Sensegood Spectrophotometer

Troubleshooting Guide

Version 1.0

SENSEGOOD
INSTRUMENTS PVT LTD

www.sensegoodinstruments.com

Revision History

The following table shows the revision history for this document.

Date	Version	Revision
31/10/2019	1.0	Initial release.

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Caution: If the equipment is used in a manner not specified by the Sensegood, the overall safety may be impaired. The instrument is for indoor use only and not suitable for a wet location.

When reading a sample, the illumination flashes. Please avoid looking directly at the light. User's discretion is advised.

Safety Notes

For your safety when using the Sensegood spectrophotometer, you should pay attention to the following:

- General safety instruction that should be observed at all times while operating the instrument.
- Use of this equipment in a manner not specified by the manufacturer may impair the protection afforded by the equipment.
- Danger of electric shock if liquids are spilled and fire if volatile or flammable liquids are spilled. Use care when measuring liquid samples**.**
- Please take care to remove fingers, jewelry and clothing to prevent damage when sample platform is rotating.
- Sensegood spectrophotometer is for indoor use only at an altitude of up to 2000m and pollution degree 2.

Sensegood spectrophotometer troubleshooting guide

This document briefly covers the frequent user concerns related to Sensegood spectrophotometer.

To assemble the instrument, please refer to: Assembly and Quick start guide
For instrument's operating, please refer to: User's manual
For SensegoodSmart utility, please refer to utility user's manual.

Document repository: https://sensegoodinstruments.com/support.php

Why screen displays "Restart Required"?

If you have completed any critical procedure like "FACTORY RESET", Hardware Reset, or "SELF TEST", or else if you have entered in user restricted section which may compromise instrument's factory calibration, instrument will prompt for restart by displaying a message: "Restart Required!". Without pressing anywhere on the display, just power off the instrument and then power it on.

Doubts related to touch display?

- The display has resistive touch technology which works with gentle pressure at specific location.
- For smooth functioning of the LCD, user must use provided stylus.
- For touch robustness, icons are configured to work with press and hold.
- Press and hold till you hear a beep or the desired screen shows up. However you won't hear touch sounds if buzzer is muted.

What is the LCD viewing angle?

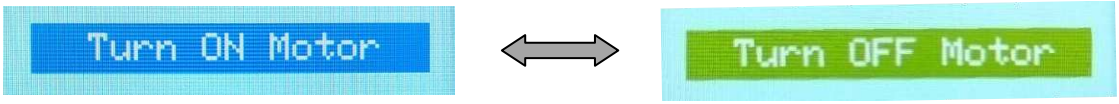
Used TFT has 6 o'clock viewing angle hence colors in spectral graph are more differentiable when viewing from 6 o'clock angle.

I do not want to use motor, what should I do?

Turn off the motor in instrument's settings screen. Now power off the instrument and remove Motor wire jack from socket to electrically disconnect the motor from sensor head.

Turn ON Motor: Currently motor is disabled, press to enable

Turn OFF Motor: Currently motor is enabled, press to disable



Motor is not rotating, what should I do?

Consider implementing following steps:

a. Turn on the motor in instrument's settings if it is off.
b. Check if any physical object is restricting the motor movement.
c. Measure when no sample / no load kept on the rotating platform. If motor is rotating without sample, ensure that the total load is <1kg for motor to rotate with sample.
d. Check if the motor jack is properly inserted to the socket. Power off the instrument, try removing and reinserting the motor jack. Check after powering it on.
e. Open rotating table / motor enclosure and check wire solder joints with motor terminals, if broken, needs to be soldered by professional.
f. Open four bottom screws of sensor head. Check wire solder joints with motor socket connector, if required, do solder rework without taking out the pcb.

g. If still motor is not rotating then check motor terminals on main PCB itself. If required, do solder rework with the help of professional.

   For professional: You should get +5V across motor terminals and across motor socket when a measurement is being taken. You can put instrument into averaging mode with AVG on, or use “SELF TEST” in Settings->Help to continuously rotate the motor. If required, flange coupler can be simply pulled out.

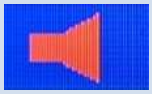
   Contact us if the problem is not resolved.

LEDs stopped blinking, what should I do?

Power off the instrument, unscrew sensor head bottom. Check CON-7 on LED PCB and CON-2 on main PCB. Open connector locks and pull out the cable. Reinsert the cable with proper alignment and then lock the connectors. Power on the instrument and check. Contact us if the problem is not resolved.

Why buzzer icon blinks red when pressed?

This means buzzer is turned off internally. Go to instrument settings and turn on the buzzer.

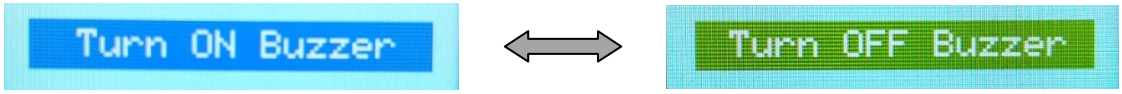


How to permanently turn off the buzzer?

Go to instrument’s settings screen and turn off the buzzer. This will also stop icon touch sounds.

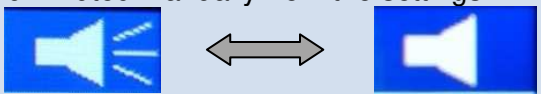
Turn ON Buzzer: Currently buzzer is disabled, press to enable

Turn OFF Buzzer: Currently buzzer is enabled, press to disable



Why even if the buzzer is muted, on next restart it becomes un-muted?

Pressing on buzzer icon it mutes or un-mutes the buzzer. This setting is saved in instrument’s RAM only and it will be un-muted upon next power on by default. If you want to make it permanently off, turn off the buzzer from instrument’s setting. Now it will stay muted even after restart, till it is un-muted manually from the settings.



Selected illuminant- observer changes to something else when index is selected

- The instrument automatically selects the illuminant and observer based on which the index algorithm is defined. For example, for citrus color index, illuminant-observer

combination is C/2^0. This modified setting is temporary and it remains in RAM only. Once the instrument is restarted with default screen any other than index screen, it restores the original illuminant-observer pair setting.

What if the data value is observed out of limit?

If you think that the color data value is out of the desired limit, try different physical target distance positioning. Increase or decrease the physical target distance in steps of 0.5cm while keeping the same target distance in settings, till you get a desired response. Once properly positioned, you should use the same target distance for all your measurements specific to that sample.

What is the warning message? Why is it appearing?

In case if you see a message: "INVALID! Move sensor head upwards" when "GO" is pressed, do following:

1.Verify if the target distance set in settings is the same as the physical target distance.
2.If above point is verified then move sensor head upwards (increase target distance) physically in 0.5 cm steps till the message stops coming after pressing "GO". In this procedure, don't change the target distance in settings, just increase the physical sample-to-sensor distance.

How to prepare a sample? What are the allowed sample holders?

- Sensegood spectrophotometer empowers your ergonomics to use any sample holder of your choice such as; tray, bowl or jar depending on the type of your sample and application.
- You can put any solid, liquid, powder or paste in the sample holder and do the analysis.
- Color of the sample holder should be white, black or transparent.
- Sample holder in neutral white color is the most recommended, as it can give comparatively good response even for semi-transparent liquid and paste samples.
- Holder/tray size should be enough to provide the adequate area to the sample to satisfy field-of-view criteria. So that the sensor's light does not fall outside.
- Sample placed in the tray/holder should be uniform in height. Just make a quick level using your hand and you are ready to measure. You can consider giving a quick compress to the powdery samples to maintain the consistency of measurement process.
- Samples that aren't opaque need to be folded, wound, or stacked – depending upon the material – so measurements aren't affected by background colors showing through.
- Samples with directional orientations such as textile samples; must be carefully measured to avoid errors. Consider situating the samples in the same orientation and take measurements. Even taking multiple measurements in averaging mode should be considered.
- Samples with irregular colors need to be measured multiple times. Move and mix the sample between each measurement and average the data.
- For accuracy, maintain the consistency of the sample being filled in the tray. i.e., amount of sample (certain amount will achieve specific height in the tray which will affect the target distance) and arrangement/placement of sample (e.g., cookies).
- For online/in-process measurements, consider installing the sensor where the sample flows more uniformly i.e. sample height roughly remains the same.

Why the object color that I see is different than the one that is measured?

In the process of visual color match; there are factors like eye fatigue, aging of the eye, stress, individual's different expressive perception toward color, and light source that affect the color match decision. Hence, it becomes difficult to make decision of accepting, reprocessing or rejecting the sample based on visual match. And this directly hampers the quality of the final product. While on other hand there are advantages of instrumental color quality control as it provides results with same accuracy, consistency and reliability. It eliminates subjectivity in color assessments, eliminates the variability among different analysts and maximizes precision.

Measurement errors?

In certain months of the year when the temperature and humidity are high, it is possible that the temperature and humidity levels of the unit can be exceeded, especially in a manufacturing environment. Move the unit to cooler and dryer location; let it settle for some time and retest.

Apart from these, there are factors that affect the instrumental color measurement are: improper sample preparation, external light conditions, sensor maintenance and cleaning, target distance, and sample's gloss. If set target distance is such that the field of view (FOV) of sensor is larger than the sample surface (light is falling outside of sample surface), the instrument will pick up the unwanted color outside of sample surface.

Glossy surfaces?

Extremely glossy surfaces, mirror like finishes and metallic paints (silver, gold) cannot be truly measured due to shiny reflection which leads to dull measured colors. However instrument can truly measure not so glossy surfaces like shiny plastics and automobile colors.

Measuring black?

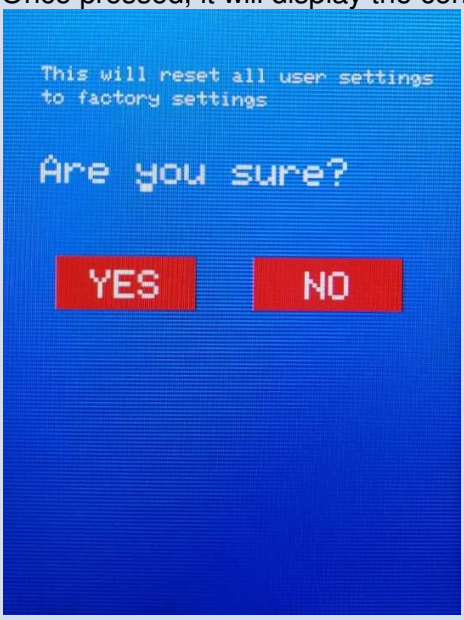
Ideal black is what that does not allow any color to reflect as it absorbs all the colors, something like black hole. If we can 'see' a thing in black it certainly means that it is reflecting certain color components. However black has tendency to absorb most of what it gets, the reflected power of color components is typically small. More ever there are shades of black as well. When black is measured using Sensegood spectrophotometer, it represents normalized spectral density for visible wavelengths and hence you may see a peak at certain wavelength where the reflected power is maximum.

Measuring white?

Perfect white reflects all the color components in equal proportion. However typical white is not perfect and it has some amount of access chroma, it can be very little yellowish, bluish, pinkish, greenish or in combination. The reflected power of all color components from white is typically high. When measured with Sensegood spectrophotometer, it shows peak at a wavelength where the maximum color power is measured.

How to perform software factory reset?

- In Settings -> Help, Pressing "FACTORY RESET" initiates software factory reset.
- Once pressed, it will display the confirmation screen. Press "YES" to reset.



- Upon successful reset, you will see a message being displayed prompting restart. Now you will require restarting the instrument.
- This will erase all user settings and reset the instrument to the factory settings. However, this will not affect the instrument's factory calibration; it will still remain even after reset.

- *We highly recommend not applying any reset until you really need to do so.*

How to perform hardware factory reset?

- Along with the software factory reset, instrument also supports hardware reset for extreme cases.
- Apply hardware reset only if the problem is not resolved even after applying the software reset.
- Applying hardware reset, instrument implements high priority algorithm internally. Instrument accesses the protected original factory setting copies in its memory and creates new set for routine operations.
- This will erase all user settings and reset the instrument to the factory settings. However, this will not affect the instrument's factory calibration; it will still remain even after reset.
- Open sensor head by unscrewing its bottom. On main PCB, search for "RESET" connector with two berg-sticks, as shown in figure below.

- To apply reset these two berg-sticks are required to be shorted for a moment. You can take any metallic part to apply momentarily short circuit to this connector. For instance use the screw driver, touch both the berg-sticks simultaneously with the bare metallic tip of screw driver, while the instrument is on.
- The instrument will immediately sense the applied hardware reset and it will perform the same internally.
- Upon successful reset, you will see a message being displayed prompting restart. Now you will require restarting the instrument.

- *Hardware reset in the instrument is robust and properly designed and it does the job if performed correctly. However hardware reset is more critical. You need to take utmost care.*
- *As hardware reset is performed while the instrument is powered on, care must be taken that the short circuit is not being applied to anywhere else other than the "RESET" connector. If metallic part touches to any other part of live circuit, there are chances of permanent damage.*
- *To avoid risk, it should be considered that instead of powering the instrument by mains supply or computer, it should be powered by charged power bank.*
- *We highly recommend not applying any reset until you really need to do so.*

What to do if the data is not reflecting to SensegoodSmart utility?

- Correct procedure is to first connect the instrument to computer USB port, turn it on, and then open the utility.
- Try re-connecting USB cable properly both instrument side as well as computer side.
- Check whether you see a COM port in the utility. Open the COM port and then take the measurement.
- If you are facing this issue for the first time installation, make sure that the VCP driver and utility are installed correctly. Refer to the installation guides.
- Check whether you see a COM port in device manger. Refer to installation guides to understand the same. If not,
- Consider uninstalling and removing all related files from the installation folder. Install VCP driver, and then install the utility. Make sure that you restart the computer after every install/ uninstall procedure to reflect the changes for proper functioning.

What are the ways to power up the instrument?

- Instrument can be operated using +5V adapter or power bank or computer USB port.
- Use the provided adapter or any good quality +5V 1–2Amp adapter only.
- Power bank can be used to supply +5V directly without the need of adapter.
- Instrument can be supplied by computer USB port without the need of additional power supply. The same port also works as data communication port. In the instrument, this is enabled by its low average power consumption. It collects and stores energy when illumination and motor is off and releases the stored energy whenever required, avoiding peak supply burden. Algorithm is even optimized using task and schedulers and it is powered by niche electronics.

Sending instrument for service?

- First take confirmation from Sensegood about your concerns before you ship your instrument for repair, service or calibration, as many times, on-the-phone diagnosis is all that is required.
- Use the original packaging if possible. Else cover the display and measurement area with density foam. Do not use the duct tape. Painter's tape is preferred if required, as it will not leave residue on the instrument.
- Enclose a photocopy of the invoice.
- Provide an itemized packing list of all contents of the shipment.
- Insure the shipment.

Need assistance?

- When you have a problem with an instrument or software, or need technical advice concerning a specific application, contact Sensegood for assistance. Please provide us following information. Many times, on-the-phone diagnosis is all that is required.
- The instrument for which you need assistance (Spectrophotometer)
- The serial number of the instrument (mentioned at the instrument's boot screen)
- If software related query then: computer configuration - the type of processor, operating system and version that you are using, and the brand, if applicable.
- The specific nature of the problem, including the precise description.
- The steps performed prior to the start of the problem.
- Steps already performed to reconcile the problem and/or results of any diagnostic tests.
- The type of product being measured.
- Environmental conditions under which the instrument is normally used (temperature, humidity, dust, fumes, etc.)

www.sensegoodinstruments.com
Phone, WhatsApp, Signal, Telegram: +91 79 8484 8002
info@sensegoodinstruments.com
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