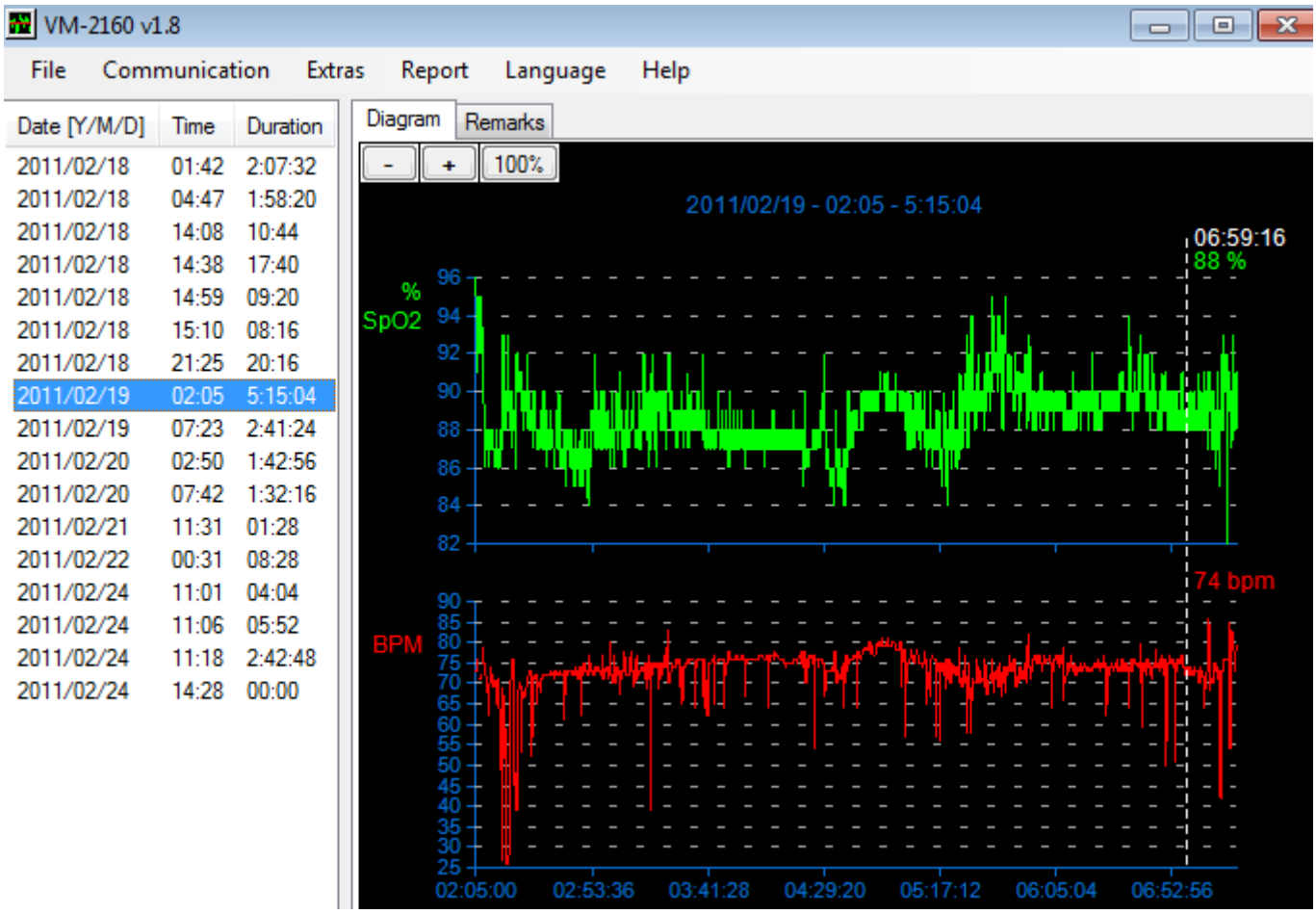

VM-2160 PC-Software

USER MANUAL

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VM-2160 PC-Software User Manual
Version: EN 1.4
Released: 06/2018

The information in this document is subject to change without notice.

Manufactured by bluepoint MEDICAL GmbH & Co.KG, An der Trave 15, 23923 Selmsdorf, Germany

1 Introduction

The VM-2160 handheld pulse oximeter is intended for continuous or spot check monitoring of functional arterial oxygen saturation (SpO2) and pulse rate of adult, paediatric and neonatal patients. The VM-2160 PC-Software is used to download measurement data and stored alarm limits from the VM-2160 device onto your computer via USB interface. The datasets can be viewed and information added. Datasets can be printed or exported as CSV file for processing with additional software. Refer to the instructions for use of the VM-2160 device for more information.

With the VM-2160 PC-Software version V1.5 and higher a statistic summary report can be generated for each dataset.

2 System requirements

- Windows XP SP3, Windows Vista SP1, Windows 7, Windows 8, Windows 8.1, Windows 10
- Microsoft.net Framework 4.0 or higher (latest version is installed on your PC while installing the VM-2160 PC-Software)
- CPU: Pentium 1 GHz or higher
- RAM: 512 MB RAM or more
- Super VGA (800 x 600) or higher-resolution video adapter and monitor
- One free USB port
- Keyboard and mouse or compatible pointing device
- Available hard disk space: x86 – 600 MB, x64 – 1.5 GB
- To install the PC-software you must have Administrator rights

Caution:

Changing the PC Operating System, the USB Drivers or the Microsoft.net Framework version may result in malfunction of the CapnoTrue® PC-Software due to incompatibility.

Caution:

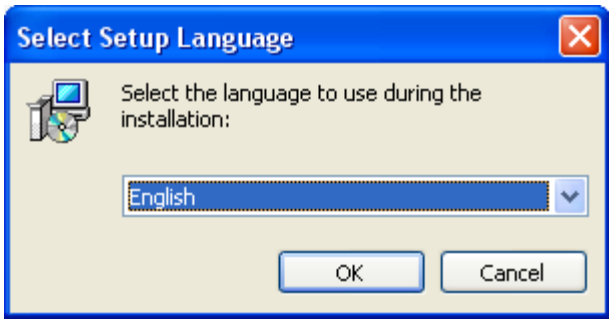
Bad connectivity of the USB cable or incompatibility with the PC Operating System, the USB Drivers or the Microsoft.net Framework can result in errors during download of data.

In such case an error message will be displayed by the PC software. Note that data will not be deleted on the device. Try the data download again on a PC with correct System Requirements.

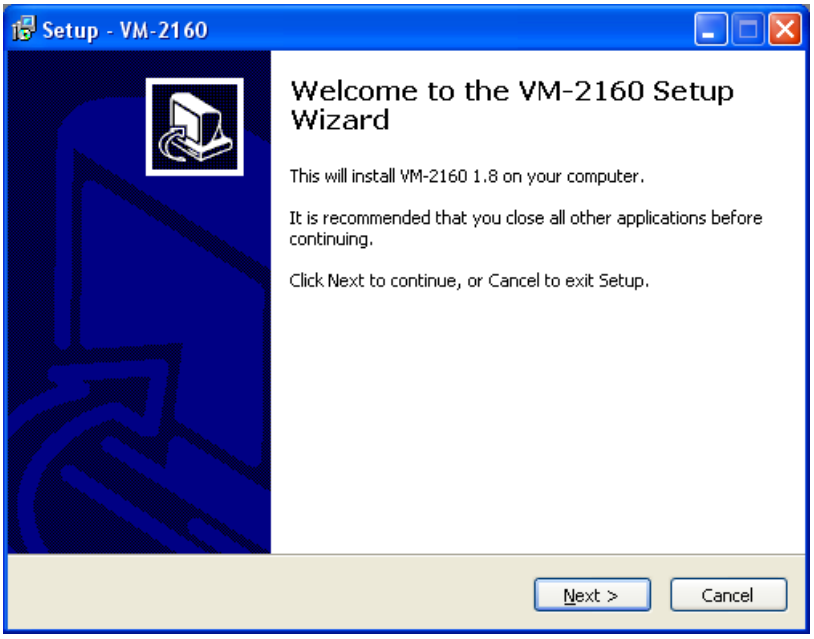
3 Installing the PC-Software

1. Search the folder "**VM-2160_PC SW**" on your CD and double-click on the file "**VM-2160 vx.y.exe**".

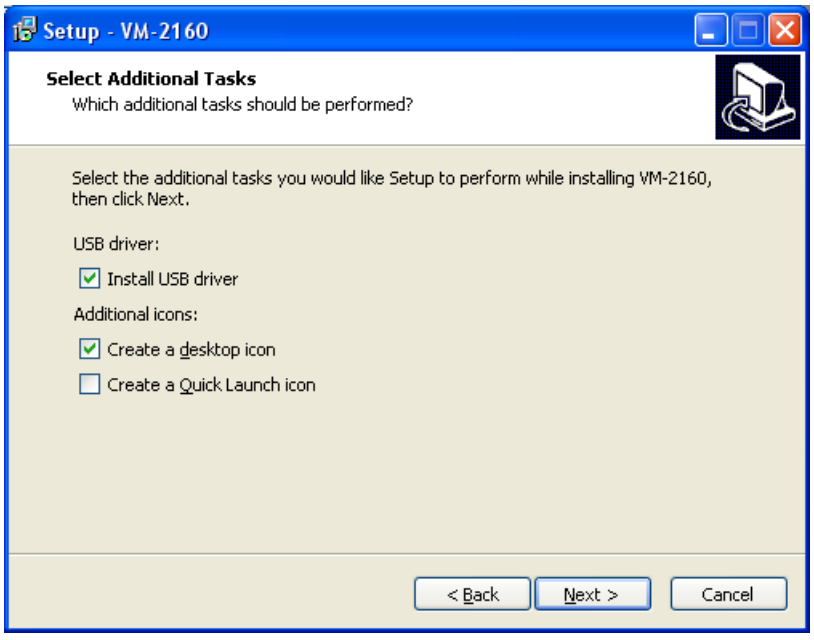
2. Select the language during installation.



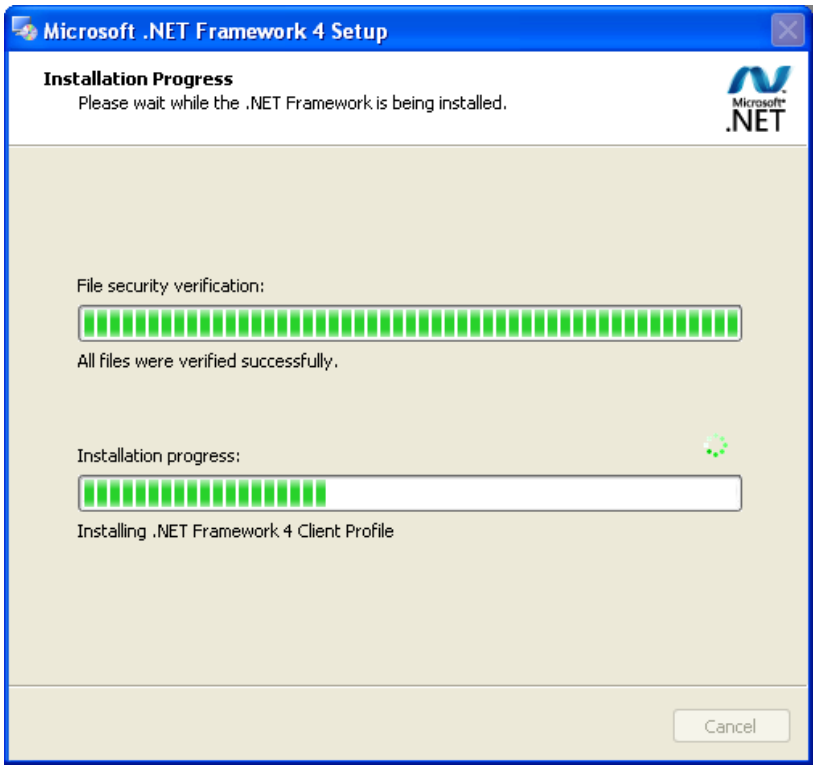
3. The Setup Wizard will guide you through the steps required to install the PC-Software.



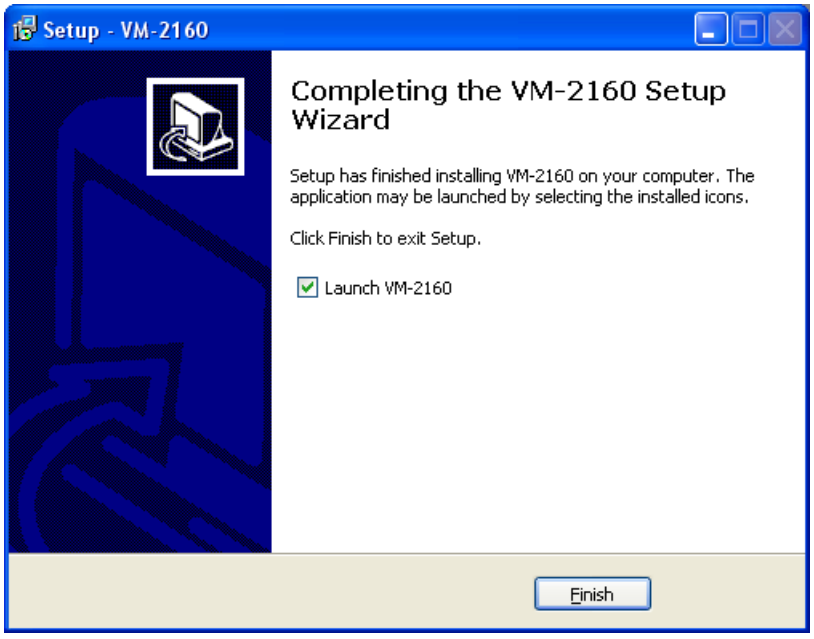
4. The PC-Software can only work with the correct USB driver installed. Select option “Install USB driver” to check is you have the correct version, click “Next” and accept the licence agreement to install if required.



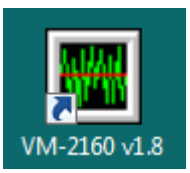
5. In case the .NET Framework is not already installed on your computer, the Setup Wizard will install this Windows component automatically before continuing the PC-Software setup.



6. Select “Finish” to complete the installation of the PC Software



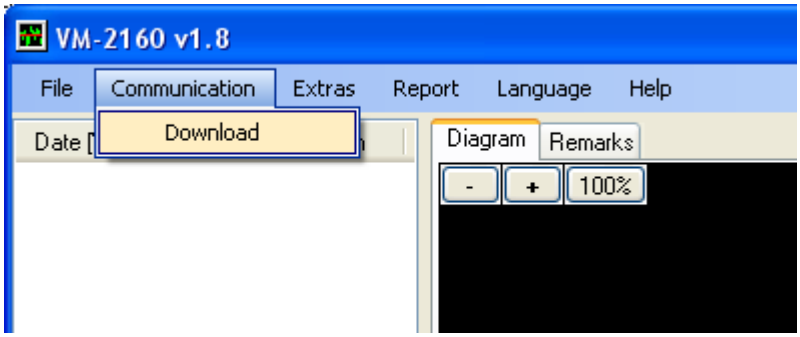
7. An icon is generated on your desktop after successful installation of the PC-Software. Double-click on the icon on your desktop to start the PC-Software.



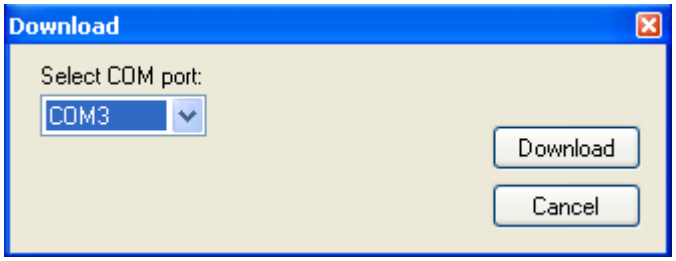
4 Download data from the VM-2160

Download the measurement data saved on the VM-2160:

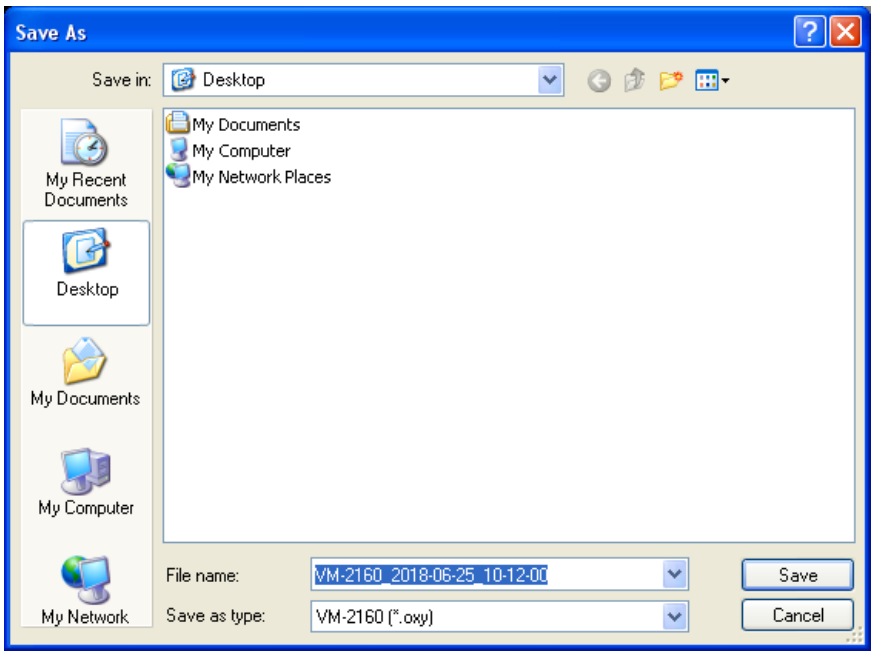
1. Turn on the device by pressing and holding the ON/OFF button briefly until an opening “Welcome Screen” appears. Here the device firmware version is displayed.
2. Connect the VM-2160 via USB-port to the PC using the USB cable that came with the device. The device now displays the message “USB connected”.
3. Double-click on the icon on your desktop to start the PC-Software
4. Select the menu point COMMUNICATION → DOWNLOAD



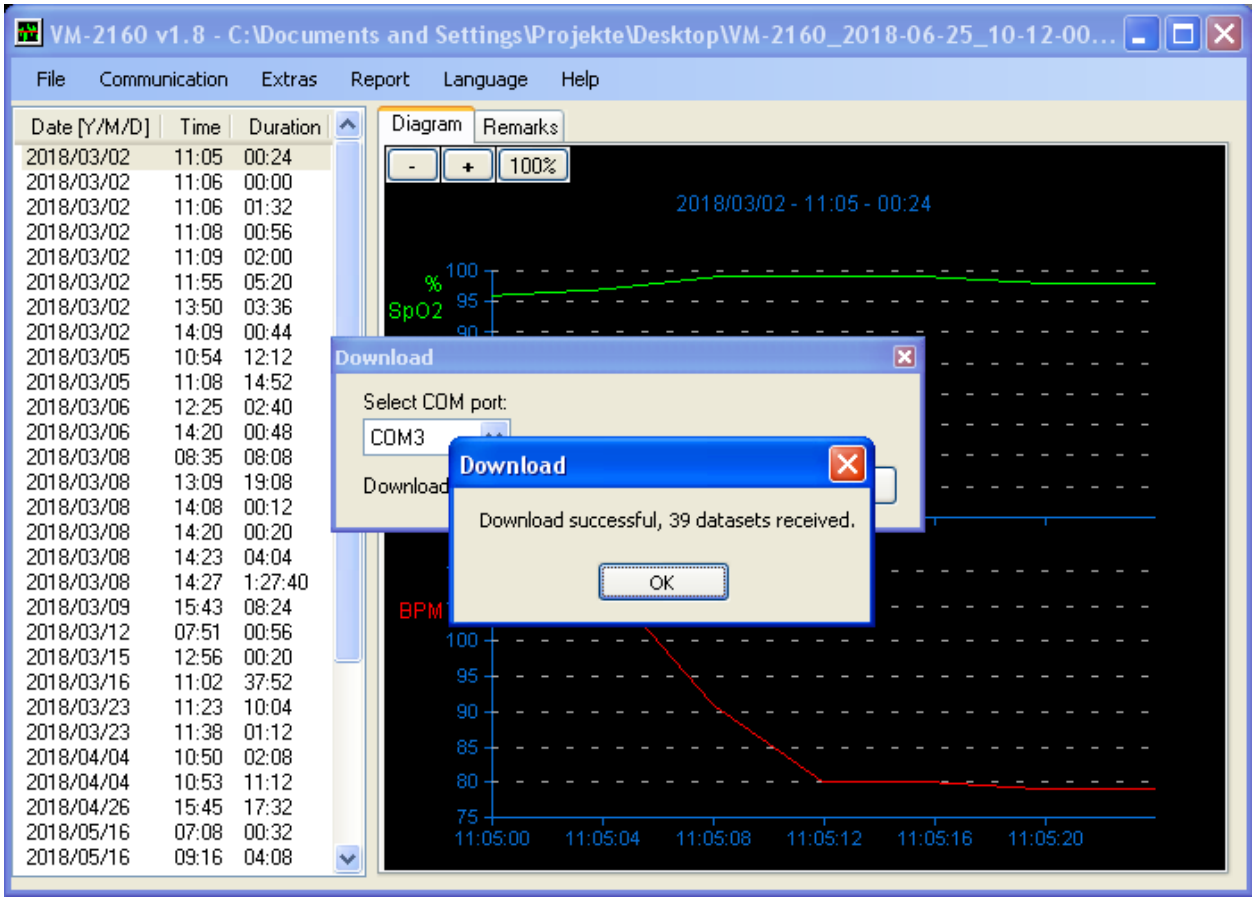
5. Select the correct COM Port. Usually the software is able to auto-detect the correct port (refer to Chapter 7: “Identify COM port”, if there are problems in connecting the device).



6. After pressing the button DOWNLOAD, a window opens for selection of the file path for saving the data file to your computer. Accept the suggested filename or choose a new name and select SAVE to start the download



7. Select OK to finish the download.

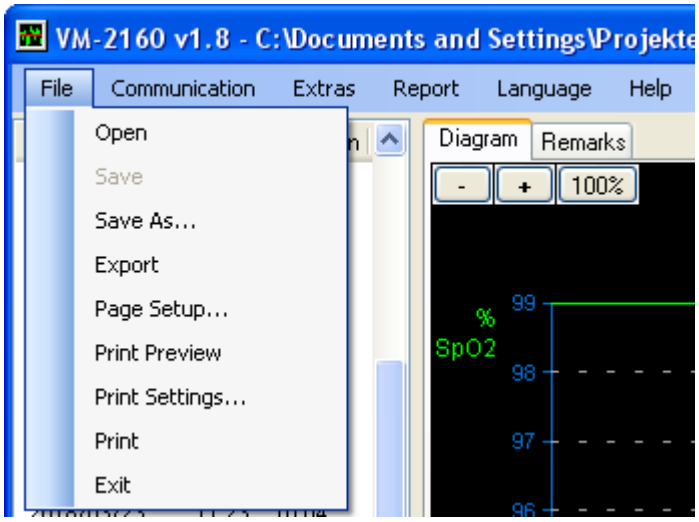


NOTE: The oldest data is displayed at the top.

5 Open data saved on the PC

Open the saved file formerly downloaded from the device to your PC:

1. Select “FILE → OPEN” in the menu

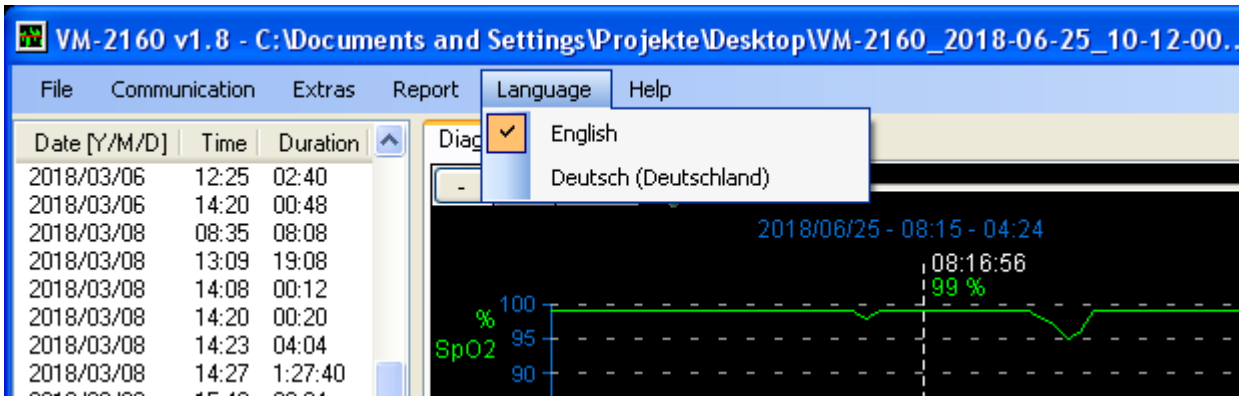


2. Choose a “.oxy” file and select “OPEN” (Alternatively the data can be opened via drag-and-drop)

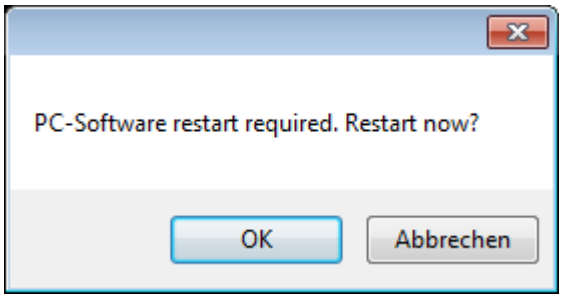
6 PC-Software functions

6.1 Select language

To change the language of the PC-Software, select LANGUAGE.



The new language is implemented after PC-Software restart.



The PC-Software always starts with the last selected language.

6.2 Analyse Data

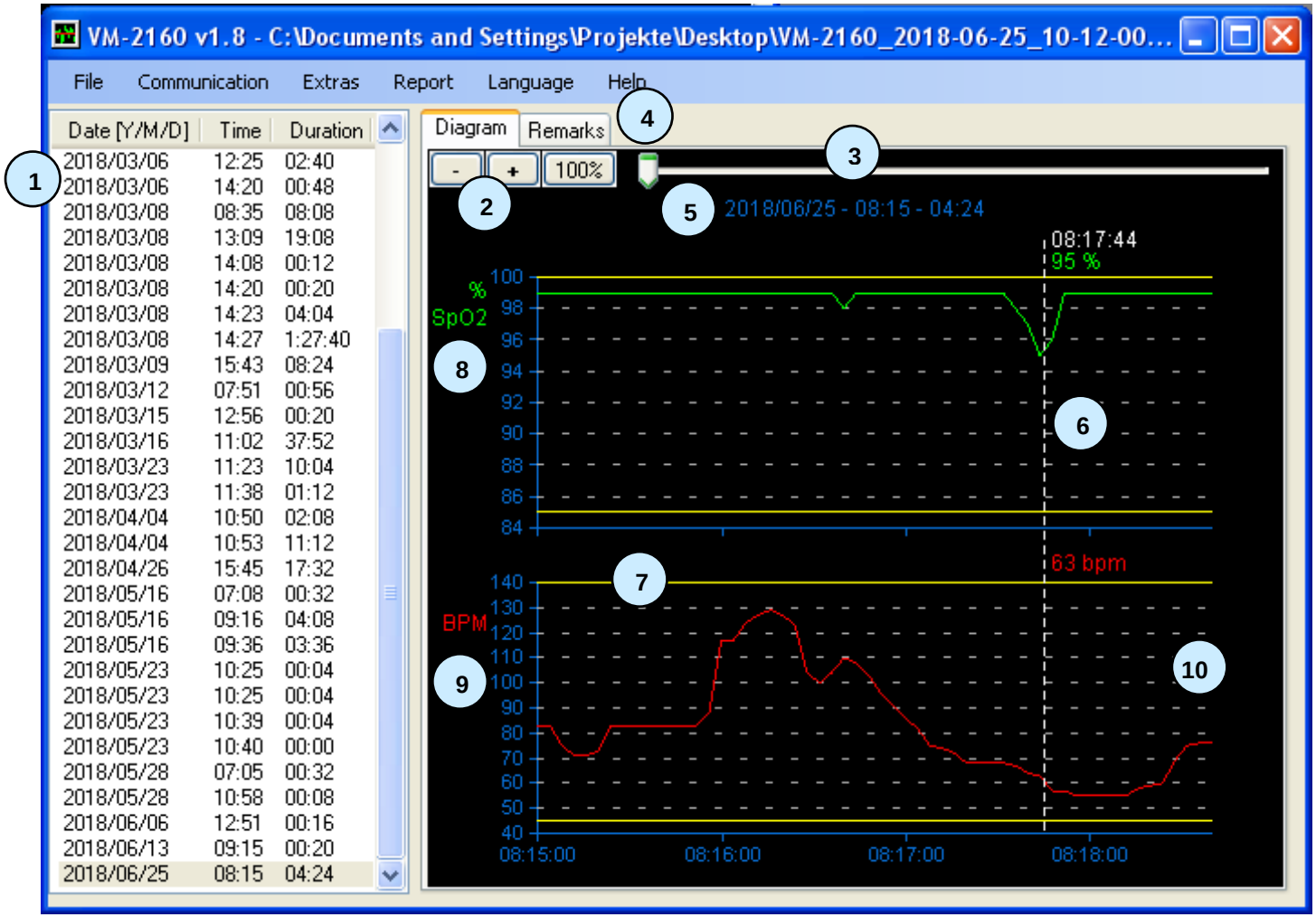


Figure 1: Diagram tab

Load a set of data as described in Chapter 4 - 5. Select the “Diagram” tab. The “Diagram” tab graphically displays the stored SpO_2 and pulse rate measurement data together with the alarm limits set at the VM-2160 during data acquisition.

See the figure 1 for descriptions in the table below:

No.	Definition
1	List of data sets
2	Zoom: “+” to zoom into the graph “-”to zoom out of the graph “100%” to zoom back to the standard zoom level Scrollbar to navigate through the zoomed dataset
3	Scrollbar to navigate through the zoomed dataset
4	Diagram tab and tab to enter remarks
5	Date and time of stored data file
6	Indication bar to show the exact measurement values at the chosen position. Drag with the left mouse button to zoom in. Click the right mouse button to zoom out to 100%.
7	Alarm limits set at the device as yellow line
8	SpO_2 trend
9	Pulse rate trend
10	Horizontal grid

6.2.1 Colour code of the graphs

Green = SpO2 [%]

Orange = Pulse rate [bpm]

Yellow = Alarm limits

6.2.2 Zooming with the mouse

1. Click into the graph
2. Highlight the zoom area by dragging the mouse while keeping the left mouse button pressed
3. Release the mouse button
4. Click the right mouse button to zoom back to 100%

6.2.3 Zooming with the zoom buttons

1. “+” to zoom into the graph
2. “-” to zoom out of the graph
3. “100%” to zoom back to the standard zoom level
4. Use the scrollbar (3) to the right of the buttons (2) to navigate through the zoomed dataset

6.2.4 Adjustable diagram options

User adjustable diagram settings are available by selecting “EXTRA → OPTIONS”.

Select OK to activate the new setting.

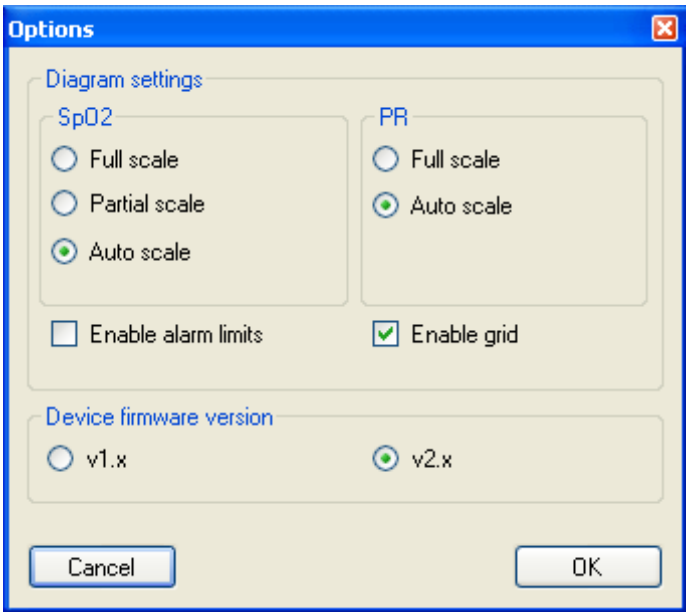


Diagram settings:

1) Y-axis

The y-axis zoom function can be set for SpO_2 and pulse rate (PR) independently:

- Select the option “Full range” to set the y-axis to full range
- Select the option “Auto scaling” for optimal amplitude scaling of the data within the selected data window

In case of SpO_2 it is also possible to select the option “Partial scale“ for a fixed y-axis scaling optimized for the most relevant SpO_2 data range (60% up to 100%)

2) Display alarm limits and grid

- Selecting “Enable alarm limits” to display the alarm limits which were set at the device during data acquisition.
  Note: Do not enable the alarm limits if the aim is to have a detailed “Auto scaling” of the measurement data only
- Selecting “Enable grid” to plot a horizontal grid in the diagram

Device firmware version:

Select the format of the time axis (x-axis) depending on the firmware version of the device. Two formats are available *v1.x* (*8sec resolution*) and *v2.x (4sec resolution)*.
NOTE: All devices manufactured in 2008 and later use format v2.x.
After restart of the PC-software the last selected device firmware version setting by the user will be active. Also see chapter 8.1.

Warning: If the wrong format is selected the displayed time axis is affected.

6.3 Data remarks

Load a set of data to the VM-2160 PC-Software as described in Chapter 4 - 5. Select the "Remarks" tab.

User-defined data remarks can be added or removed from this tab.

Enter data remarks:

- Select the "Remarks" tab
- Click into the text field
- Enter user-defined remarks
- To permanently store remarks you will be asked to save the changes when you exit the program

6.4 Print, save or export data

Print

- Assure that the correct printer is selected as standard printer (Windows Start → Printer)
- Select a dataset from the list of datasets (see figure 1 no. 1)
- Zoom and scroll to select the detail for printing (see 6.1.2 - 6.1.4)
- Select the menu point FILE → PRINT (it is also possible to select PRINT PREVIEW before printing the diagram)

Save

- After change of the remarks tab, you will be asked to save the changes when you exit the program
- Select the menu point FILE → SAVE AS to store the data under a different filename

Export

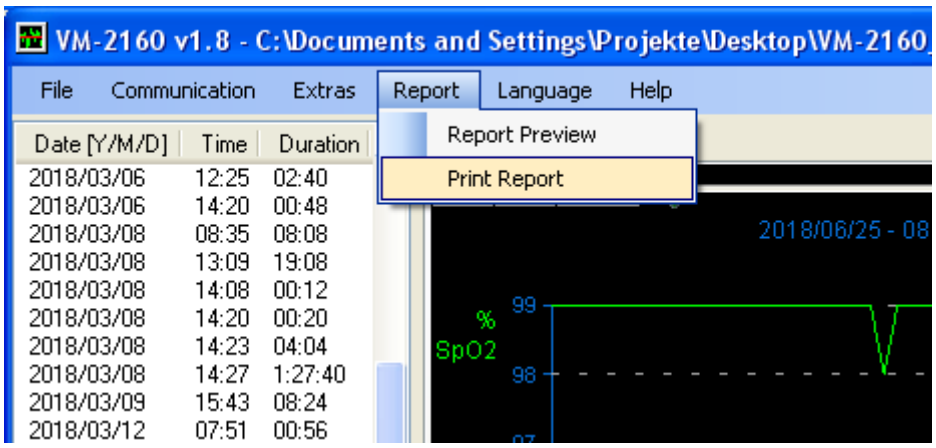
- Select the dataset for export
- Select the menu point FILE → EXPORT
- Enter a filename and save as type *.csv
- A message is displayed to confirm the successful export of the data. Confirm with OK
- This *.csv can be opened e.g. using EXCEL

6.5 Statistic summary report

With the PC-Software version V1.5 and higher a statistic summary report can be generated and printed for each dataset.

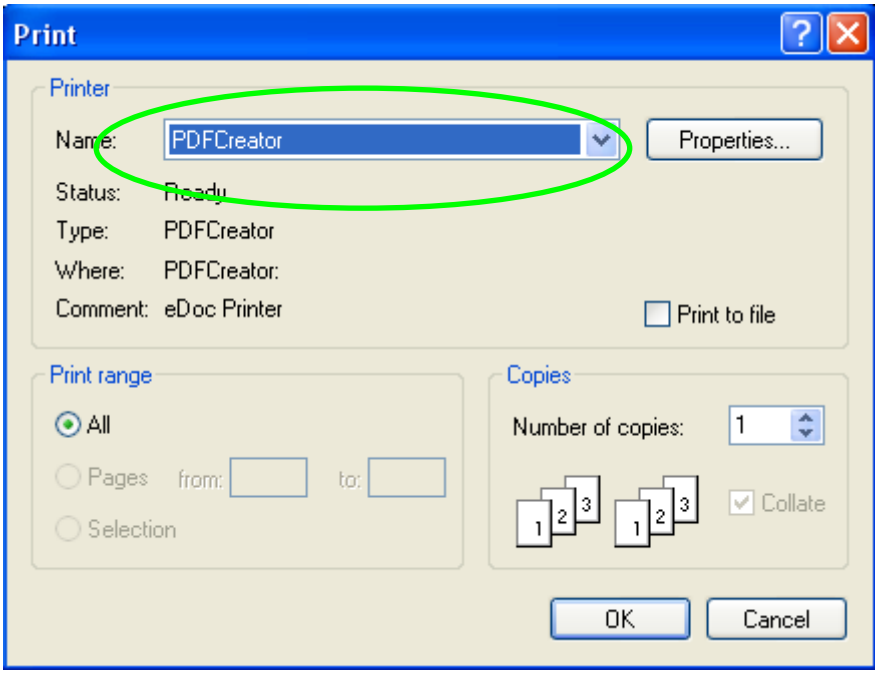
1. Assure that the correct printer is selected as standard printer (Windows Start → Printer)
2. To generate a print preview of the statistic summary report select "REPORT → REPORT PREVIEW"

3. To print the statistical summary report as hard copy, select PRINT REPORT. The standard WINDOWS printer window is opened. Select the printer to be used and confirm with OK



4. It is also possible to generate a soft copy of the report by printing it as PDF file (be aware that a tool e.g. “FreePDF” of “Acrobat Distiller” has to be installed on the PC to print the report as PDF document).

   Select FILE → PRINT SETTINGS to select the PDF printer



5. The report includes basic statistical analysis and histogram data of SpO_2 and pulse rate. A typical summary report including description is plotted below.

1

Date: 2011/02/19 Start time: 02:05 Duration: 05:15:08

Oximetry: Summary report

Recording time : 05:15:08
Valid SpO2 data : 05:14:24
Valid Pulse data : 05:14:16

2

Saturation

SpO2 max : 96 %
SpO2 min : 82 %
SpO2 mean : 88.7 %
SpO2 SD : 1.6 %

3

SpO2 >98: 0.0 % time	SpO2 89: 19.5 % time	SpO2 79: 0.0 % time
SpO2 98: 0.0 % time	SpO2 88: 27.0 % time	SpO2 78: 0.0 % time
SpO2 97: 0.0 % time	SpO2 87: 17.7 % time	SpO2 77: 0.0 % time
SpO2 96: 0.1 % time	SpO2 86: 4.6 % time	SpO2 76: 0.0 % time
SpO2 95: 0.3 % time	SpO2 85: 0.8 % time	SpO2 75: 0.0 % time
SpO2 94: 0.4 % time	SpO2 84: 0.2 % time	SpO2 74: 0.0 % time
SpO2 93: 0.8 % time	SpO2 83: 0.0 % time	SpO2 73: 0.0 % time
SpO2 92: 2.8 % time	SpO2 82: 0.0 % time	SpO2 72: 0.0 % time
SpO2 91: 3.9 % time	SpO2 81: 0.0 % time	SpO2 71: 0.0 % time
SpO2 90: 21.8 % time	SpO2 80: 0.0 % time	SpO2 70: 0.0 % time

SpO2 <90: 69.9 % time, 03:39:44	SpO2 =>90: 30.1 % time, 01:34:40
SpO2 <80: 0.0 % time, 00:00:00	SpO2 =>80 & <90: 69.9 % time, 03:39:44
SpO2 <70: 0.0 % time, 00:00:00	SpO2 =>70 & <80: 0.0 % time, 00:00:00
SpO2 <60: 0.0 % time, 00:00:00	SpO2 =>60 & <70: 0.0 % time, 00:00:00
SpO2 <88: 23.4 % time, 01:13:32	

The longest time with a saturation less then 89% was 00:13:28, which started at 02:39:44.

Pulse rate

Pulse max : 86 bpm
Pulse min : 26 bpm
Pulse mean : 73.2 bpm
Pulse SD : 5.6 bpm

4

Pulse >200: 0.0 % time
Pulse 175-200: 0.0 % time
Pulse 150-174: 0.0 % time
Pulse 125-149: 0.0 % time
Pulse 100-124: 0.0 % time
Pulse 75- 99: 44.4 % time
Pulse 50- 74: 54.4 % time
Pulse 40- 49: 0.6 % time
Pulse 20- 39: 0.7 % time
Pulse < 20: 0.0 % time

First 10 minutes

Minute	SpO2	Pulse
1	-- %	-- bpm
2	95 %	71 bpm
3	92 %	75 bpm
4	87 %	75 bpm
5	87 %	70 bpm
6	88 %	70 bpm
7	88 %	71 bpm
8	87 %	70 bpm
9	87 %	70 bpm
10	87 %	64 bpm

5

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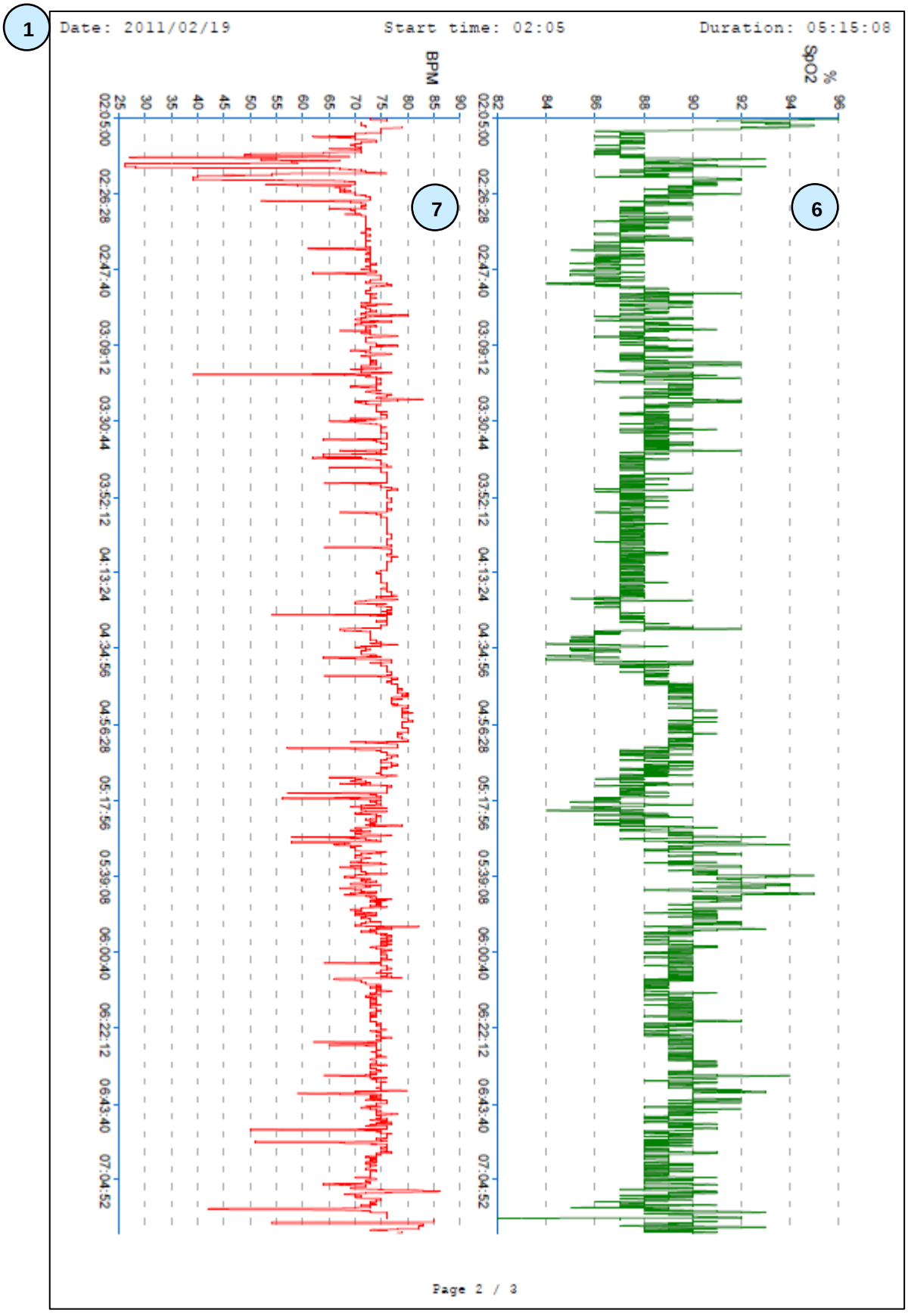
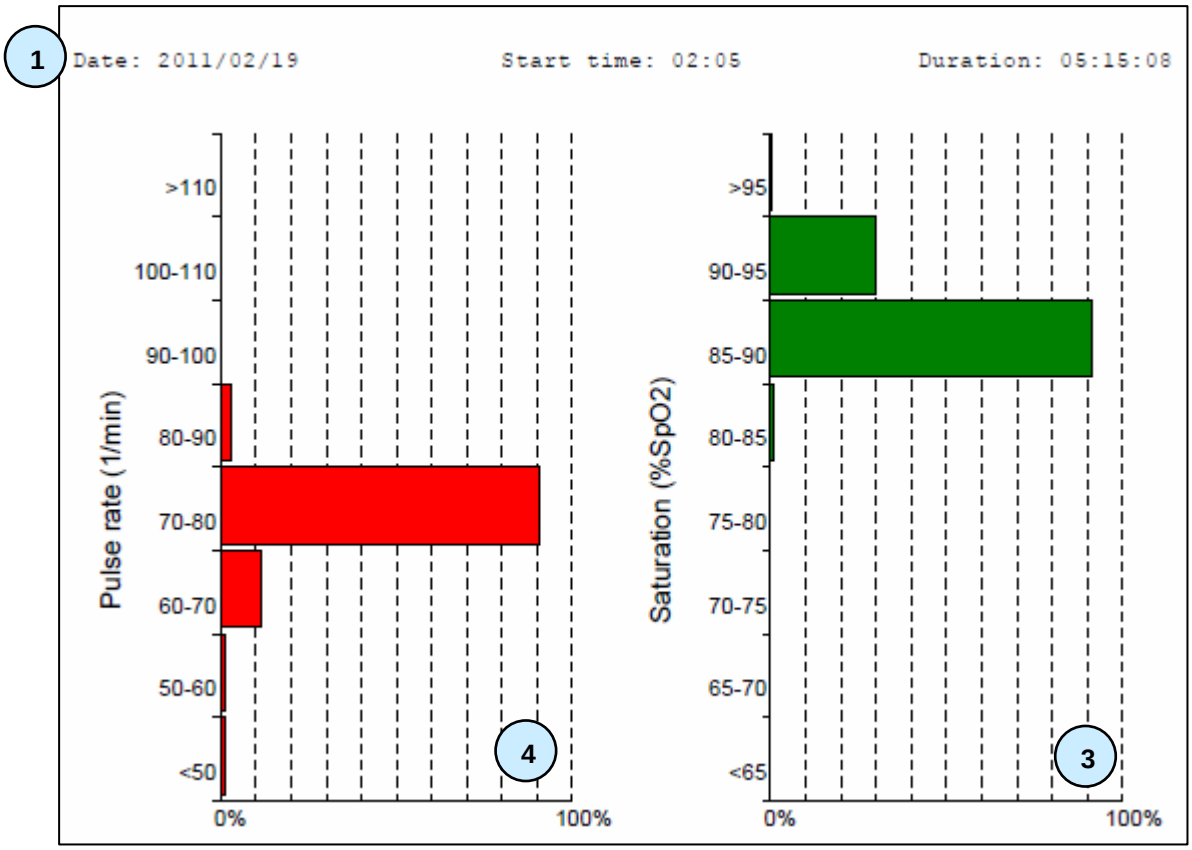

1
Date: 2011/02/19
Start time: 02:05
Duration: 05:15:08
BPM
SpO2
%
7
6
02:05:00
02:26:28
02:47:40
03:09:12
03:30:44
03:52:12
04:13:24
04:34:56
04:56:28
05:17:56
05:39:08
06:00:40
06:22:12
06:43:40
07:04:52
Page 2 / 3



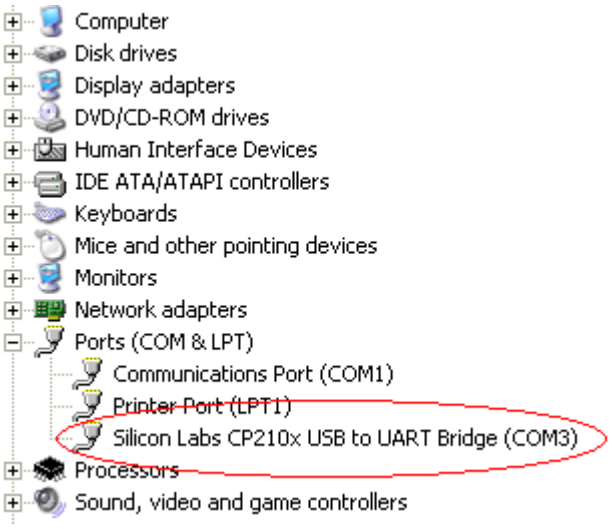
No.	Definition
1	Header with Start date, Start time and duration of the measurement
2	Duration of valid data. If the sensor is not connected or no finger is inserted the measurement data is not valid. Not valid data is not included in the statistic histogram data, but is included in the trend data
3	SpO_2 histogram data
4	Pulse rate histogram data
5	SpO_2 and pulse rate spot-check measurement in the first 10 minutes after switch-on of the device (typically used for the “6 minute walk test”)
6	SpO_2 trend data
7	Pulse rate trend data

7 Identify COM-port

In general the VM-2160 PC-Software is able to detect which COM-port has been assigned to the VM-2160 device. The following steps are only required if the connection could not be established.

1. Assure that the USB cable is plugged into the device and connected to the USB-port of the PC
2. Assure that the VM-2160 is switched on
3. Open DEVICE MANAGER on the PC (Right-click with the mouse button on “My computer”. Select “Properties → Hardware → Device Manager”. Double-click on “Ports (COM and LPT)”.)

There you should see the new entry “CP210x USB to UART Bridge Controller (COM**x**)”. At the end of the line you can see which COM port has been assigned to your device. In the following example the device was assigned to COM 3.



8 FAQ and Troubleshooting guide

1. How frequently does the device record the patient data?

The SpO_2 and pulse rate data is stored in the VM-2160 every 4 seconds for devices manufactured in 2008 and later and every 8 seconds for devices manufactured before (refer to chapter 6.1.4). In addition the set alarm limits are recorded.

This time interval cannot be changed.

2. Problem: No connection to device

1. Is the device switched on?
2. Is the USB cable connected to the device?
3. Is the USB cable connected to the PC?
4. Is the USB Driver properly installed (refer to Chapter “Installing the PC-Software”)?
5. Is the correct COM-port selected (refer to Chapter “Identify COM-port”)?

6. If the device is properly connected, it will show “USB connected” on the screen as soon as the USB cable is plugged. If this is not the case the USB cable or the VM-2160 could be defective. Replace the USB cable. If this does not solve the problem, contact your local service representative (see back page).

3. Problem: Dataset checksum Error

Errors occurred during storing the data in the device or download of the data to PC.
First try to re-download the data. If this is not successful, retry with a new USB cable.
If the error occurred during storing the data in the device, it is not possible to recover the data. Delete all data and retry. If the error continues, contact your local service representative (see back page).
Note: All datasets without errors will be successfully downloaded and displayed in the PC-Software

4. Problem: No data to display

A dataset within a saved data file is empty and therefore does not show a graph as no measurement was performed between switching the VM-2160 on and off.

5. Problem: Empty download file

An entire download has no data. Check the data manager in the device to see if there is any stored data. If no data is stored, the reason could be that the menu function “Delete all data” of VM-2160 has been performed and no new measurements were taken since.

6. Printing problems

Assure that the correct printer is selected as standard printer.

Go to the menu point “File” and select “Print Settings”. Make sure that the correct printer is selected and the correct settings have been set for the printer.

9 Sales & Service contact information

Viamed Ltd.
15 Station Road, Cross Hills, Keighley, West Yorkshire BD20 7DT
United Kingdom

Tel: +44 (0)1535 634542
Fax: +44 (0)1535 635582
E-mail: info@viamed.co.uk
www.viamed.co.uk