

 SENORICS

 ***USER GUIDE***

SENOCORDER  
SOLID

## HELLO, NICE TO MEET YOU!

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We are pleased that you chose our SenoCorder Solid. To get started, read this short user guide. If you have any questions, feel free to contact us via mail at [support@senorics.com](mailto:support@senorics.com).

Would you like to get to know us better? Here are a few words about us:

We are Senorics, a high-tech start-up based in Dresden, Germany. We build miniaturized sensor solutions for visible (VIS) and near-infrared (NIR) spectroscopy to make material sensing easy and affordable.

Our sensors are small, robust, low cost, fully customizable and need no additional optics – VIS-NIR spectroscopy on chip level!

To support you on your journey to implement spectroscopy in your products, we offer hardware, software and services like consulting and engineering. You can learn more about our technology and our offers on our website, YouTube channel and social media.

But now, enjoy your SenoCorder Solid!



## SAFETY INSTRUCTIONS

Read the handout and procedures before starting to experiment with the device. Please follow all written and verbal instructions carefully. If you do not understand the instructions, the handouts or the procedures, ask Senorics.

Always ensure that all electronic equipment is set up stable on the work bench. Keep your work area clean and dry. Keep electronic equipment away from water, moisture and other liquids. Please do not work with fire whilst using the device.

For a secure connection from the battery to the device, the connector on the device must be plugged in as far as possible. No more metal should be visible on the connector socket. Keep the device connected to the power bank while working with it. Disconnect it from the power bank after you have finished your work. The measurement device can get hot after extensive usage.

If you smell anything burning, immediately turn off the power bank, disconnect it from the device and check what went wrong.

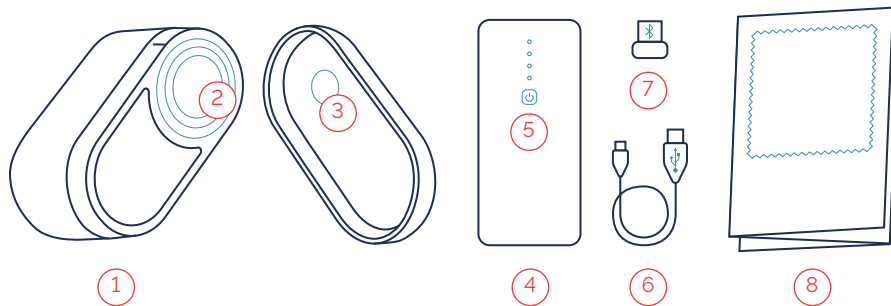
Never remove the cover or other parts of the device, otherwise you risk getting an electric shock. Always check for signs of wear, defects and fraying on electronic equipment such as cables, cords and connectors. If any parts are damaged, please do not replace them yourself. Stop working with the device and call Senorics to receive alternative components or repair service.

Never touch the measurement window as it can break.

## PACKAGE CONTENT

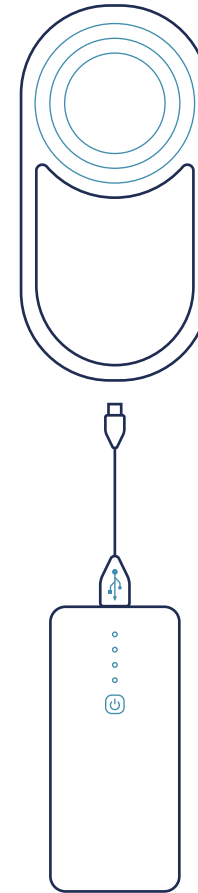
The following table lists all parts shipped with the SenoCorder Solid package. If anything is missing please contact Senorics via the contact information given in section **First Start**.

Item	Description
1 SenoCorder Solid	sensor system for measurement
2 Measurement Window	to measure the reflected light
3 Calibration Standard	to calibrate the SenoCorder Solid
4 Battery Pack (rechargeable)	for powering the SenoCorder Solid - press the power button after connecting
5 Power Button	to switch on the battery pack
6 USB Power Cable	to connect the battery pack to the SenoCorder Solid
7 Bluetooth Dongle	to connect the SenoCorder Solid to the PC
8 Textile Sample Deck	for demoing the textile application
Quick Start Guide	this document



## HARDWARE SETUP

- 1 Connect the battery pack to the SenoCorder Solid by using the USB cable.
- 2 The battery pack will automatically turn on when connected to the SenoCorder Solid. The blue indicator lights will show the charging status of the battery pack. If needed, turn it on manually by clicking the power button on the battery pack. The battery pack will turn off automatically after ~1 min non-use. It can also be turned off manually by double clicking the power button on the battery pack.
- 3 A data connection to the PC is available via Bluetooth only. If the PC has no built-in Bluetooth connectivity use the Bluetooth dongle included in this package. Follow the installation instructions once the dongle is connected to your PC.



## SOFTWARE SETUP

### Minimum requirements

- PC with dual core, 250 MB free hard disk space, 512 MB RAM, Bluetooth functionality
- Windows 10 (previous versions may also work but are not supported/tested, use at own risk)

### Download



### Download and Installation

Login to your user account or register for free at [www.senorics.com/my-account](http://www.senorics.com/my-account). Then go to the **Downloads** section and download SenoSoft.

Save the zip-file in a local folder and unzip it into another local folder (using built-in Windows capabilities). The path name of the local folder must not contain any special or local language characters, only standard ASCII characters are allowed. Make sure you have full access rights to this folder, otherwise SenoSoft will not work properly. This will be your start up folder for SenoSoft, there is no installer.

Bookmark the file **start.bat** located within the **bin** folder of your local SenoSoft folder. This will be your starting point for using/executing SenoSoft.

## FIRST START

- Connect the components of the SenoCorder Solid as described in **Hardware Setup**.
- Make sure the battery pack is powered on (indicator lights lit up, you may have to press the power button on the battery pack).
- Pair the SenoCorder Solid with your PC via Bluetooth. To do this,
  - Open the Windows Settings panel and go to **Devices**
  - Click on **Add Bluetooth or other device**
  - Select **Bluetooth**
  - You should see the SenoCorder Solid appearing in a format like „SCS-X-X-X-X-XXXXXX-X“ where „X“ are numbers according to your specific SenoCorder Solid device. For example, the device could appear as „SCS-1-8-2-1-230985-2“.
  - Click on **SCS-X-...**
  - Click **Finish**
  - Click on **Devices and Printers** (link at right side) to show all installed devices.
  - Double click on **SCS-X-...** and go to the tab **Services**.
  - Write down the COM port number, you will need it later when using the software.
  - Close all Windows Settings panels.
- Start SenoSoft by clicking on **start.bat** as described in **Download and Installation**. Accept any security warning and continue.
- If started for the first time, skip the import option to start with an empty database.
- For further information about the usage of SenoSoft download the User Guide from your account at [www.senorics.com/my-account](http://www.senorics.com/my-account).

### Technical Support

Contact us if you have any questions concerning the software or hardware setup

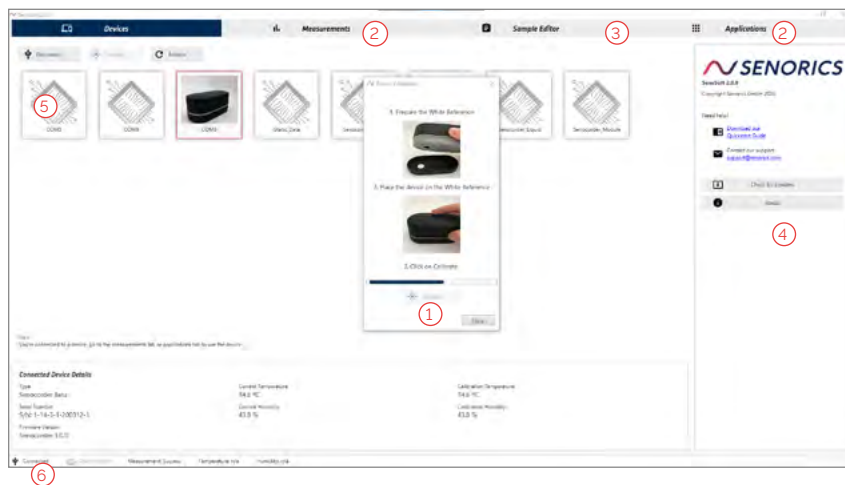
[support@senorics.com](mailto:support@senorics.com)

## SOFTWARE USAGE

After launching SenoSoft (see **First Start**), you now need to connect to the SenoCorder Solid. The software will show a list of available devices / COM ports. Click on the entry with the COM port number you wrote down earlier (see **First Start**) and click **Connect**. After successful connection, the device needs to be calibrated first, using the included calibration standard (also called **White Reference**). Follow the instructions on the screen to calibrate the device. After successful calibration click **Ok**.

After this, you are free to move within the Graphical User Interface (GUI) of SenoSoft by clicking on the particular navigation tabs. The most important components and their meaning are shown in the following pictures. The modes **Measurements** and **Applications** as well as the **Sample Editor** are described in the following sections.

**Note** When you copy from graph to clipboard using the right mouse click, a picture will be pasted when using a graphic software like **Paint** and ASCII data will be pasted when using a text editor like **NotePad**.



- |   |                            |   |  |
|---|----------------------------|---|--|
| 1 | Click to calibrate         | 4 | Information about SenoSoft and contact to Senorics |
| 2 | Measurement selection mode | 5 | List of available devices                          |
| 3 | Sample Editor              | 6 | SenoCorder Solid connection & measurement status   |

## VIRTUAL DEMO DEVICE

The use of SenoSoft in correspondence with the **virtual device** enables the user to get familiar with the software and learn about the first steps. The function **demo application** allows the user to test and edit relevant modes of the software, such as **Measurements**, **Sample Editor** and **Application**.

After installing the start.bat as described above, the SenoSoft user interface opens and the demo device „Demo\_1“ becomes visible. By clicking on the Demo\_1 area, the virtual device is selected and then connected to the software by pressing the connect button.

After connecting, the device calibration window appears to simulate the reference measurement. The virtual calibration is performed by clicking the calibrate button. The successful calibration can be recognized by the button "OK" changing its color to a dark blue. Press the OK button to successfully complete the calibration. Now there are two ways to use SenoSoft in demo mode.

One way to use SenoSoft in demo mode is to **simulate measurements** freely without a device by selecting the tab **Measurements** in the upper area of the screen. To conduct measurements simply click the button **Measure**. To edit the name of the measurement select it with a click. To open the sample mask, click on the pen icon in the sample row. There are three options in the sample mask: creating, applying and clearing a sample. There is also the option to filter by name. Export the spectra by selecting the desired data from the measurements list and clicking the export button or simply by using the right mouse click on the graph window to export the displayed spectra as either picture or ASCII data to clipboard.

The other way of using the demo mode can be accessed by clicking the tab **Applications** in the upper area of the screen. By pressing the **Demo-Textile application** button, the simulated application will be loaded, and measurements can be taken. Simply click on **Measure** to see how it works and the software will indicate you the measured material (wool, polyester, silk or wool). If you want to learn more about this process, see the section **Application Mode** within the user guide.

## MODE MEASUREMENTS

In this mode you can record spectra (intensity vs. wavelength) of arbitrary objects of your choice. Remove the SenoCorder cover lid and simply bring the object in contact with the SenoCorder Solid measurement window (see **Hardware Setup**). You can do this by putting the object onto the window or by placing the SenoCorder Solid on the object with the measurement window face down.

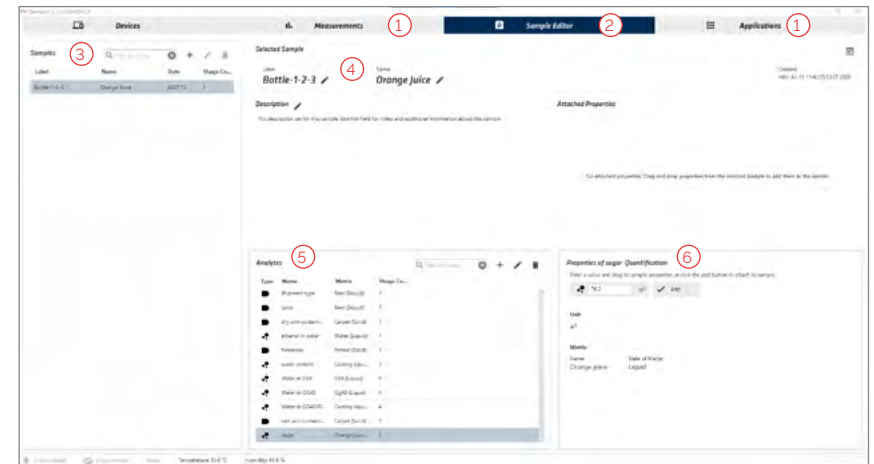
After placing it correctly, press the **Measure** button to record the spectrum. The measurement only takes a few seconds, please follow the progress bar in the lower right of the GUI. Each measurement will be automatically saved into a local database and displayed in the graphs and in the **Measurements** list on the left side of the screen. Export the spectra by selecting the desired data from the **Measurements** list and clicking the **export button**, or simply by using the right mouse click on the graph window to export the displayed spectra as either picture or ASCII data to the clipboard.



- ① Measurement selection mode
- ② Sample Editor
- ③ Start a measurement
- ④ Re-Calibrate the SenoCorder Solid in case of suspicious readings
- ⑤ List of measurements
- ⑥ Click for numerical representation of measurement data, right mouse click to copy to clipboard
- ⑦ Graphical representation of measurement data, right mouse click to copy picture
- ⑧ SenoCorder Solid connection & measurement status

## SAMPLE EDITOR

This tab provides the feature to create and maintain samples and connect properties to them. To achieve a connection between a measurement and a sample, you need to click on the **sample column** in the row of the measurement you want to link a sample to. A list of all existing samples will appear, and you can choose the right one.

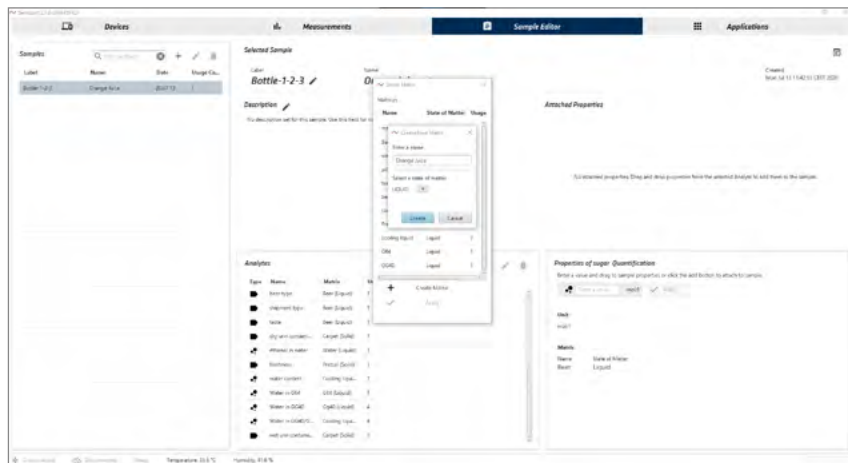
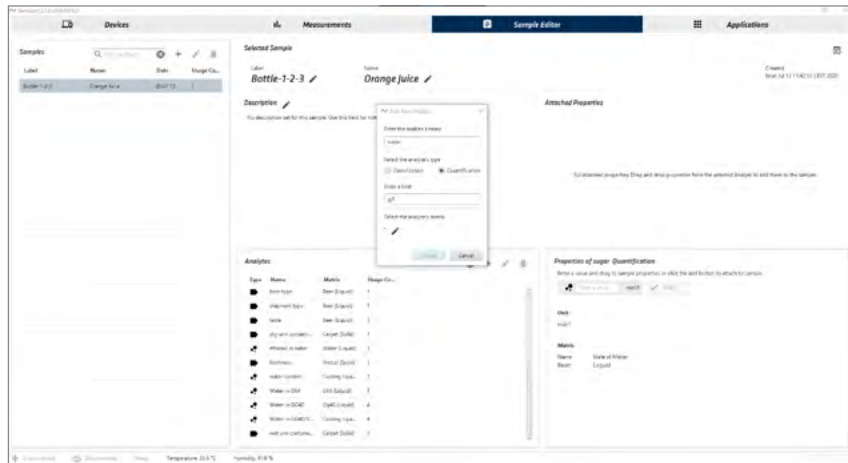


- ① Measurement selection mode
- ② Sample Editor
- ③ List of samples
- ④ Provide label, name and description for the sample
- ⑤ List of analytes' types, names and matrix
- ⑥ Properties of the selected analyte

For the creation of new samples, you can either click the **add button** in the sample table or use the dialog on the **Measurements** tab.

A sample consists of a mandatory unique label and an optional name. After creating the sample, you can select and specify it in detail. To attach a property to a sample you will need to select an analyte and add either one of its categories (classification) by drag and drop or enter the value of the analyte (quantification) and confirm by hitting the **add button**. Once you have used Senorics Applications with SenoSoft, there will be some entries in the analyte table already.

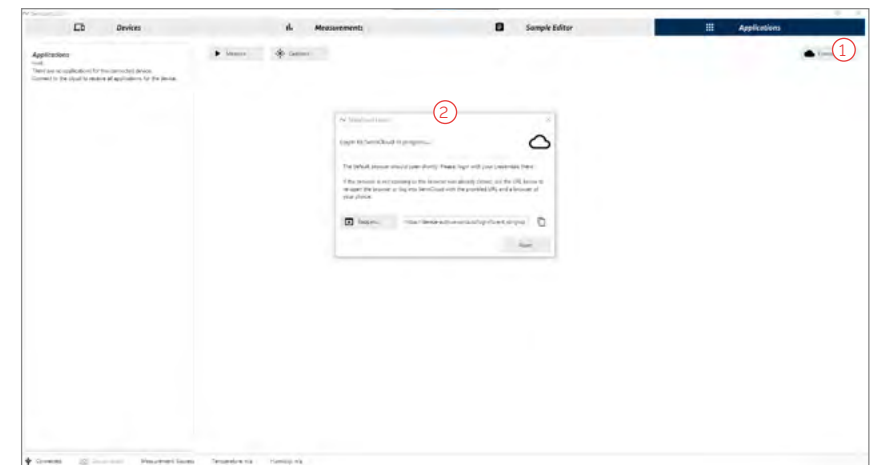
## SAMPLE EDITOR



In order to create custom analytes, you have to click the **Add icon** and specify your analyte. For every analyte there must be an associated matrix, which can also be created by you. For analytes of the type classification you can also create categories in the properties area.

## MODE APPLICATIONS

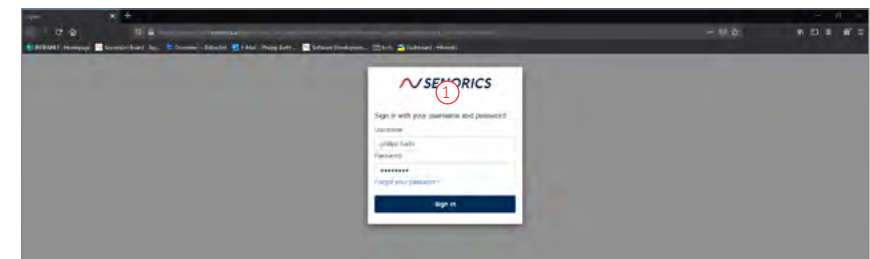
Click on the **Applications** tab to enter this mode. In order to receive the applications that are suitable for your device, hit the **connect** button in the upper right corner. Afterwards an information dialog will pop up and your default browser will open a **login page**. Here you must log in with your provided credentials. If the login succeeded, SenoSoft will pop up again and initiate the download of the applications. You will see a list of applications after a short period of time. If you have successfully logged in but still do not see a list of applications, you may have a server / proxy configuration problem. Please refer to our **FAQ section** how to solve this issue.



1 Click to login to SenoSoft

2 The pop-up appears and your standard browser applications is opened

### The login page



1 Provide your login credentials and click on Sign in

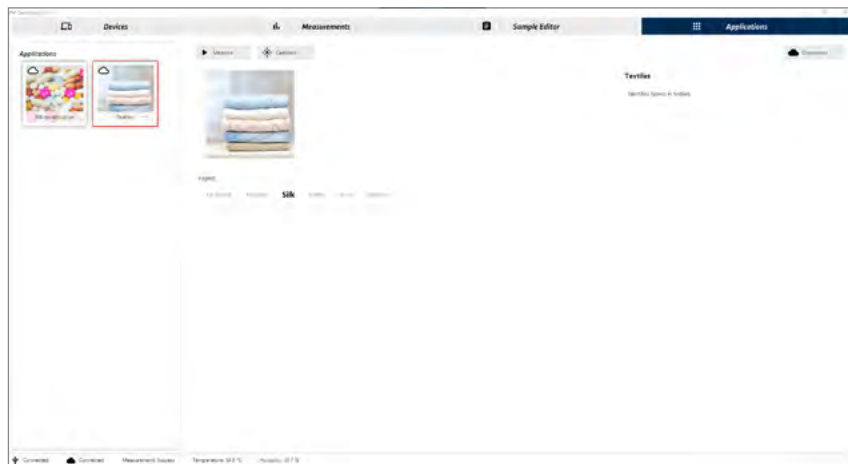
## MODE APPLICATIONS

An application is a specific use case for the SenoCorder Solid to detect a certain material class or material composition. It records a spectrum and applies a software model to predict the material class/composition based on physical information contained in the spectrum.

For the SenoCorder Solid, one entry is already implemented per default, it is called **Textiles**. Place the SenoCorder Solid on one of the textiles included in the shipped **textile sample card** (measurement window facing down) and press **Measure**.

Instead of showing the recorded spectrum you will get a prediction of the measured textile type. This is done by computing the prediction from the measured spectrum, using the textile software model developed by Senorics and implemented in the SenoCorder Solid.

More models can be developed and added by Senorics, please use the **contact details** in section **First Start** if you have a question concerning the models.



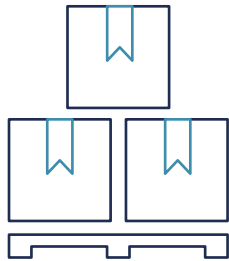
## MAINTENANCE

The device should be kept in a dry environment. Make sure that the measurement window is free of dust and other contaminations. To clean it use a dampish soft cloth. Do not apply any force to the window or use sharp tools as it could scratch and destroy it.

## TECHNICAL DATA

Wavelength Range	1200-1700 nm
Wavelength Points	16
Wavelength Spacing	Equidistant within range
Wavelength FWHM	25 nm
Detector Type	Organic Photodiodes
Communication Interface	Bluetooth
Operating Temperature	0-35°C (non-condensing)
Size	110 x 60 x 50 mm
Weight	140 g
Power	DC 5 V/2 A





## STORAGE

The storage place should be clean, cool, dry, ventilated, weatherproof and protected from direct sunlight. For storage, the temperature should be between +10° C and +25° C and must not exceed +30° C. Relative humidity values above 95 percent and below 40 percent over a long period of time, as well as condensation, should be avoided.

Keep electronic equipment away from harmful atmosphere for example chlorine gas (Cl<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and sulfur compounds such as sulfur dioxide (SO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S).

Dropping the device and any other hard impact from the outside must be avoided at all time.

### Storage Boxes

Before putting the device into a storage box, wrap it in a cotton cloth and make sure the box is clean. This will help absorb moisture, keeping your electronic equipment dry even if the atmosphere is a little humid. Do not use plastic wraps as they hamper air circulation, trapping moisture in the storage box.

### Remove all dust

Clean your equipment properly so that there is no dust remaining. Dust and grime clog your air vents, creating heat and humidity, which can damage your electronic equipment.

Disconnect wires and battery: Remove all wires from your electronic equipment and store all of them separately in the box. Wrap wires into circular coils and label each one of them for your later convenience. Remove the battery to prevent leakage of battery acid, spoiling your electronic equipment. This will ensure that your electronic equipment does not get damaged.



## DISPOSAL

We are legally obliged to give you the following information regarding the correct disposal of the packaging, the battery packs and other electrical equipment included in the package.

- The sign of the crossed-out bin serves as a symbol that disposal with residual waste is forbidden.
- The buyer is liable for the correct and lawful disposal of the supplied battery packs.
- The battery packs can be brought to an urban recycling center or handed back to Senorics free of charge for disposal (WEEE Registration number DE74523638).
- Do not dispose of the electrical equipment with residual waste.

Please dispose of the packaging such as plastic, paper and cardboard considering the conventional recycling process (Grüner Punkt), do not dump them with residual waste either.

By following these guidelines, you are complying with the legal obligations and are contributing to the protection of our environment. Please make sure to consider these instructions whenever you are disposing of any parts included in the supplied package.



## FAQ

**Q:** The application **Textiles** does not give the right prediction.

**A:** Recalibrate the SenoCorder Solid by using the **Calibrate** button and follow the shown instructions.

**Q:** How and when to charge the battery pack?

**A:** Use a standard micro USB charging cable and charger (as typically used for your mobile phone). The battery pack needs a full recharge when only one indicator light remains lit on.

**Q:** SenoSoft gets stuck during calibration or measurement procedure.

**A:** Make sure that the battery pack is (i) connected to the SenoCorder device, (ii) is turned on and (iii) is not connected to a USB port for charging at the same time when operating the device.

**Q:** SenoSoft does not start or gets stuck during startup sequence.

**A:** Make sure that SenoSoft is either installed in a local folder with full access rights or that you have admin rights and started SenoSoft with **Run as administrator**.

**Q:** SenoSoft closes unexpectedly during the startup or operation.

**A:** Make sure you use a Windows 10 system with the minimum requirements (see **software setup**) and your installation path does not contain any special or local language characters. Only standard ASCII characters are allowed.

In case of any other problems or questions, please contact us at [support@senorics.com](mailto:support@senorics.com) with a short description or classification of your problem.

**Q:** After successful cloud login in **Applications** tab, there is no list of applications and the **Connect** button is still at stage **Connect** (should be **Disconnect**).

**A:** You may need to change the proxy configuration of SenoSoft. If you need a proxy, open file **proxy.properties** at SenoSoft installation directory **/conf** and change the settings according to the comments in this file. Save the file and restart SenoSoft after you have completed the changes.

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## GET IN TOUCH

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