FlowLab™

User Manual

imtmedical

1   Content

2   Preface

Application

This documentation applies to the products described as:
• ***FlowLab^{TM}***

Software and Firmware versions

This documentation applies to the following versions:
• ***FlowLab^{TM}* Software**   **Version 5.0.3**
• ***FlowAnalyser^{TM}* Firmware**   **Version 4.3.1**
• ***CITREX^{TM}* Firmware**   **Version 3.6.0**

When using older or newer versions small differences to this manual may appear.

Key to symbols used in this manual

References to pages and chapters   The symbol (> XY) is used for references to pages and chapters.

Version details

Edition of this User Manual: January 2015

Version: 01.15

Subject to technical modification without prior warning.

3   Intended Use

To minimize connectivity problems, please follow the recommend connection procedure:

1. Power on the device and wait until it is started up
2. Attach the USB cable to the computer (on the first time the driver is installed automatically)
3. Start *FlowLab*^{TM}
4. Start measuring

> ⚠   Power saving options like standby or hibernate while *FlowLab*^{TM} is running and devices are connected can lead to connectivity problems.

> ⚠   *FlowLab*^{TM} is a measuring software for testing and calibrating ventilators together with a *FlowAnalyser*^{TM} or *CITREX*^{TM}. The *FlowLab*^{TM} should not be used for patient monitoring.
>
> *FlowLab*^{TM} must not be connected to a ventilator which is being used by a patient.

4   Technical Data

4.1 Minimum PC Requirements

Intel® Pentium® 4 2.4 GHz
(Intel® Core™2 Duo recommended)

Microsoft® Windows® XP, Vista, 7, 8 (32 bit / 64 bit)

Microsoft® .NET Framework 3.5 or above

128 MB RAM (512 MB recommended)

160 MB hard disc space (full installation)

Screen 800 x 600 (1280 x 1024 recommended)

5   *FlowLab^TM* Software

5.1   Installation

Check that your computer meets all minimum requirements before installation (> 4.1 Minimum PC Requirements) and disconnect your *FlowAnalyser^TM / CITREX^TM*. Please observe the software instructions during the installation process. During installation the digitally signed USB drivers will be automatically installed.
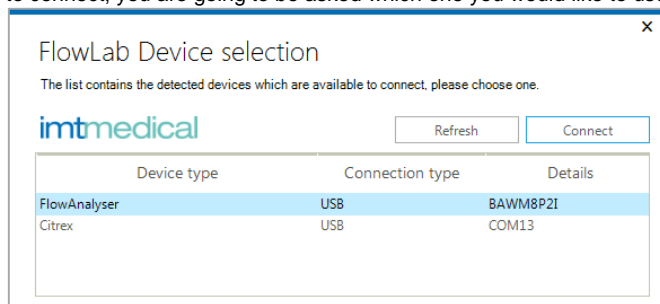
If you wish to reinstall the driver manually after installation, the USB drivers are located in your *FlowLab^TM* installation directory.

Download-Link: http://downloads.imtmedical.com/flowanalyser/flowlab

5.2   Compatible devices

FlowLab^TM can be operated with a *FlowAnalyser^TM* or *CITREX^TM*. To make the user manual easier to read, all examples are related to *FlowAnalyser^TM*.

On application startup *FlowLab^TM* searches for available devices. If there are multiple devices to connect, you are going to be asked which one you would like to use.
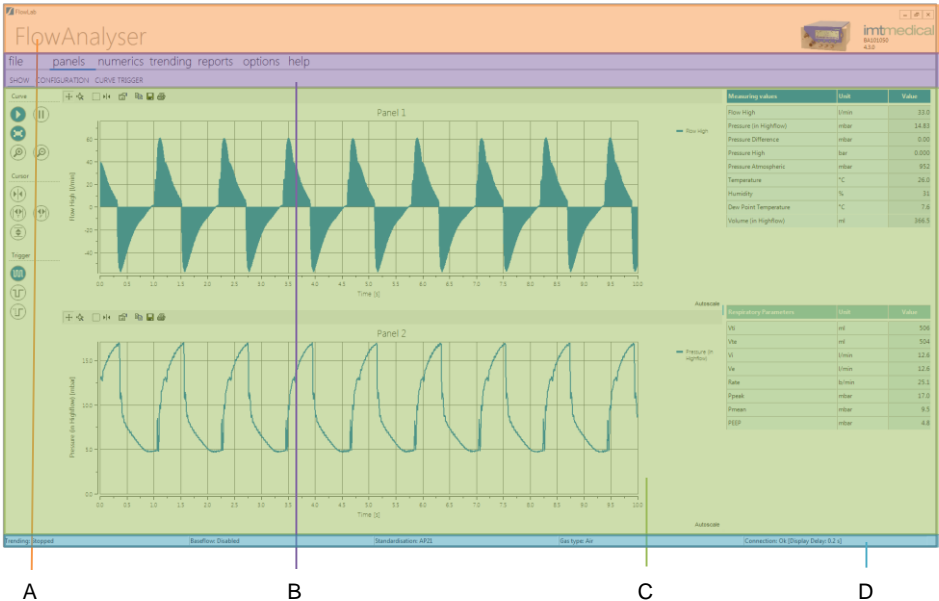

Note about multiple instances: It is possible to have multiple *FlowLab^TM* instances running in parallel. However there exists only one configuration file. This means that the last instance which is closed overwrites the previous configuration. This use case is not officially supported.

5.3   USB Communication

If your device was not configured to use *FlowLab^TM* software in the factory, you will need to do this afterwards by entering a clearance code for the USB interface. This code can be obtained from your *FlowAnalyser^TM / CITREX^TM* dealer.

5.4   Overview

A	B	C	D

(A)   **Application header.** Information about the connected device and window commands (minimize, restore and close)

(B)   **Menu & submenu navigation.** *FlowLab*^TM^ software is divided into five main areas:
- Panels
- Numeric
- Trending
- Reports
- Options

Select the required area from the main navigation area. The main areas will be described in the following chapters.
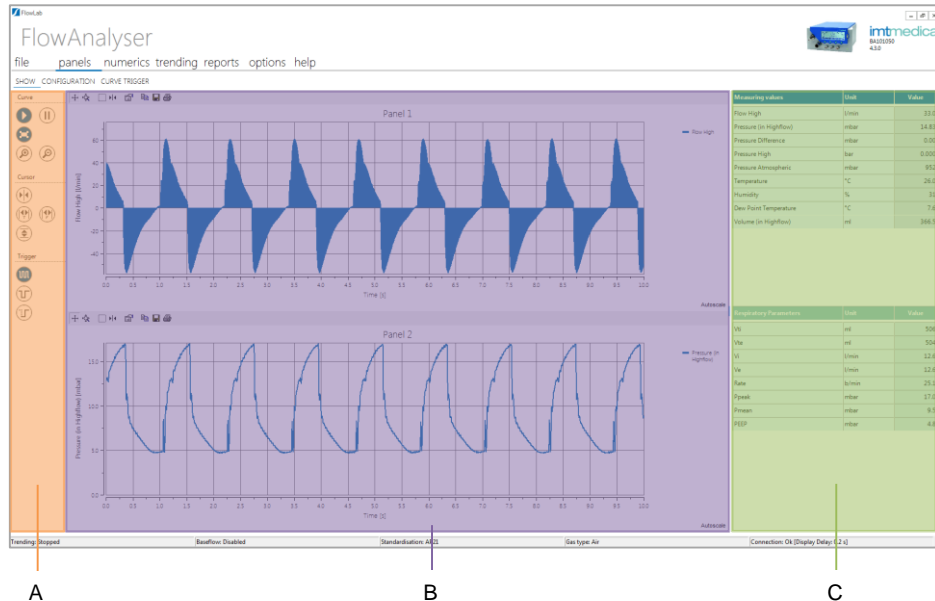
(C)   **Content area.** Content of selected main area (specific for each)

(D)   **Status bar.** Status information

5.5   Panels

The panels area has three specific areas:

- Show
- Configuration
- Curve Trigger

5.5.1 Panels Show

(A) **Panels toolbar.** Toolbar buttons to configure the behavior of the real-time curves
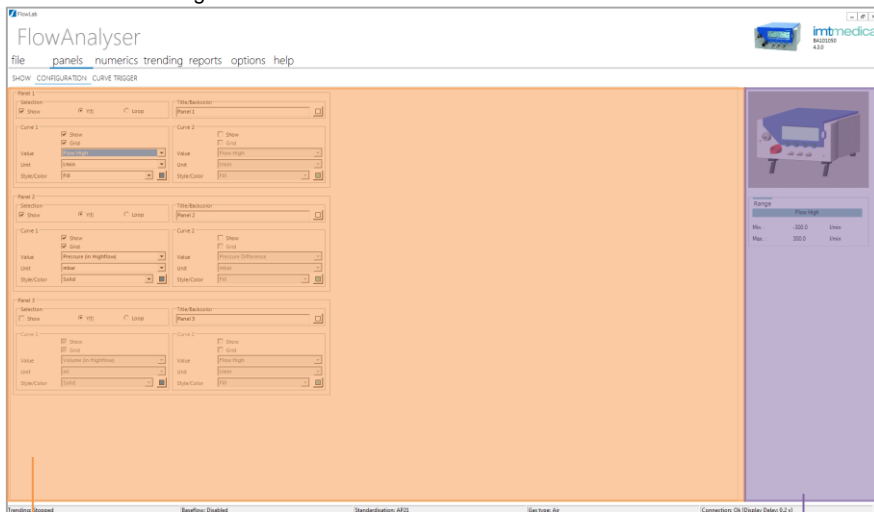
Curve

   Run / Freeze. Run / freeze the panels

   Autoscale. Automatic adjustment of real-time curve value scale

   Zoom in / Zoom out. Increase / decrease scale resolution

Cursor

   Global value cursor. Y value at the point where the cursor is

   Global time / frequency cursor. Time / frequency between two cursors

   Global value to value cursor. Y value between two cursors

Trigger

   Curve trigger auto. Continuous panel updates (roll mode)

   Curve trigger normal. Updates when specific curve trigger reached

   Curve trigger single. Updates once when specific curve trigger reached

(B) **Real-time curves.** Graphical representation of data

   A maximum of 6 readings can be graphically displayed here. All related settings can be made in the **Configuration** menu.

(C) **Numerics side panel.** Current numerical values. The configuration can be made in **Numerics configuration** menu.
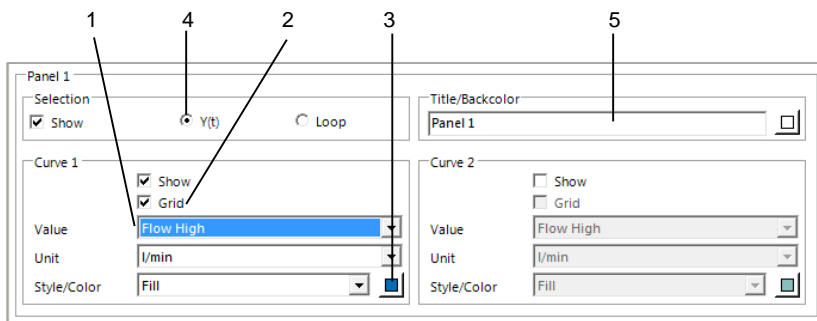
5.5.2   Panels Configuration

A   B

(A)   **Value configuration.** Configure which values and appearance of real-time curves.

A maximum of three real-time curves can be displayed simultaneously.

(1)   **Value.** Measured variable and its unit of measurement.

(2)   **Grid.** A grid can be displayed.

(3)   **Line** color and its type can be chosen.

(4)   **Curve type**. The curve can be chosen in function of the time or as loop. For the display of a loop two values have to be selected, one for the x-axis and one for the y-axis.

(5)   **Title/Background color**. Each chart can here be identified by title. The back color of the chart can be changed.

(B)   **Sensor highlighter.** Whenever you select a variable the corresponding mechanical connection is highlighted in the box on the right-hand side, and the range is shown below.
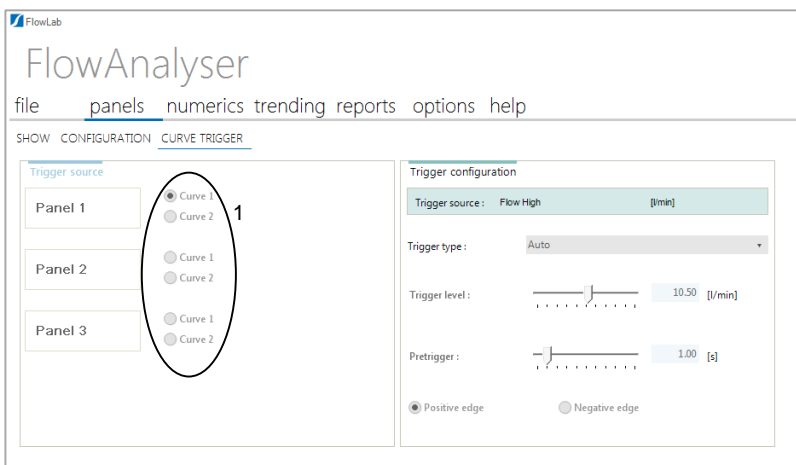
5.5.3   Panels Curve Trigger

The menu *curve trigger* is relates to the graphical display of the curves.

> ⚠   If the curve shall be displayed as Norm- or Single Shot Curve, curve triggers are needed to start the display.
>
> Do not confuse this trigger with the volume trigger, which calculates volumes and respiratory coefficients.
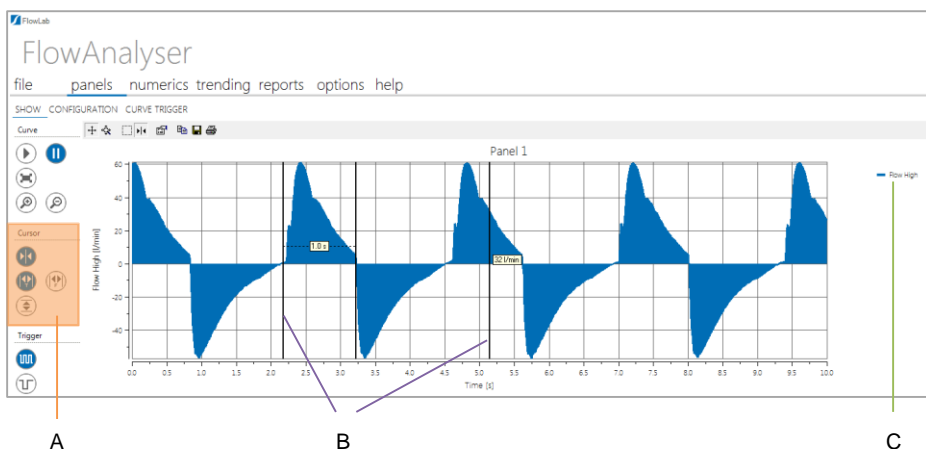

(1)   **Trigger source.** Here you can choose the curve which shall be adjusted below.

(2)   **Trigger type.** Here you can choose the type of the trigger. This setting stays the same for all curves. There are three different types:

- *Auto*: This always displays the updated curve. No curve triggers are needed!

- *Norm*: This displays a static curve, which is updated with each new trigger.

- *Single Shot*: Use this function to capture a single curve. The trigger has to be activated manually.

(3)   **Trigger level.** The curve starts to be displayed when the measured value passes this level.

(4)   **Pretrigger.** If a certain period of the curve has to be displayed prior the effective trigger point this can be adjusted here.

(5)   **Edge** for the trigger.

5.5.4   Customizing cursors and curves

If you wish to look at a curve in more detail, this can easily be done with the cursors provided. Altogether there are 4 different styles of cursor

Value Y   Displays the Y value at the point where the cursor is

Period   Displays the time period between two cursors.

Frequency   Displays the frequency between two cursors.

Peak - Peak   Displays the Y value between two cursors.

(A)   **Global Cursor**. By choosing one of the 4 corresponding icons you can select a cursor to apply to all displayed curves in the corresponding style.

(B)   **Individual Curser**. It is also possible to apply a cursor only for one curve. If you right-click the cursor, a menu pops up where you can change the style of the cursor.

(C)   **Curve.** If two curves are displayed simultaneously in one panel, you can click the corresponding curve title to select the curve relating to the cursor.

5.6 Numerics

The numerics area has two specific areas:

- Show
- Configuration

5.6.1 Numerics Show
The general sensor variables are in the top section and the respiratory parameters in the bottom section.

(A)   **Numerics toolbar.** Reset the statistics min / max / average

(B)   **Numerical values.** Numerically representation of data.

      The statistical values for each variable can also be seen here, i.e. the mean value, and the smallest and largest value since the last reset

(C)   **Tolerance check.** Configurable setpoint and limits

      It's possible to check the tolerance of each measurement. If the measured value is fitting to the predefined accepted measurement range, the software will mark the value with: ✓

5.6.2   Numerics Configuration

(A)   **Value Configuration.** The overall appearance of the Numerics display can also be adjusted to individual requirements in the Configuration menu.

In the columns Setpoint, Limit Lo and Limit Hi you can set the conditions for the automatic check of the measurements.

(B)   **Sensor highlighter.** Whenever you select a variable the corresponding mechanical connection is highlighted in the box on the right-hand side, and the range is shown below.
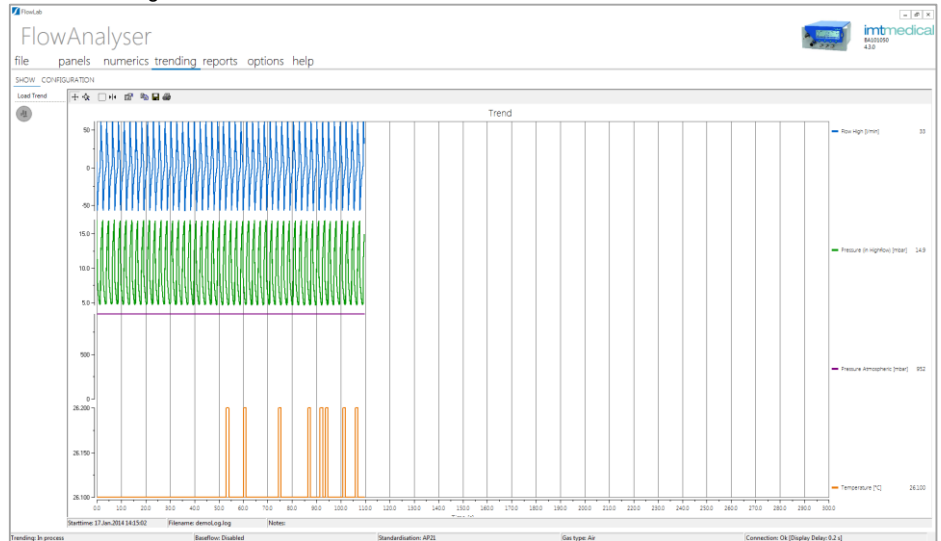
5.7   Trending
In this area measurements can be recorded within a specific time range. Select the
Configuration menu to start a specific trending recording

5.7.1   Trending Show

In the Display view the curves can be visualized and analyzed.
By pressing load trend you can load another trending file which has been produced earlier.

5.7.2 Trending Configuration

(1)   In the field **Measured Variables** you can define the variables and units of measurement to be recorded. You can also select the color of the graphical display. The corresponding mechanical connection and possible measurement range can be found in the box at the top right-hand section of the display.

(2)   In the field **Recording duration** you can specify the length of the data recording. The range goes from 1 minute to 100 hours.

(3)   The field **Recording interval** defines how often data should be recorded. Select from a range of 0.1 seconds to 60 minutes.

(4)   In the **Time axis** field you can select the unit of measurement which applies to the x-axis.

(5)   In the field **Memory resources** you can check the expected file size and required working memory.

> ⚠   Depending on the recording time and interval very large files a ring buffer has to be used to visualize the trending data.
> The data recording into the file however is not affected by this. If this is the case, the keyword "Buffer" is displayed next to the RAM resource.

(6)   In the **File name** field you can specify the file name and storage location.

(7)   The section **File** enables you can to enter a title, which will be displayed above the trending curves. Descriptive notes will be copied to the trending file but are not shown in the *Display* section.

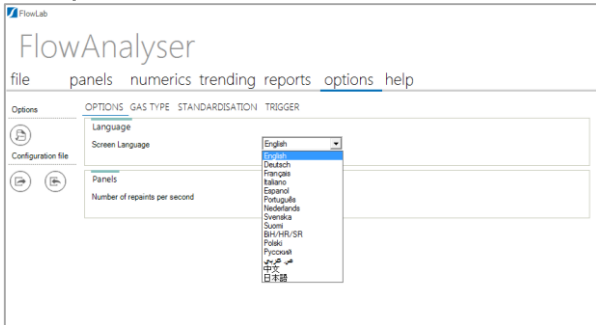(8)   Once the **Start** button is pressed, the data are captured as defined and displayed in real time.

Two files will be generated: The *.log file is containing all measurements and can be used by Excel or other data base systems. The *.cfg file contains the information for **FlowLab**TM to be able to reopen the trending files.

You can follow the data acquisition in the Trending show menu.

5.8   Reports

The reporting function is to print out your measurements in a sheet which includes the measured numerical data, the curves, the company's data and descriptions.

(1)   In the **Reporting Options** area you can select whether numerical data and/or curves shall be printed in the report.

(2)   In the **Test Equipment** area you see all information regarding the connected device. The data is automatically loaded from the device.

(3)   In the **Test Center** field you can edit the company's data and there is also the possibility to load your company's logo to be shown in the report.

(4)   Use the **Test Object** area to edit the information about the test object, such as place of test, tested instrument or serial number of the instrument under test. Further you can define to print a unique ID number in the footer of the report.

(5)   Apply changes and save configuration.

(6)   With the **Preview / Print Actual Data Report** button an actual data report can be produced, which displays the actual numerical data and curves.
On the preview screen you have access to the printing options as well as to page layout and save settings options.

(7)   With the *Preview / Print Trending Report* button a trending data report can be produced, which displays the trending curves.

5.9 Options

In the Options menu you can set the same settings as in Menu of the device:

- Language
- Gas type
- Gas standardisation
- Volume Triggers

⚠ **Warning:** Except of the language the device will adopt any changes that you make here to the device!

Additionally you can find the setting Performance where you can change the update rate for the real-time panels.
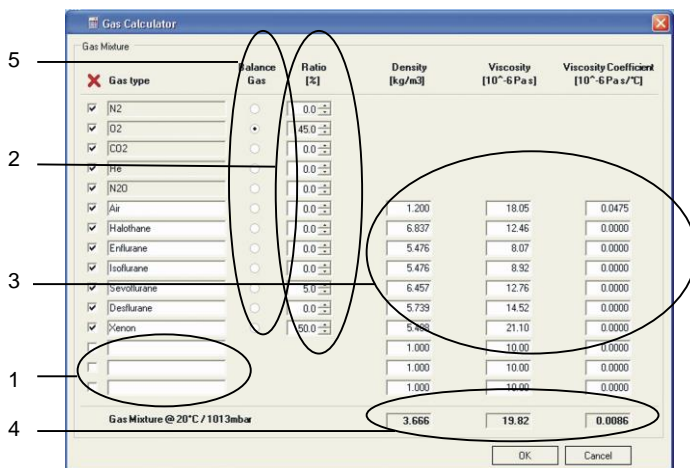
If you change the trigger setting in the flowlab, this will be changed and saved on the measurement devices too. Also, if you then disconnect the measurement devices, the setting will be kept on the measurement devices. => FlowLab is Master

If you save the flowlab settings for example for bellavista to an .ini-file, and if you later load this setting-file (measurement device must be connected), all settings will be applied also to the measurement devices. => FlowLab is Master

If you have set up the flowlab without connection with a measurement device, and then connect a measurement devics to flowlab => all setting in flowlab will be changed to the measurement device settings => Measurement device is Master

5.10 Gas Calculator

The gas calculator enables users to configure a mixture of varying gas fractions for flow and volume measurements. Users can select the ratio of standard gases as well as the ratio and physical characteristics of customized gases.

(1)   Customized gases (user-defined)

(2)   Ratio of the total gas volume

(3)   Physical characteristics (entered by the user)

(4)   Total gas mixture

(5)   Balance Gas (The ratio of the balance gas is automatically calculated. The sum of the ratios must be 100%.)

5.11 *FlowLab^{TM}* Settings

In the header toolbar menu listing under **File** the **Load FlowLab Settings…** and **Save FlowLab Settings** options allows users to save and load user-defined settings.

The following settings can be saved using this important menu function:
- Panels
- Numerics
- Trending
- Reports

The settings are then saved as an **.ini* File.

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