



FiSens

FBG-Interrogator

[Multi-Channel Software]

Quickstart Guide

Software versions covered in this handbook:

- FiSens FBG-Interrogator 1.5 alpha 2

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FiSens GmbH Autorenkollektiv

38126 Braunschweig

Germany

Contents

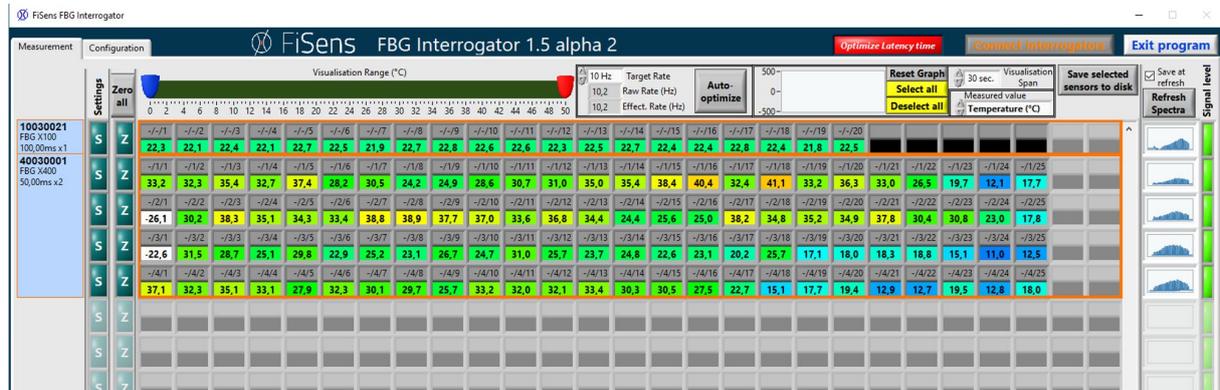
- 1 System, Fiber and FBG Channel Setup 1
 - 1.1 Connecting Devices and Fibers..... 1
 - 1.2 Setting FBG sensor channels 1
- 2 Selection and Visualization of FBG Sensors..... 3
 - 2.1 Selecting FBG sensor channels 3
 - 2.2 Visualizing FBG sensor channels..... 3
- 3 Sampling Rate and Measurement Recording..... 4
 - 3.1 Adjusting Measurement Rate..... 4
 - 3.2 Recording Measurements 5

1 System, Fiber and FBG Channel Setup

1.1 Connecting Devices and Fibers

Once you have successfully installed the LabView runtime and FiSens FBG-Interrogator software is copied to your hardware drive, please open the executable file: *“FiSens FBG-Interrogator”*.

As soon as the window is opened, to **start click on the top right button: *“Connect Interrogators”***.



The software should then connect to the systems, their fibers and FBG sensors. If the software does not connect nor show the system and their FBG, please check under Windows Device Management, whether the system is detected and most likely the driver not automatically installed. You will find an FTDI driver installer in the installation folder, which after installation should allow Windows to detect the Interrogator properly under the COM-Ports.

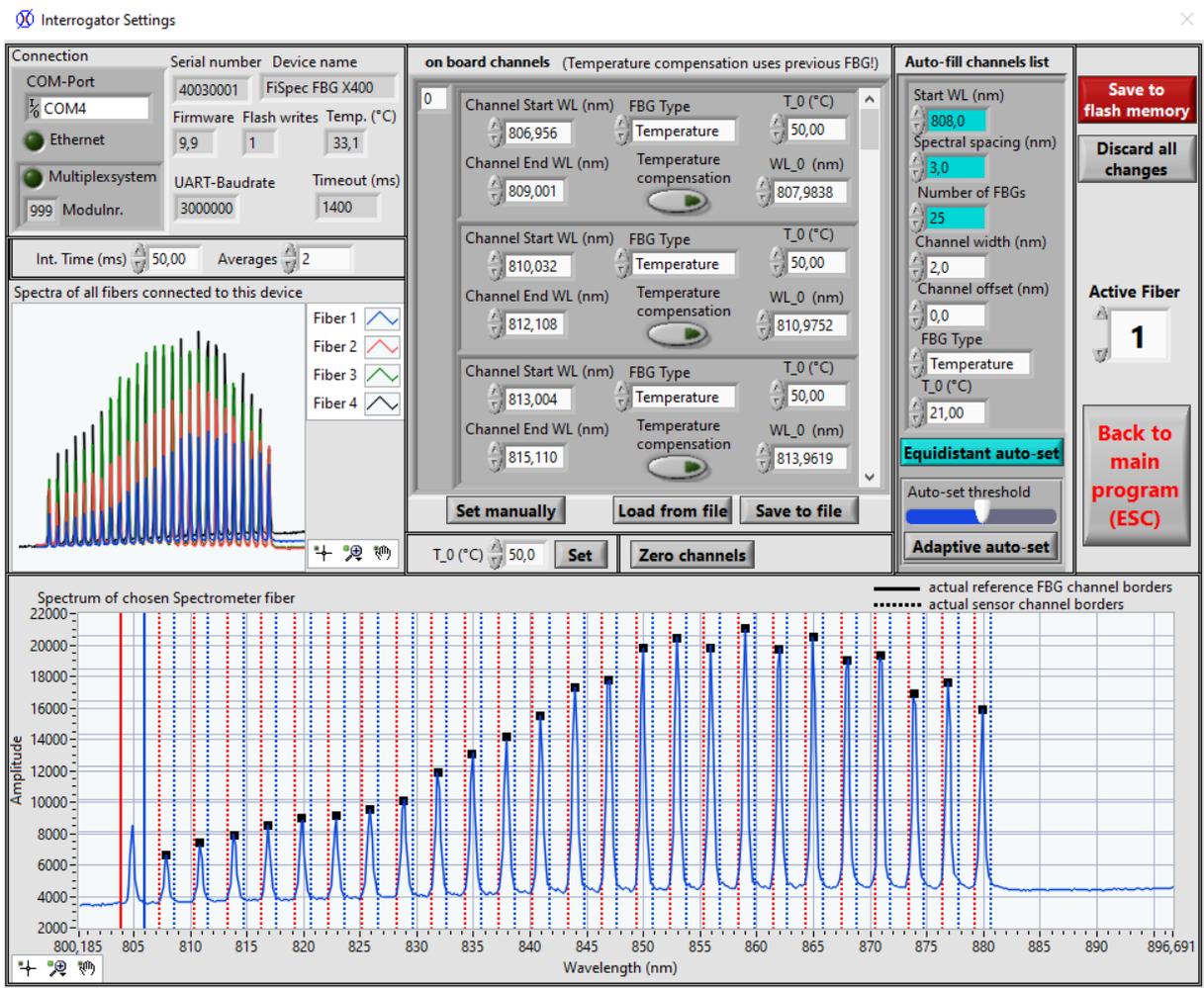
Once connected, each fiber is displayed by a row and multiple fibers are framed by an orange line highlighting their correspondent Interrogator system shown on the left. Each FBG sensor is displayed by a block counted from left to right: 1 to maximal 32 FBG per fiber.

1.2 Setting FBG sensor channels

Since this is the first time you connect the fiber to the system, not all FBG sensor channels are properly adjusted (as you can see by the inhomogeneous color distribution over the FBG sensor blocks).

To start the setting and zeroing of all FBG sensors per fiber **click on the left button: *“S” (for Settings)***. A new window should then open, where you can set all kind of FBG wavelength channel interrogation parameters for each respective fiber. In the left chart you will also see the raw spectra of the different fibers connected. You can switch between the fibers by simply use the up-/down arrows on the right.

For now, **click on the button: *“Adaptive auto-set”*** in the middle right of the window. The software will then automatically detect all FBG sensors along the fiber and set a correspondent FBG sensor channel.



After closing the window by clicking on the middle right red button: “Back to main program (ESC)” you will come back to the main window of the application.

After you have “Adaptive Auto-Set” all connected fibers, the FBG sensor blocks should look homogenously colored and zeroed at one temperature or strain, like this:

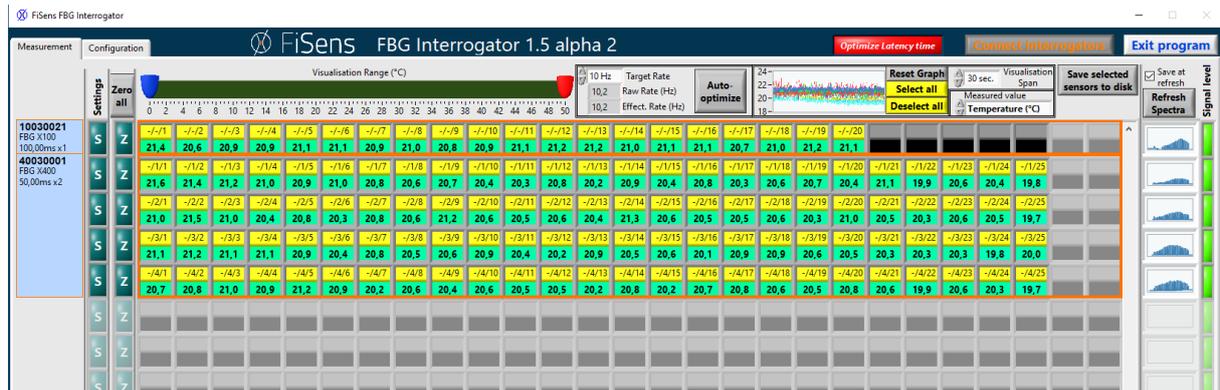


Basically you are now ready to start your measurements.

2 Selection and Visualization of FBG Sensors

2.1 Selecting FBG sensor channels

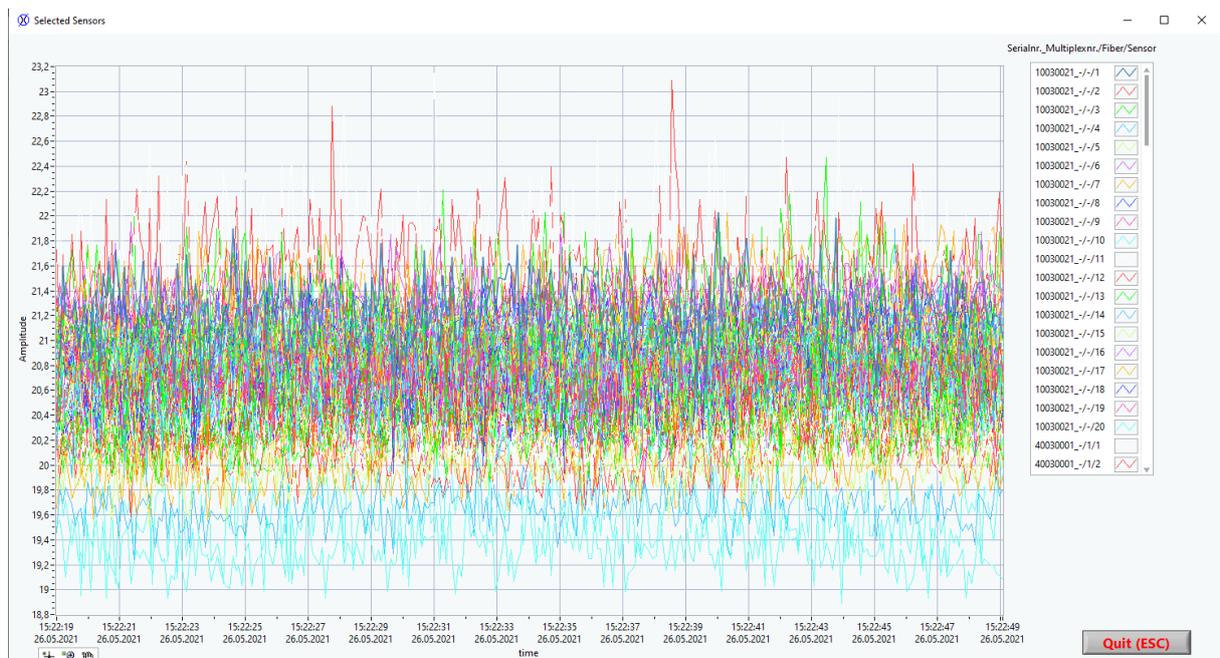
Before you start visualizing or saving your measurement data you will have to select each FBG sensor you like to read out. This can be either done by clicking on the upper part of each FBG sensor block (the part will then light up yellow) or by clicking on the button: **“Select all”** on the top right.



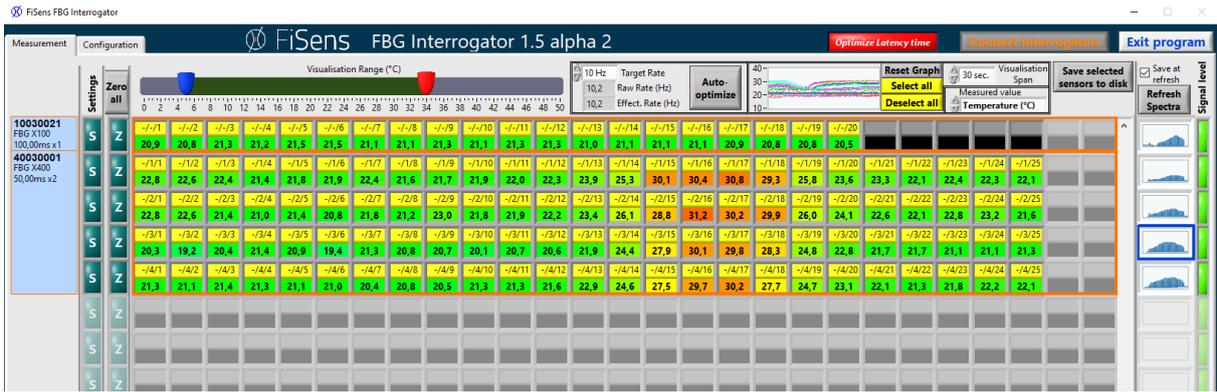
Besides all FBG sensor blocks lighting up yellow, you will see on the top, next to **“Select all”**, that the FBG measurements have started to plot within a small white window. You can enlarge this window by simply clicking on it.

2.2 Visualizing FBG sensor Range channels

With this additional window opened you can visualize all measured FBG values (temperature/strain) over time.



Next to this graph visualization of the FBG values, it is also possible to graphically show the information with a color spectrum level between blue and red, as can be seen in the following picture.



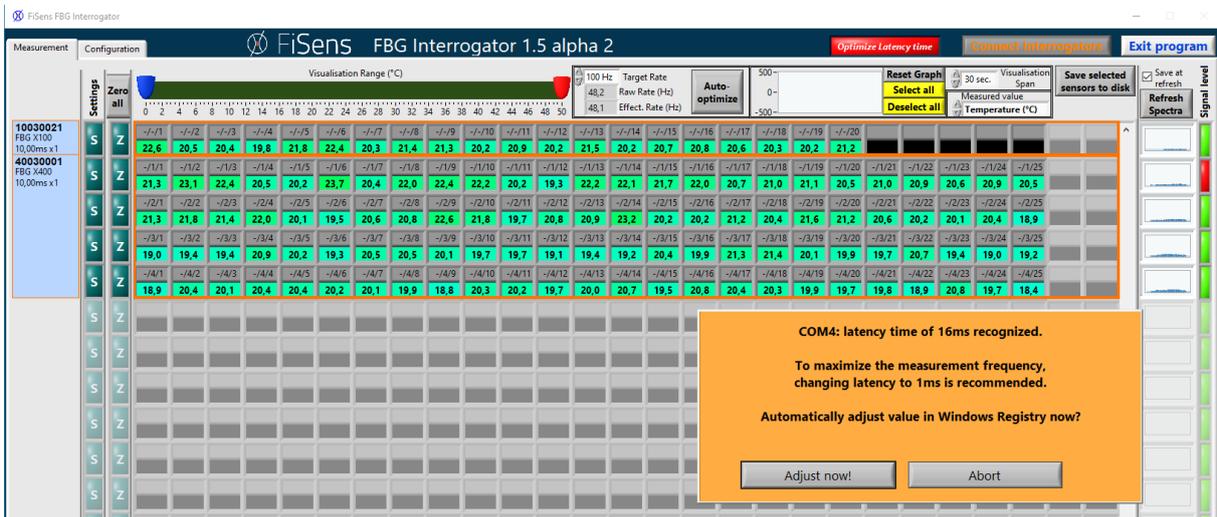
To adjust the color level within a certain range, you can use the slider on the top left to fit your application dynamic range. For instance, the range was set here from 5° to 34° C and once the FBG sensors were touched in the middle of the fibers, the color shifted from green over yellow to red.

3 Sampling Rate and Measurement Recording

3.1 Adjusting Measurement Rate

To change the sampling rate from 1Hz, to 10Hz or even higher frequencies, you can click on the top middle and choose a target rate and then by confirming with a **click on the button: "Auto-optimize"**. The measurement frequency will be automatically adjusted.

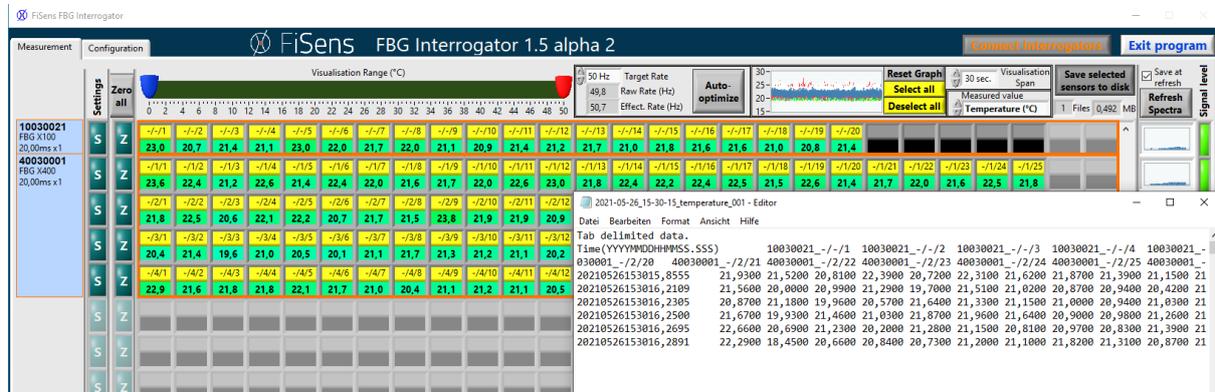
Due to Windows USB limitations, it might be required to change the Windows latency time from 14ms to 1ms. To confirm this setting, you first have to restart the FiSens FBG-Interrogator application with Administrator Rights, then click on the top button: *"Optimize Latency time"* and then within the orange window: *"Adjust now!"*. After you have done this, you can restart the application in a standard mode, the settings will be remembered for all set devices.



You will now be able to increase the target sampling rate to higher frequencies of up to 100Hz or 150Hz.

3.2 Recording Measurements

All selected and visualized FBG values can be also recorded within a txt-file (saved in your users FiSens folder). For doing so you will have to **click the button: “Save selected sensors to disk”**.



As you can see in above screenshot all selected FBG sensors all recorded within a txt-file for each respective row with a time stamp. To adjust the time stamp format, go to the second tab: “Configuration” and then into the Sub-Tab: “Program settings”.

These are the basic functionalities to setup, start and visualize or record your FBG sensor measurements. There are a lot of more possible configurations which are described in more detail within the FiSens Handbook.

We wish you enlighting measurements!