

Glucose^T

DirectSens®

Glucose Biosensor Kit

to be used with the
DirectSens® Reader T4

Product No. GK0101

User Manual

Version: 3.0

DirectSens®

DirectSens GmbH
Muthgasse 11/2, 3rd Floor
1190 Vienna
Austria

+43 699 1835 5188
office@directsens.com

www.directsens.com



The **DirectSens® Glucose Biosensor Kit** enables fast and accurate quantification of glucose in food and beverage samples.

The measurement is based on an optimized enzyme for glucose detection, immobilized on a disposable biosensor strip. In combination with the **DirectSens® Reader T4**, the glucose concentration can be measured accurately.

Specifications

Measuring range:	5 – 375 g/L glucose
Measuring time:	2 minutes
Sample volume:	min. 100 µL
Repeatability:	≤ 4 % standard deviation
Reproducibility:	≤ 6 % standard deviation
Shelf life:	18 months at 2 – 8 °C (36 – 46 °F)
Validated matrices:	oat, rice and spelt drinks, oat- and rice-based products with common additives (e.g., cocoa, coconut), oat base concentrate (liquid and solid)
Cross Sensitivities:	The following concentrations did not have a significant influence on the glucose results (1+49): sucrose, fructose, maltotriose and lactose up to 60 g/L each; raffinose up to 10 g/L; calcium up to 1.25 g/L; vitamin C up to 0.125 g/L; vitamin D up to 50 mg/L.

General Hints

- Perform the measurements at room temperature 20 – 24 °C (68 – 75 °F).
- Close the biosensor strip vial immediately after taking out a biosensor strip.
- Prevent microbial contamination in buffer and control solutions.
 - Always use fresh and clean pipette tips.
 - Close bottles and vials directly after taking out the liquid.
- Avoid spilling liquids into the reader. This may cause damage to the instrument.

01. Materials

DirectSens® Glucose Biosensor Kit

- 25 Glucose Biosensor Strips
- 1 bottle (8 mL) of Glucose Buffer, ready-to-use
- 1 vial (1.8 mL) of Glucose Control Solution, ready-to-use
- Manual
- Quality Assurance Certificate

Additionally Required Materials

- **DirectSens® Reader T4**
- Vials, pipettes, tips for product dilution and sample application
- Deionized water
- **Optional:** PC with the DirectSens® Biosensor Software installed

02. Sample preparation

2.1. Preparing the stock dilution

Dilute the sample **1 + 49**, **1 + 99** or **1 + 149** with deionized water, depending on the expected glucose concentration of the tested sample. Typically, 100 µL sample are diluted with 4900 µL or 9900 µL water using precision laboratory pipettes. For the highest dilution of 1 + 149, the dilution of 133 µL sample in a 20 ml volumetric flask is recommended. Make sure to mix thoroughly.

Range glucose	Dilution factor	Dilution
5 – 125 g/L	1 + 49	100 µL sample + 4900 µL water
10 – 250 g/L	1 + 99	100 µL sample + 9900 µL water
15 – 375 g/L	1 + 149	133 µL sample filled up to 20 mL with water

2.2. Preparing glucose measuring solution

- Mix 100 µL stock dilution with 100 µL glucose buffer.
- Mix thoroughly, e.g. by taking the liquid up and down 5 times with the pipette or vortexing.

03. Measurement

3.1. Switching on the reader

- Press the **on/off** button for a few seconds until the display is activated.
- Press the **Measure** button.

3.2. Transferring the calibration constants and inserting sample information

- Select the user and press **Select**.
- Point the red light of the QR scanner directly onto the QR code of the biosensor vial (distance 10 – 20 cm / 4 – 8 inch) until the next screen appears. The calibration constants are transferred via the QR code.
- Press **Continue**.
- Scan (QR or Bar Code) or alternatively type in the sample name. Then press **OK**.
- Select the concentration range according to the selected stock dilution factor and then press **Select**.



The calibration constants are specific for each batch of the Biosensor Kit. Always use the QR code of the currently used kit.

3.3. Measuring glucose

- Take one biosensor strip out of the biosensor strip vial and close the vial. **Avoid touching the sensitive area on the biosensor strips!**



- Take the biosensor strip with the blue side upwards and the metal contacts pointing towards the reader and insert it into the reader as far as it can go.
- Confirm by pressing **Continue**.

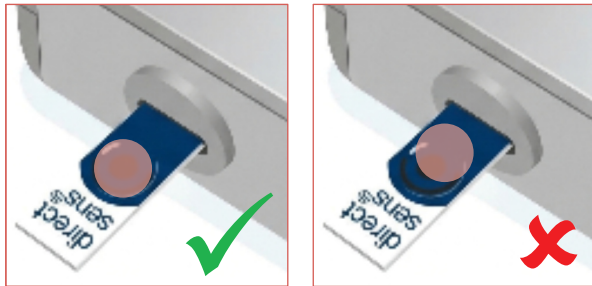


- Apply 100 μ L glucose measuring solution with a pipette onto the sensitive area of the biosensor strip.
- Distribute the sample evenly over the sensitive area using the pipette tip.



Avoid pipetting the sample up- and down on the biosensor. Avoid scratching the central black spot with the pipette tip.

- Make sure to cover the complete sensing area within the 15 seconds sample application step.
- The reader will automatically detect the sample and start the measurement. The measurement will take approximately 30 seconds. **Do not touch the biosensor during this step!**



3.4. Viewing the result

- After measurement, the result is displayed.
- Press **Continue** to initiate a new measurement (start from step 2.1) or press **Stop** to terminate the measurement sequence.

04. System performance checks

4.1. Performing a control solution test



The control solution imitates a 1 + 99 diluted sample, that was already mixed with buffer. Therefore it can be readily used, no dilution or mixing with buffer necessary.

- In the start-up screen of the reader T4, press on **Control**.
- Follow the measurement procedure (steps 3.2 – 3.4) to perform the control solution measurement.
- The target result for glucose is between 85 and 115 g/L (95 % confidence interval).



- Perform a control solution test in case there is any doubt about the performance of the biosensor kit, e.g. due to elevated temperatures during transport or storage or due to unexpected results.
- Adapt the frequency of the regular control solution tests to your laboratory's quality guidelines. Best practise is to do a control solution test as first measurement when opening a new biosensor kit.

4.2. Performing a reader test

The DirectSens® Reader T4 Kit contains an electronic testing device. This device can be used for a 3-minute check-up of the electrical measuring characteristics of the reader. In order to perform a reader test, the reader must be connected to the DirectSens Biosensor® Platform Software via USB or Bluetooth. For detailed information please read the **DirectSens® Reader T4 Kit and Software User Manual**.



- Perform the reader test in case there is any doubt about the reader performance. This can be due to exposure to a strong mechanical shock, due to a liquid that entered the reader, or due to unexpected results.
- Adapt the frequency of regular reader test to your laboratory's quality guidelines.

05. Disposal

All liquids of the biosensor kit can be disposed of in normal water drains. All solid parts can be disposed of in standard household waste.

06. Further information

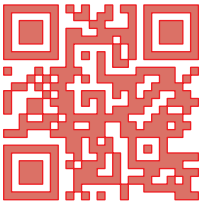
On the website of the glucose biosensor kit you find this manual and a tutorial video.

<https://www.directsens.com/products/glucose/>

For personal support, please contact

Mail: support@directsens.com / **Phone:** +43 699 1835 5188

All specifications and procedures are subject to change without notice.



Scan for more info