

Sparklike®

GASGLASS LASER INSTRUCTION MANUAL

PAGE

- 2 Connections**
- 2 Setting up the Gasglass Laser**
- 4 Starting to use the equipment**
- 6 Taking a measurement**
- 8 Troubleshooting**
- 12 Service & maintenance**



NOTIFICATIONS:

- Do not position the equipment in a way that it would be difficult to reach and operate the power cable.
- If the equipment is used in a manner not specified by the manufacturer, the safety protection of the equipment may be compromised.
- Do not replace detachable mains supply cords by inadequately rated cords.
- **Always make sure that you are using a safety grounded socket with safety grounded mains supply cord to connect the mains supply.**
- Main fuse is located inside the power connector
Europe: 250 V, T, 1,25 A, **USA** and **Asia:** 250 V, T, 2,5 A

SPARKLIKE GASGLASS LASER SPECIFICATIONS

Laser Classification



The Sparklike GasGlass Laser device uses a Vertical-Cavity-Surface-Emitting-Laser (VCSEL) as a light source. According to the regulations, the VCSEL is tested by a third party as class 1 laser product (SGS-CSTC Standards Technical Services Co. Ltd., test report GZES150500576331)

Laser Specifications

Wavelength:	760 nm
Maximum optical output power:	3 mW
Maximum single mode output power:	0,6 mW
Classification:	Class 1
Visibility:	NIR (Near Infrared)

Class 1 Laser product

Cannot emit laser radiation at known hazard levels. Users of Class 1 laser products are generally exempt from radiation hazard controls during operations and maintenance. **Class 1 laser is eye-safe under normal operating conditions.**

Standards and Regulations

IEC 60825-1: 2014 (Third edition)

SPARKLIKE GASGLASS LASER

Thank you for choosing Gasglass Laser to measure the gas concentrations on your insulating glass products. Gasglass Laser is a unique product for non-invasive analysis, that measures even through coatings. Gasglass Laser measures oxygen, and therefore the results can be converted to argon and krypton, just as well as xenon.

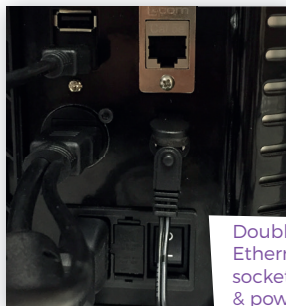
The equipment consists of 3 parts : Main unit: 500 x 350 x 132 (L x W x H, in mm), measuring head: 350 x 150 x 350 (L x W x H, in mm) Display: 10.1" Touch Screen with pen.

Before operating the equipment - connect the three parts with provided cables. Follow the instructions carefully before starting the device. We recommend also to register your device at our website for more straightforward service to your device.

www.sparklike.com/register-your-device



Signal cables, 4 pcs



Double USB, Ethernet, HDMI, 12V socket, power switch & power cord

1 CONNECTIONS

Connect all 3 (4 on manual devices) signal cable plugs from measuring head to the matching sockets on the main unit.

Connect the HDMI to HDMI+USB cable and the power cable to the display and to the main unit. (In older models the display is connected only with dual USB cable.)

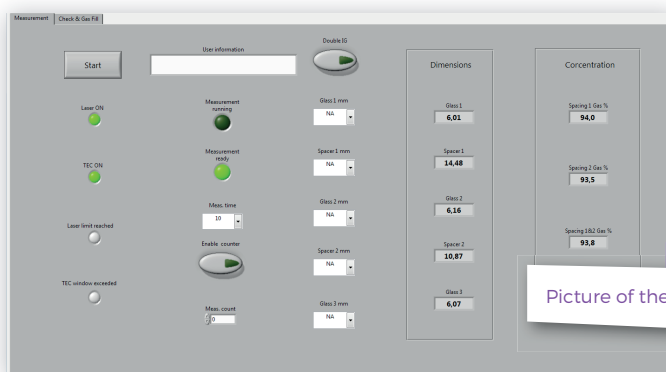
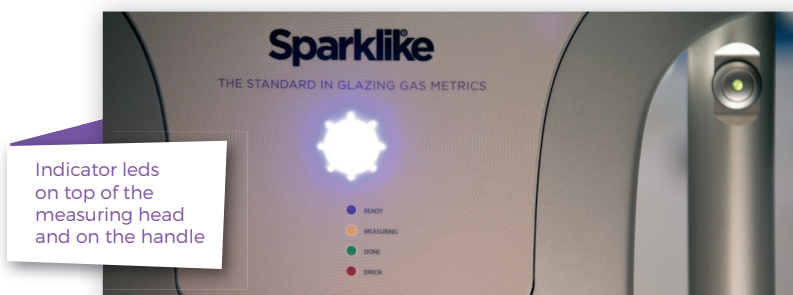
Connect the provided power cord to the main unit and the other end to the mains power outlet.

Ethernet connection is for online use only, and left disconnected in normal use.

ATTENTION: Please note that one of the signal plugs may have an extra socket attached to the cable. If there is one, it needs to be connected to the ODU 10-pin at all times, when the plug is not connected to the main unit socket. This is a safety feature for the laser against ESD (electro-static-discharge).

2 STARTING UP THE GASGLASS LASER

After connecting all the cables, turn on the device from the power switch on the main unit. Windows will start and "Start" button's led on the measuring device's handle will light up. After Windows has started, start GGLaser software. Sparklike logo shaped indicator light on the measuring device should light up.



If either of the leds do not turn on, please restart the software from the screen (see troubleshooting section in Chapter 5)

3 STARTING TO USE THE EQUIPMENT

3.1 Software functionality and options for measurement

STARTING UP THE DEVICE

"Measure" button will start the measurement. It is also possible to start the measurement directly from the measuring head handle. For more information on taking the measurement, read Chapter 4.

After the first start, on left hand side of the window, you will see "Laser ON" and "TEC ON" lights green. Below these, the "Laser limit reached" and "TEC window exceeded" should be off.

"Measurement time" drop down box indicates the time to collect data from one cavity. This can be adjusted between 1-10 seconds. Longer measurement time is advised for greater accuracy.

If you activate "Enable counter" button, it is possible to make multiple measurements in a row. You can do this by pressing the button. A green light is switched on.

If you have enabled counter, signal how many measurements you would like to take in a row. Select a number for "Meas. count"

MEASUREMENT RESULTS

Once using the analyzer, you will see your measurement results on the right hand side of the screen. The dimension's column will give you a result on the thickness of the glass and the space between the glasses. You will get this reading whilst your gas concentration measurement is being calculated.

The concentration column gives you the results of the gas fill in each cavity once the measurement is finished.

SETTINGS

You can write text to be added with your measurement result using the on-screen keyboard found in the Windows Task bar. This information is saved to the file together with your results. Use the text box labelled "User information".



box by clicking up or down, or by typing a value with the on-screen keyboard.

Triple glass measurement is set as a default for Gasglass Laser analyzer. It is possible to measure also double glass products. Do this by enabling double glass measurement by pressing down "Double IG" button. This is not necessary, but it will make the measurement time quicker, and helps the operator to interpret the results correctly.

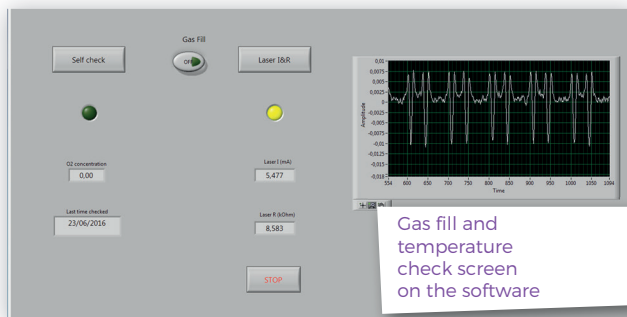
"Glass" and "Spacer" drop down boxes can be used to assist the software on intended thickness measures.

Note: Measurement results are shown on the screen, but are simultaneously saved on your device, and can be accessed at Windows Explorer: Computer\Local Disc(C:)\Temp\Results

3.2 Daily operations for temperature check and gas fill

AT EVERY START UP: The operator should check for temperature and oxygen concentration. This ensures the correct operation of Gasglass Laser.

Temperature check



Laser component needs to be operated in correct temperature in order to yield highly accurate measurement results. Incorrect temperature adjustment might result in incorrect measurement results or unexpected functions. Take the following actions to test the temperature adjustment every time when starting up the device.

Choose the "Check and Gas fill" page from the upper left corner on the software. Press "Laser Test" button and see the following:

- Laser I should be 5.3 – 5.7mA and Laser R 3 – 16 kΩ. Value is specific for each device.
- Graph should be adjusted so that X axis is approximately 500 points wide and Y axis according to the height of the spikes. This can be done from the bottom left of the graph.
- Figures on the graph should be equally spaced and with approximately 50 (in older devices 100) points spacing.

If these are correct, press stop.

If these don't apply, see troubleshooting section in Chapter 5.

Oxygen concentration check

Gasglass Laser is a gas fill analyzer, however it measures the oxygen absorption from the insulating glass unit. For correct readings, oxygen inside the measuring head needs to be removed as well as possible. This is done by flushing the measuring head with argon/xenon/nitrogen to replace the oxygen.

On "Check and Gas Fill" page, press "Self Check" button. This will measure the oxygen concentration inside the measuring head, and show the result on the box below the button. The operator can begin to use the device if the result is below 0,15%.

If the result is over 0,15%, there's too much oxygen inside the measuring head and the following actions should be taken:

- Place the measuring head facing (glass window) down on unscratching surface.
- Open the end cap from the left handle on the measuring head, and take out the two hoses.
- Apply dry and pure (>99,9 %) argon flow of 1 – 3l/min to the hose marked with "IN" label
- Press the "Gas fill" button on the software (light on the button will turn on). This will open the internal valves and guide the argon flow through the measuring head.

During the filling, press "Self Check" button to check the concentration. On each check, you should see the concentration to decrease. Continue filling as long as the concentration does not go any lower, and the self-check result is < 0,15%.

After you have successfully removed the oxygen from the measuring head by replacing it with argon, press the "Gas fill" button again to close the valves (light on the button will turn off), disconnect the gas flow and close the handle cap.

Note: Internal oxygen concentration can be tested anytime by choosing the "Check and Gas fill" page and pressing the "Self Check" button. It is recommended to do this check every 2 hours, or every time when suspecting incorrect readings.

For any problems, see the troubleshooting section in Chapter 5.

4 TAKING A MEASUREMENT

MEASUREMENT

Place the measuring head front cushion firmly against the window. It is possible to start the device in two alternative ways:

- Press the "Measure" button on the "Measurement" page of the software.
- Press the "Start" button directly on the right handle of the device.

Vacuum pump sucks the measuring head against the glass, the "Laser ON" and "TEC ON" lights stay green in the software and the "Measurement running" led starts to blink. Indicator led on the measuring head will turn yellow. Keep your hands on the handles!

Measurement takes about 11 – 30 seconds depending on the settings and the window to be measured. Once the measurement is ready, the vacuum pump stops and the measuring head is released from the glass. "Measurement ready" led turns green and the results are displayed in the "Dimensions" and "Concentration" boxes.

Concentration: this is the gas concentration measurement. See the argon, krypton or xenon concentration on the result boxes.

- For double glazed unit only "Spacing 1" result is shown.
- For triple glazed unit all three results are shown. "Spacing 1" and "Spacing 2" are results from first and second cavities. "Spacing 1 & 2" is the average gas fill of the whole insulating glass unit.

Dimension: this is the thickness measurement of the glass and spacer cavities.

Check that the dimensions are what they should be. If they are not, see troubleshooting section in Chapter 5.

Note: Measurement results are shown on the screen, but are simultaneously saved on your device, and can be accessed at Windows Explorer: Computer\Local Disc(C:)\Temp\Results

UNDERSTANDING YOUR RESULTS

Dimensions

Glass 1

3,83

Spacer 1

12,01

Glass 2

3,84

Spacer 2

12,4

Glass 3

3,94

Concentration

Spacing 1 Ar%

89,9

Spacing 2 Ar%

96,8

Spacing 1&2 Ar%

93,4

Sample results on software

5 TROUBLESHOOTING

5.1 Restarting the program

If the indicator LED on the measuring head does not light up when starting the system (Chapter 1.2), restart the program:

Press the "Stop Software" button and then "Start/run continuously" button from the upper left corner of the software screen.

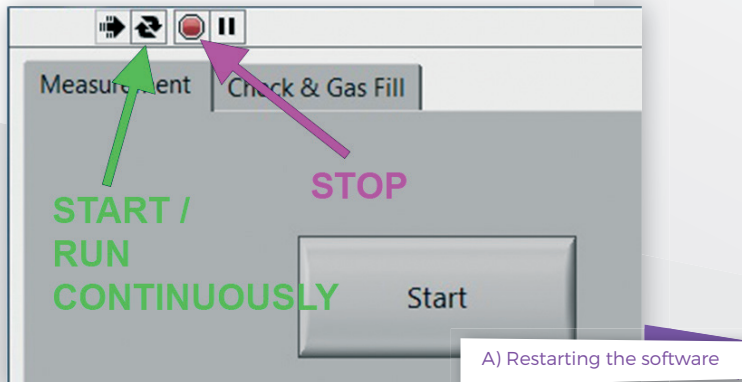
See picture A for reference.

5.2 DAQ identification error

Check that Windows has connection to the DAQ. From Windows Desktop press "Start" >> Control Panel >> Device Manager. There should be Data Acquisition Devices >> USB DAQ.

If the device is working properly, restart Windows. If the device is inactive, check the USB connection between the DAQ and PC, and check that there is a blue light on the DAQ USB port.

See picture B for reference.



5.3 Laser Temp or Current out of range

Check the 10-pin ODU is firmly connected to the connector panel. Open control box and check the two green leds are on when software is running. Restart Windows.

5.4 Drive error

Check ODU-connectors are firmly attached. Restart Windows.

5.5 Glass detection error

Pre-set glass and spacer values are wrong, device window needs to be cleared, device is not firmly against the glass or device is tilted. If not, restart Windows.

5.6 Adjusting the Laser temperature

If the parameters and the graph on the daily operations (Chapter 3.2) are incorrect, please try following:

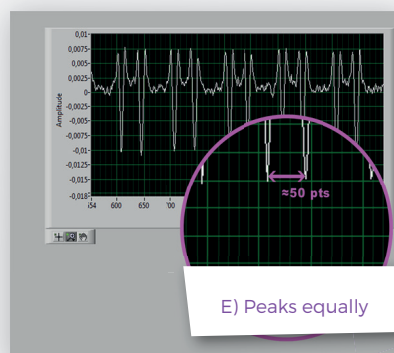
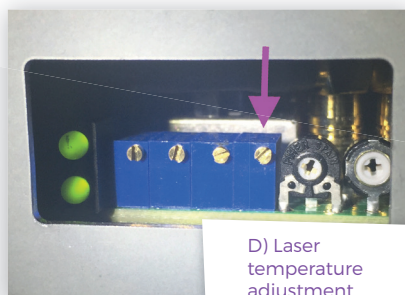
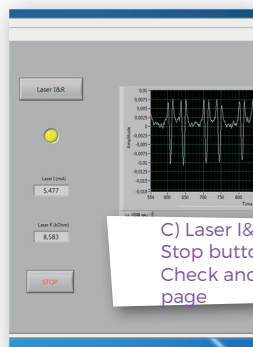
Press the "Stop" button and then "Laser I&R" button again to restart the test process (see picture B). If the readings or the graph are still incorrect, restart the program (see Chapter 5.1.1 Restarting the program) and press "Laser I&R" button again. See picture C for reference.

If this does not help, and the graph is still not correct (about 50 dots equal spacing), it means that the laser temperature is incorrect and needs to be adjusted:

1. Keep the device on, and open the main unit top cover (printed cover, 6 pcs of screws).
2. Locate the adjustment trimmer seen in picture D, once the cover is off. The correct trimmer is the rightmost of the blue trimmers.
3. Check from the software that the "Laser test" button is enabled so that the graph is printed, turn the trimmer about 1/16 of the full circle left or right to observe the graph behaviour on the screen. See picture E for reference.

4. Adjust the graph so that the negative peaks are equally spaced.

See picture E for reference.



5.7 Internal oxygen concentration problems

Gasglass Laser is a gas fill analyzer that works by measuring the oxygen inside the glazing unit. To ensure correct readings, oxygen needs to be removed from inside the measuring head by replacing it with argon.

Internal oxygen concentration is tested from the "Check and Gas fill" page on the software and pressing the "Self Check" button. When testing the internal oxygen level or making the argon fill, operator might run into following situations:

Internal oxygen concentration result does not go below 0,15%, as required. Normally the internal oxygen concentration level should drop below 0,15% within about 20 min of flushing time. If the oxygen level settles to a value over 0,15% and does not go any lower, please check that:

- the used argon is pure (>99,9% argon)
- There is pressure and flow rate is 1 – 3 l min
- Gas fill button is enabled on the software "Check and Gas fill" page
- The argon is flowing out from the hose marked "OUT"
- Place device vertically for few minutes while the gas flow is on

If all of these are OK, but the problem persists, please contact sparklike@sparklike.com for further assistance.

Internal oxygen concentration result drops below 0,15%, but there is considerable variation in "Self Check" results. Once the result is very low, around 0,01% – 0,05%, operator might see some variation in the "Self Check" readings so that some readings might be even > 0,15%. This is normal, as the concentration is so low, that sometimes the measurement noise can cause variation. Important thing is that most of the "Self Check" measurements are < 0,15%, as required.

5.8 Measurement problems

If unexpected inconsistent readings are received, please check the following things:

- Laser temperature
- Internal oxygen concentration
- Vacuum suction holds the measuring head tightly against the insulating glass to be measured
- Glass and spacer thicknesses are approximately according to the correct expected thicknesses
- Try to measure close to the spacer.

If the vacuum does not hold the measuring head tightly against the glass, make sure that the IG surface is not too bent to avoid proper contact. You can try to help the vacuum by pressing the measuring head against the glass firmly once you start the measurement.

If glass or spacer thicknesses are shown incorrectly, the measurement is taken from incorrect location and the results are not correct. Operator can try to help the analysis by providing the nominal thicknesses to the centre drop down menus at the centre of "Measurement" page on the software. When operator provides this information, the software can locate the correct measurement locations more easily.

If the problems persist, please contact sparklike@sparklike.com. Please, also prepare to have the IG structure information and coating characteristics available.

TECHNICAL SPECIFICATION

Overall Dimensions

Main unit	500 x 350 x 132 (L x W x H, in mm)
Measuring head	350 x 150 x 350 (L x W x H, in mm)

Supply voltage and frequency (refer to product label on mains connector)

USA	120 V / 60 Hz	± 10%
Europe	240 V / 50 Hz	± 10%
Asia	100 V 50/60 Hz	± 10%
Korea	220 V 50/60 Hz	± 10%

Power Consumption Max 250 W

Connecting cable ≈ 2 m

Weight

Main unit	16 kg
Measuring head	6 kg

Operating Conditions +5 – +40 °C, indoor use only

Humidity 20–80%

Altitude up to 2000 m

Measurement Accuracy ± 1,5% Std *

Thickness measurement acc. ± 50 µm

Measurement Time 11 – 30s (depends on the settings and IG structure)

Maximum IG thickness: 50 mm

Minimum panel thickness: 2 mm

Connectors 4x ODU multipin, RJ-45, 2x USB 2.0, VAC Power (C14)

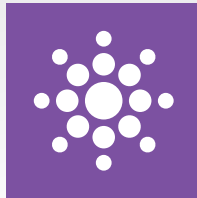
Display 10,1" Touch Screen with Pen

Software Windows 7 Embedded Standard, Custom GGLaser (all included)

Data Logging Capability SSD Storage (15 GB), USB/Network transfer

Pollution degree 2

* Average results on current tests. Might change on complex constructions



Sparklike

Like other valued equipment, Gasglass Laser requires maintenance to keep its accuracy and reliability at highest level. Sparklike recommends users to calibrate their product once a year.

Sign up for Service Solution and let Sparklike professionals take care of your calibration and maintenance needs. For more information:

sparklike.com/service-and-maintenance/service-solution

For customers without service agreement, contact your nearest calibration centre in Finland or in USA. For more information:

sparklike.com/service-and-maintenance/calibration

Sparklike Oy

Hermannin rantatie 12 A 21
00580 Helsinki
Finland

+358 10 387 7701

+358 10 387 7707

sparklike@sparklike.com

www.sparklike.com