

FLOW-RATE PLATFORM SOFT FRONT PANEL



User Manual

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1.	INTRODUCTION	3
2.	SYSTEM REQUIREMENTS	4
3.	INSTALLATION INSTRUCTIONS	4
4.	HOW TO START	4
4.1	Material needed to use FRP-SFP	4
4.2	Starting FRP SFP	5
5.	FRP-SFP MAIN PANEL	6
5.1	Toolbar	7
5.1.1	General description	7
5.1.2	Device Configuration	8
5.1.3	Record Configuration	11
5.2	Workspace Panel	12
5.2.1	FLOW UNIT Panel	12
5.2.2	Graph Panel	14
5.2.3	Splitter bars	16
5.3	Status line overview	18
5.4	Connection / Disconnection of devices	18
6.	FRP SFP HELP	19
6.1	Contact Us Button	19
6.2	Help Button	19
7.	QUITTING FRP SFP	20
8.	FREQUENTLY ASKED QUESTIONS (FAQ)	21

1. Introduction

The Flow-Rate Platform Soft Front Panel is a software solution for flow-rate measurements in a fluidic environment. Used with a Flow-Rate Platform (at least one FLOWBOARD and several FLOW UNITS), the FRP-SFP provides a quick and user-friendly view of up to sixteen (16) FLOW UNITS. Many features have been imagined to enable you to customize your FRP-SFP to your specific needs and simplify your daily use of the FRP.

The FRP-SFP user manual describes how to use the FRP SFP for your day-to-day work. It describes all the FRP-SFP features that will help you to assess your fluidic system. Detailed answers to frequently asked questions are also provided, to enable you to make the most of FRP-SFP performances and features.



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2. System Requirements

This installation requires one of the following Microsoft operating systems:

- Windows XP Service Pack 3
- Windows Vista x86
- Windows Vista x64
- Windows 7 x86
- Windows 7 x64
- Windows 8 x86
- Windows 8 x64

This installation requires that version 3.1 of the MSI (Windows Installer) Engine is installed on your computer. If you do not have MSI 3.1 or later, the installer updates the engine automatically and might require that you restart your computer.

The FRP SFP software requires:

- A minimum of 512 Mo of RAM (2 Go recommended)
- Minimum process or Intel Pentium 1.6 GHz
- Minimum screen size 800 x 600

3. Installation Instructions

Before installing the FRP-SFP, log on as Administrator or as a user with Administrator privileges. The FRP-SFP setup program must have Administrator privileges because the program modifies the configuration registry of your system. Complete the following steps to install the FRP-SFP:

1. Plug your FRP-SFP USB key. The installer launches if your USB key plays data automatically. If the installer does not launch automatically, navigate into the USB key files using Windows Explorer and launch the setup.exe file from your FRP SFP software USB key.
2. The installation wizard guides you through the necessary steps to install the FRP-SFP. You can go back and change values where appropriate by clicking the **Back** button. You can exit the setup where appropriate by clicking **Cancel**.
3. When the installation is complete, click **Finish**.

4. How to start

4.1 Material needed to use FRP-SFP

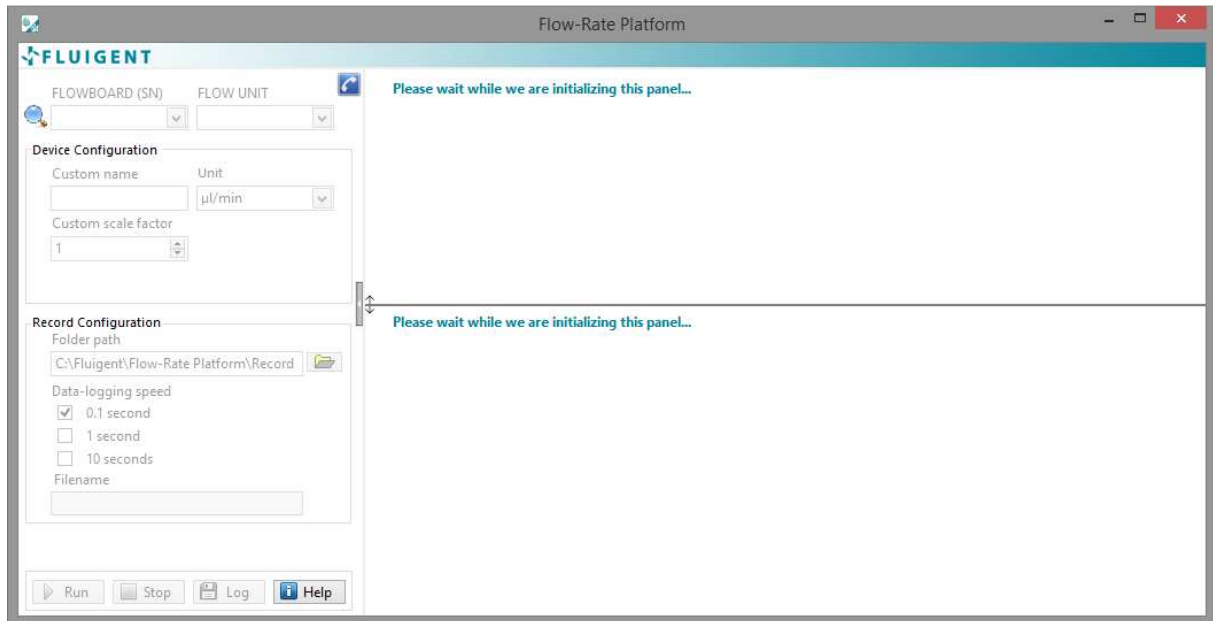
The FLUIGENT devices below are needed for starting FRP-SFP. All the devices must be connected to your computer.

- One (1) or two (2) powered FLOWBOARDS connected via USB to the computer (cf. FRP User Manual).
- The FLOWBOARD alone does not enable you to measure flow-rates in your fluidic system. Connect at least one (1) FLOW UNIT, and up to sixteen (16) FLOW UNITS, to your FLOWBOARDS to handle your circuit with flow-rate measurement possibilities.

4.2 Starting FRP SFP

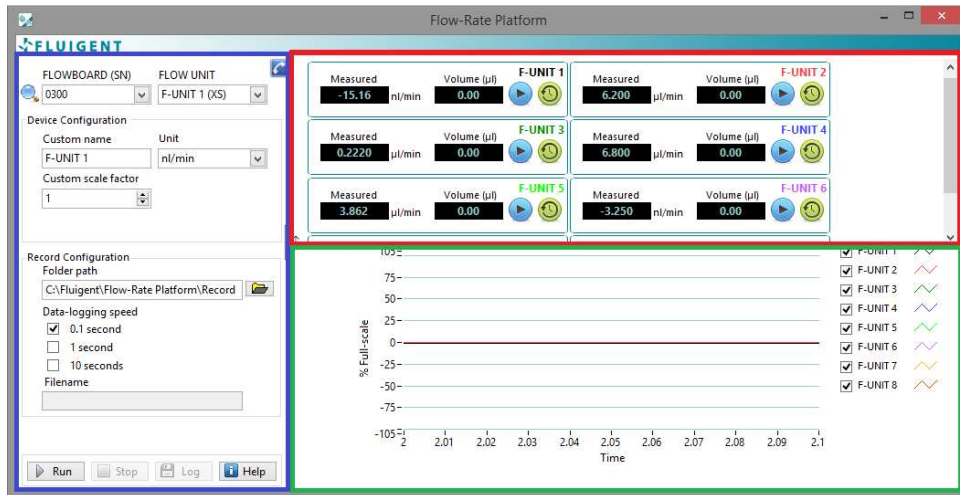


- ▶ Double click on the FRP-SFP shortcut on your desktop to launch FRP-SFP.



- ▶ The FRP-SFP Main Panel appears, with the Toolbar on the left and the Workspace on the right. The FRP-SFP Workspace is automatically adjusted to the number of FLOW UNITS connected to the FLOWBOARDS.

5. FRP-SFP Main Panel



Description

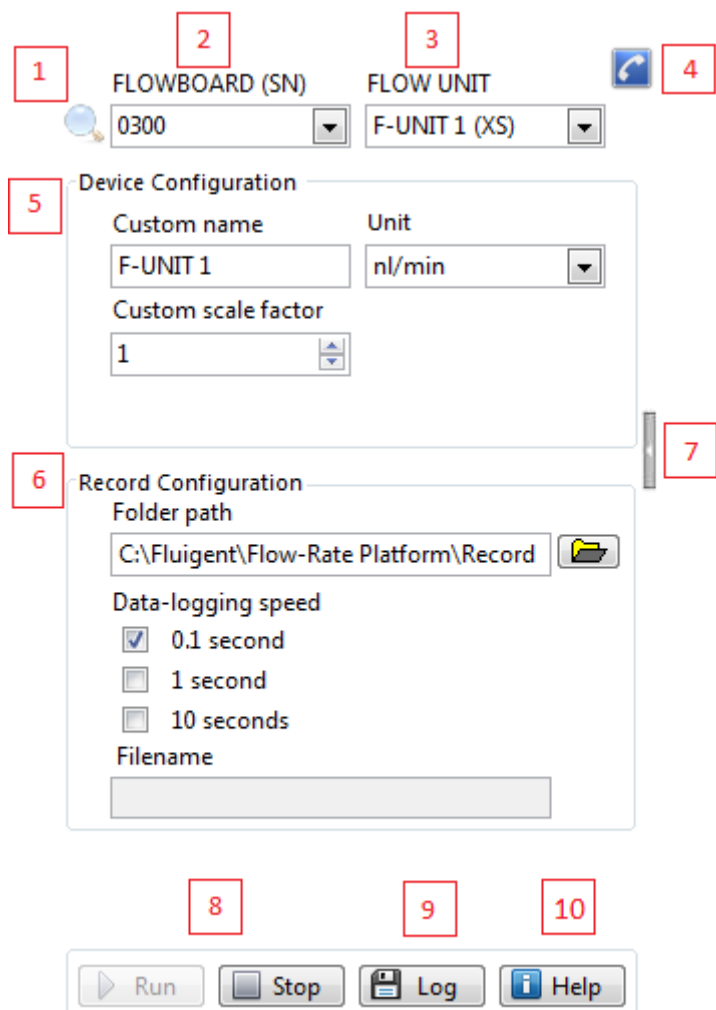
The FRP SFP Main Panel consists in:

- ▶ A **Toolbar** on the left (blue rectangle).
- ▶ An **Upper Workspace** displaying the direct measurements of the FLOW UNIT connected to the selected FLOWBOARD (red rectangle)
- ▶ A **Lower Workspace** displaying the selected graphs of the different flow rate measurements in % of full scale (green rectangle).

These three (3) parts are detailed hereafter.

5.1 Toolbar

5.1.1 General description



1. REFRESH MAGNIFIER

Click the magnifier to refresh the connection between the software and the FLOWBOARD and FLOW UNITS. Use it after connecting or disconnecting devices.

2. FLOWBOARD (SN)

Display the selected FLOWBOARD. The serial number is indicated. To change the selected FLOWBOARD, click on the FLOWBOARD list drop-down menu.

3. FLOW UNIT

Display the selected FLOW UNITS connected to the FLOWBOARD and its range.

4. CONTACT US

Click the phone-shaped button to open a box with information about FLUIGENT. More details in §6.1

5. DEVICE CONFIGURATION

Display the current name, the unit and the scale factor of the selected FLOW UNIT. More details in §Erreur ! Source du renvoi introuvable..

6. RECORD CONFIGURATION

Display the chosen record file path and the data logging speed of the acquisition and the configuration of the recording. The file name is also displayed. More details in §0.

7. CONTRACT / EXPAND TOOLBAR SPLITTER BAR

This button allows you to contract or expand the split limit between the Toolbar and the Workspace so that you can respectively, crop the Toolbar and expand the Workspace or access the Toolbar and reduce the Workspace

8. RUN / STOP

Click the **Run** button to start the flow-rate measurements. When activated, the **Run** button becomes grayed to indicate that the data is displayed on the **Workspace** and the **Stop** button is non-grayed. To stop data acquisition, click on the **Stop** button.

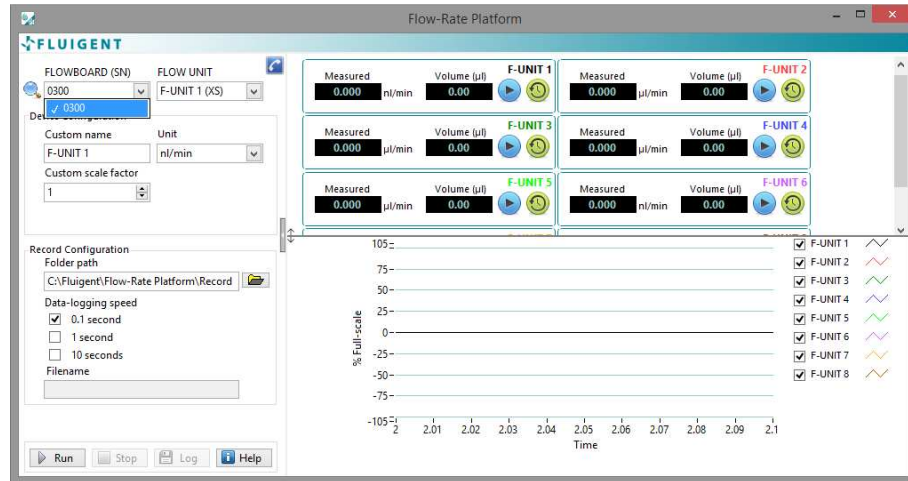
9. LOG

Click this button to start recording the the measured flow-rates. More details in §0.

10. HELP

The Help button enables you to go to the Help menu in the Menu bar. More details in §6.1.

5.1.2 Device Configuration

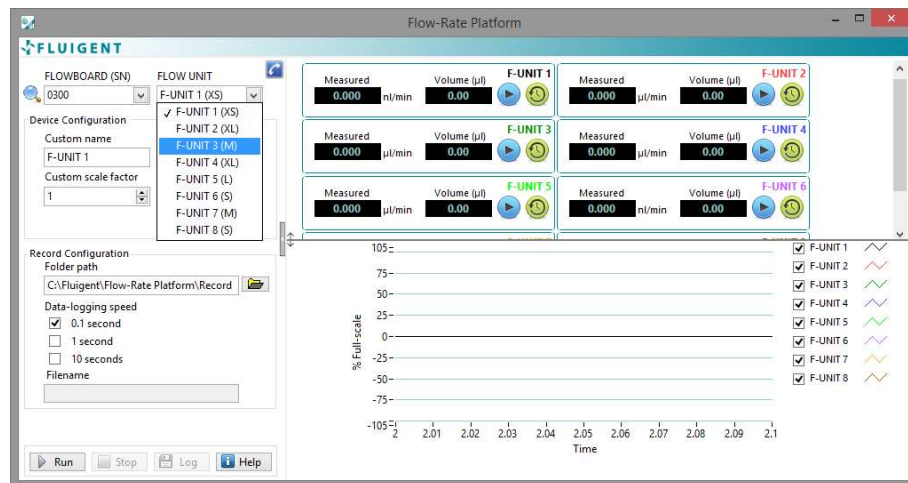


To start a configuration for your devices, you need to select the FLOW UNIT of interest:

- ▶ First select the FLOWBOARD on which your FLOW UNIT is connected with the **FLOWBOARD (SN)** drop-down menu. A little tick on the left of the serial number of the FLOWBOARD appears when selected.

Remember that the serial number of your FLOWBOARD is written on the bottom of your FLOWBOARD.

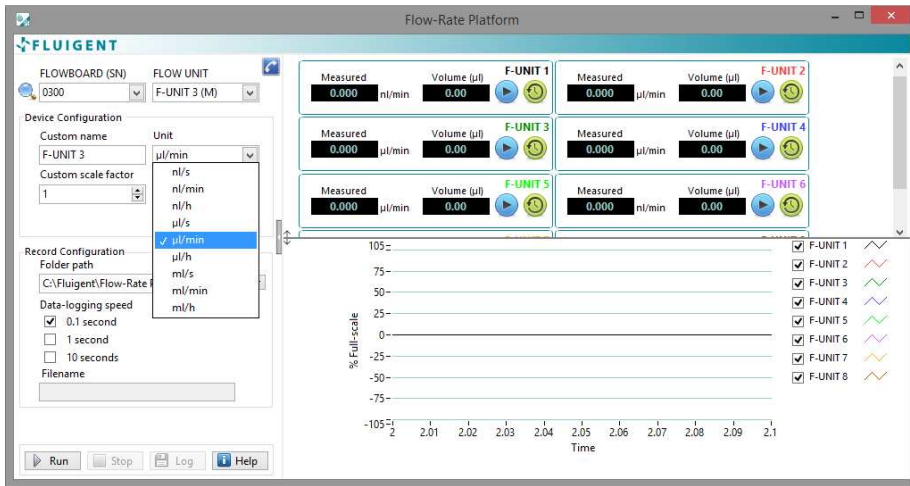
Note: the FLOWBOARDS are ordered by growing serial numbers.



- ▶ Then select the FLOW UNIT with the **FLOW-UNIT** drop-down menu. The FLOW UNITS are ordered by the port number they are plugged in. Their models are shown between brackets (from XS to XL). A little tick on the left of the port number of the FLOW UNIT appears when selected.

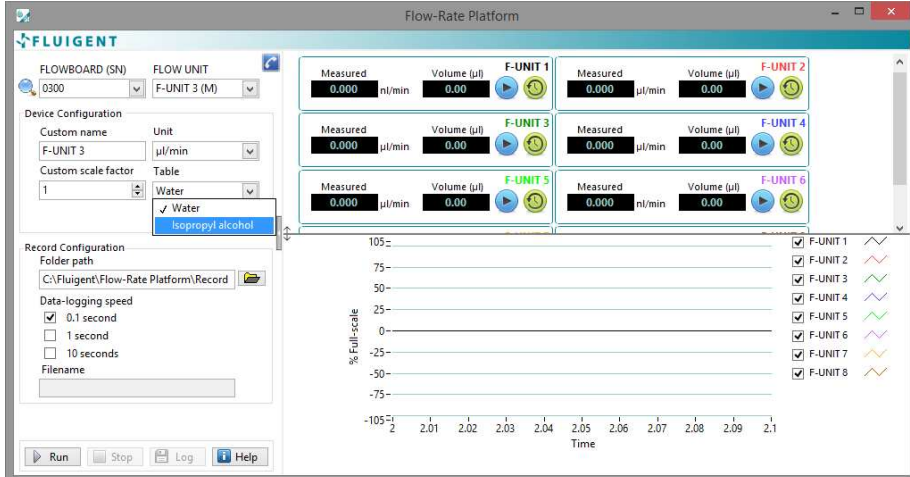
Remember that the model of your FLOW UNIT is written on the top and on the bottom of your FLOW UNIT.

You can now change your FLOW UNIT configuration.



- ▶ Enter a Custom Name in the **Custom Name** box. The name by default is “F-UNIT XX” where XX is the port number of the selected FLOW UNIT.
- ▶ Select the unit you want your measurements to be displayed in with the **Unit** drop-down menu. A little tick on the left of the unit appears when selected.

Note: the unit by default is “nl/min” for the XS and the S models and “µl/min” for the M, the L and the XL models.



- ▶ A second table, calibrated with Isopropyl Alcohol, is available for the S, M and L FLOW UNIT models. When one of these models is selected, the **Table** box appears and you can choose the calibration you want with the drop-down menu. A little tick on the left of the calibration table appears when selected.
- ▶ If your liquid is not the liquid for which the flow sensor is calibrated with, a scale factor enables you to match the displayed values to the real measurements *See the Flow Rate Platform User Manual for more details on the scale factor.*

Note: your scale factor must be higher than 1. If not, you may have to change your calibration table in order to have a scale factor higher than 1.

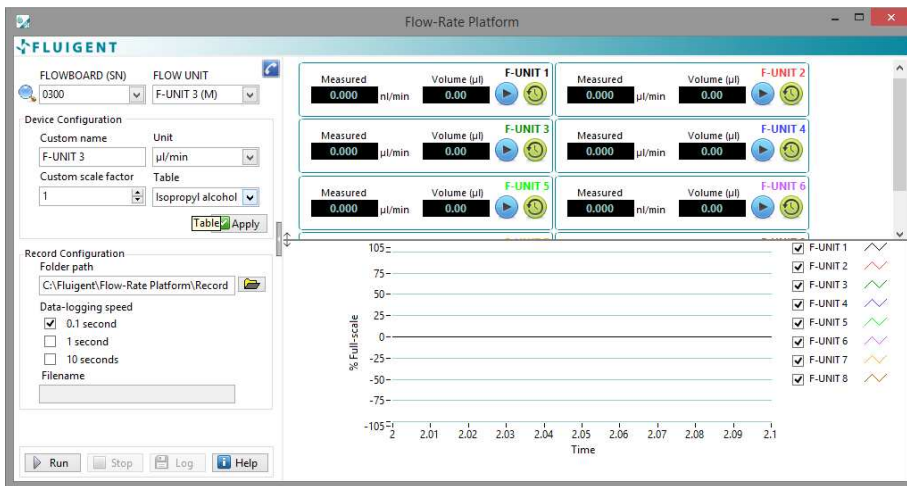


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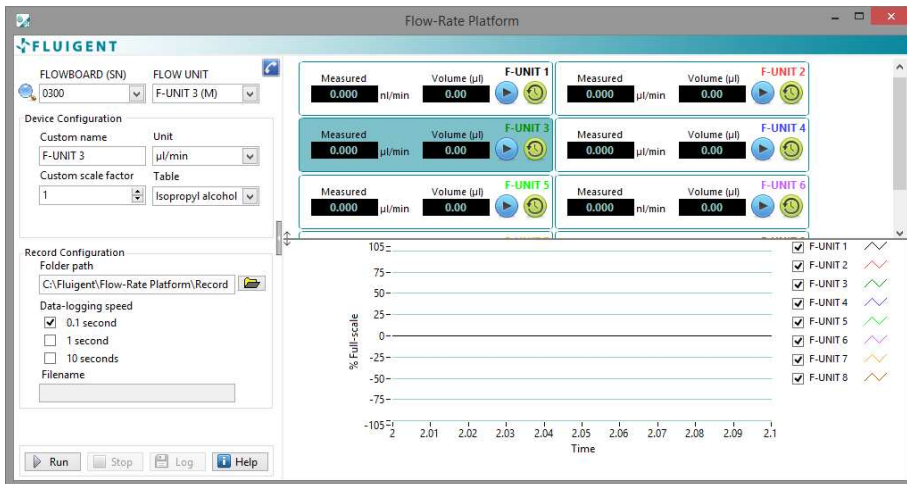
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- ▶ When a change is made in a device configuration (Custom name, Unit, Custom scale factor or Table), the **Apply** button appears on the bottom right of this panel.
- ▶ Click the **Apply** button if you want the changes to be effective.

Note: no changes in the device configuration will be taken into account if you do not click the **Apply** button.

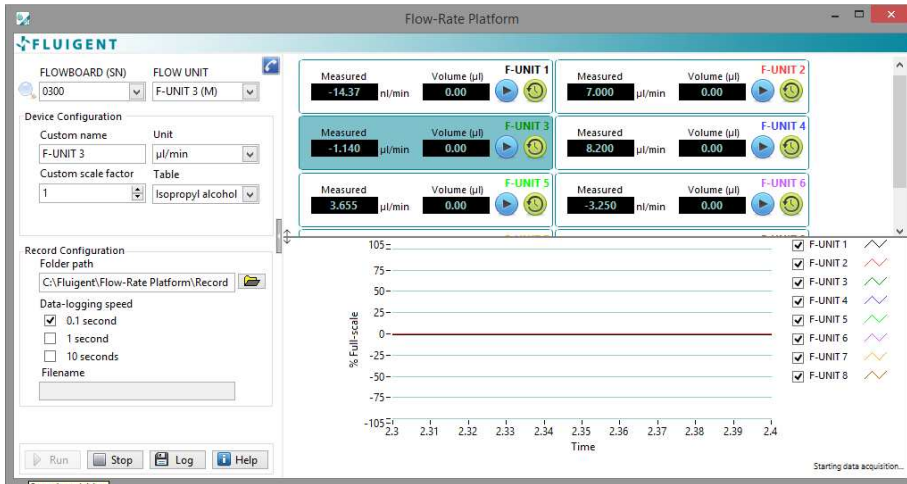


You can check your changes on the Workspace Panels.

- ▶ The custom name is changed on the FLOW UNIT Panel and the Graph Panel.
- ▶ The unit is changed on the FLOW UNIT Panel
- ▶ The scale factor is taken into account on the measurements on the FLOW UNIT Panel.
- ▶ If the Isopropyl Alcohol table is chosen, the selected FLOW UNIT becomes blue on the FLOW UNIT Panel.

Note: the value displayed on the FLOW UNIT Panel is not changed if the data acquisition is not in progress (cf §5.1.1)

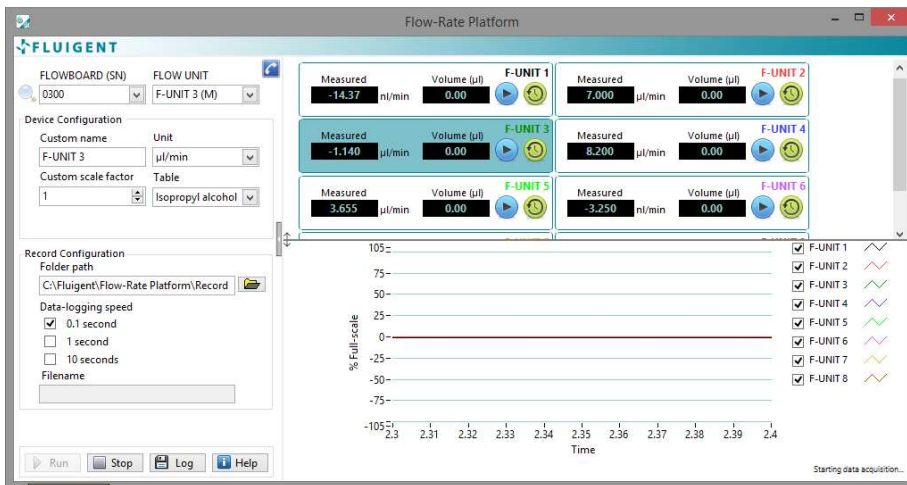
5.1.3 Record Configuration



To start a recording, you first need to click the **Run** button in order to start data acquisition:

- ▶ Select the folder path you want your data to be recorded to. You can write it down on the **Folder Path** box or browse it with the folder icon on the right of the box.
- ▶ Choose the speed you want your data to be logged at by ticking the corresponding period: 0.1 second, 1 second or 10 seconds.

Note: the path by default is **C:\Fluigent\Flow-Rate Platform\Record**.



Click the **Log** button to start data logging

- ▶ The Record Configuration Panel becomes gray when logging is proceeding. The name of the data logging file appears in the **Filename** box.

Note: The filename is **FRPData_YYYYMMDD_HHMM.txt** and is not changeable by the user, Y=Year, M=Month, D=Day, H=hour, M=Minute.

Note: the .txt file is a comma-delimited file containing the acquired data.

You can stop the data logging clicking again the **Log** button.

5.2 Workspace Panel

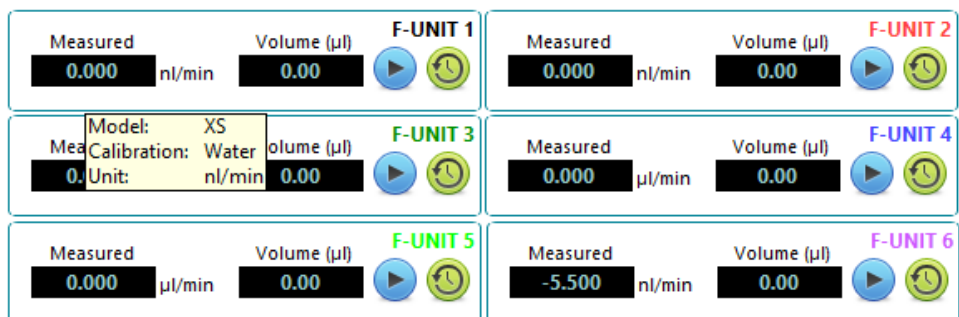
5.2.1 FLOW UNIT Panel



The Upper Half of the Workspace Panel displays the measurement of up to sixteen (16) FLOW UNITS connected to the FLOWBOARDS:

- ▶ 1. Flow-rate measurement
- ▶ 2. Volume measurement
- ▶ 3. Start/stop volume measurement
- ▶ 4. Reset volume measurement

Note: The FLOW UNITS are ordered by the port number they are plugged in the FLOWBOARDS.



Tool tips display as you hover your mouse pointer over the various elements. You will find information on the Model (**XS**), Calibration (**Water**) and Unit (**nl/min**) regarding the selected FLOW UNIT.



In this other example, the Model is **M**, the Calibration is Isopropyl Alcohol (**iPrOH**) and the Unit **µl/min** for the FLOW UNIT 3.

If the calibration for FLOW UNIT S, M and L is fixed to be Isopropyl Alcohol, the channel is highlighted in blue (cf FLOW UNIT 3). If the calibration used is water, the channel is highlighted in white (cf other FLOW UNIT).

Note: The explanations related to the dual calibration of FLOW UNIT are given in the Flow-Rate Platform User Manual

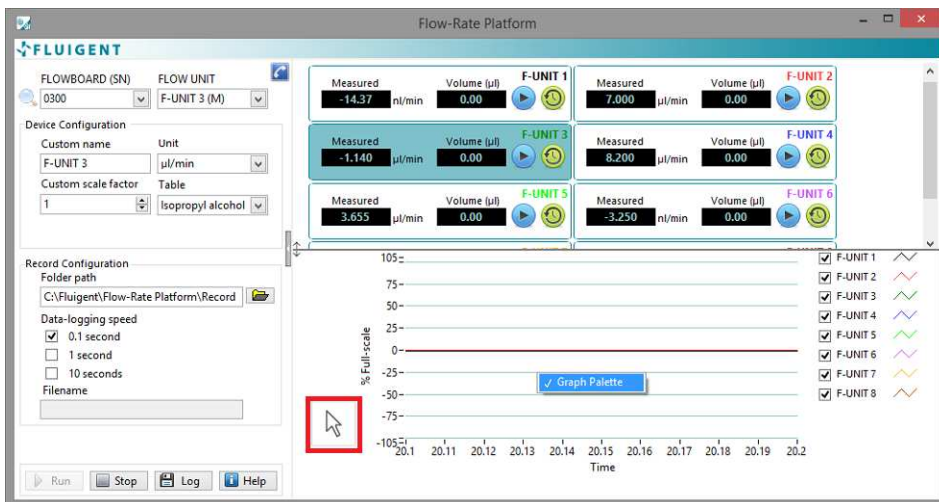
5.2.2 Graph Panel



This panel displays flow-rate measurements of the different channels in % of full scale of the FLOW UNIT.

You can choose which flow-rate channel you want to display by ticking the corresponding box on the right.

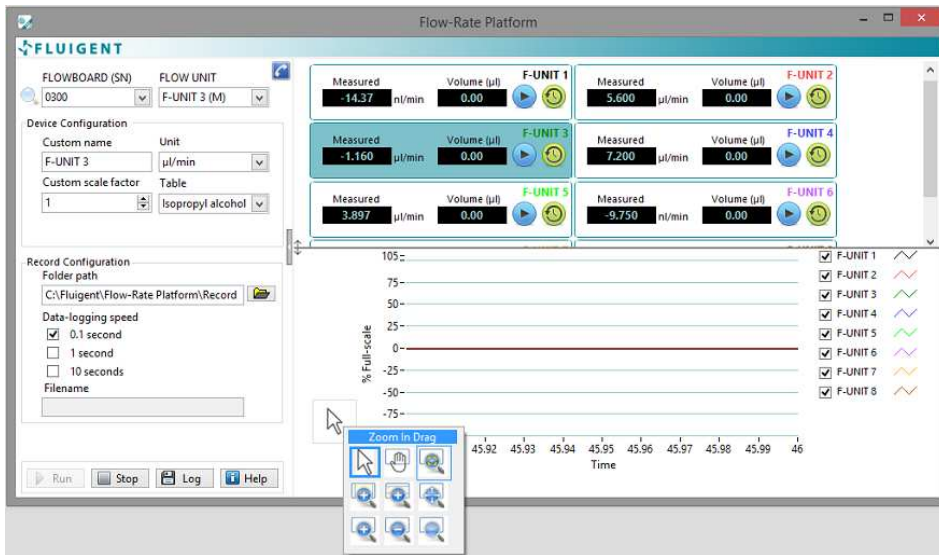
Graph options are available by clicking the drawing in front of the corresponding FLOW UNIT.



By right-clicking the Panel you can access the **Graph Palette**.


▶ A mouse pointer appears on the bottom left of the Graph Panel


Note: you can also access the Graph Palette by hitting the **Z** key on your keyboard.





- ▶ Clicking the mouse pointer enables you to access the zoom in and out tools for a better view of the graphs displayed on the Graph Panel.
- ▶ Hover your mouse over the different tools to see their functions.
- ▶ Click the tool icon to use this tool to zoom in or out.


Note: you can leave this Graph Palette by right-clicking again the Graph Panel and selecting **Graph Palette**.


 Mouse pointer: default tool.


 Pan: tool to move around the graph.


 Zoom in Click: click a point you want to zoom in on.


 Zoom out Click: click a point you want to zoom out from.

 Zoom in Drag: click a point on the display you want to be the corner of the zoom area and drag the tool until the rectangle covers the zoom area.

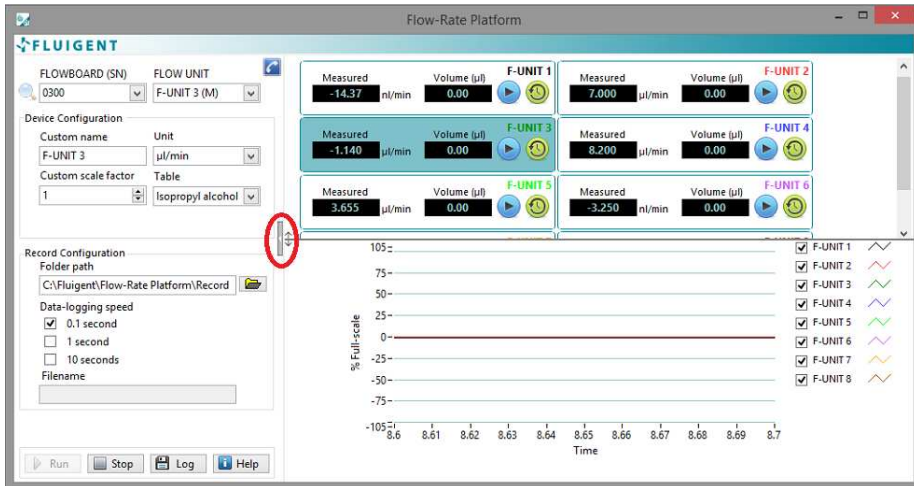
 Horizontal zoom drag: zoom in on an area of the graph along the x-axis.

 Vertical zoom drag: zoom in on an area of the graph along the y-axis.

 Zoom in fit: Autoscale all x- and y-scales.

 Restore Default: restore y-scale between -105% and 105%.

5.2.3 Splitter bars



The vertical splitter bar separates the Toolbar and the Workspace.

- ▶ Click it to collapse the split limit between the Toolbar and the Workspace so that you can contract the Toolbar and expand the Workspace
- ▶ When the Toolbar is collapsed, the Workspace fills the Main Panel.



- ▶ Click the splitter bar again to display the Toolbar back.



The horizontal splitter bar divides the Workspace between the FLOW UNIT Panel and the Graph Panel.

- ▶ Drag it up or down to get a full view of the FLOW UNIT Panel or the Graph Panel.
- ▶ Here is an example of the Workspace with the splitter bar down, displaying the FLOW UNIT Panel.

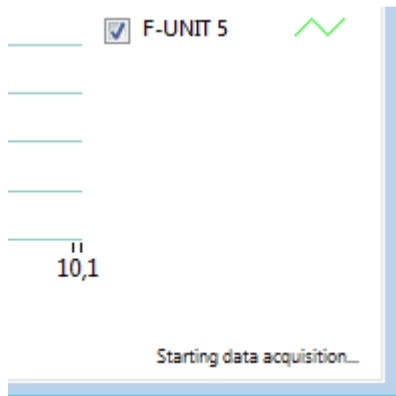


- ▶ Here is an example of the Workspace with the splitter bar on the top, displaying only the Graph Panel

5.3 Status line overview

The following table sums up all the **Status line** that can be displayed in the Status bar, on the bottom right of the **Main Panel**.

Note: only one message on the **Status line** can be displayed at the same time. A message lasts 10 seconds.



Status line
Detecting hardware...
FLOW UNIT detection...
One or more FLOW UNIT has been disconnected or added...
Starting data acquisition...
Stopping data acquisition...
Starting data logging...
Stopping data logging...
One FLOWBOARD has been disconnected...

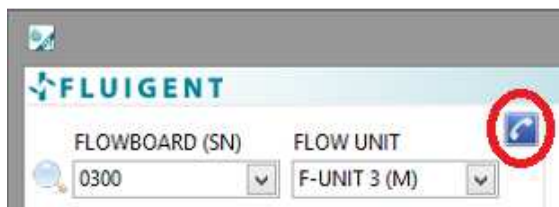
5.4 Connection / Disconnection of devices

If you need to change your device configuration by disconnecting devices, adding devices or changing of FLOWBOARD ports for some devices, click the **Stop** button and simply operate your operations. Status lines will appear to indicate the operations that have been made. Once you are done, simply click on the **Magnifier** button to refresh your connections.

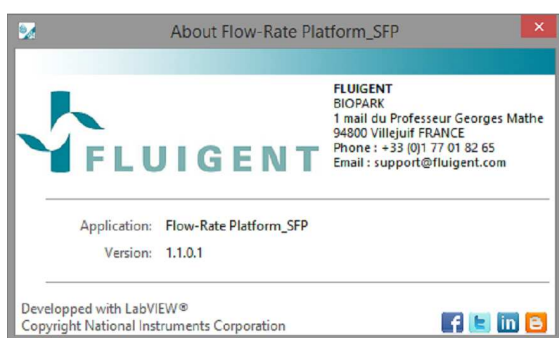
Note: the data acquisition must be stopped to access the refresh magnifier.

6. FRP SFP Help

6.1 Contact Us Button



The **Contact Us** button gives you access to a new window with information about FLUIGENT and how to contact us, as well as the name and version of the current application.



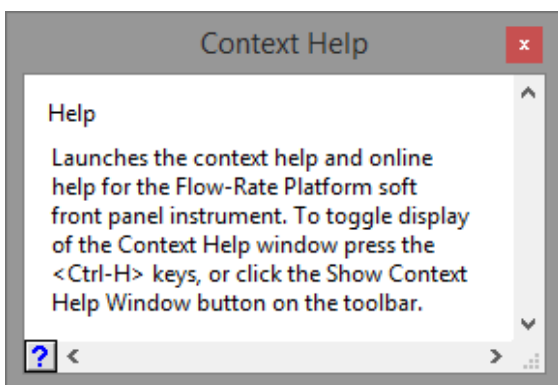
Note: you can quit this window by clicking the Windows close button on the top right of the window.

6.2 Help Button



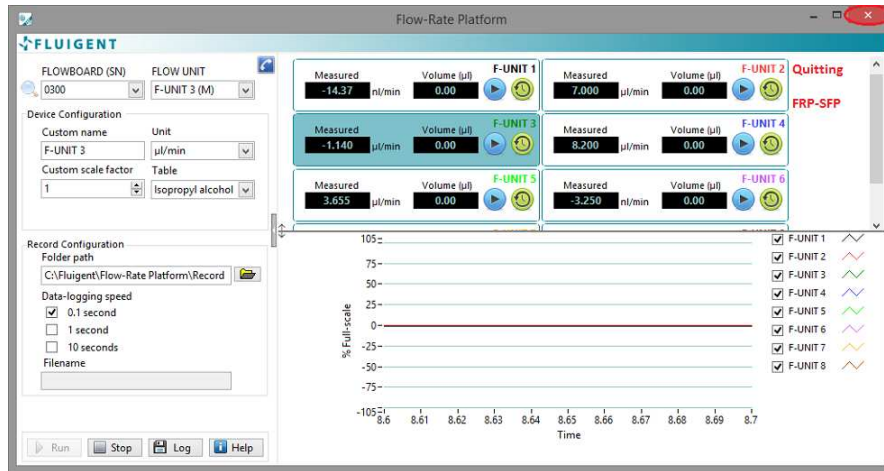
The Help button enables you to access the information about FRP-SFP:

- ▶ By browsing your mouse over the Main Panel the Help windows shows you the functions of pointed buttons.
- ▶ If you click the question mark on the bottom right of this window, this User Manual opens in a Windows Help window.



Note: you can reach directly this User Manual by tapping F1 on your keyboard.

7. Quitting FRP SFP



To quit FRP SFP, click the Windows close button at the top right of the FRP SFP Main Panel.



A message will appear to ask you to confirm that your intention is to close FRP SFP.

Click on OK to quit definitely FRP SFP

8. Frequently Asked Questions (FAQ)

Why are my flow-rates not measured by the Flow-Rate Platform Soft Front Panel?

There may be the consequence of several causes:

- ▶ Check that your FLOW UNITS and FLOWBAORDS are correctly connected
- ▶ Check that all the FLOW UNITS are displayed in the drop-down menu in the toolbar.
- ▶ Check that you hit the **Run** button in order to start the data acquisition

In which range of temperature the values given by the sensors stay accurate?

The FLOW UNIT sensors are already temperature compensated, so they work in a range of 10°C to 50 °C. This can be useful if your device needs to be contained within an incubation chamber.

Will the size of the capillary of the XS FLOW UNIT model have an influence on my system?

Yes the diameter of the capillary is small: 25 µm, so depending on the size of your system, you may need to push your fluids harder to obtain a given flow-rate. Then the maximum pressure drop between the sides of the XS FLOW UNIT model at maximum flow-rate is 0.8 bar.

Is there a specific way of washing the XS FLOW UNIT model?

You can find cleaning procedures in the FRP user manual .Concerning specifically the XS FLOW UNIT model, it may withstand pressures up to 200 bar, so is it possible to use high pressure or flow-rate pumps in case of clogging.

Why is the flow-rate measured by the FLOW UNIT not stable?

Some fluid controllers are unable to limit the fluctuations of the flow-rates around a mean ordered value because of the mechanical actuation they use.**Erreur ! Source du renvoi introuvable.** Therefore the flow-rate within your system can be an imprecise response to the fluid controller. *Visit us on www.fluigent.com for further information.*

Why will the measured flow-rate not reach a steady state?

For some fluid controllers, the settling-time may be long. For this reason, the transition phase after an order change in the fluid controller takes much longer, depending on the nature of the fluid controller. *To reduce the settling time, one can purchase a MFCS™-EZ provided by FLUIGENT.*

Why does the flow-rate measured by the FLOW UNIT not match the ordered flow-rate on my fluid controller?

- ▶ The flow-rate calculated by the FLOW UNIT is based on a temperature diffusion-advection measurement with the glass capillary. If your fluid is not pure water you first need to add a scale factor to calibrate your FLOW UNIT. *See FRP user manual for more details on the calibration of the FLOW UNIT.*
- ▶ There might be a leak within your system. Please check if your system is completely tight before going any further. *See FRP user manual to connect your FLOW UNIT.*
- ▶ The settling time may be long. *Check your fluid controller supplier for more information.*
- ▶ Your fluid controller may not be as precise as the FLOW UNIT sensor.



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