

# Sparklike Laser Integrated<sup>™</sup>



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# 1. TECHNICAL SPECIFICATIONS

The equipment consists of set of components, movement system and software installed into a typical insulating glass production line. After gas press, the glass will stop to a pre-defined location and linear movement takes the measuring head to the preset height and the measurement takes place. After been measured, the glass can move further. The results are stored to a hard drive and can be transferred to an external system. The operation of the Sparklike Laser Integrated will be linked to the insulating glass line cycle and operation.

## Sparklike Laser Integrated 2000, 2600 or 3200

Sparklike Laser Integrated is a device to perform non-invasive gas measurements inside insulating glass units by means of a semi-conductor laser with 763nm wavelength (TDLAS technology). A laser beam is transmitted through the insulating glass unit and the reflection is measured and converted to the oxygen content. From oxygen content the integrated computer automatically calculates the insulating gas (argon, krypton, xenon, etc.) amount as a percentage. The measurement can be done through most coatings and laminated units. The nature of the measurement performed by the Sparklike device is optical, so any obstructions present on the measurement surface(s) will have an adverse effect on the result of the measurements performed. The system can measure double-glazed unit and triple-glazed units. The Sparklike Laser Integrated can also measure and report the glass and cavity thicknesses.

# 2. SPECIFICATIONS

<b>Approximate dimensions</b>	Size	700 x 1300 (Length x Depth mm) Standard heights: 2000, 2600, 3200 mm
	Weight	Approximately 350 kg
<b>Operating Conditions</b>	Temperature	5-40°C
	Humidity	20-80%
<b>Supplies</b>	Main Power Supply	220–240 VAC50/60 Hz, PE
	Connected Power	1000W
	Connectors	Ethernet, USB 2.0, VAC Power, Argon supply with 6 mm tube
	Software	Custom made Sparklike Laser Integrated SW running on Windows 10 LTSP platform
<b>Data Logging Capability</b>	SSD Storage (128 GB), USB/Network transfer	
<b>Measurement Specifications</b> IGU size information received from IG-line	Measurement Time	9s DGU / 16s TGU (minimum)
	Glass thickness range	2 - 23 mm
	Cavity range	6 - 40 mm
<b>Measurement Specifications</b> IGU size information measured by Sparklike Laser Integrated	Cycle Time	22s DGU / 30s TGU (*)
	Glass thickness range	2 - 13 (2 - 23**) mm
	Cavity range	6 - 24 (4 - 40**) mm
	IG-thickness	Max 51mm from surface 1 to 3 or 1 to 5

\* Z-movement and Y-movement are glass size dependent

\*\* With manual presets

Thickness measurement accuracy  $\pm 50 \mu\text{m}$  Repeatability of the gas measurements  $\pm 2\%$

With typical construction of the insulating glass unit.

At least 30 measurements are needed that 95 % confidence interval is valid. Calibration interval for the specified accuracy is max. 12 months.

## 3. SAFETY GUIDE

### General instructions of safety when operating and servicing the equipment

IMPORTANT! Safety is the single most important consideration in the operation of this equipment. The following instructions must always be followed. Failure to follow instructions listed below may result in electric shock, fire, and/or serious personal injury. There are certain applications for which this tool was designed. We strongly recommend that this equipment not be modified and/or used for any other application other than that for which it was designed. If you have any questions about its application, do not use the tool until you have contacted us, and we have advised you.

### General Safety

The equipment is equipped with protection covers protecting the user and inserting hands or any body parts inside the covers or between the equipment and IG-line may cause serious injury. Equipment is designed to be used with the protection covers and operating the equipment with the protection covers removed is strictly forbidden.

Do not open or remove any of the protective covers inside the electrical cabinet without consulting Sparklike service for instructions. Electrical couplings should not be modified without consulting the device supplier, modifying couplings in an incorrect manner might lead to device failure and imminent danger for the operator of the device.

#### Laser Classification

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

#### 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.**

#### Laser Specifications

Wavelength:	760 nm
Maximum optical output power:	3 mW
Maximum single mode output power:	0.6 mW
Classification:	Class 3B
Visibility:	NIR (Near Infrared)

#### Standards & Regulations

IEC 60825-1: 2014 (Third edition)

### Before using the equipment

ELECTRICAL SAFETY IMPROPER ELECTRICAL CONNECTION can result in risk of electric shock. CHECK with qualified electrician or service personnel if you do not completely understand electrical connections related, or if you are not sure the equipment is properly connected to the electrical system.

### Installation

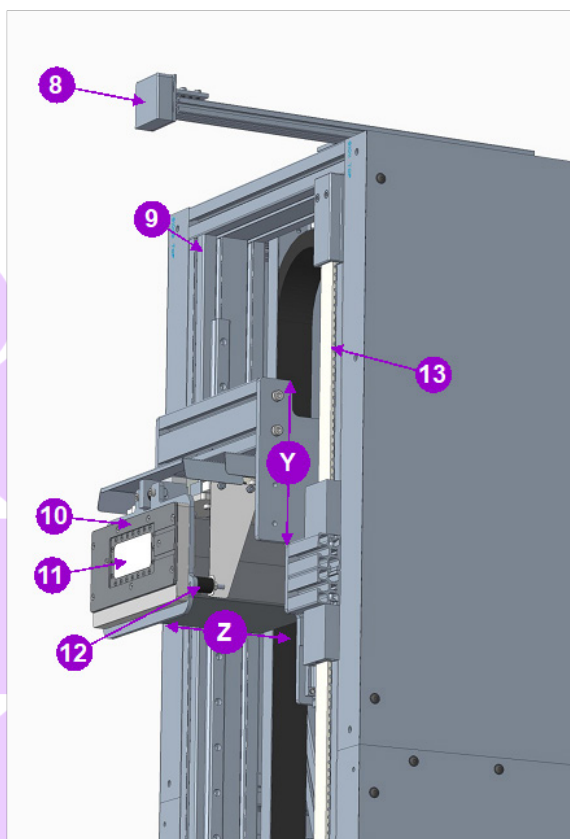
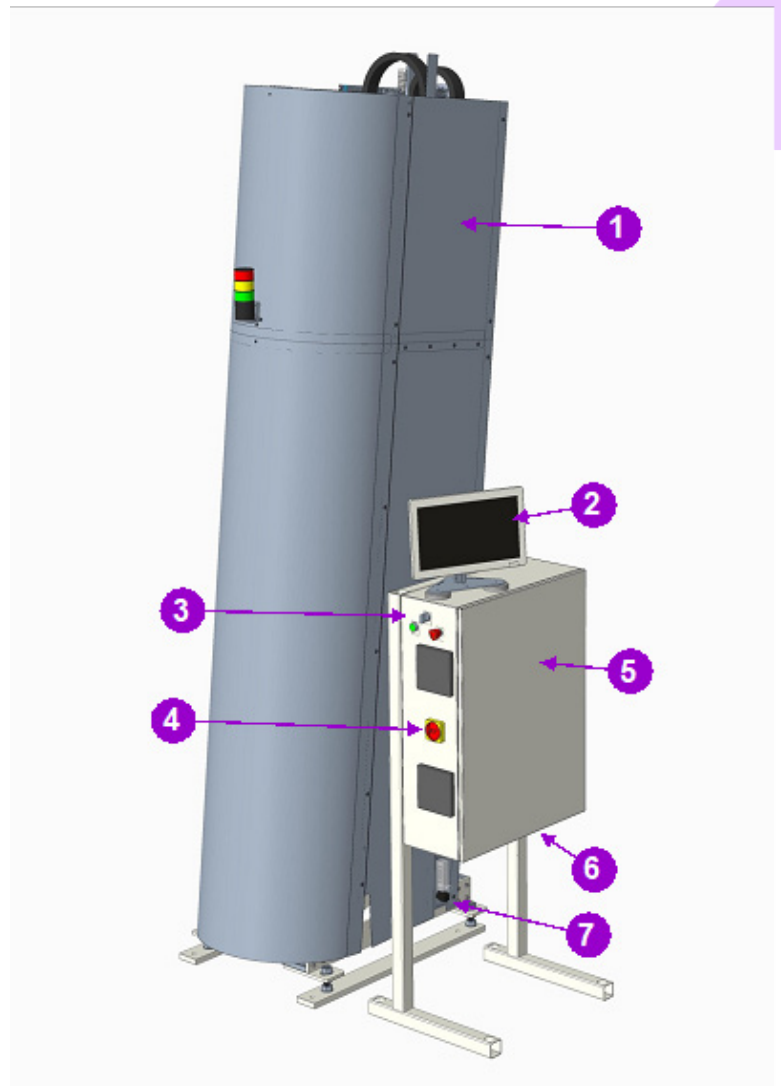
This equipment can be used only once properly installed by the Supplier's specialists or Supplier's authorized specialist.

## 4. GENERAL DESCRIPTION

General description, main parts  
General view (isometric general view)

Picture 1: Isometric front side view

1. Protective covers
2. User interface
3. Main switches
4. Safety mains switch
5. Electrical cabin
6. Electrical connection point
7. Flushing gas connection point



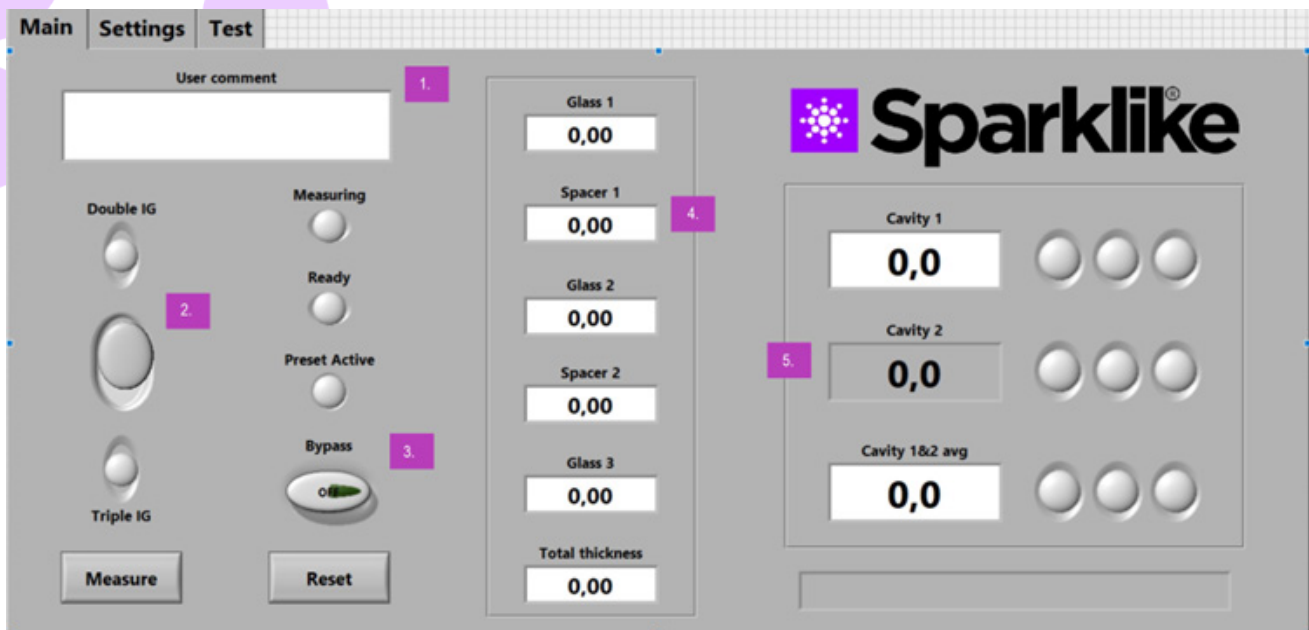
Picture 2: Isometric rear view:

8. Distance laser
9. Frame
10. Measuring head
11. Measuring window
12. Measuring head flexible rubber joints
13. Tooth belt

## 5. OPERATION INSTRUCTIONS

Turn on the device from the power switch on the main unit. After Windows has started, start Laser Software by double clicking the icon Labeled “Laser Integrated 1.0g”.

NOTE: When the device is turned on, start the software and let the device warm-up for 15-30 min.



1. User comment field
2. IGU type switch
3. Software Bypass switch
4. IGU dimension display
5. IGU gas content display

### 5.1 Software functionality and pages

The following chapters will discuss each page of the software – Main Page, Settings Page, and Test Page – and their functions. “Measure” button on the Main Page will start the manual measurement.

#### 5.1.1 Software – Main Page

The Main Page of the software entails the following functions: A place to add user comments, the choice between measuring double or triple glazed units and showing obtained results.

In the box labelled 1. “User Comment” you can write text to be added with your measurement result using the on-screen keyboard found in the Windows Taskbar. This information is saved to the file together with your results. Double glass measurement is set as a default for Sparklike Laser analyzer, this can be observed from the “Double IG” indicator being green. It is possible to measure also triple glazed products. To measure triple glazed units, slide down the (2.) button on the left-hand side of the Main Page. Once this is done, the “Triple IG” indicator lights up. The default settings can be found in the image representing the Main Page

with the default setting.

##### 5.1.1.1 Software bypass button

Toggling this button on will bypass the Laser Integrated device in the production line, enabling IGU:s to pass without stopping at the specified measurement location.

##### 5.1.1.2 Manual measurement

Pressing the “Measure” button will initiate the measurement. During the measurement, the “Measuring” indicator is blinking. After the measurement has been completed, the “Ready” indicator is lit, and you will see your measurement results on the right-hand side of the screen. Note Automatic measurement The equipment will select double/triple automatically. With automatic or manual measurement in the middle of the page, you will also be able to observe the results on the thickness of the glass and the space between the glasses as well as the total thickness of the IGU. You will get this reading whilst your gas concentration measurement is measured. To return all the manually set values back to default values, press the “Reset” button or change the values back manually. When pressing the “Reset” button it takes a few seconds to return all the values back to default.

## 5.1.2 User interface – Settings Page

With automatic measurement manual presets are not used/needed.

The Settings Page of the software entails the following functions: defining glass and spacer thicknesses (pre- set), setting measurement time, setting the device for multiple sequential measurements, setting the measurement result indicator limits, measurement head inner oxygen concentration check, and opening the daily measurement results.

Adding (1) pre-set values with “Glass” and “Spacer” drop-down boxes assists the software to identify the correct glass and spacer thickness values and to enable the measurement of glass and spacer thicknesses outside the software default values. It is recommended to use pre-set values if it seems that the glass thicknesses are measured wrong. This may happen, e.g., in the case of certain coated or laminated glasses. As a default software identifies glass thicknesses between 2 and 13 mm and spacer thicknesses from 6 to 25 mm. The device operator can set glass thicknesses from 2 to 23 mm and spacer thicknesses from 4 to 40mm. When using the pre-set values via the drop- down boxes, the software identifies the glass and cavities thicknesses in the  $\pm 1$  mm range from each given value. The glass and spacer closest to the measurement device are “Glass 1” and “Spacer 1”, the further glasses and spacer being sequentially “Glass 2”, “Spacer 2”, and “Glass 3”.

The results are displayed once the measurement is finished. When the gas measurement results are over the high limit value, the green indicator will light up on the Main Page next to the measured gas concentration results. The limits for color indicators can be defined on the Setting Page and the indicators, green, yellow, or red, will light up accordingly (instructions in the following chapter labelled Software).

“Measurement time” (2) drop-down box indicates the time to collect data from one cavity. This can be adjusted between 2–5 seconds. The default time is 5 seconds. Longer measurement time is advised for greater accuracy.

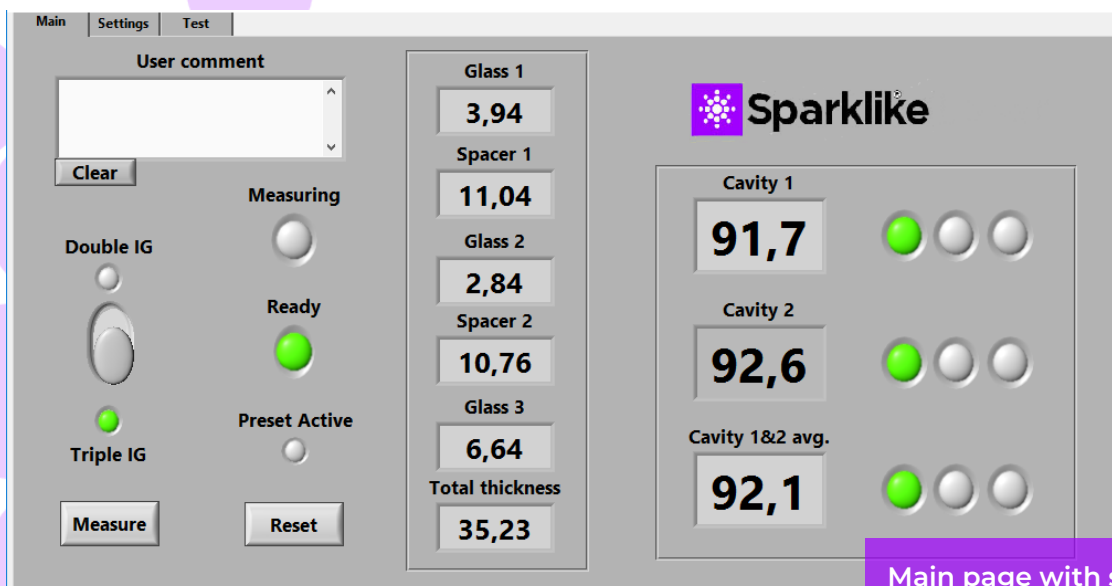
“Enable counter” and “Meas. count” (3) refer to settings for making multiple measurements.

“High limit” and “Low limit” (4) refer to the desired result range. For easy interpretation of the results, there are three indicator lights next to the results, featured on the Main Page of the software. To suit their local requirements, the user can set these values via the Setting Page by adjusting the “High limit” and “Low limit” values by clicking up or down or by using the on-screen keyboard to type the desired value. i) when the gas measurement results are over the high limit value, the green indicator will light up, ii) if the result is between high and low limit, the yellow indicator is lit, iii) and if the result is below the low limit, the red indicator turns on.

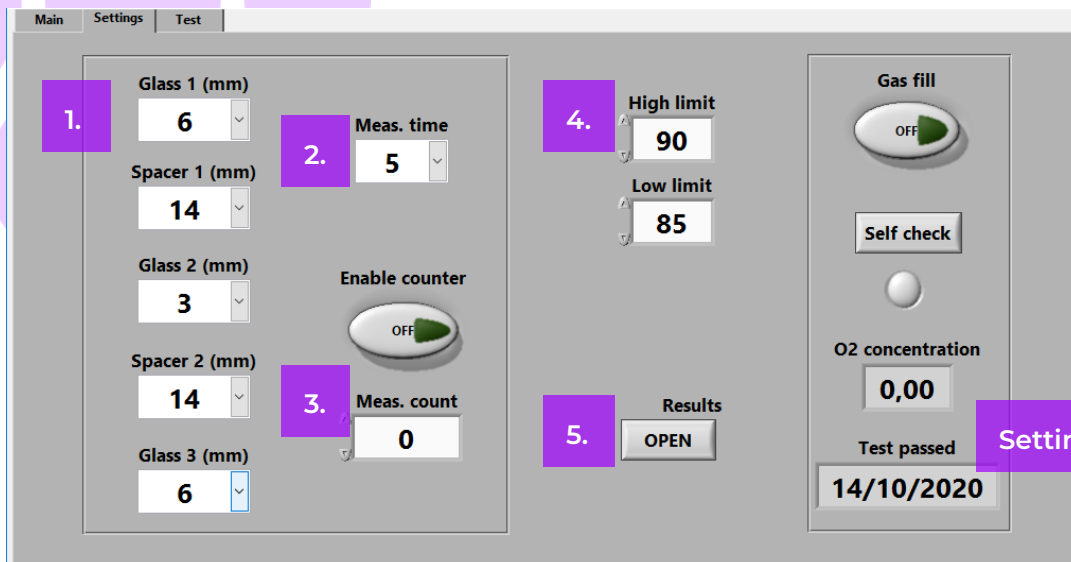
To access the daily measurement results, click on the Results “Open” button (5).

**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

“Gas fill”, “Self-check”, “O2 concentration”, and “Test passed” (6) refer to purging oxygen from the measurement head. “O2 concentration” tells the measured O2 concentration inside the measurement head in percent. “Test passed” shows the last date the self-check has been passed. This check needs to be performed to ensure the oxygen level inside the measuring head is low enough not to interfere with measurement results.



Main page with sample measurement results for triple glass



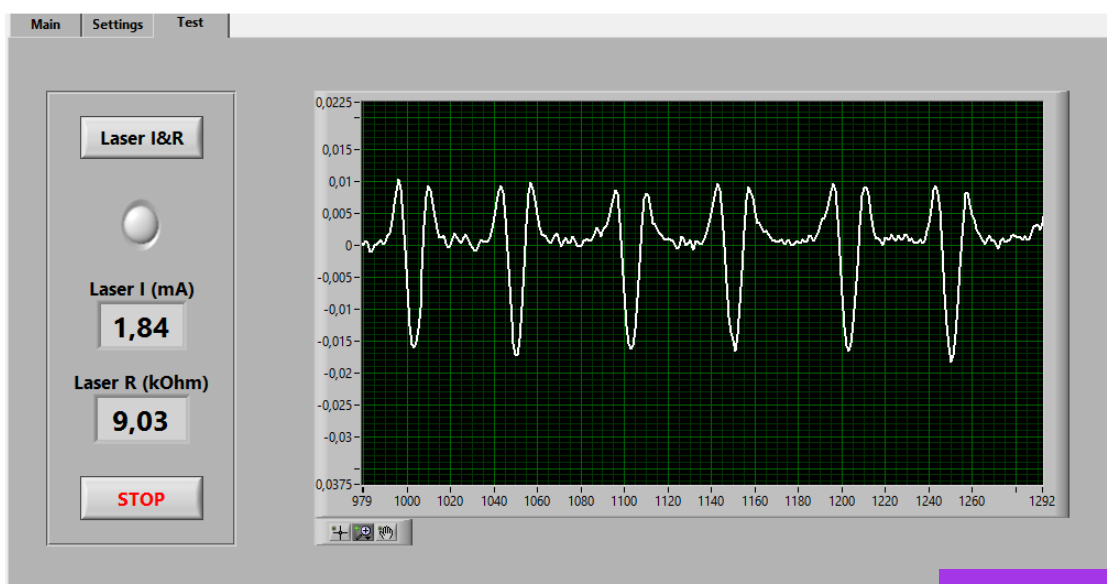
1. Presets
2. Measuring time
3. Measuring count
4. Low and High limits
5. Results tab

### 5.1.3 Software – Test Page

The Test Page of the software provides the laser temperature and current check function. The laser component needs to be operated at the correct temperature to yield highly accurate measurement results. Incorrect temperature adjustment may crash the software.

The peaks seen in the signal should be distributed evenly on the x-axis. In an optimal situation the distance between two adjacent peaks should be 50 points on the x-axis. However, it's completely

normal for the signal peaks to drift in use a little bit. The device functions within normal parameters if the peaks are at 25 points or over from each other. If the drift exceeds nominal operational parameters, the device will attempt to adjust the signal automatically when running a measurement sequence or when running the Self-check test. If the auto adjustment fails, or no peaks are visible please refer to the Troubleshooting section of this guide.



Test page

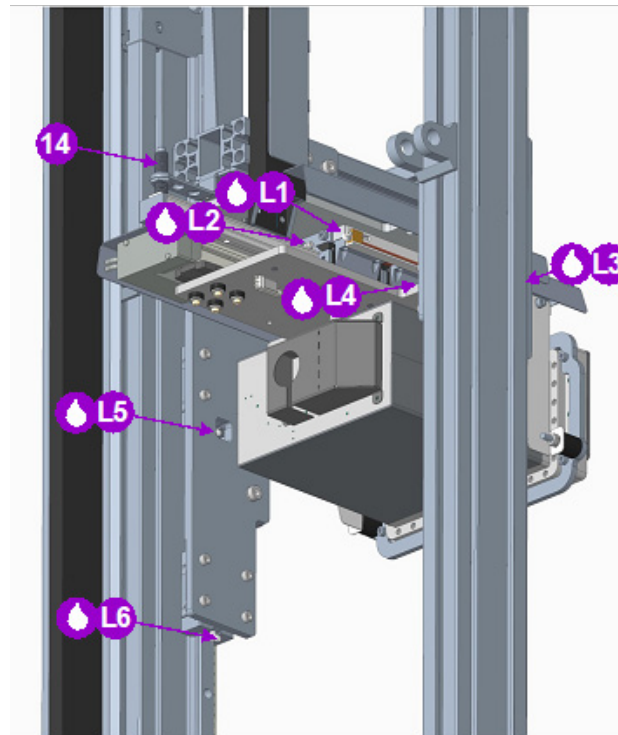
## 6. MAINTENANCE INSTRUCTIONS

Maintenance of the Y and Z movers. In picture 3 lubrication nozzles L1 – L6 are shown, which are used for lubricating the bearings on the movers.

Picture 3: isometric inside view

Z-movement home sensor Lubrication points

- L1: Z-movement center sledge
- L2: Z-movement rear sledge
- L3: Z-movement front sledge
- L4: Y-movement auxiliary sledge
- L5&L6: Y-movement main sledges



### 6.1 Daily inspections

Check the equipment and its vicinity for any foreign objects and for general cleanliness. Clean the measuring head window (see picture 2) Check the argon gas connection and flow (0,1-0,3liters/min) (see picture 1)

### 6.2 Weekly inspections and maintenance

Check the flexible rubber joints for cracks; spare joint location, see picture (see picture 2) Clean the distance lasers lens (see picture 2)

### 6.3 Monthly inspections

Check the timing belt has no damage, cracks, or dents (see picture 2)

### 6.4 Annual maintenance

- ▶ Software updates, when available.
- ▶ Calibration of the equipment is needed for maintaining the accuracy.
- ▶ Lubricate the linear guides (see picture 3)
- ▶ On-demand maintenance => contact the Supplier
- ▶ Timing belt replacement if needed.
- ▶ Any damaged parts or components

**NOTE:** To maintain functionality and safety, all service must be performed by authorized personnel. Unauthorized service or using any third-party components voids the warranty and may cause malfunction and/or personal injury.

## 7. DAILY OPERATION INSTRUCTIONS

### 7.1 Starting the device and preliminary steps

To switch the device on turn the main power switch (1). To switch the safety relay on enabling the servo drivers in the electrical cabinet, press the "Reset" (2) labeled button after startup. The "Reset" button must be pressed before starting measurements to enable measuring head movement.

1. Main power switch
2. Reset button
3. Emergency stop button

In case of device failure or an accident causing imminent danger or harm to the operator or people working nearby press the "Emergency stop" button. To release the emergency stop simply twist the button clockwise to release it.

If the gas regulator valve has been turned off previously, open the valve and set the gas flow to 1-2 l/min, once the device has been flushed the gas flow can be reduced to around 1 l/min.





## 7.2 Daily operations for temperature check and gas fill

AT EVERY STARTUP: The operator should check for temperature and oxygen concentration, by running the I&R test on the device software in the “Test” page for the temperature and the “Self-check” test in the “Settings” page for gas concentration inside the measuring head. This ensures the correct operation of Sparklike Laser. To ensure the quality of the measurements it is recommendable that the operator checks the oxygen concentration regularly.

### 7.2.1 Temperature check

The laser component needs to be operated at the correct temperature to yield highly accurate measurement results. Let the device warm-up with software running for 15-30 min. Incorrect temperature adjustment might result in incorrect measurement results or unexpected functions. Take the following actions to test the temperature adjustment whenever starting up the device.

Choose the “Test” page from the upper left corner of the software. Press the “Laser I&R” button (the indicator below the button starts blinking) and see the following:

- ▶ “Laser I (mA)” should be 1,7–5,9 mA and “Laser R (kOhm)” should be 5–17 kOhm). The values are specific for each device, depending on the laser source.
- ▶ Figures on the graph should be equally spaced and with approximately 50 points spacing. See test menu picture.

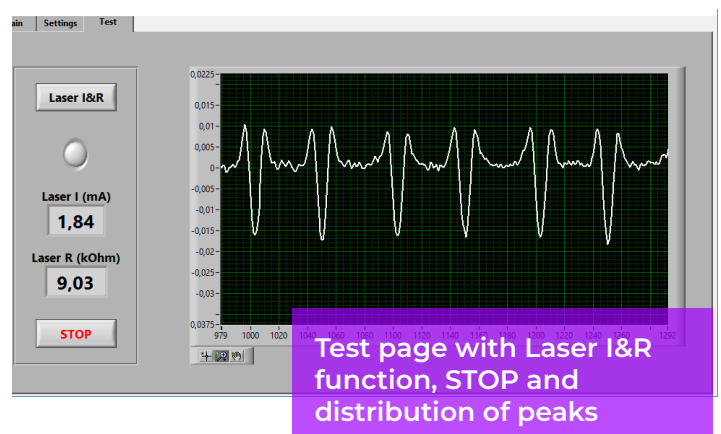
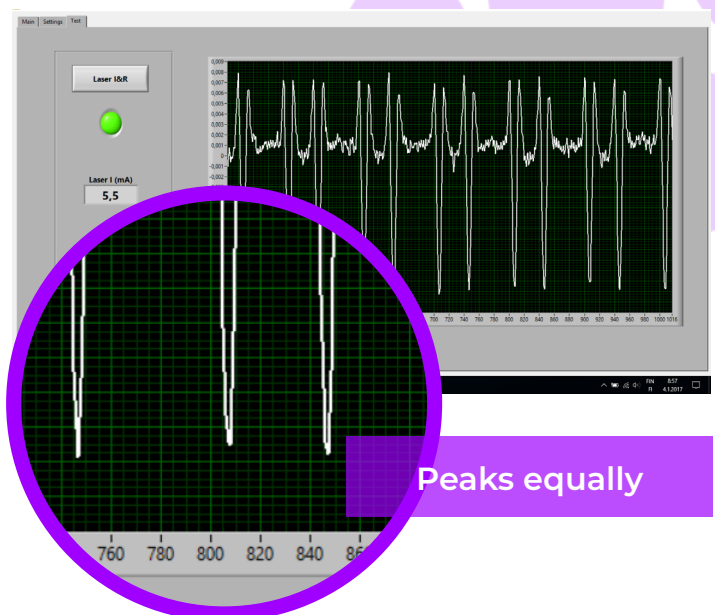
measurement results or unexpected functions. Take the following actions to test the temperature adjustment whenever starting up the device.

Choose the “Test” page from the upper left corner of the software. Press the “Laser I&R” button (the indicator below the button starts blinking) and see the following:

- ▶ “Laser I (mA)” should be 1,7–5,9 mA and “Laser R (kOhm)” should be 5–17 kOhm). The values are specific for each device, depending on the laser source.
- ▶ Figures on the graph should be equally spaced and with approximately 50 points spacing. See test menu picture.

If these are correct, press STOP. The indicator below the “Laser I&R” button stops blinking. If these do not apply, see the troubleshooting section.

**NOTE:** remember always to press STOP before starting to use the laser or checking the oxygen level in the measuring head.



## 7.2.2 Oxygen concentration check

Sparklike Laser is a gas fill analyzer; however, it measures the oxygen absorption peaks 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. These gases are later referred as flushing gases.

**NOTE:** Check regulator and flowmeter to ensure argon gas supply.

On the Settings Page, press “Self-check” button. The indicator below the button starts blinking and the indicator light on the measurement head turns yellow. The self-check 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 0.1 %. If the oxygen concentration is higher than this, the software gives a “Low inner gas concentration! Fill the device!”.

The date for the last successful self-check can be found in the “Test passed” box on the Settings Page. If the result is over 0.1%, there is too much oxygen inside the measuring head, and you should flush the device. A high oxygen concentration within the measuring head will have an effect on the measurement results, if measurements are done with a oxygen level of over 0.1 % the measurement data is not reliable.

**NOTE:** Internal oxygen concentration can be tested anytime via Settings Page by pressing the “Self-check” button. It is recommended to do this check regularly, or every time when suspecting incorrect readings. For any problems, see the troubleshooting section.

## 7.3 Manual measurement

Choose “Double IG” or “Triple IG” from the Main Page depending on which type of IGU you are going to measure. Place the IGU in the front of the measuring head. Once the IGU has been stopped in front of the device and all prerequisite steps have been taken (I&R

test is acceptable and O2 gas concentration inside the measuring head is low enough as shown by the Self-check test) the button labeled “Measure” can be pressed in the “Main page” of the device software. Pressing the “Measure” button will trigger a single measurement sequence. Several manual measurements can be performed one after the other if needed. It is recommended however to use the “Enable counter” functionality as described in the next segment.

**NOTE:** While using the device in manual mode you will need to release the IGU manually in the IGU line, otherwise the glass unit will not proceed in the line after measurement sequence has completed. This can be done by physically moving the IGU to next line segment or driving the line segment from a PLC or other control system in use.

## 7.4 Advanced manual measurement

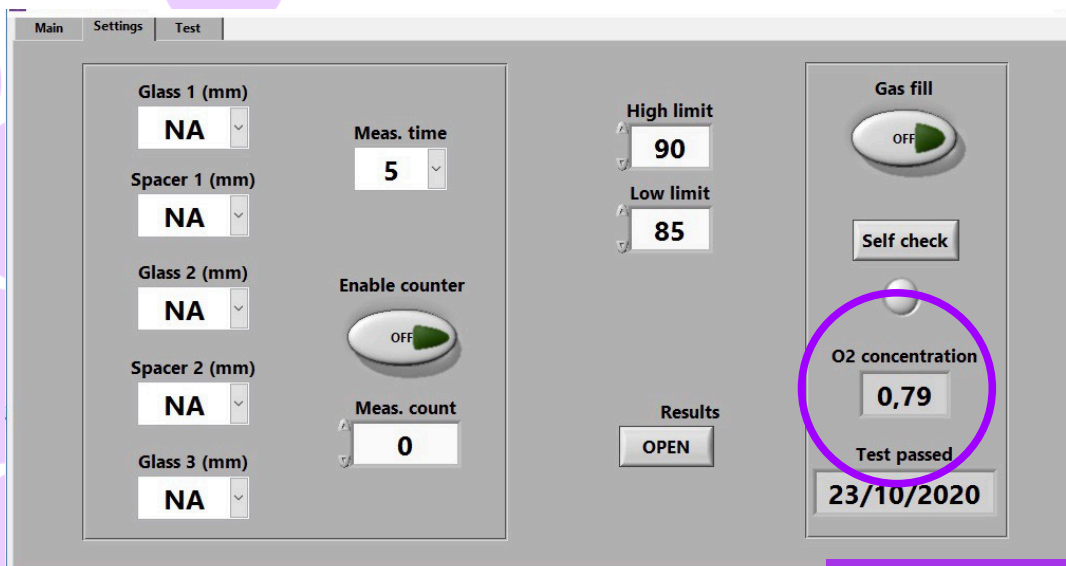
### 7.4.1 Enable Counter

If you have enabled counter (Settings Page), signal how many measurements you would like to take in a row.

First, select a number for the “Meas. count” box by clicking up or down arrows, or by typing a value with the onscreen keyboard. Use of “Meas. count” is recommended if you want to run a series of measurements on a particular IGU.

Then, if you press the “Enable counter” button, multiple measurements are done in sequence. A green indicator is switched on.

**NOTE:** If the user has changed any of the following default values: i) glass or spacer thickness ii) measurement time or iii) counter state, the “Preset Active” indicator on the Main Page turns red when measuring. This reminds the user that the measurement settings are different from the default values. To return all the values back to default values, press the “Reset” button on the Main Page or change the values back manually. When pressing the “Reset” button it takes a few seconds to return all the values back to default.



Settings page after Self check is performed

### 7.4.2 Editing the default settings

You can edit the default values with normal Windows editing applications such as Notepad.

Open the `c:\temp\Settings.ini` file. Change the corresponding values. Do this with discretion to not interfere with the operation of the device. Safe values to edit are, e.g. High limit and Low limit for the indicator lights on the Main page of Sparklike Application. It is not recommended to edit other values without consulting Sparklike product support.

Minimum and maximum dimensions of the IGU can also be edited in the settings file by changing the values labeled:

`Distance_max`, `Distance_min` and `Distance_glass_edge`, all dimensions are given in millimeters, no unit type designators should be used when editing the settings file.

- ▶ `Distance_max`, gives the maximum height of the IGU that can be measured with the current setting.
- ▶ `Distance_min`, gives the minimum height from which the device can measure the IGU, it's not recommended that the minimum setting is put below 300 mm.
- ▶ `Distance_glass_edge`, determines the measuring spot distance from upper edge of the IGU, default is set at 300 mm,

Summarized the measuring zone of the IGU is the area between the `Distance_max` and `Distance_min` values, with `Distance_glass_edge` value determining the measurement spot at a distance from the upper edge of the IGU.

Save and close the file.  
Stop and restart the Sparklike Application to use the new settings values.

### 7.5 Understanding the results

For triple glass units, the device measures first the overall value of both cavities, then the 1st cavity, and then based on these measured results, calculates the gas content of the 2nd cavity. Therefore, the results of the 2nd cavity can be considered as indicative of what complements the information of each cavity.

- ▶ See the insulating gas (such as argon, krypton, or xenon) concentration on the result boxes on the Main Page.
- ▶ For a double-glazed unit, only the "Cavity 1" result is shown.
- ▶ For a triple glazed unit, all three results are shown.
- ▶ "Cavity1" is measured, and "Cavity2" is a calculated.
- ▶ "Cavity 1&2 avg" is the overall gas fill and it considers the thicknesses of both cavities (weighted average).
- ▶ The measurement accuracy is defined in Technical Specifications at the beginning of this manual.

Check that the glass and cavity dimensions are what they should be. If they are not, see the troubleshooting section.

**REMINDER: Measurement results are shown on the screen, but are simultaneously saved on your device: `Disc (C:)\Temp\Results`**

### 7.6 Shutting down the device

When you want to shut the device down use the following steps:

- ▶ Shut down the Sparklike software simply by pressing the "x" in the upper right corner of the software window. Make sure that the device is NOT performing a measurement or Self-check test at time of shutdown to avoid errors and malfunctions.
- ▶ Once the device software has been closed. Simply shutdown the onboard computer from the Windows start menu, like you would shutdown any other computer.
- ▶ When the computer has been successfully shutdown you can switch the main power off by turning the main power switch on the electrical cabinet.

**NOTE: It is important to perform the shutdown like with any common computer using the windows shut down button from the start menu. Shutting the device down by just switching the main power off will cause unexpected errors and malfunctions when powering the device on in the future.**

## 8. TROUBLESHOOTING

In this section some of the most common errors and problems encountered are presented, with probable causes and possible fixes suggested.

### 8.1 DAQ identification error message

The device onboard computer fails to identify or connect to the NiDAQ data acquisition card in the device and the device operating software crashes as a result.

#### Cause:

Usually, this error is caused by improper shutdown procedure of the device or by a Windows driver/software update.

Other causes for this error might include a faulty DAQ card (in very rare cases) or that the USB cable connecting the DAQ card to the onboard computer is faulty or loose.

#### Solution:

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

If the USB DAQ is found (This device is working properly): Run the ResetNIConfig at C:\Program Files (x86)\National Instruments\ Shared\Reset NI Config. After running ResetNIConfig it will ask you to restart the computer, select No and turn off the computer from the windows operation system and then turn it on from the power switch.

If the USB DAQ is not found: the device is inactive. Check that the DAQ led on the connector panel inside the case is on.

If DAQ led is on: the USB connection is working. Then shut down windows and after that, restart the device. If this does not solve the problem, contact the product support at Sparklike for instructions.

If DAQ led is off, contact the product support at Sparklike for instructions.

### 8.2 Laser temp or current out of range

The I-value (current) or R-value (temperature) are not detected within the default range described in chapter 7. Or there is a problem reading the laser diode thermistor.

#### Cause:

Usually, this error occurs if a measurement is performed too soon after device startup. The laser hasn't had the time to warm up after a prolonged off period.

Other reasons for this error are problems with reading the data from the laser thermistor due to a faulty connection of the signal cable or a problem with the laser diode or thermistor itself.

#### Solution:

Check the connector panel inside the electrical cabinet that the green labelled circular multipin connector is firmly connected to the connector panel. Shut down the Windows, wait 20 seconds before restarting the device.

When the device has started turn on the measurement software, let the laser warm up for 10-15min and then run the I&R test. If the problem persists, please contact Sparklike service for further assistance.

### 8.3 Drive error

The stepper driver inside the measuring head is inhibited from moving the laser and detector assembly.

#### Cause:

The control signals for the stepper motor are inhibited. This is usually due to faulty cables or rarely a broken stepper motor.

#### Solution:

Check from the connector panel that all the circular multipin connectors are firmly attached. Shut down the Windows, wait 20 seconds before restarting the device.

If the problem persists, please contact Sparklike service for further assistance.

### 8.4 Glass detection error message

The device fails to identify the IGU being measured.

#### Cause:

This error occurs if a measurement sequence is started without a IGU being present, or if the IGU is moved before the measuring sequence is started / completed. This error might also occur if a measurement using presets is performed with incorrect preset values, as the device then incorrectly adjusts the distance between cavities and glass thickness for the measurement.

Also, if there is highly reflective coating present or the measurement surface is obstructed in some way on the IGU on the side on which the measurement is being performed this error might occur.

A highly reflective surface or obstruction in the

IGU will lead to not enough of the laser being transmitted into the IGU to gain a strong enough reflected signal back to the detector inside the measuring head.

#### **Solution:**

If the “Glass Detection Error” message appears, check that the pre-set glass and spacer values are correct. In these cases, the device window may need to be cleaned. If that does not help, shut down the Windows, and wait 20 seconds before restarting the device.

If the above-mentioned actions do not work, try measuring the unit from another side if possible.

This is due to insufficient amount of laser light passing the surfaces 1 or 2 on the IGU due to coatings or obstructions.

### **8.5 Adjusting the laser temperature**

If the parameters and the graph on the daily operations (Chapter 7) are incorrect, please try the following actions:

- ▶ Let the device warm up for 15 minutes.
- ▶ Press the “Stop” button and then “Laser I&R” button on the Test page again to restart the test process. If the readings or the graph are still incorrect, restart the device and software and press “Laser I&R” button again.
- ▶ If this does not help, and the graph is still not correct (about 50 points equal spacing or at a minimum of 30 points between two adjacent peaks), it means that the laser temperature is incorrect and needs to be adjusted: Try the self-check function on Settings Page. The device will automatically try and adjust the signal peak position. See the picture Peaks equally for the reference.

If the temperature of the laser has changed so much that the peaks cannot be found at all in the Test page “Laser I&R” test, it is possible to attempt to fine-tune the temperature as follows:

- ▶ Open the c:\temp\Settings.ini file with Windows Notepad.
- ▶ Change the value of the “T\_fine\_tune” variable. Changing the value from 0 to 0,01 will move the peaks to about 5 data points. Using a negative value (-0,01) will move the peaks to the opposite direction.
- ▶ Save and close the file.
- ▶ Open the laser software and run the “LaserI&R” test from the “Test” page. The peaks should have moved according to the value you’ve set to the variable.
- ▶ Increase the value as much as needed and try to find a value where the peak spacing is close to 50 data points.
- ▶ Check that the final “Laser R” value is close (inside couple of hundred Ohms) to the “R-value” mentioned in the “Settings.ini” -file. If not, there could be another oxygen peak closer to the original value but to the “other direction” (negative or positive adjustment value).

The peaks can be adjusted manually using a potentiometer present on the laser driver inside the electrical cabinet. This might be required if the above-mentioned steps don’t work (auto adjustment and T fine tune). DO NOT attempt manual adjustment before consulting Sparklike service, as adjusting the wrong potentiometer might lead to damage to laser itself.

### **8.6 Internal oxygen concentration problems**

Sparklike 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 gas.

Internal oxygen concentration is tested from the Settings Page on the software by pressing the “Self-check” button. When testing the internal oxygen level or making the argon fill, the operator might run into the following situations:

Internal oxygen concentration result does not go below 0.1 %, as required. Normally the internal oxygen concentration level should drop below 0.1% within about 20 min of flushing time. If the oxygen level settles to a value over 0.1% and does not go any lower, please check that: the used flushing gas is pure (>99.9 % argon)

- ▶ There is pressure in the gas line, the gas line is not obstructed in any way, the gas line and flow regulators are open, and the flow rate is 1–3 l/min (maximum 3 l/min!).
- ▶ If the gas concentration does not drop to acceptable levels with the flow being ok, check the measuring head window for cracks that might cause a leak.
- ▶ If the problem persists, please contact Sparklike service for further assistance.

If internal oxygen concentration result drops below 0.1%, but there is considerable variation in subsequent “Self-check” results with the gas concentration showing results above and sub 0.1%, let the measuring head flush for a few minutes before running the Self-check test again. Once the result is very low, around 0.01–0.05%, the operator might see some variation in the “Self-check” readings. 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 < 0.1%, as required.

## 8.7 Measurement problems

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

- ▶ Laser temperature
- ▶ Internal oxygen concentration
- ▶ Glass and spacer thicknesses are approximately according to the correct expected thicknesses.

The exceptional results might be measurement errors due to unmeasurable IGU.

If there is a special reflective coating (e.g., Low-E), try measuring from the non-coated side if possible, to get a better signal and more accurate results.

If glass or spacer thicknesses are shown incorrectly, the measurement is taken from the incorrect location and the results are not correct. The device operator can try to help the analysis by providing the pre-set values to the drop-down menus for glass and spacer thicknesses on the Settings Page.

When the operator provides this information, the software can locate the correct measurement location more easily. If the problems persist, please contact [service@sparklike.com](mailto:service@sparklike.com). Also, please be prepared to have the IG structure information including coating characteristics available and the corresponding measurements data file.

# 9. GENERAL SERVICE AND MAINTENANCE

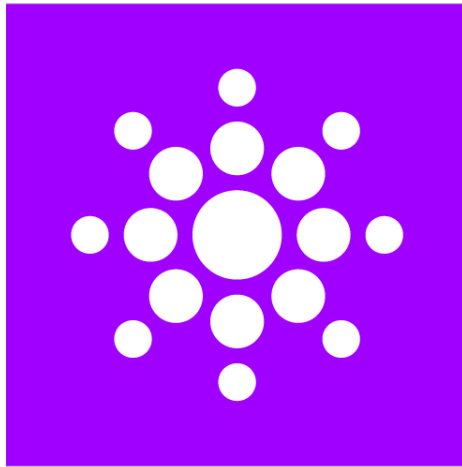
## 9.1 Calibration

To ensure the measurement accuracy Sparklike Laser Integrated must be calibrated and maintained annually.

To request calibration and/or maintenance, please contact Sparklike Service Center [sparklike.com/en/order-calibration/](https://sparklike.com/en/order-calibration/).

## 9.2 Technical support using remote connection

Sparklike can offer remote technical support using TeamViewer application. Connect your device to the Internet using an Ethernet cable. The Ethernet connector is in the connector panel inside the electrical cabinet. Please contact Sparklike [service@sparklike.com](mailto:service@sparklike.com) to open the remote connection for technical support.



**Sparklike<sup>®</sup>**

**Like any measuring device, Sparklike Laser Integrated™ requires annual calibration and maintenance to keep accuracy and reliability.**

**Check Sparklike web page for more information.**

**SPARKLIKE OY**

[www.sparklike.com](http://www.sparklike.com)

Helsinki, Finland

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