

Figure 3-3: Setup File

For this installation process you need to have administrator rights.

The User Account Control (UAC) might show up warning you, that an unidentified program wants access to your computer. If you want to continue with the installation process, click on "Allow".

The setup process starts with the End User License Agreement, the so-called "EULA". Please read the whole EULA carefully (scroll down the dialog box for the whole text) and continue if you agree with the terms of Grimm Aerosol Technik GmbH & Co. KG by clicking on "Agree".

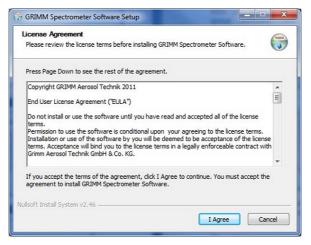


Figure 3-4: End User License Agreement

The second step is an information of what you are about to install. Please click on "Next" to continue.

Choose Components Choose which features of GRI	MM Spectrometer Software you	want to install.
Check the components you wa install. Click Next to continue.	nt to install and uncheck the con	nponents you don't want to
Select components to install:	GRIMM Spectrometer	Description GRIMM Software for IAQ Spectrometers
Space required: 5.1MB		
llsoft Install System v2.46		

Figure 3-5: Software components to install

The setup automatically suggests installing the GRIMM Spectrometer Software into the path C:\Program Files\Grimm\Spectrometer. To install in a different folder, click "Browse..." and select a different folder. The setup now installs the program. Furthermore, the setup process creates an empty folder at C:\Grimm\_Measurement\_Data where your measured data can be stored at



The default path for installing the software is the directory C:\Program Files\Grimm\Spectrometer Another empty folder will be created at C:\Grimm\_Measurement\_Data. This folder is intended for saving your measured data.

Choose Install Location		(NUMBER OF ALL O
Choose the folder in which to install GR	IMM Spectrometer Software.	
Setup will install GRIMM Spectrometer S folder, click Browse and select another		
TOIDE Y CICK DI ONSE GINA SECCE ON OTRA		8001.
Destination Folder		
Destination Folder C:\Program Files\Grimm\Spectrome	ter 📄	Browse
	ter	Browse
C:\Program Files\Grimm\Spectrome	ter .	Browse

Figure 3-6: Destination folder

In order to complete the installation process, please click on "Finish". In this last installation window you can choose if you want to start the software subsequent to the installation or not by setting on unsetting the checkmark. The setup process will automatically create a desktop icon.

GRIMM Spectrometer Softw	vare Setup
	Completing the GRIMM Spectrometer Software Setup GRIMM Spectrometer Software has been installed on your computer. Click Finish to close this wizard. Start Grimm Spectrometer Software
	< Back Finish Cancel

Figure 3-7: Completing the installation

After you click on "Finish", a further window will appear, advising you, that your measurement data has to be stored on the just created directory C:\Grimm\_Measurement\_Data because of the directory rights of Windows.



Figure 3-8: Location for saving measurement results

Depending on having the checkmark set or not in the previous window, the software will automatically start up after the installation is finished. You can also start up the program by clicking on the application file Spectrometer\_V2-2-3 (Grimm logo in front of the file name) or via the shortcut on your desktop.

Organize 🔹 Include in library 💌	Share with 🔻 Burn New folder				•	
Favorites	Name	Date modified	Туре	Size		
	🎯 Uninstall.exe	12.10.2011 13:29	Application	51 KB		
🗃 Libraries	Spectrometer_V2-2-3.ini	06.10.2011 12:06	Configuration sett	1 KB		
	Spectrometer_V2-2-3.exe	06.10.2011 12:06	Application	2.012 KB		
🖳 Computer	Readme_Spectrometer_2-2-3.txt	05.10.2011 08:48	Text Document	6 KB		
	M_E_LabView_Software_rev_2p0.pdf	06.10.2011 12:06	Adobe Acrobat D	3.605 KB		
🙀 Network	🚳 Ivanlys.dll	06.10.2011 12:06	Application extens	1.148 KB		

Figure 3-9: Installed software

**Please note:** The software is now ready to use as demo version. In order to use the full version (see <u>Step</u> <u>3</u>), you have to purchase a license file.



Activating the full version.

**Please note:** all further explanations refer to the installation of the software into the default destination directory:

#### C:\Program Files\Grimm\Spectrometer\

If you chose a different destination directory before (<u>Step 2</u>), please follow the instructions according to the file path you selected (location of the Spectrometer\_V2-2-3.exe file).

In order to run the software 1178 as full version, you need to have a license file with the file ending \*.lic. For GRIMM aerosol spectrometers the name of the license file is identical to the 8-digit serial number of the device, e.g. 8F100031.lic or 9G080012.lic. This license file has to be copied into the directory where the software has been installed at. The setup file is called Spectrometer\_V2-2-3.exe (respectively a higher number for later versions) and is labeled by a red GRIMM logo.



Sometimes, the directory rights prohibit – as a safety feature of Windows – to directly drag files into the destination C:\ProgramFiles\.

When having an error message, that moving or copying the license file into the folder C:\Program Files\Grimm\Spectrometer\ is not possible, please copy your license file first from the USB flash drive onto your desktop, and then into the folder C:\Program Files\Grimm\Spectrometer\.

Organize 🔻 📄 Open	Burn New folder				•	?
🔆 Favorites	Name	Date modified	Туре	Size		
	🎯 Uninstall.exe	12.10.2011 13:29	Application	51 KB		
词 Libraries	Spectrometer_V2-2-3.ini	06.10.2011 12:06	Configuration sett	1 KB		
	Spectrometer_V2-2-3.exe	06.10.2011 12:06	Application	2.012 KB		
🖳 Computer	Readme_Spectrometer_2-2-3.txt	05.10.2011 08:48	Text Document	6 KB		
	M_E_LabView_Software_rev_2p0.pdf	06.10.2011 12:06	Adobe Acrobat D	3.605 KB		
🙀 Network	🚳 Ivanlys.dll	06.10.2011 12:06	Application extens	1.148 KB		
	9G100055.lic	12.10.2011 12:05	LIC File	1 KB		

Figure 3-10: Location of the license file

When both files (\*.exe and \*.lic (here e.g. 9G080012.lic) are in the same directory, the demo version has been activated to the full version.

These files (\*.exe and \*.lic) can be moved into any other directory, for example if you operate several aerosol spectrometers, as long as you make sure, that both files remain together in the same directory. It is also possible to have several license files in one directory (together with the setup.exe file).

### Step\_4\_USB-Driver-for-Grimm-Data-Cable

In order to enable the communication between your PC and the GRIMM aerosol spectrometer via the GRIMM data cable RS-232 to USB (catalogue number 1.141), you have to install a driver once. This device driver is on the provided USB flash drive in the directory Step\_4\_USB-Driver-for-Grimm-Data-Cable.

<u>.</u>	▶ Computer → Removable Disk (F:) → Ste	p_4_USB-Driver-for-(	Grimm-Data-Cable 🕨		<ul> <li>✓ 4y Search Step_4_USB-Driver-for-Grimm </li> </ul>
Organize 🔻	🖌 🏹 Open Share with 🔻 Burn	New folder			III 🔹 🖬 🔞
∈^	Name	Date modified	Туре	Size	
-	길 _IO Cable_PL-2303_Drivers - Generic_Win	19.04.2011 10:23	File folder		
	JO Cable_PL-2303_Drivers - Generic_Win	18.04.2011 13:59	Compressed (zipp	2.316 KB	

Figure 3-11: Driver file

Analogous to <u>Step 1</u> and <u>Step 2</u> extract the content of the zipped files and execute the application PL2303\_Prolific-DriverInstaller\_v130.

The driver will now be installed onto your PC. Your Windows operating system will recognize the GRIMM data cable automatically when connecting it to the USB port

Annotation:

Later versions of the GRIMM Spectrometer Software 1178 will be available for free on our homepage as download to upgrade your current version.



### 4 Connecting the Spectrometer to the PC

Connect the spectrometer to the PC either via serial-to-serial port cable or via USB-to-serial port cable. Then switch on the device. Please mind, that only a special GRIMM cable transmits data.



To guarantee a continuous operation, we recommend to hook up the instrument to the mains adapter instead of running it on battery power.

After switching on the instrument, wait for the filter test query to show up on the LCD of the spectrometer. This is a query as to whether or not the filter has been changed.

Filter changed: Key +	In case the filter was indeed replaced, respond by pressing the "+" key on the keypad of the instrument; this will reset the total sample volume and its corresponding dust mass to zero.
Filter not changed: Key -	If you have not replaced the filter, respond by pressing the "-" key on the keypad of the instrument; the instrument will continue measuring and adding up the total volume and the corresponding dust mass.

After responding to this question the spectrometer continues with its self-test. The self-test is being executed by the instrument prior to every instrument start in order to verify the proper functioning of the instrument.

The self-test takes about half a minute. After successful completion of the self-test, the instrument will display the message SELF TEST OK.



Should the LCD display "New Self Test", please wait for the self-test to complete. If this message appears more than once in succession, the following message appears: FATAL ERROR PLEASE CHECK. In such a case please consult the instructions provided in the manual for the spectrometer.



If you are using our meteorological sensors (1153FH for temperature and relative humidity or 1154 for temperature, relative humidity, and wind speed), please make sure, that you have this sensor connected already in stand-by mode of the instrument before making all necessary settings in the program. Otherwise, if you connect the sensor afterwards, the software will not recognize the sensor and thus show no data.



### 5 Program features

After starting the software (C:\Program Files\Grimm\Spectrometer\Spectrometer Software V2-2-3 or by double-clicking the shortcut on the desktop) the following start window appears.

Control GR	UMM-Spectromete	er   Program Revision	: Version 2.2.3	-		
Control	Overview	Distribution	Table	Time	Statistic	Help Stop & Exit
Scan	Ports					
Time I	nterval					
Synchro	onization					
User S	ettings					
Start Spe	ctrometer					
Start Dat	a Storage					
Memo	ry Card					
Open	Files					
Port tel	egram					
						*
						•
"Please execu	ute commands step-	by-step".				

Figure 5-1: Control window

This window is the default start window. The program also indicates you, which instrument you are using by its color. After scanning the ports, the software recognizes the connected spectrometer. If you have connected a spectrometer model 1108, it remains grey; if you connected a spectrometer model 1109, it turns into red.

The software leads you through the program step by step. Buttons and features are disabled and greyed if different settings have to be made before. Information about the current program status or the next step to do is shown at the bottom of the Control window.



The measurement results are visualized by several graphs. These graphs can be modified using the context menu (press right mouse button), the plot menu (press left mouse button while pointing on a plot of the plot legend) or the zoom menu.

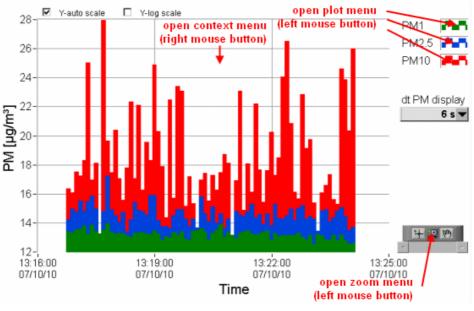


Figure 5-2: Graph menus



One of the most outstanding features are the "AutoScale" settings. If you disable "AutoScale", you can edit the minimum and maximum values of the corresponding axis to the axis values you favor. If you enable "AutoScale", the graph will be updated with each measurement cycle. If you change to a different tab and go back to the previous one where you changed the layout settings, the default program settings are restored.

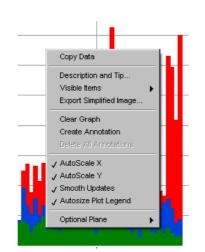


Figure 5-3: Graph context menu

You can change the view of each plot separately via the plot menu. Either you select a plot style in the sub menu "**Common Plots**", or you can set single items of the selected plot in the other sub menus. If you restart the software, the default program settings are used.

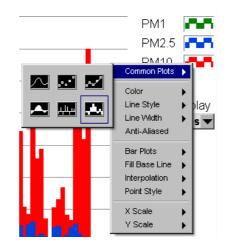


Figure 5-4: Graph plot menu

The zoom menu should be used only if you stopped the measurement or you disable "AutoScale X" and "AutoScale Y" first. Otherwise the zoom settings will be reset with each new measurement value. If you zoom in into the graph, you can use the scrollbar for horizontal scrolling only. If you restart the software, the default program settings are used.

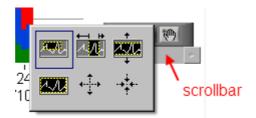


Figure 5-5: Graph zoom menu

Г



### Starting a measurement

Please press Scan Ports to detect the connected devices and to check for valid licence files. If more than one spectrometer is detected, a window pops up where you can select a device. If the program does not detect any connected device, a window pops up where you can select the port manually.

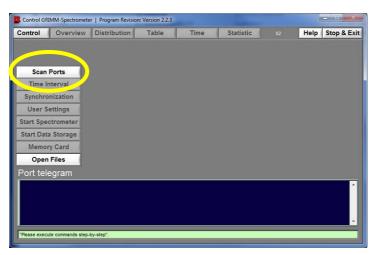


Figure 6-1: Scan Ports



Figure 6-2: Select serial port manually

Please check the cable connection and select the port manually. If the port is not listed, select Refresh. If the port is still not listed, please check Window's COM-port list (Device Manager  $\rightarrow$  Ports) If the program detects a device and there is no valid licence file found, you can still run the program in demo mode.



Depending on the detected device, the window colour changes and some features will remain disabled or even invisible. The device type (model) is shown in the header line. The green bottom line gives you some hints what to do next.

Control Ove	rview	Distribution		Table	Th		Statistic	02	Help	Stop & Ex
	1	Serial No.	of	device		Мо	del		Port	
Scan Ports		9G10	005	5		1,1	09	*	COM	3
Time Interva										
Synchronizatio	on									
User Setting										
Start Spectrome	ster									
Start Data Stor	ege									
Memory Care	1									
Open Files										
Port telegram	n									

Figure 6-3: Control view

Next step is to select the time interval. If you select a time interval longer than 6 seconds, the device will still measure and show results every 6 seconds on the display, but it will send average values to the program and the memory card depending on the selected time interval.

📧 Set Time Interva	II, Serial No. 9G100055
Sele	ect Time Interval
	6 seconds 🥆
Initialize	Stop

Figure 6-4: Select time interval

The device internal timer is very accurate. You only need to synchronize the device-time with the PC-time every 3 months or when you change the time zone only. To compare the current PC and device time, please press Get Current time. If you want to synchronize the OPC and PC time, please press the button Synchronize.

Sy	nchronize Time	
OPC dat	e&time	
2011		
PC date8	Stime	
30.09.201	1 09:48	
et Current Time	Synchronize	OK

Figure 6-5: Synchronize Time



In order to execute a measurement, to store the measurement results on the hard disk, and to use all visualization features, you have to specify some user settings. All user settings and some additional information about the used device and program version are stored in the header section of each result file. These files are ASCII files (spreadsheet format) and can be opened after the measurement with this Grimm software, with Excel, or a simple text editor. If you do long-term measurements, the feature create file per day allows you to let automatically separate the result data into single days. Due to the ASCII format, you can easily concatenate the files later.

Control GRIMM-Spectr	ometer   Model: OPC 1.109   s/n: 9G100055   Program Re	evision: Version 2.2.3
	ttings and press "OK". The final result file name r day", you will get new result files each day au rv .	
counts file name:	TEST1_2011-10-13-C.dat	
mass file name:	TEST1_2011-10-13-M.dat	
log file name:	TEST1_2011-10-13-L.dat	
result file path	C:\Grimm_Measurement_Data	<b>b</b>
file name prefix	TEST1	create file per day
C-factor	1,00	
comment	Normal conditions	
user name	John Doe	
location	Office	
	OK	el

Figure 6-6: User settings

After completing the settings, all buttons of the control window should be activated. Star Data Storage will only be active after starting the measurement by clicking on Start Spectrometer.

device type OPC 1.109
Scan Ports
Time Interval
Synchronization
User Settings
Start Spectrometer
Start Data Storage
Memory Card
Open Files

Figure 6-7: Control Buttons

To start the measurement, please press Start Spectrometer. To enable the data logging, please press Start Data Storage. If you stop the measurement, the data logging will be stopped, too. It is possible to stop the data logging only, change the result file and continue the data logging.



If you want to get the data of the complete measurement, you either need a memory card, or you must enable the data logging. There is no internal program buffer which collects the measurement results.



Figure 6-8: Tab Control

The picture above shows a measurement in a 6 second time interval. If you do not activate the data logging by pressing the button "Stat Data Storage", the tabs "Distribution", "Table", "Time", and "Statistic" will not be accessible. The blue window "Port telegram" shows the raw data provided at the COM-port of the device.



Depending on the device type, some features (tabs) will remain disabled or invisible.

### **Tab Overview**

All currently measured data is displayed here in this overview. Please mind, that all displayed data will be saved only if you activate the data storage in the tab "Control". If you have connected a meteorological sensor (1153FH for temperature and relative humidity or 1154 for temperature, relative humidity, and wind speed), the gained data will also be displayed in the left column below the mass fractions. If no sensor is connected, it will not be displayed. All values will be updated every 6 seconds or less often depending on the selected time interval.

total counts [1/]	151400	1				- 14/0			
counts < 1 µm [1/]	150400	E min mid		nax mid s		ts [1/i]			
counts > 1 µm [1/]	1000	0,265		34,000 µr	And in case of the local division of the loc	counts	min max	11/0	151400
PM10 [µg/m <sup>2</sup> ]	91,6			Nation Comments					
PM2.5 [µg/m <sup>#</sup> ]	17,7	do fum!		0.28-0.30		0.35-0.40	0.40-0.45		0.50-0.58
PM1 [µp/m <sup>2</sup> ]	12,5		62800	33100	25150	15700	8350	2000	1700
Inhalable [µg/m <sup>4</sup> ]	947,2	0.58-0.65	0.65-0.70	0 70-0 80	0.80-1.00	1.00-1.30	130-160	160-2.00	2.00-2.50
Thoracic [µg/m <sup>4</sup> ]	120,9	750	550	300	0	0	300	100	70
Alveolic [µg/m <sup>2</sup> ]	25,9	2.50-3.00	300-350	3.50 4.00	4.00.5.00	5 00 6 50	6575	7585	8.5-10.0
		100	90	50	70	50	40	10	0
		10.0-12.5	125-150	15.0-17.5	17.5-20.0	20 0-25 0	25.0-30.0	30 0-32 0	132
		50	20	0	10	20	10	0	10
Qbatt	45								
imot	32								
C-factor	1								

Figure 6-9: Tab Overview



### **Tab Distribution**

The tab Distribution shows bar graphs for the current measurement values dN/dlog(dp), dS/dlog(dp) and dM/dlog(dp). Here you can also modifive the x- and y-axis, and also let the program display the data as gliding mean value smoothened over 60 seconds.

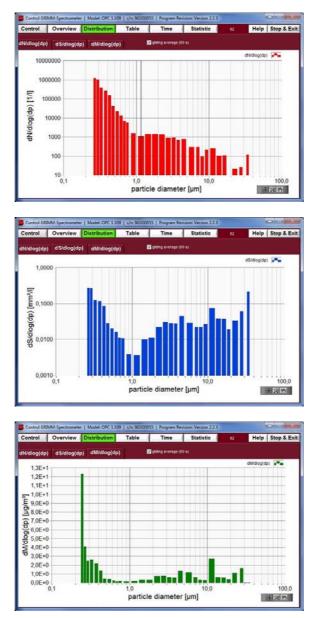


Figure 6-10: Tab Distribution

D



### Tab Table

In this tab the software displays all measured data according to your set time interval in real-time. It gives you all information about the counts and mass of the particles, as well as in the submenu "log" all relevant device status information. If you have connected a meteorological sensor (1153FH for temperature and relative humidity or 1154 for temperature, relative humidity, and wind speed), the gained data will also be displayed in the log table.

1400 1500 1450 1600 1750 1650 1650	61 µm 859 800 730 650 550 1000 650 1000 650 950 750 850 750 850 300 650 950 950
1400 1300 1500 1600 1600 1700 1700 1700 1700 1700 17	859 600 730 650 650 500 550 750 550 750 550 750 550 750 650 650
1400 1300 1500 1600 1600 1700 1700 1700 1700 1700 17	859 600 730 650 650 500 550 750 550 750 550 750 550 750 650 650
1300 1500 1660 1660 1750 1660 1750 1660 1760 1660 1660 1500 1500 1500 1560 1550 155	600 750 650 500 500 500 750 550 750 550 750 850 750 850 200 650
1900 1900 1750 1750 1950 1950 1950 1400 1400 1350 1550 950 950 950 1500	650 650 500 1150 750 1000 650 750 550 750 550 750 850 200 650
1800 1750 1850 1700 1800 1700 1400 1400 1400 1400 1500 1500 550 550 550 550 1500	650 500 500 1150 750 1000 650 750 550 750 850 200 650
1750 1750 1750 1750 1750 1750 1400 1500 1500 1550 1550 1550 550 1550 550	500 500 1150 750 1000 650 750 550 750 850 200 650
1650 1700 1700 1700 1700 1700 1700 1700 1500 15	500 1150 750 1000 650 750 550 750 850 200 650
1760 1650 1750 1400 1700 1400 1700 1100 1350 1350 1550 1550 1550 1550 1550 1000	1150 750 1000 650 950 750 550 750 850 200 650
1650 1700 1400 1500 1700 1350 1350 1550 550 1600 1200	750 1000 650 950 750 550 750 850 200 650
1700 1400 1600 1700 1100 1550 1500 1000	1000 650 950 750 550 750 850 300 650
1400 1600 1700 1100 1350 1850 550 550 550 1500 2000 1200	650 950 750 550 750 850 300 650
1600 1700 1100 1350 1856 950 950 1600 2000 1200	950 750 554 750 850 300 650
1700 1100 1360 1866 1566 950 1600 2006 1300	750 550 750 850 300 650
1100 1350 1856 1550 950 1600 2000 1300	550 750 850 300 650
1856 1550 950 1600 2000 1200	850 300 650
1550 950 1600 2000 1200	300 650
950 1600 2000 1300	650
1600 2000 1200	
2000	950
1200	
	900
700	600
1300	550
600	000
	100
0	- ×
lelp Stop	p & Ex
	-
	-
	-
	-
	1000
	-

Figure 6-11: Tab Table



#### Tab Time

In the tab time all measured data can be illustrated as a graph. On the right side of this window, you can select up to three values (by holding the key Ctrl and clicking at the same time on the desired values). Also the time interval can be varied. Your data can be illustrated based upon counts, PM-values, or IAQ (which means the inhalable, thoracic and alveolic fraction). If you have connected a meteorological sensor (1153FH for temperature and relative humidity or 1154 for temperature, relative humidity, and wind speed), the gained data will also be displayed in two separate sub-tabs next to "IAQ". If no sensor is connected, only the three sub-tabs "Counts", "PM", and "IAQ" will be displayed.

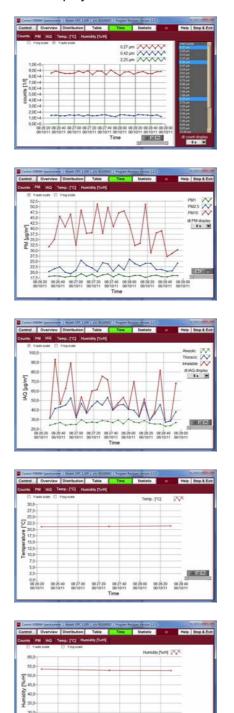


Figure 6-12: Tab Time

08.20.40 08.27.00 08.27.20 08.27.40 08.28.00 08.29.20 08.2 06.10.11 06.10.11 06.10.11 06.10.11 06.10.11 06.10.11 06.10.11

20.0-08.26.20 06/10/11

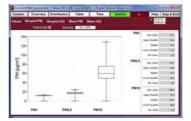


### **Tab Statistic**

This feature provides information about the number of particles, as well as their masses split in various size classes (environmental PM values and occupational health fractions).

Within this tab Statistic you can enter sub-tabs and choose different possibilities to get more information about the measured particles (chart or graph).

lemenol	Overview	Distrib	dion	Table	1 7	ine .	Stativitic		Help Sto	P & Exit
ters me	union PART 1	Beaples I	NO Mee		Maan U	a			10.5138 Texasterio	
			10-re 1ger 218	Saura		Per bartet	PHES Sophet	ment beginnen	French Sugar	Parent.
in of Hondory			37.4		27.8	27.9	37.8	37.8	37.8	
80.00		4.4	- 60		- 60	- 10		4.9	1.1	
( Sector		14.3	1294.3		- 6.6	163	30	(2E.+	913	
that have	•	194.3	3244.1		4.4	64,0	34.7	138.4	- 94.8	
	• ]	414	40.3		- 63	11.8	96.8	673	20.8	
Di Devido		120	PIET		- 14	1.4	4.8	10	11	
Valation Cost					hatt	- 63		8.4	U	
Unique M		101.5	1585.8		.1.7	415	14.7	100.1	- 20	
ine les		116.3	110		- 63	15.4	84.4	- 164	- 20	
Period	•	101.1	381,8		- 10	10.1	101	86.1	341	
1000-600			246.4			11.8	40.5			
Ottain 12	۱	HLI .	201.2		- 11			48.7	16.1	
	-	_		-	_					
	-	_		-						
	-	_		-						
		_								
	-	_		-	_					
	-			-						



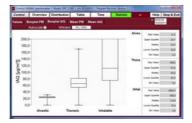






Figure 6-13: Tab Statistic



### 7 Save and Open Measured Data

### Save Data

In the main window "Control", you can access the button Memory Card after scanning the ports for a connected spectrometer. You do not need to make any settings before reading out the memory card.

Countrie Countrie	e Distribution Table	Time Statistic		Help Stop & Exit
	Serial No. of device	Model		Port
Scan Ports	9G100055	1.109	M	COM3
Time Interval				
Synchronization				
User Settings				
Start Spectrometer				
Start Data Shirage				
Memory Card				
Open Files				
Port telegram				

Figure 7-1: Main window Control - Memory Card

Clicking on the button Memory Card opens a dialog where you can read the data from the memory card or the device internal buffer, which is 80kBytes only, or you can clear and reset the memory card.

Read	Data from memory card
wmload Memory C	ard :
Read Memory Car	Stop Download Clear Memory Card
	Convert data to spreadsheet format
n	eading memory card data

Figure 7-2: Read data from memory card

Do not interrupt the download, otherwise data may get lost. After the download is completed, the button "Convert data to spreadsheet format" will be active. Please note, that the data is not saved, yet. You now have to press "Convert data to spreadsheet format"

Read	Data from memory card
wnload Memory C	Card
Read Memory Ca	rt Stop Download Clear Memory Ca
	Convert data to spreadsheet format
	dy with reading, please press vert data to spreadsheet format"

Figure 7-3: Read data from memory card



Now please choose the folder where you want to save the data at. For this procedure you have to have full write access at you desired destination for saving the data.

Click on the icon for browsing and choosing a folder where you want to save your files.

Please use the "up/down" buttons, or the "PageUp/PageDown"	Please select the output file path and the file name prefix. The final result file names are listed below.	
keyboard buttons, or type the number to select the section you want to convert	path: 1	
THE CONTENT.	file name prefix:	
Section Measurement Start Time	Counts file name: C:UsersU. DoelDesktoplTest110fice Test-C.dat mass file name: C:UsersU. DoelDesktoplTest110fice Test-M.dat	
1 14:44:00 30:09:2011	log file name: CNUsersU. DoelDeskopiTest10ffice TesHL.dat	
$\checkmark$	Start Conversion Stop	

Figure 7-4: Choosing the destination for saving data at

When browsing for your desired destination, please enter the folder you want to save your files at, and then click on "Current Folder" and not on "Save". Only by clicking on "Current Folder" you will save the data.

Save in:	🕕 Test 1	•	G 👂 📂 🗔 🗸	
(A)	Name	^	Date modified	Туре
Lecent Places		No items match your	search.	
Network	Vetwork	m		
	File name:		-	Save
	Save as type:	Alle Dateien (*.*)	-	Cancel

Figure 7-5: Choosing the folder for saving data at

Now the destination has been accepted and you can start your conversion. If you have more measurement sessions on your memory card, you can choose the sections you want to save by selecting them on the left side of this window. The sections have their respective numbers and according time of the measurements. Thus you can identify them by time. Press now "Start Conversion" in order to save the converted files.

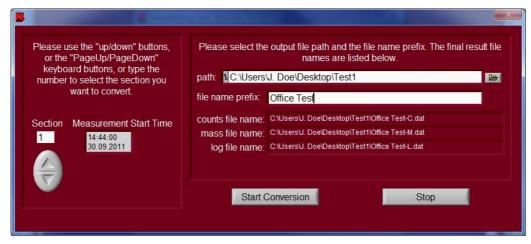


Figure 7-6: Convert and save memory card data



### Open Data

You can open your saved data at any time from your PC. It is possible to open the files with "Grimm", which means, that the file will be displayed in this software as charts and graphs, or you can open the file with Excel. This spreadsheet file can then be saved.

For opening a file, please click in the main window "Control" on "Open Files". A window will appear asking you for choosing the file you want to open. Please browse for it by clicking on the respective icon.

📴 Open Count File		
count file		
8		browse
mass file		
웅 <kein pfad=""></kein>		
名 <kein pfad=""></kein>		
Open files with Grimm	Open files with Excel	Abort
-		
please select count file with (corresponding mass and lo	browse button og files will be selected automa	atically)
toon oop onenig made and to	g mee min ze colocioù datorre	

Figure 7-7: Choosing a file to open

Only one file will be displayed which you can open, although you saved three files before. This file contains all data.

Look in:	🔒 Test1		•	G 🖻 🖻 🖽 -	
(Au	Name	*		Date modified	Туре
Recent Places	Office Test	t-C.dat		04.10.2011 13:49	DAT File
Network	•				
	File name:				OK

Figure 7-8: Opening the file

After selecting the file destination, please choose if you either want to open the files with the software by clicking on "Grimm", or if you want to open them with Excel. Opening the file with Grimm will display the data in this software, and opening the file with Excel will automatically open an Excel file with all data in it.