

# Creating and uploading 'O Curves' on BP/Uni Sim and Med-eBase

Manufacturers of NIBP monitors all use slightly different software algorithms to determine Systolic and Diastolic values. By creating a custom 'O Curve' for a particular pressure simulation the BP-SIM can be made to match the NIBP Monitor much closer than using a Default 'O Curve'.

The purpose of this document is to provide information on how to create 'O Curves' for an NIBP monitor and add them to part of a test sequence within Med-eBase.

## **Note:**

*Each 'O Curve' developed needs to be created in two different csv formats:*

- One for use on the Uni/BP Sim
- One for downloading into Med-eBase.

## Creating and uploading 'O Curves' onto Uni-Sim and BP-Sim

### Items Required

- NIBP Monitor
- PC with Bluetooth connectivity
- Calibrated Uni/BP Sim
- 'O Curve' Template
- Microsoft Excel
- Data Transfer software (found on Rigel Utilities CD or [rigelmedical.com](http://rigelmedical.com))

Make sure your Rigel device is paired with the PC using Bluetooth Favourites (use the User Manual or Application Note 0035).

The 'O Curve' format in excel must be followed in order that the system will function correctly (The red writing indicates an example of the final 'O Curve'):

- 1) Line 1: [O Curve] This is standard and should not be altered as it tells the unit that the following data is an 'O Curve'.
- 2) Line 2: [Colin] This should be the name of the monitor/manufacture. Whatever is written in line 2 will appear in the 'Monitor Type' field in the 'NIBP Test settings' screen (max 31 characters).
- 3) Line 3: 120 80 These two numbers are the Systolic and Diastolic pressures being simulated and appear in the 'Systolic/Diastolic' field in the 'NIBP Test Settings' screen.
- 4) Line 4: 80 1 The first number is the default heart rate that appears in the 'Heart Rate' field in the 'NIBP Test Settings' screen and the second number refers to the Pulse Volume which depends on the patient being simulated (see table below for values)

| Value | Patient Type | Pulse Volume Simulated |
|-------|--------------|------------------------|
| 0     | Adult        | Low                    |
| 1     | Adult        | Medium                 |
| 2     | Adult        | High                   |
| 3     | Infant       | Low                    |
| 4     | Infant       | Medium                 |
| 5     | Infant       | High                   |

**Note:**

It is recommended that the medium pulse volume be used for both the Adult or Infant monitor/cuff configuration.

- 5) Line 5 to the 43 (end): 15 12 The values in these lines are the data that forms the actual 'O Curve'. The numbers in the left column form the x axis (Pressure in mmHg) and the right column form the y axis (pulse amplitude).

**Note:**

The maximum number of data points is 41 and the minimum is 3 and the peak pulse amplitude should not exceed 127.

- 6) Line 44 [END] This is a mandatory line which indicates the end of the data file and should not be changed

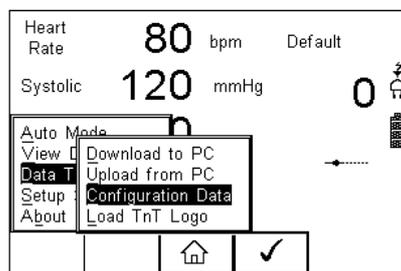
An 'x-y scatter graph' can be created using lines 5 to 43 as the source data. This type of graph will allow you to click on the graph points and adjust the shape of the graph. The data for this adjusted graph is automatically added to the data lines (5 to 43). The graph can be adjusted to whatever shape is required in order to create a new 'O Curve'.

When complete the file should be saved as an Excel file (.xls). The name of this file is unimportant as the Uni/BP Sim will reference line 2 (monitor/manufacture name). However; a sensible filename may be 'MonitorTypeA\_120\_80.xls'

Using the 'Save As' function this file must also be saved as a .csv file.

Uploading 'O Curve' to Rigel Uni/BP-Sim

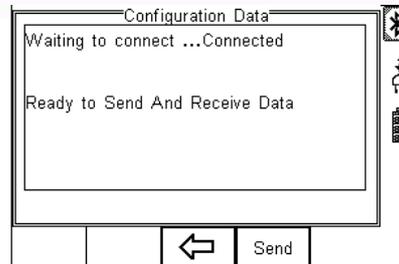
- 1) In order to get the new 'O Curve' into the Uni/BP Sim switch on the unit and select F4 . Select D Data Transfer and then C Configuration Data and press F4 ✓.



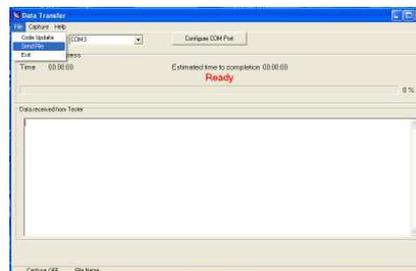
- 2) The Uni/BP Sim will then attempt to make a Bluetooth connection to the PC (Once a connection is made 'Ready to Send and Receive Data' will appear on the screen of the Rigel device).

**Note:**

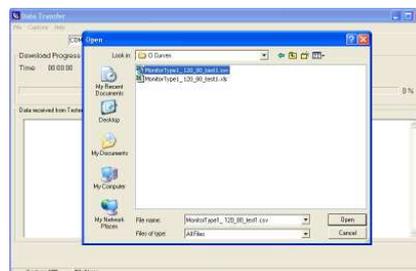
Application Note 0035 details Bluetooth pairing



- 3) At this point open the DataTransfer.exe software program on the PC. Select File and Send File.



- 4) Change the Files of Type field to All Files and then select the correct .csv file and select Open.



- 5) The file will be transferred in around 2 seconds. The Uni/BP-Sim will show Valid Data Received.

- 6) Press F3  to return to the main screen

#### Testing the uploaded 'O Curve'

The new 'O Curve' can be selected by pressing NIBP (F3) followed by  (F4) to select 'NIBP Test Settings'. Use the arrow buttons to select the new Monitor Type which you have created and sent to the device. Then press  (F4) to confirm. Press the Green button to start and then start the NIBP reading for the monitor.

It is recommended that if 20 tests are performed on an 'O Curve' the average Systolic and Diastolic readings should be within  $\pm 1$  mmHg of target and the repeatability over the 20 tests should be within  $\pm 3$  mmHg of target.

### Creating and uploading 'O Curves' into Med-eBase

To add an 'O Curve' onto the Med-eBase V2 software you will need to add the 'O Curve' to a folder structure which is outside of Med-eBase.

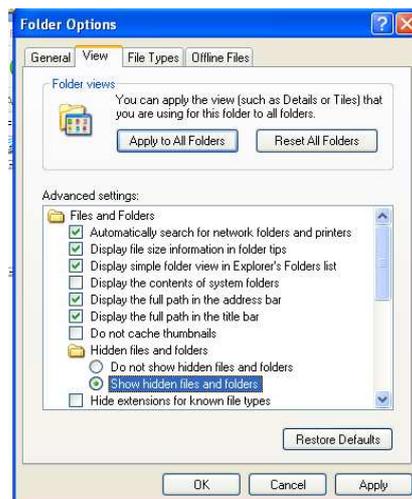
- 1) For Windows XP: Go to C:\Documents and Settings\All Users\Application Data\Rigel\Med-eBase V2\OCurves

For Windows 7: Go to C:\ProgramData\Rigel\Med-eBase V2\OCurves

#### **Note:**

*ProgramData and Application Data may be hidden folders. To view these folders:*

- 2) In XP, go to Tools and then Folder Options  
In Windows 7, go to Organize then Folder
- 3) Then select the View tab and "Show hidden files and folders", click Apply and then Ok



- 4) The original csv file used to download the 'O Curve' onto the Uni/BP Sim needs to be altered by erasing lines 1 to 4. Then the csv file needs to be saved in the follow folder structure which is critical for loading 'O Curves' onto Med-eBase:

<O Curves>

<Monitor Type name> e.g. Datascope Passport 2. These folder names will be shown in the Monitor Type drop down list in Med-eBase

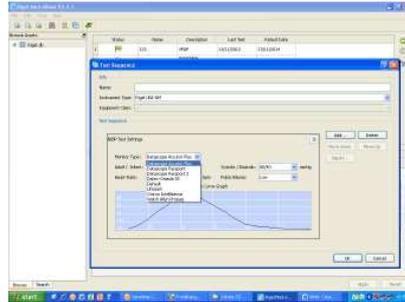
<Adult>

<Infant> These folders will contain the csv file for Adult or Infant curves

<CSV files> Each curve should be saved using the format of Systolic and Diastolic values as 3 digits e.g. 080\_040.csv.

- 5) Re-open Med-eBase V2 and click on Tools, then Global Test Sequences and then New.
- 6) Then select BP/Uni Sim and enter the name of the new test sequence.
- 7) Add... then select 'NIBP Test Setting', click on the + and there will be a drop down list in Monitor Type field where you can select your 'O Curve'.

- 8) Then in the Adult/Infant field select the type of patient and the chose the Systolic/Diastolic field to select the exact 'O Curve' you want to add to the test sequence.



End