



# SunChemical<sup>®</sup>

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Color & Comfort

## **MANUAL FOR THE SUNSENS POTENTIOSTAT FOR FRUCTOSE MEASUREMENTS Volumetric Extraction Edition**

This document is intended to provide information about:

- 1. Parts and Components**
- 2. Charging and Operating the SunSens Potentiostat**
  - 3. Prior Setup to Testing Extracts**
  - 4. Running the Application and Testing**
  - 5. Reviewing Data**
  - 6. Trouble Shooting**
- 7. Copying and Reviewing the Data using a PC**



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## 1. Parts and Components

Each instrument is provided with a:

- SunSens Potentiostat
- Stirrer
- Micro-Pipette (able to deposit 40µl)
- USB-C connector cable for the SunSens Potentiostat
- Tablet (with pre-installed Fructose application)
- USB (and UK Plug) charger for the Tablet

Users will require:

- Sample Preparation Equipment  
*Refer to sample preparation manual*
- Tweezers
- Micro-pipette tips
- Lint-free tissue
- Gloves
- USB Electrical Charger (Regional)



(Model of tablet and pipette may vary)

## 2. Charging and Operating the SunSens Potentiostat

The SunSens Potentiostat is a battery operated, stand-alone device, with an internal battery. For initial use or when the red battery light is flashing, the device can be recharged using the USB-C cable.

The device can be charged during measurement operation. This is achieved by plugging the USB-C cable to the top of the device and to a USB charger.



To turn on the SunSens Potentiostat, press the centre power button, a white light will appear around the button. If the white light does not appear then the device may require charging.



### 3. Prior Setup to Testing Extracts

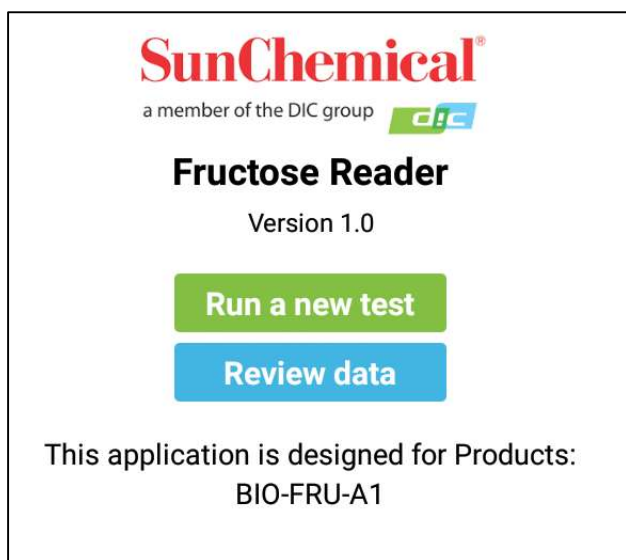
*Prior to running a test, the extract sample should be prepared according to the procedure.*

### 4. Running the Application and Testing

Once the tablet is turned on, click the SunSens Fructose Application Icon. This can be found on the front page of the tablet.

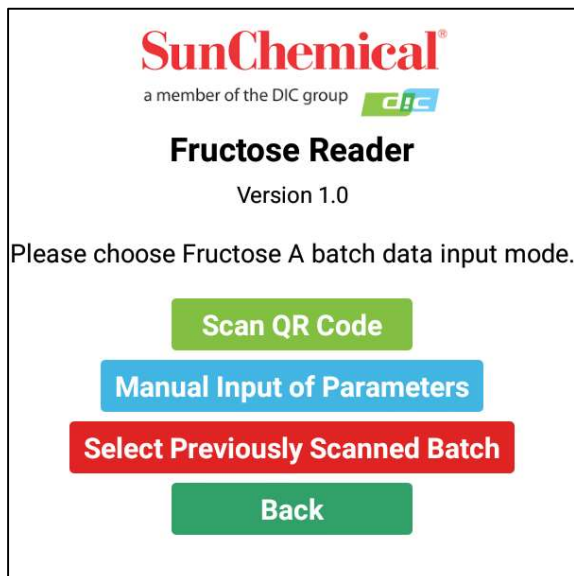


Fructose  
Reader



Once the application is open, a screen containing a “Run a new test” button should appear. Click the button to run a new test.

*NB. This page only contains one button, when the application has been run for the first time or when all the review data has been deleted.*



When a new test is run, the application will ask for the batch information of the Fructose A sensor. These values will change from batch to batch.

When testing, using a new batch of Fructose A sensors, press the “Scan QR Code” button.



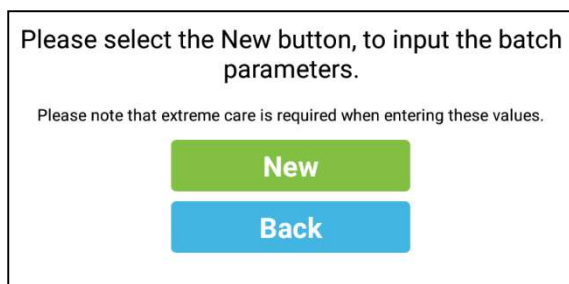
### **Scanning QR-Code**

Once the “Scan QR Code” button is pressed, the front camera of the tablet will be activated.

Select the batch of Fructose A sensors (Product Code BIO-FRU-A1a) that is to be used for testing,

Hold the QR Code steadily above the front of the tablet, the QR Code is located on the top side of the vials. For best results the QR code should fill most of the centre area of the screen.

*NB. If the incorrect product is being scanned then a message “Incorrect Product” will appear.*



### **Manual Input of Parameters**

If the “Manual Input of Parameter” is selected, a new screen will appear. This approach should only be used in the event that the QR-Code has been damaged.

When entering the batch values of the sensors, care should be taken as the values contain numbers of up to five significant figures.

Please enter Fructose A sensor values and press continue.

Batch number: \_\_\_\_\_

A: \_\_\_\_\_

B: \_\_\_\_\_

C: \_\_\_\_\_

D: \_\_\_\_\_

**Continue**

**Back**

The batch values can be found on each pot of sensors.

*Example of a sensor label:*

Fructose A Sensor	Sensor Values
Product Code: BIO-FRU-A1a	A: 26.191
Batch Number: 20A13.01	B: 1.1825
	C: 9.0066
	D: 1.9375

## Selecting a Previously Scanned Batch

Please select a Fructose A batch.

**1234**

**q**

**Delete**

**Back**

If the "Select Previously Scanned Batch" is selected, a new screen will appear. Previously scanned batches will appear as buttons. Ensure that the Batch number on the screen is the same as the Batch number of the pot that's being used.

Repeat the process for the Fructose B Sensors (Product Code BIO-FRU-A1b)

A summary screen of the sensor's parameters will appear. It is recommended to check these values against the values that appear on the main label of the sensors.

Selected batches:

Batch: 1234  
A: 1, B: 0, C: 100, D: -100

Batch: 1234  
A: 1, B: 0, C: 100, D: -100

Please insert fresh sensors.  
Fructose A in slot A and Fructose B in slot B, then press Continue

**Continue**

**Back**

*Both Fructose A and Fructose B batches must be the same batch number, or the system will not progress to the next screen*

Fructose A and Fructose B Batch Numbers Do Not Match

During this screen the sensors should be inserted into the device.



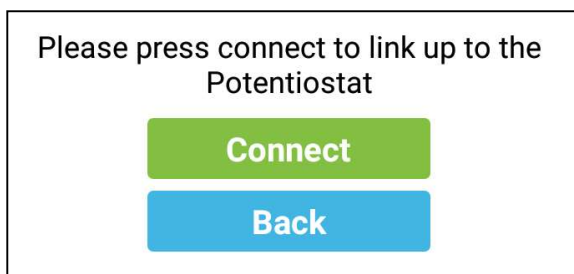
Using a tweezers and gloves (not provided), remove the sensors from their container and place in the module.

*NB. Do not touch the central circle section of the sensor*

The Fructose A sensor should be inserted into the left-hand slot (earlier models known as slot "G") and the Fructose B sensor should be inserted into the right-hand slot (earlier models known as slot "S").

*NB. Ensure that the sensors are inserted correctly, with the connectors aligning to the tracks of the sensors*

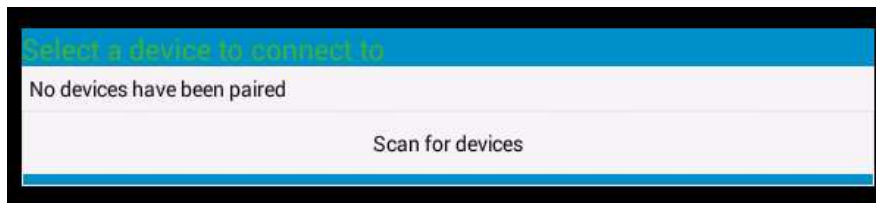
Once the sensors have been inserted correctly, press the "continue" button.



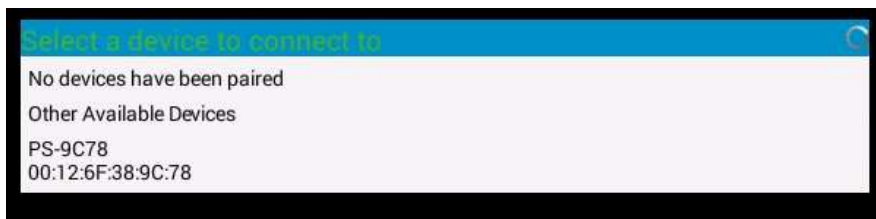
The application will ask you to connect the Tablet to the SunSens Potentiostat. Ensure the potentiostat is turned on (see section 2) and press "Connect".

If the tablet has been used with the potentiostat before then it will appear in the list and should be selected. This will re-initialise the connection automatically.

If the tablet has not been used with the potentiostat before then a dialog box will appear, with "No devices have been paired". In this instance press the "Scan for devices" button.



Select the description beginning with “PS-“.



The device may ask you for a PIN, if it does, type “1234” and press “OK”

Please load sample extracts onto the sensors and press "Start measurement". Be ready to stir the Fructose samples as soon as the measurement starts.

**Start Measurement**

**Alignment Check**

**Back**

Fructose A Aligned: Unknown  
Fructose B Aligned: Unknown

The application will then ask the user to load the extract onto the sensors.

40µl of the extract should be deposited onto the Fructose A sensor.

40µl of the extract should be deposited onto the Fructose B sensor.

To check that the sensors are positioned correctly, press the “Alignment” button

*NB. The extract requires depositing on the sensors before pressing the “Alignment” button.*

Fructose A Aligned: Searching  
Fructose B Aligned: Searching

Fructose A Aligned: Detected  
Fructose B Aligned: Detected

If the sensors are correctly aligned the screen will display them as “Detected”

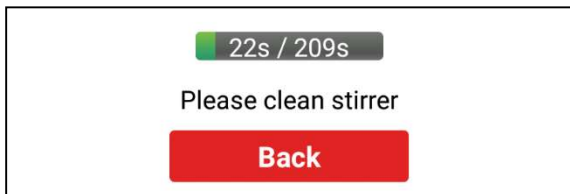
If one of the sensors is not aligned correctly, or not inserted, then “Undetected” will be displayed.



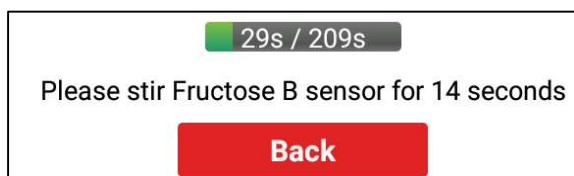




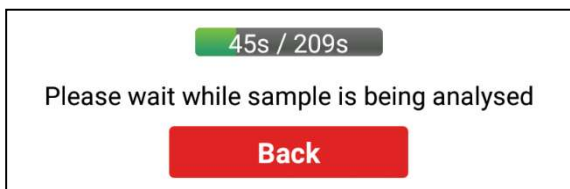
Once the “Start” button has been pressed a progress bar will appear, with the instructions to stir the Fructose A sensor. During this time the Fructose A sensor should be stirred, for 20 seconds, using the stirrer provided.



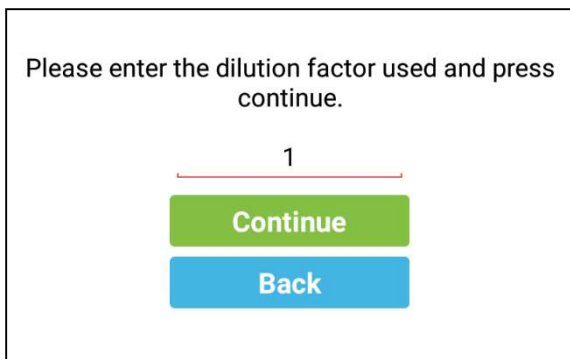
A sound will occur when it is time to stop stirring. The stirrer will then require a simple wipe using a lint free tissue.



The application will give instructions to stir the Fructose B sensor, for 20 seconds.



A sound will occur when it is time to stop stirring. The stirrer will then require a simple wipe using a lint free tissue.



Once the extract has been analysed, the application will ask for the extraction dilution factor. If the extract has not been further diluted, from the protocol, enter “1”.

If the extract has been diluted further, then the number of parts of water to the number of parts of extract requires to be added together.

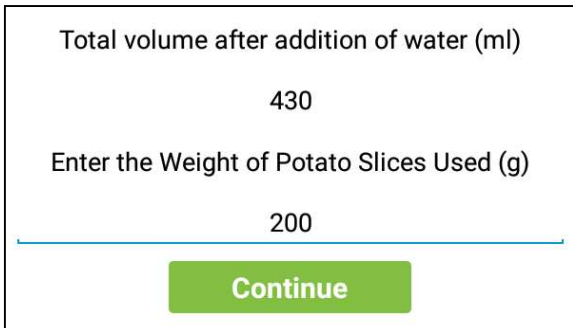
*Example: 9 parts water with 1 part extract will result in a 10 extract dilution factor.*

Press “Continue” once the extract dilution factor has been entered.



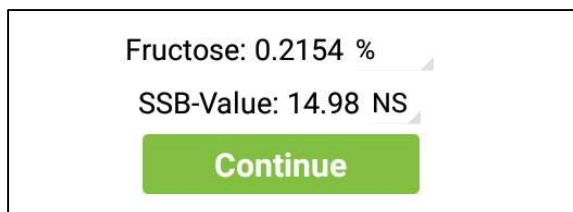


Select the “Use Volumetric Extraction Method” option

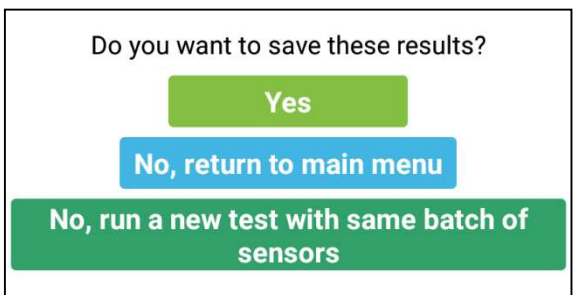


Enter to total volume after the addition of water (in millilitres), this volume is referred to in the extraction protocol.

Then enter the weight of potato slices used (in grams), this weight is referred to in the extraction protocol.



The results will be displayed as a percentage. Select the small grey arrow to convert to alternative units. Press “Continue” to continue to the next page.



The application will ask the user if they wish to save the results.

- Press “Yes” to save the results
- Press “No” to not to save results and to go back to the main menu.
- Press “No, run a new test with the same batch of sensors”

if the user does not want to save but does want to run another test using the same scanned pots of sensors.



If the user has selected “yes”, to save the results, a new screen will appear. The user will be asked to enter a suitable name for the sample. The date will automatically be added to the sample name.

Please enter the sample code and date.

Sample:

20-Jan-2010

Save and return to main menu

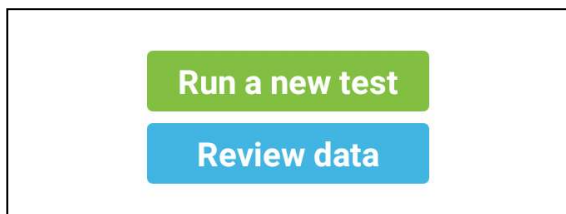
Save and run a new test with same batches of sensors

Back

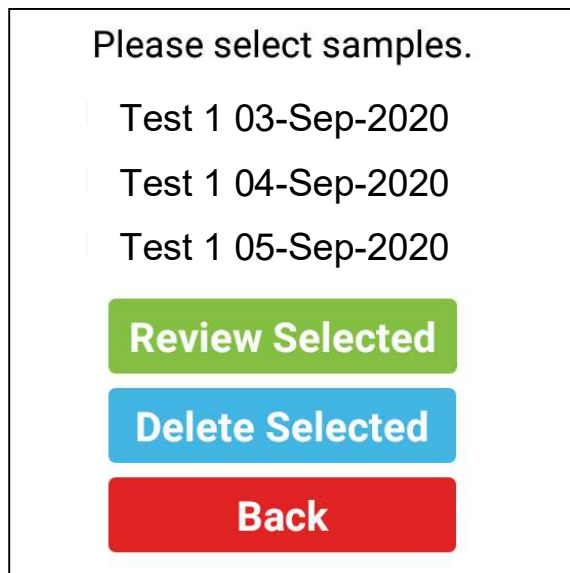
The user can press “Save and return to main menu”, to save the data and return to the main menu.

Alternatively, the user can press “Save and run a new test with the same batches of sensors. This will allow the user to run another test using the same scanned pots of sensors, without having to input the sensor details again.

## 5. Reviewing Data

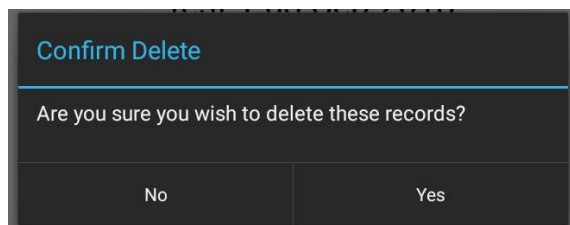


If data has been saved onto the tablet, then a “Review data” button will appear on the opening page of the application. Press this button to review the data.



The data will be shown in the format the user had previously saved the data as. The user can select multiple samples to review. This is achieved by ticking the samples and then pressing “Review Selected”. This will show the samples that were selected, with the results.

If the user requires deleting samples, then tick the samples that are desired to be deleted followed by pressing the “Delete Selected”.



A confirmation dialog box will appear, in case the button is accidentally pressed.



## 6. Trouble Shooting

Error Message	Cause
<p>Sample less than limits of detection</p> <p>Fructose Sample less than limits of detection. Less than 0.0004</p>	<p>The fructose quantity is less than the limits of detection. This may occur with over diluting the extract.</p>
<p>Fructose dilution required, suggested 1 part solution to [x] part(s) water</p> <p>Fructose dilution required, suggested dilution of 3 times.</p>	<p>The fructose quantity is more than the limits of detection. The extract requires diluting, the software will provide a suggested dilution but this is only an approximation</p>
<p>Fructose sensor not detected. Please check alignment</p> <p>Error - Fructose Sensor not detected. Please check alignment</p>	<p>The fructose sensor has not been detected by the potentiostat. Ensure that a fructose sensor is inserted and aligned correctly</p>
<p>Fructose Sensor not detected</p> <p>Fructose: Fructose Sensor not detected. %</p>	<p>The fructose sensor has not been detected by the potentiostat. Ensure that a fructose sensor is inserted and aligned correctly. <i>NB. This will occur if only the fructose is being measured</i></p>
<p>Fructose sample less than limits of detection</p> <p>Fructose: Fructose sample less than limits of detection.</p>	<p>The fructose quantity is less than the limits of detection. This may occur with over diluting the extract.</p>
<p>Incorrect Product Scanned</p>	<p>The incorrect pot of sensors has been scanned. Check to ensure that the correct pot of sensors is being scanned.</p>
<p>Process canceled during measurement:</p> <p>Process cancelled.</p>	<p>Charge the potentiostat.</p>

## 7. Copying and Reviewing the Data using a PC

There are various ways of copying the data to a PC. The method below will explain how to copy the data using the USB cable provided and importing to excel.

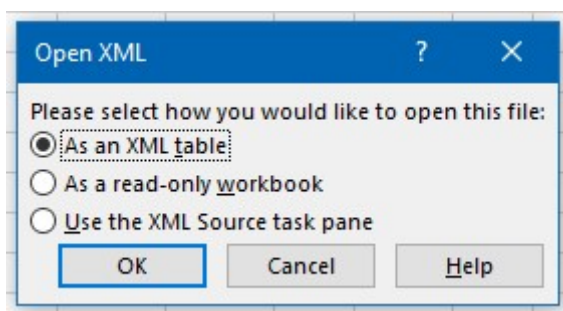
Connect the tablet to a suitable windows based PC. When connected the tablet will appear as a portable device, in “Computer”/”My Computer”.

Load Office Excel and select “open”

Select the file from the location:

*This PC\TABLET ID CODE\Tablet\Sun\FRV2\Samples.xml.*

Excel will present the following dialog box:



Select “OK”

The information in each column is described below:

A	Sample Code
B to H	Fructose Sensor A Batch Information
I to O	Fructose Sensor B Batch Information
P	Fructose A Percentage Result
Q	Fructose B Percentage Result
R to T	This information is for diagnostic purposes only

