

Operating Instructions



Novo-Curve 4 Benchtop Glossmeter

RHOPOINT
NOVO-CURVE 

Thank you for purchasing this Rhopoint product.

Please read these instructions carefully before operating this product and retain them for future reference. The images shown in this manual are for illustrative purposes only.

This instruction manual contains important information about the setup and use of your Rhopoint Novo-Curve. It is essential that the contents be read before powering up and operating the instrument.

If this instrument is passed to other users you must ensure that the instruction manual is supplied with the instrument. If you have any questions or require additional information about the Rhopoint Novo-Curve please contact the Rhopoint Authorised Distributor for your region.

The technology and components used in the device are based on state-of-the art optic and electronics. As part of Rhopoint Instruments commitment to continually improving the technologies used in their products, they reserve the right to change information included in this document without prior notice.

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Specifications

60° Gloss			
Range (GU)	0-10	10-100	100-1000
Repeatability	0.1 (GU)	0.2 (GU)	0.2%
Reproducibility	0.2 (GU)	0.5 (GU)	0.5%*
Resolution (GU)	0.1		
Measurement Spot	2.0 x 2.0 (mm)		
Standards	ISO 2813 ASTM D523		

*A mirror gloss calibration standard is required to achieve this reproducibility

Instrument Specifications	Details
Power	110 -120V AC or 220 -240V AC to power external 9v DC power pack
Measurement aperture	4.5mm ϕ
Operation	Full colour easy to read screen Adjustable brightness 5 button touch sensitive interface, measurement button or optional footswitch
Construction	Integrated calibration holders for error free calibration
Measurement	Fast measurement Results batching with user definable names
Graphical Analysis	On board trend analysis
Statistical Analysis	Max, min, mean, S.D.
Memory	8MB, 2,000 readings
Operating Temperature	15-40°C (60-104°F)
Operating Humidity	Up to 85%, non condensing

Dimensions and Weights	Details
Dimensions	70mm x 190mm x 230mm (H x W x D)
Weight	2.2kg
Packed weight	3.4kg
Packed dimensions	110mm x 280mm x 220mm (H x W x D)
Languages	
Commodity code	9027 5000

Order Codes	Details
Novo-Curve Glossmeter	A1277-600
4x Jigging posts	B1277-602
Mirror gloss calibration standard	B6000-101

Free extended 2 year warranty: Requires registration at www.rhopointinstruments.com within 28 days of purchase. Without registration, 1 year standard warranty applies.

Free light source warranty: Guaranteed for the life of the instrument.

Calibration and service: Fast and economic service via our global network of accredited calibration and service centres. Please visit www.rhopointinstruments.com for detailed information.

Accessories

The Novo-Curve 4 is supplied complete with the following:

- Novo-Curve instrument
- Certified calibration tile in protective case
- USB containing instrument manuals and software
- USB data cable
- Power supply unit with adaptors for UK, EU and USA

Optional Extras:

- 4 x jiggling posts
- Replacement calibration tile
- Supplementary calibration/checking tiles
- UKAS (ISO17025) calibration/checking tiles
- Novo-Curve Cylinder Measurement Jig
- Custom fixture jigs
- Footswitch

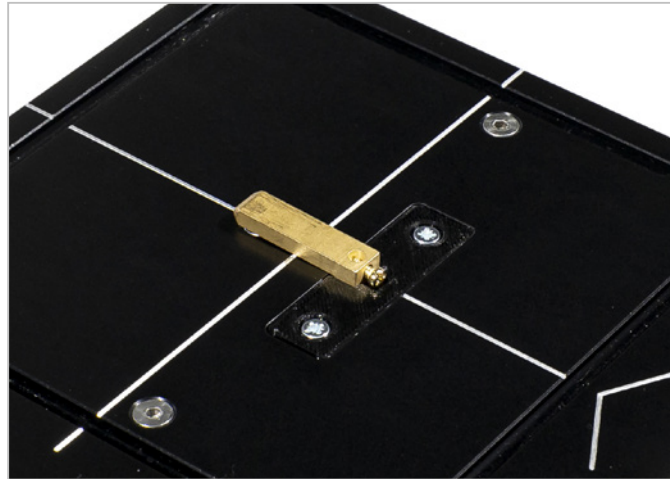
About the Novo-Curve Glossmeter

The Novo-Curve Glossmeter is a unique instrument with specially designed optics for accurately measuring the gloss at 60° of curved surfaces and small areas.

Multiple options exist to increase the repeatability of gloss measurement of irregular sample shape.

Moveable jiggling posts ensure cylindrical objects can be positioned correctly and measured in the same place each time (requires additional accessory).

For an exact fit for small complex shapes, a custom cutout enables the sample to be measured in exactly the same spot each time (requires additional accessories).



Benefits of using the Novo-Curve Glossmeter

- Measures small, curved or irregular surfaces
- Simple jiggling system (requires additional accessories)
- 2mm x 2mm measurement spot
- Hands free operation, easy sample manipulation
- Full statistical analysis
- Constant read feature
- Measures matt to mirror finish
- Download and analyse readings using Novo-Gloss Multi Gauge software (included)

Labelled image / Functional Overview



Label No.	Function
1	Read & Continuous read button
2	High resolution display
3	Up / Down / Left / Right and enter navigation buttons
4	Power on switch
5	DC input
6	USB connection
7	Foot switch input
8	Test plate

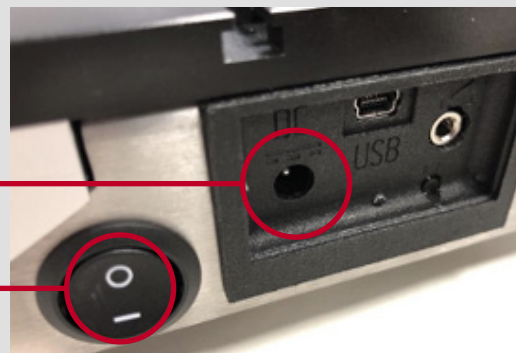
Power

The Novo-Curve is powered using an external low voltage power supply.

The DC jack is inserted in the side panel as shown. The instrument is turned on with the power switch to the left.

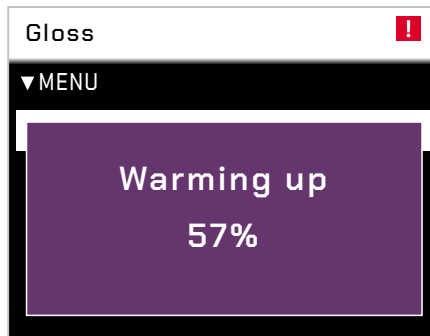
DC Jack

Power Switch

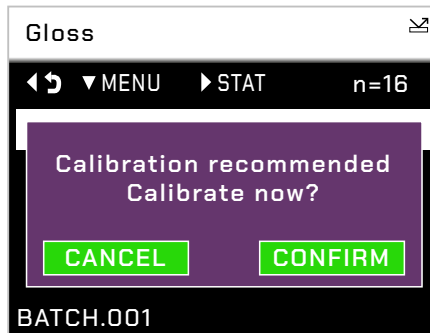


Set-up

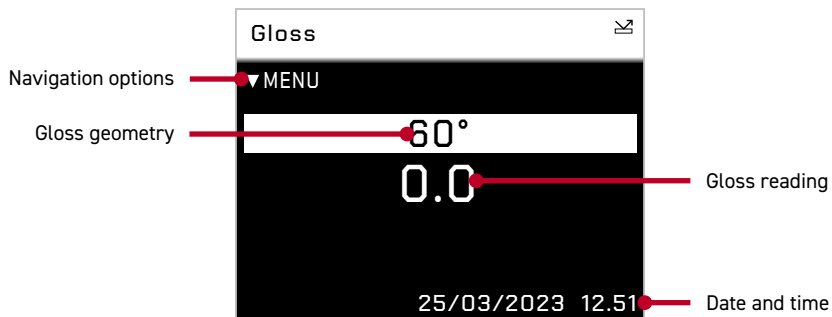
With the unit switched on and initialised, the Novo-Curve will go into a warmup mode as shown below. From initial power on, the approximate time to reach optimal operating temperature is 2 minutes.



Once initial warm up is complete, the instrument will display the home screen as shown below. It is recommended that the instrument is calibrated. See page 16.

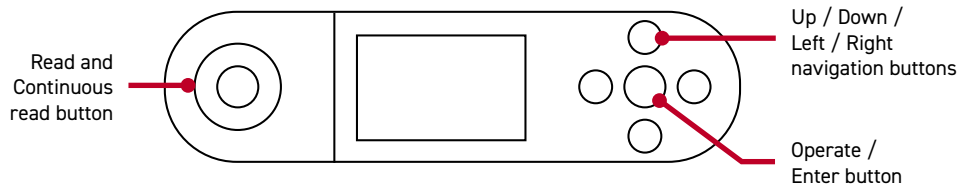


With warm up complete and instrument calibrated it is ready to use.



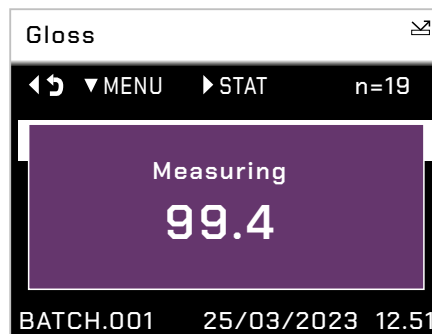
Making a measurement

In the mode detailed above, measurements can be made by simply pressing the operate button, the centre button on the instrument's keypad. Or the foot switch if connected.



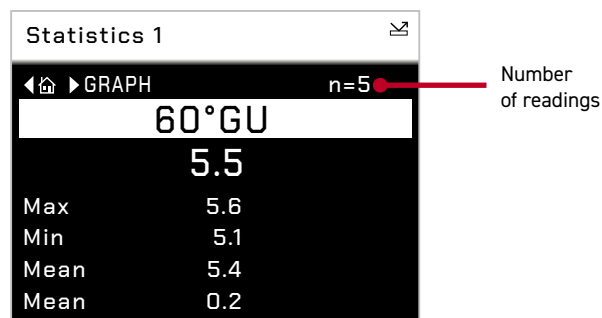
The instrument will perform a measurement and display the results.

The **Read and Continuous read button** to the left of the screen can be used to perform a continuous read. Releasing the button will save the last displayed reading.

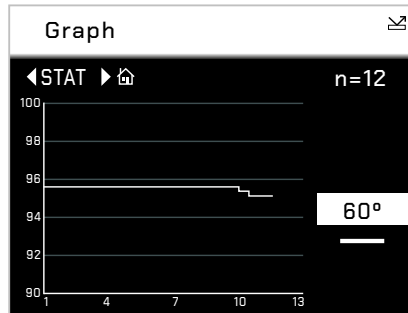


When the instrument memory is turned on (see page 11 for instructions), in the **Home screen** press the **Right button** to display the gloss statistics screen for the current batch.

Measurements can be taken whilst in this screen and the statistics will be updated each time.



Press the **Right button** in the statistics screen to display the graph screen; this screen displays a trend graph of the gloss measurement data.

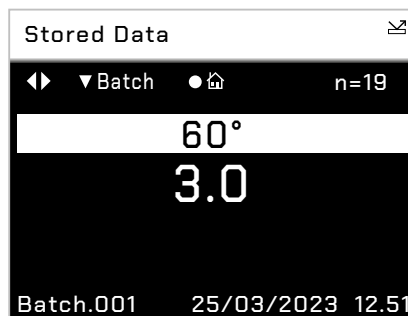


Measurements can be taken whilst in this screen and the graph will be updated after each reading.

Press the **Left button** to return to the **Statistics screen**.

Press the **Right button** to return to the **Home screen**.

In the **Home screen** press the **Left button** to display the **Stored Data screen**.



When Memory is set to ON (as detailed later in the Menu Screen section of this manual on page 11) measurements can be recalled and displayed from any batch stored in the memory.

Press the **Left / Right buttons** to review the measurement data.

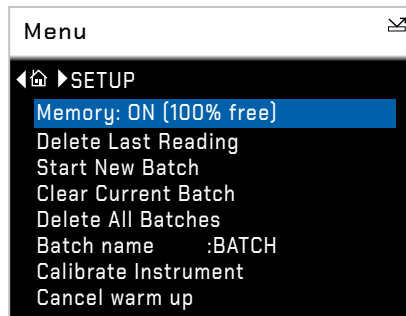
Press the **Up / Down buttons** to select each batch.

At the end of each batch the mean results are displayed.

Press the **Enter / Operate button** to return to the Home screen.

Main Menu

The **menu** is used for quick access to often used options. Press the **Up and Down buttons** to navigate through the options, press the **Enter** button to select the option required.



Options in the menu screen are: -

Memory	<p>Set to ON - enables storage and batching of measurement results. The amount of available storage memory is also displayed (250 readings per batch).</p> <p>Set to OFF - disables result storage</p>
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With Memory ON:

Delete Last Reading	Delete last measurement, no. of measurements and statistics data updated to previous values.
Start New Batch	Start new batch of readings, Batch name is incremented by 1.
Clear Current Batch	Delete entire batch of measurements for current batch.
Delete All Batches	Delete all batches and measurements stored.
Batch Name	Default name is BATCH, a maximum of 8 user defined batch names can be used as detailed in the "Batching Options" section.
Calibrate Instrument	Perform a calibration of the instrument as detailed under "Operation".
Cancel warm up	Will cancel any remaining warm up period and allow a reading to be made.

Press the **Left button** to return to the Home screen.

Press the **Right button** to access the Setup screen.

BATCHING OPTIONS

The batching feature allows the user to group measurements together in batches. Each batch has associated statistics; the data for each batch can be accessed by connecting the instrument to a PC.

The current batch name is displayed on the **home screen** in the bottom left corner, the sample number within that batch is shown in the top right of the screen indicated with n= (sample number).

A new batch is started using the **start new batch** option in either the **menu screen** or the **Data menu**, note that the batch name will increment as will the 'n' indicator.

The current batch can be cleared in either the **menu screen** or the **Data menu**, the batch name will remain the same but the 'n' indicator will reset to zero.

Auto batch size is user defined using the **auto batch** option in the **Data Menu**. When the number of readings in the current batch reach the number set by the user, the instrument will automatically increment the batch name and set the 'n' indicator to zero.



VIEWING DATA

To access the stored batch information connect the instrument to a PC using the USB data cable supplied.

A new device name "NOVO-CRV" can be viewed and accessed via "MY COMPUTER", in this device open the DATA folder. This folder contains subfolders which contain the data for each individual saved batch.

Each reading is saved as an individual comma separated value (.csv).

USER DEFINED BATCH NAMES

Batch names are user definable. With the instrument connected to a PC, open the folder named "CONFIG". Within this folder there is a document named "batches". This is a .csv file that can be opened in Notepad, Excel or Wordpad.

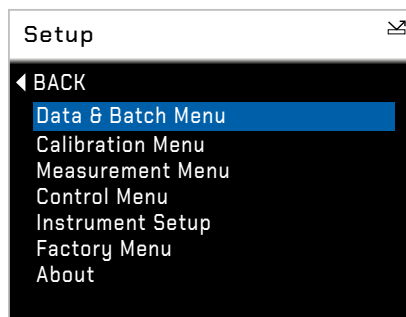
User defined names should be saved in this document each name listed on a separate line. Ensure that the final line is terminated with a carriage return.

The format of these names should only contain letters, no numbers, spaces or other characters can be used. Once completed save the file then switch the instrument off and on again to initialize the new batch names.

SETUP

The **setup** is used to customise the instrument to the users preference.

Press the **Up and Down buttons** to navigate through the options, press the **Enter button** to select the option required.



Data and Batch Menu	Batch / Data options (See Data & Batch Menu Screen)
Calibration Menu	Calibration options (See Calibration Menu Screen)
Measurement Menu	Geometry setup (See Measurement Menu Screen)
Control Menu	Bluetooth setup (See Control Menu Screen)
Instrument Setup	Language, Date / Time and Power options (Setup Menu Screen)
Factory Menu	Pin locked menu options for Rhopoint Authorised Service Centres
About Menu	Information about the instrument's firmware version, serial number and last date of Factory Calibration

Press the **Left button** to return to the Home screen.

NOVO GLOSS MULTI GAUGE

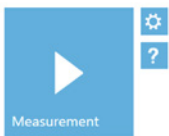
The Rhopoint Novo-Curve can be connected to NOVO-GLOSS MULTI GAUGE to receive measurement data via USB.

Connect the instrument to a PC using the Mini USB cable.

Select Access files.

Launch Multi Gauge.

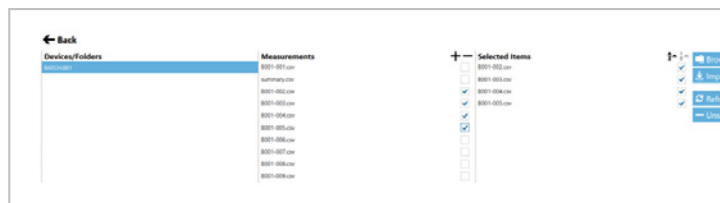
Press **measurement** button.



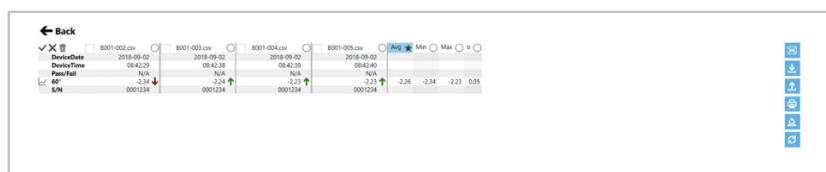
Press **import** button, second down.



Select the batch the results are stored in and then the samples to view. Press **import**.



Data selected will be available to view.



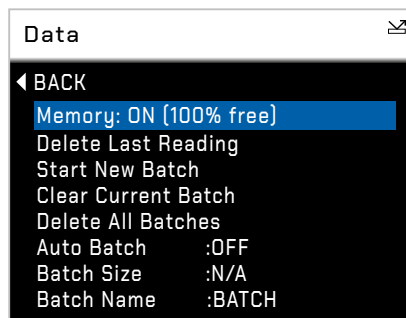
The full manual for Novo-Gloss Multi Gauge software can be downloaded here:
www.rhopointinstruments.com/download/novo-gloss-multi-gauge-user-guide/

DATA & BATCH

The **data** has similar in functionality to that of the menu screen but also allows the selection and setting of the **auto batch** size.

By selecting **auto batch** to **on** the batch size can be selected between 1 – 250, press the **left / right buttons** to select the relevant digit and the **Up / Down buttons** to increment / decrement the value.

Press the **Enter button** to save the batch size.



If batch names have been user defined, as detailed under Batching Options, selection of the **batch name** required is achieved by repeatedly pressing the **Enter button** with **batch name** selected.

Press the **Left button** to return to the Home screen.

Calibration

⚠ Inspect the condition of the calibration standard prior to use.

Inspecting and cleaning the calibration standard

The calibration standard must be perfectly clean from smears and scratches before attempting calibration. Fingerprints and dust can be removed with the supplied optic cleaning cloth.

Scatched or damaged standards are not suitable for gloss calibration. The instrument and standard must be returned to an approved Rhopoint service center for tile replacement and re-calibration.

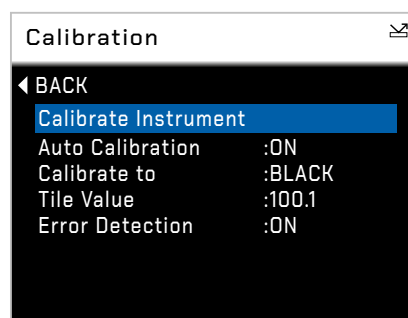
CALIBRATION

Calibration is used to setup the instrument calibration to the users preference.

Place the calibration tile on the test plate. It will magnetically locate. Adjust the position of the calibration standard so that the alignment marks on the side line up with the marks on the sample plate.



Press the **Up and Down buttons** to navigate through the options, press the **Enter button** to select the option required.



Options in the Calibration screen are: -

Calibrate instrument	Performs an instant calibration of the instrument; a dialogue box being displayed upon completion to either "Cancel" or "Confirm".
Auto Calibration	Set to ON, a dialogue box appears each time a measurement is taken as detailed under Operation. Set to OFF - the dialogue box is disabled; measurements are made.
Calibrate to	Set to Black - a traceable gloss tile is used as the calibration standard. Set to Mirror - a traceable mirror tile is used as the calibration standard.
Tile Value	Set the calibration values for either standard being used for calibration. Press the Enter button to select the value. Press the Left / Right buttons to select the relevant digit and the Up / Down buttons to increment / decrement the value. Press the Enter button again to save the value.
Error Detection	Set to ON the instrument detects the condition of the calibration standard being used. If there are fingermarks or debris which cause it to fall outside the value set in Haze Tolerance an error message is displayed before calibration requesting that the tile be checked for cleanliness. Set to OFF - Values are still checked against the stored reference but no other error checking is carried out. Set to ON - A check is made to see if an appropriate hardware channel is wildly different to what it should be, indicating that the calibration is being attempted on the wrong tile type.

AUTO CALIBRATION

The Novo-Curve automatically detects whether a calibration standard is fitted.

With the **auto calibration** option set to **on** in the settings menu (detailed in the previous section) a dialogue box will appear when the operate button is pressed as shown below.



Two options are available:

Either to **“Calibrate”** the instrument on the calibration standard before making the measurement or to **“Measure”** without performing a calibration. Press the **Left/ Right** and **Enter buttons** on the keypad to select the required option.

If **“Calibrate”** is selected the instrument will perform a calibration on the calibration standard and display a confirmation dialogue box when completed.

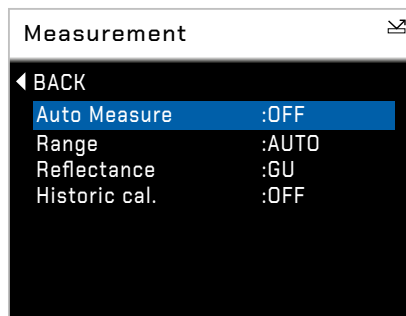
Selecting the **“Confirm”** option will save the calibration information to the instrument’s memory, which will also be confirmed by the calibration tile Gloss readings appearing on the instruments display.

Alternatively, if **“Cancel”** is selected the display will return to the Home screen.

Measurement menu

The **measurement** screen is used to configure the instruments measurement parameters to the users preference.

Press the **Up and Down buttons** to navigate through the options, press the **Enter button** to select the option required.



Selectable settings in the Measurement screen are: -

Auto Measure

Enables or disables automatic measurement mode, used for monitoring surfaces for changes over a period of time.

Press the **Enter button** to select the required measurement frequency of either 2, 5, 10, 30 or 60 seconds.

When auto measure mode is activated a dialogue box is displayed after the **Enter button** is pressed and before the beginning of the measurement sequence indicating that it is activated. To stop auto measure simply press the **Enter button** once again at any time during the sequence.

Range

Selects gloss measuring range to:

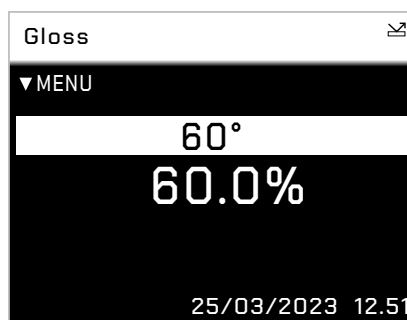
- Auto – Full range
- Black – Standard gloss scale
- Mirror - Extended scale for highly reflective materials, polished metals, requires calibration using mirror standard.

Reflectance

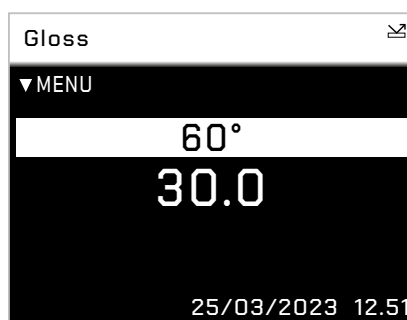
Selects the measurement unit to be displayed for each angle:

- % - display percentage reflectance, 100% reflectance = 1000GU @60°
- GU - display Gloss Units

With Reflectance set to %, measurement results for each angle are displayed as –



With Reflectance set to GU, measurement results for each angle are displayed as –



Historic cal

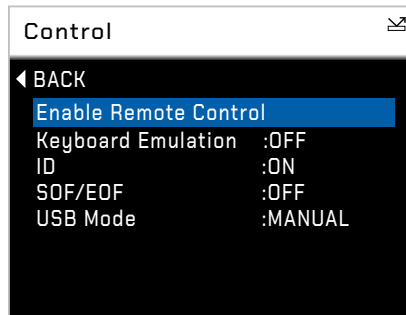
Enables or disables historic measurement result. Set to on for closer correlation to previous model Novo-Curve instruments. It is recommended that the instrument is set to OFF. In this mode the instrument will match the readings given with current Rhopoint Novo-Gloss and IQ instruments.

Press the **Left button** to return to the **Home screen**.

CONTROL

The **control** screen is used to configure the instruments communication parameters to the users preference.

Press the **Up and Down buttons** to navigate through the options, press the **Enter button** to select the option required.



Settings in the Control screen are:

ID	Measurement definition header
SOF/EOF	Start / End of file markers for use in analysis software
USB Mode	Set the functionality of the USB connection when connected to a PC Manual – Allow the functionality to be set on the instrument each time a USB connection is made RC – Remotely control the instrument via USB to make measurements and transfer data. Data – Data only mode. Instrument can be seen as a removable drive.
Keyboard Emulation	After each measurement the reading will automatically send to the PC as a simulated keyboard press followed by a line return. When in this mode a small keyboard symbol will appear in the top right of the screen.

Press the **Left button** to return to the Home screen.

KEYBOARD EMULATION

The Rhopoint Novo-Curve can transmit the gloss reading to a PC after each measurement.

Plug in the Mini USB cable and connect to a PC.

Select **Keyboard emulation** mode.

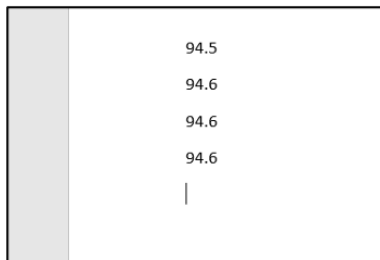
Open you chosen application to receive the data such as MS office program.

The data will be sent to the open program followed by a line return.

To terminate the connection, enter the control menu and turn off Keyboard emulation.

Alternatively unplug the cable.

MS Word



MS Office

A screenshot of a Microsoft Office Excel spreadsheet. The spreadsheet has a grid with columns labeled A, B, and C, and rows numbered 1 through 7. The data in column A is as follows:

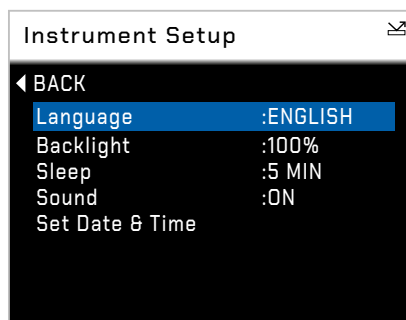
	A	B	C
1	94.6		
2	94.6		
3	94.6		
4	94.5		
5	94.6		
6	94.4		
7			

The screenshot also shows the Excel ribbon with the 'Clipboard' group expanded, displaying options like Paste, Cut, Copy, and Format Painter. The active cell is F21.

Instrument Setup

The **instrument setup** screen is used to configure the instruments basic operating environment to the users preference.

Press the **Up and Down buttons** to navigate through the options, press the **Enter button** to select the option required.



Settings in the Instrument Setup screen are: -

Language	Set instrument language to English (default), Spanish, German, Chinese, Japanese or French.
Backlight	Set screen intensity to either 20%, 40%, 60%, 80% or 100% brightness.
Sleep	<p>If the instrument is left un-used for a period of time it will enter a low power mode. The read LED will turn off and the backlight will dim to 20%.</p> <p>The sleep timer can be set to from 1-10mins or set to off. When sleep is enabled, the read LED will turn on periodically to keep the instrument from falling below optimum working temperatures.</p> <p>Upon resuming there may be a small warm up delay to reach optimum temperature.</p>
Sound	Enable or disable button press sound.
Set Date & Time	<p>Set the date and time on the instrument.</p> <p>Press the Down button to set time.</p> <p>Press the Left and Right buttons to select the date or time and the Up and Down buttons to increment / decrement the value.</p> <p>Press the Enter button again to save the value.</p>

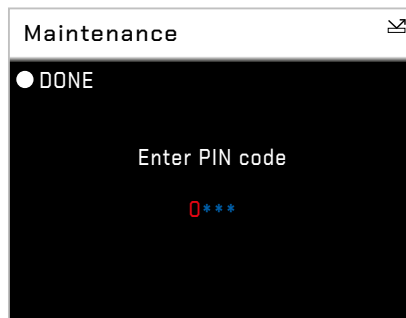
Press the **Left button** to return to the Home screen.

Maintenance

The **maintenance** screen is used by Rhopoint Approved Service Centres.

It is PIN locked to prevent unauthorised access. There are no user configurable settings available.

Press the **Enter button** to return to the home screen.

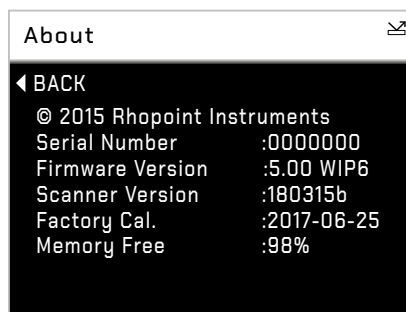


About Screen

The **about** screen is for information only.

It provides information relating to the instrument's software, the instrument serial number and last date of Factory Calibration. It also shows the amount of free memory available.

Press the **Left button** to return to the Home screen.



Appearance Theory

Gloss describes the perception of a surface appearing “shiny” when light is reflected from it.

When viewing glossy surfaces, it is found that a sudden increase in brightness occurs when the angle of observation equals the angle of incidence of the illuminating light. This condition is termed as specular reflection.

A glossmeter is used to quantify the amount of light reflected from a surface, the Rhopoint Novo-Curve uses optics like a traditional glossmeter optics at 60° to measure the reflectance from matt to mid gloss surfaces. Where it differs from a traditional gloss meter is the measuring spot size. The Novo-Curve uses a reduced spot size to accurately measure gloss on curved surfaces.

Gloss is the visual sensation associated with the brightness of direct light reflected in a surface. Surfaces with high reflectance are determined as glossy; less reflective surfaces are semi-gloss or matt.

Glossmeters quantify this effect by measuring light reflection from a sample at defined angles.

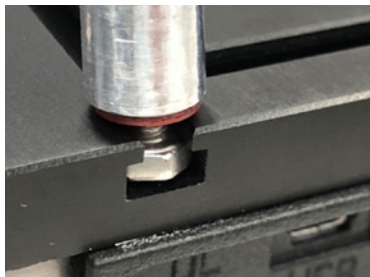
The Gloss Unit (GU) is defined in international standards including ISO 2813 and ASTM D523. It is determined by the amount of reflected light from a glass standard of known refractive index.

Calibration tiles supplied with Rhopoint instruments are traceable to master glass standards held at NIST (USA).

Optional accessories for sample placement

JIGGING POSTS

The Novo-curve measuring plate is equipped with slots so that optional jiggling posts can be used to aid accurate and repeatable placement of samples.

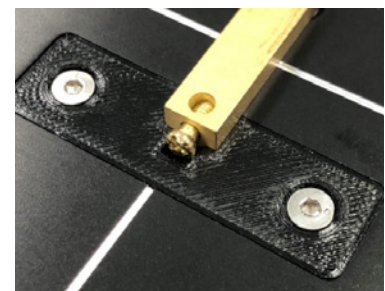
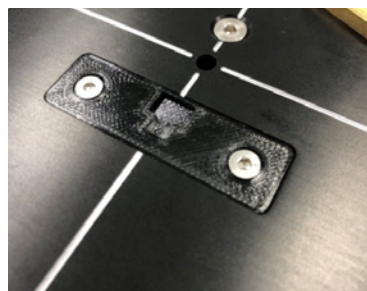
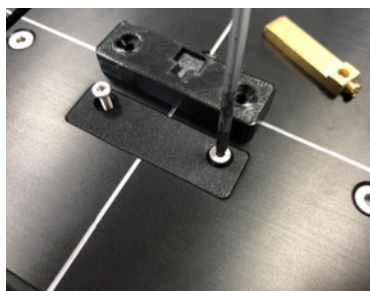


Using the 4 x jiggling posts

1. Loosen the hex bolt from the post. Push the protective washer up so it is in contact with the post.
2. Slide the hex nut into the T slots on the top plate.
3. Locate the post so that the sample being measured is in the center of the measuring hole.
4. Tighten the post to secure it.

CUSTOM SAMPLE HOLDERS

Custom sample holders are also available. The removable section allows for complex and concave parts to be measured. To remove the blanking plate, remove the two securing screws with a 2mm hex driver. The custom insert can then be fitted in its place.



Further information on designing custom sample holders is available on request from support@rhopointinstruments.com

EU DECLARATION OF CONFORMITY

WE Rhopoint Instruments Ltd, Rhopoint House,
Enviro 21 Park, Queensway Avenue South,
St Leonards on Sea, East Sussex, TN38 9AG

DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCTS

Novo Curve 4

**TO WHICH THIS DECLARATION RELATES ARE IN CONFORMITY WITH
THE FOLLOWING STANDARDS**

EN 61010-1:2010+A1:2019
BS EN 61326-1:2021
EN61000-4-2:2009
EN61000-4-3:2020
EN61000-4-4:2012
BS EN 61000-4-5:2014+A1:2017
EN61000-4-6:2014
EN61000-4-8:2010
EN61000-4-11:2020

FOLLOWING THE PROVISIONS OF DIRECTIVES

2014/30/EU Electromagnetic Compatibility (EMC Directive)
EU 2015/863 Restriction of Hazardous Substances (RoHS Directive)

Rhopoint Instruments Ltd
4th April 2023



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Tony Burrows, Managing Director



Authorised representative within the EU – Rhopoint Instruments GmbH,
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