Novo-Shade Duo+

Operating Instructions

Thank you for purchasing this Rhopoint product.
Please read these instructions carefully before operating this product and retain them for future reference.

English

RHOPOINT INSTRUMENTS

This instruction manual contains important information about the setup and use of your Novo-Shade Duo+. 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 Novo-Shade Duo+ 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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Storage and Handling

- This instrument contains precision optics and electronics. You should avoid knocking or dropping the device as the resulting impact could cause serious damage.
- In some circumstances the optical components in the instrument could become misted as a consequence of temperature change. It is recommended that the instrument is not used until it has stabilised to ambient temperature.
- Ensure that the instrument is not exposed to moisture, chemicals or to any corrosive vapours.
- Do not interfere or place any objects inside the measuring aperture as damage to the measuring system could occur.
- The instrument housing and screen are normally resistant to a variety of solvents however it is not possible to guarantee resistance to all chemicals, therefore the surfaces of the instrument should only be cleaned using a soft, moist cloth.
- Prevent exposure of the instrument to direct sunlight for prolonged periods and to continuous humidity and condensation.

About the Novo-Shade Duo+

The Novo-Shade Duo+ is a portable 45/0° reflectometer that can be used to assess either the shade of a surface (a simple indication of colour based on lightness / darkness) or calculate the opacity of a coating, plastic film or paper sample. Measuring using 0/45º the Novo-Shade Duo measures the colour of a surface and not the specular reflectance (gloss). In **Shade Mode** the Novo-Shade Duo can help maintain the production quality of the following:

- Shade of paints, inks and coatings
- Fading of textiles and plastics
- Chalking of paint
- Efficiency of detergents and bleaching agents
- Whiteness of recycled paper
- Cleanliness and oxidisation on metal surfaces

In **Opacity Mode** the Novo-Shade Duo+ can help maintain the production quality of the following:

- Hiding power of paints, inks and coatings
- Transparency of plastic film
- Opacity of paper

Accessories

The instrument is supplied as a standard package complete with all accessories required to calibrate and recharge the unit including:-

Novo-Shade Duo+ 45/0° Reflectometer

Calibration tile including certificate

Cleaning cloth for calibration tile

USB Mains Charger with four selectable mains input connectors (UK / Europe / US / Australia)

USB PC cable

Quick Start Operating Instructions

Protective instrument carry case

Functional overview

Label No.	Function
1	On / Off Button
2	High Resolution Graphic Display
3	Up/Down/Left/Right Buttons
4	Operate / Enter Button
5	Mains / USB Charger Input Connector
6	Calibration Tile

The instrument is controlled by pressing the relevant touch sensitive button. Functionality is dependent on whether the instrument is in menu or operate mode as detailed in the operation sections that follow.

Power

The Novo-Shade Duo+ is powered by an integrated high capacity lithium ion cell.

Fully charged the instrument will operate continuously for >17 Hours or >20,000 readings.

A mains powered USB charger is provided with the unit, this will fully charge the unit when connected to the units USB input (6) using the USB cable provided in under 4 hours.

Alternatively the Novo-Shade Duo+ can be powered and charged using the USB cable attached to any compatible USB host (e.g. laptop etc.), however due to the lower current available from these devices, the charge time will be a minimum of 6 – 8 hours.

Do not operate the instrument whilst it is charging

Switching on the unit

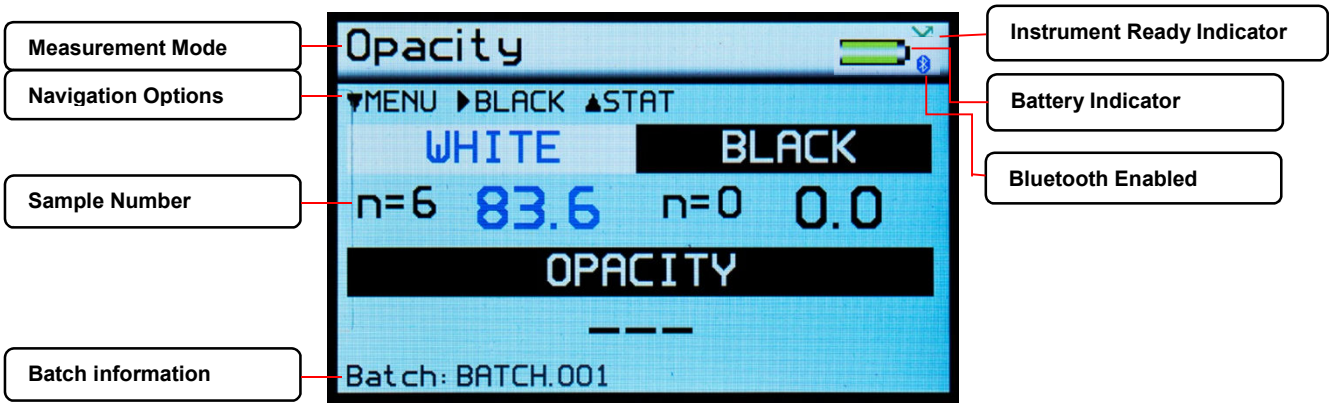
To switch on the unit touch the On/Off button located near the USB socket.

The instrument will display the Novo-Shade Duo + logo and then enter into the home screen displaying measurement parameters according to the instruments default settings or those previously configured.

Similarly the instrument is powered off by pressing the On/Off button for three seconds.

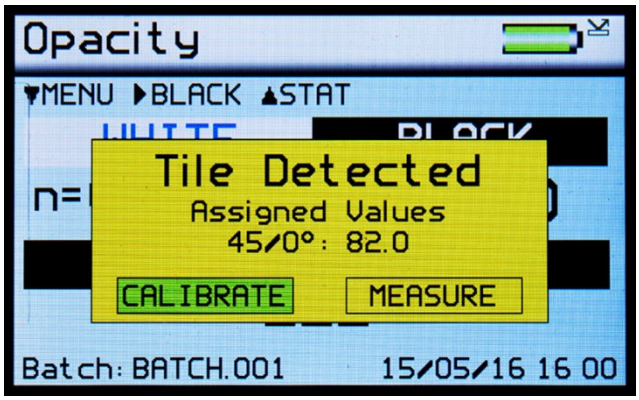
Operation

With the unit switched on and initialised the instrument will, depending on the mode selected, display the home screen as shown below.



Measurements can be made by simply pressing the operate button (4) on the instruments keypad.

Should the Auto Calibration option be set to ON in the settings menu (detailed later in the Instrument Settings section of this manual) and the calibration tile is in place underneath the instrument 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 tile before making the measurement or to “Measure” without performing a calibration. Using the Left/ Right (3) and Enter (4) buttons on the keypad the required option can be selected.

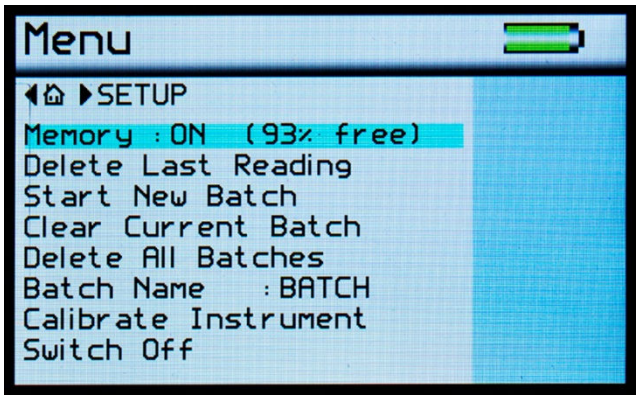
By selecting “Calibrate” the instrument will perform a calibration and display a confirmation dialogue box when completed. Selecting the “Confirm” option will save the calibration information to the instruments memory, which will also be confirmed by the calibration tile 45/0° readings appearing on the instruments display.

Alternatively if “Cancel” is selected the display will return to the home screen.
By selecting “Measure” the instrument will perform a measurement and after 3 -4 seconds display the results.

Pressing the Down button accesses the Menu Screen.

Menu Screen

The Menu Screen is used for quick access to often used options. Pressing the Up and Down buttons navigates through the options, pressing the Enter button selects that option.



Selectable settings in the menu screen are:-

Memory – Set to ON, enables storage and batching of measurement results. The amount of available storage memory is also displayed.

Set to OFF – disables result storage.

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”.

Switch Off – Turn off the instrument.

Pressing the Left button returns the display to the home screen.
Pressing the Right button will 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 the 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 Batch Data

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

A new device name "DUO-PLUS" 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) that contains Measurement Data, Time and Date of Reading, and Serial Number.

Each reading also contains the statistics for the batch up to and including that reading. To access the STATISTICS for the whole batch, the last reading in the batch should be examined.

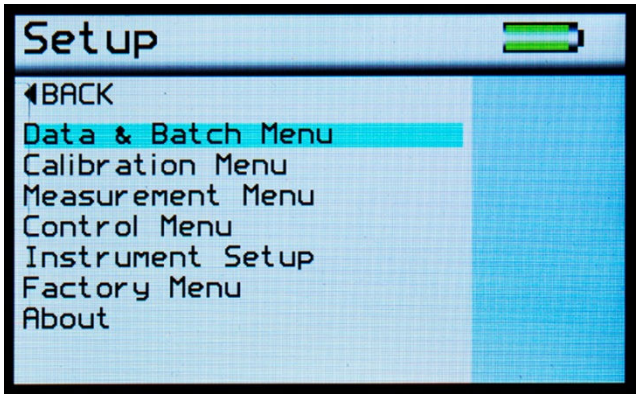
User Defined Batch Names

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 Screen



The Setup Screen is used to customise the instrument to the user's preference. Pressing the Up and Down buttons navigates through the options, pressing the Enter button selects that option.

Data and Batch Menu - Batch / Data options (See Data & Batch Menu Screen)

Calibration Menu - Calibration options (See Calibration Menu Screen)

Measurement Menu – Measurement mode 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

Pressing the Left button returns the display to the home screen.

Data & Batch Screen

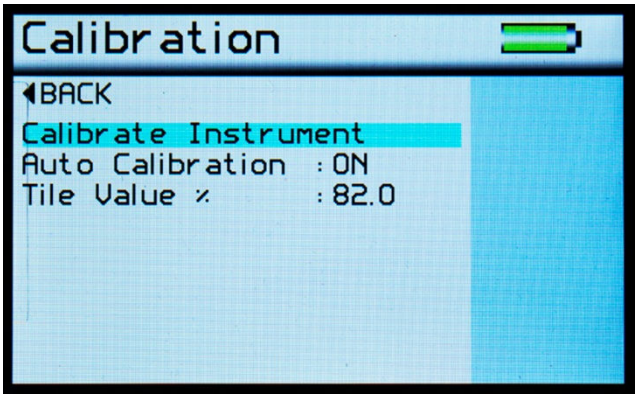
The Data Screen is similar in functionality to that of the menu screen but also allows the selection and setting of the Auto Batch size.

By selecting Auto Batch to ON the batch size can be selected between 1 - 999 by pressing the Left and Right buttons to select the relevant digit and the Up and Down buttons to increment / decrement the value. Pressing the Enter button saves 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.

Pressing the Left button returns the display to the home screen.

Calibration Screen



The Calibration Screen is used to setup the instrument calibration to the user's preference. Pressing the Up and Down buttons navigates through the options, pressing the Enter button selects that option.

Selectable settings 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.

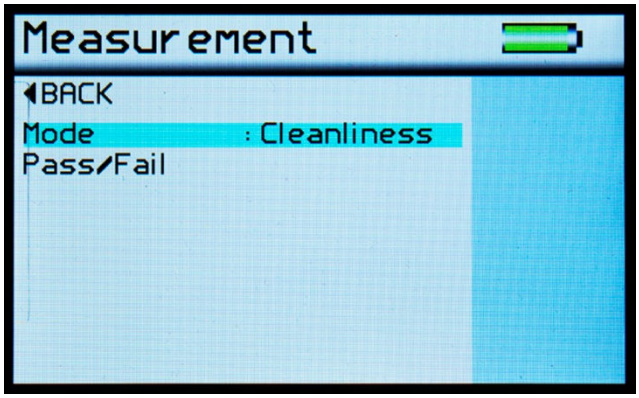
Set to OFF, the dialogue box is disabled; measurements are made.

Tile Value % - Set t the calibration value for the standard being used for calibration.

Pressing the Enter button selects the value. Pressing the Left and Right buttons selects the relevant digit and the Up and Down buttons increment / decrement the value.

Pressing the Enter button again saves the value.

Measurement Screen



The Measurement Screen is used to configure the instruments measurement mode to the user's preference. Pressing the Up and Down buttons navigates through the options, pressing the Enter button selects that option.

Selectable settings in the Measurement screen are:-

Mode- selects one of the following operation modes:-

Opacity – Selects Opacity mode (Operation as detailed under Opacity)

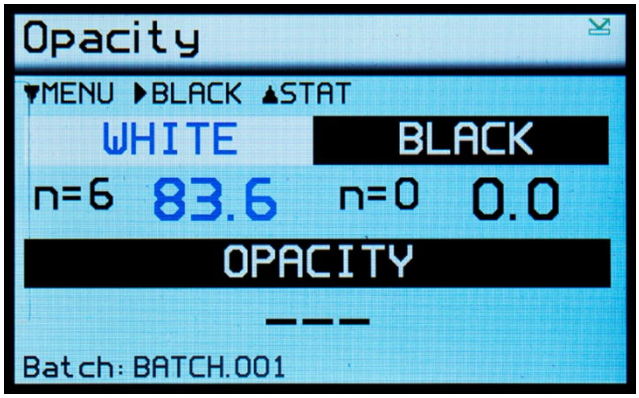
Shade – Selects Shade mode (Operation as detailed under Shade)

Cleanliness – Selects Cleanliness mode (Operation as detailed under Cleanliness)

Pass/Fail – enters the Pass/Fail setting screen (Operation as detailed under Pass/Fail Screen)

Pressing the Left button returns the display to the home screen.

Opacity



In Opacity mode the above screen is displayed.

To measure the opacity of a coating it must be drawn down on a Leneta type opacity chart at the required film weight and allowed to fully dry. To measure the opacity of plastic film, paper, textile or any other semi-opaque material, place the sample to be measured over a black and white test bed.

Ensure the instrument is correctly calibrated.

With the instrument set to White (using the left / right arrow buttons) make 6 measurements of the sample on the White substrate, then repeat changing the setting to Black on the Black substrate.

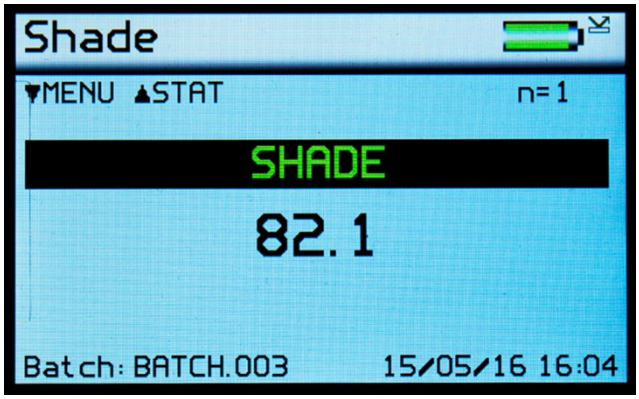
The Opacity will be calculated automatically and displayed at the bottom of the screen.

Press the Up button to display the statistics for this measurement.

Press the Left button to start a new batch.

Press Down to return to the Menu Screen.

Shade



In Shade mode the above screen is displayed.

Ensure the instrument is correctly calibrated.

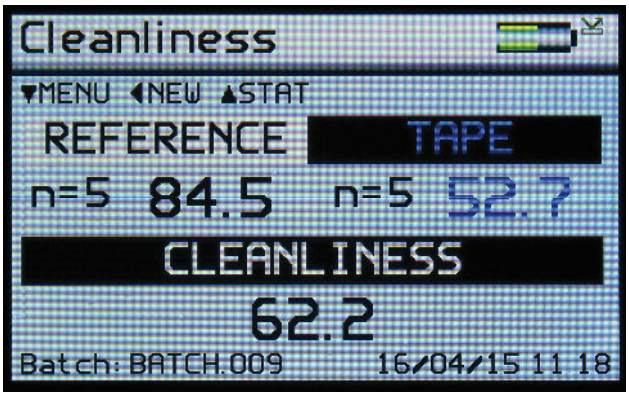
To measure the shade of a coating simply place the instrument on the surface of the sample to be measured and press the Centre button. The value is displayed on the screen. The shade measurement is based on a greyscale value where Black is zero and White is the value of the calibration standard.

Press the Up button to display the statistics for this measurement.

Press the Left button to start a new batch.

Press Down to return to the Menu Screen.

Cleanliness



In Cleanliness mode the above screen is displayed.

Ensure the instrument is correctly calibrated.

To measure cleanliness clear tape is used to collect debris from the surface under test. This is then stuck to any suitable white substrate along with a sample of tape that is perfectly clean.

With the instrument set to Reference (using the left / right arrow buttons) make up to 9 measurements of the reference sample on the substrate, then repeat changing the setting to Tape on the sample containing the debris.

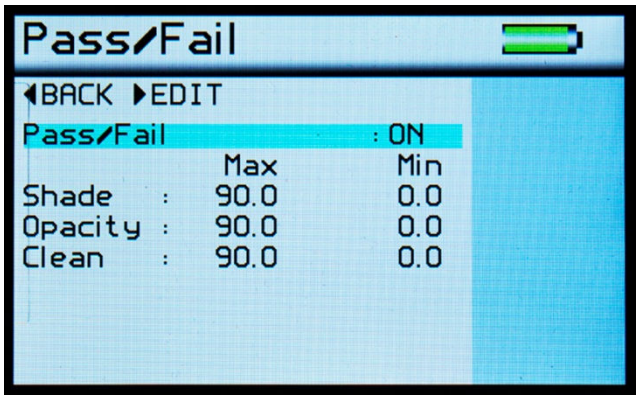
The Cleanliness will be calculated automatically and displayed at the bottom of the screen.

Press the Up button to display the statistics for this measurement.

Press the Left button to start a new batch.

Press Down to return to the Menu Screen.

Pass/Fail Setup Screen

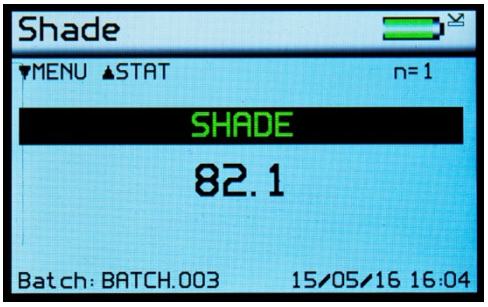


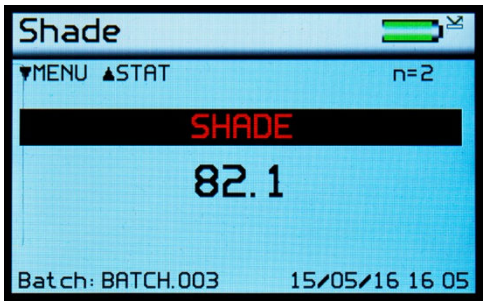
The Pass/Fail setup screen is used to enable/disable on-screen pass/fail indication and set min/max tolerancing.

The down key should be used to navigate to the Pass/Fail option and the center button pressed to toggle the feature on and off.

Pressing the right navigation button allows the user to edit pass & fail criteria.

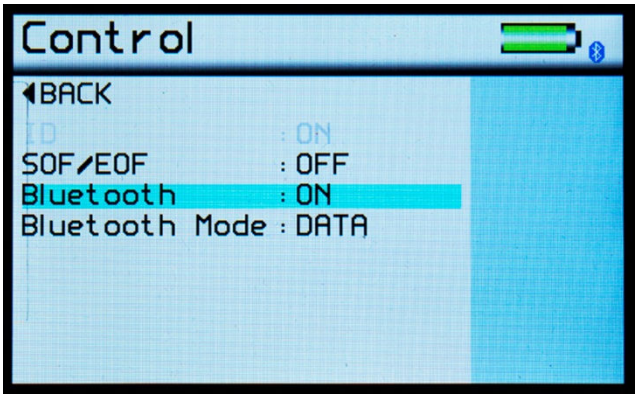
Once the Pass/Fail feature is enabled, any measurement which falls between the max and min values will be considered a pass and its header text will be coloured green. Readings above the max value or below min value will be deemed a fail and header text will be coloured red. Saved data and data transmitted by Bluetooth will also contain a pass/fail field.





Select the done option to complete this process.

Control Screen



The Control Screen is used to configure the instruments Bluetooth parameters to the user's preference. Pressing the Up and Down buttons navigates through the options, pressing the Enter button selects that option.

Selectable settings in the Control screen are:-

ID – Sends instrument ID via Bluetooth

SOF/EOF – Selects whether or not flow control commands are sent

Bluetooth – Selects Bluetooth ON or OFF

Bluetooth mode - Data - Basic data transfer mode (transmits On-Screen Parameters)

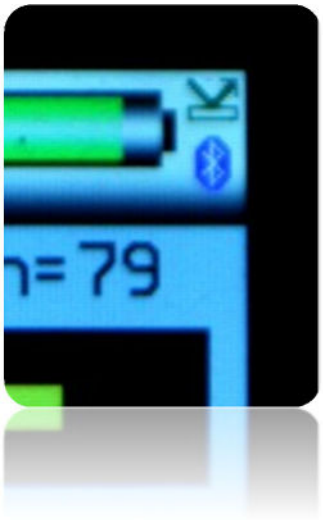
Pressing the Left button returns the display to the home screen.

Bluetooth Communication and Pairing

The Novo-Shade Duo + has a Bluetooth function that allows readings to be instantly transmitted to a compatible PC.
Measurement data including instrument serial number and service/calibration information can be instantly accessed by many PC applications including Excel, Word, Wordpad, OpenOffice or SPC packages.

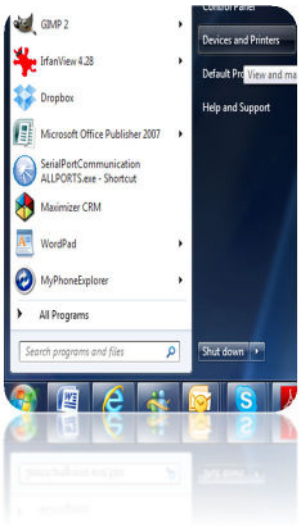
Pairing Procedure

Switch on the Novo-Shade Duo +.



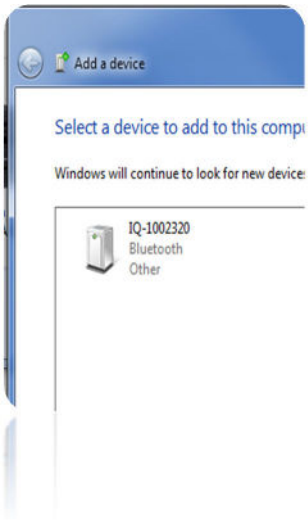
1. The Bluetooth icon must be visible to allow pairing.

2. If the Bluetooth icon is not visible, enable it as detailed in Control Screen.
   Ensure that Bluetooth mode is set to either Data or Data+

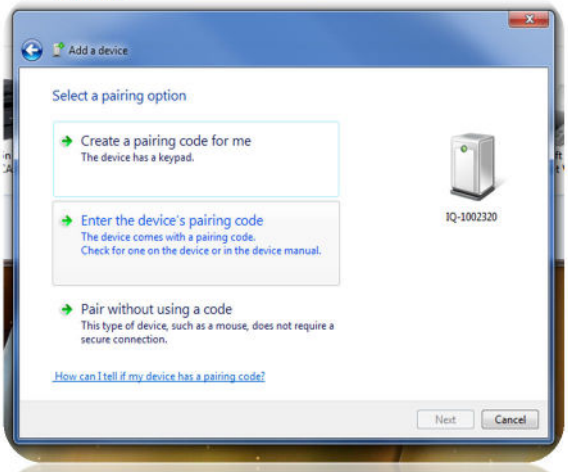


3. In Windows, go to START menu and select “Devices and Printers.”

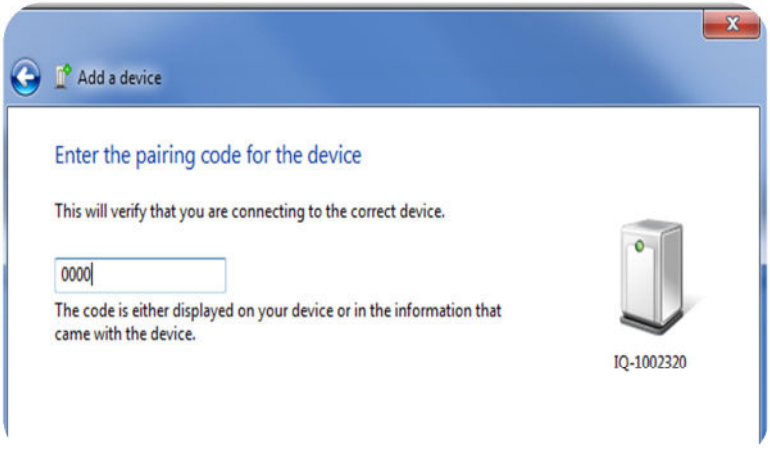
4. In Devices and Printers screen Click "Add a device"



5. Windows will now search for available Bluetooth devices, double click on the icon that corresponds to the IQ instrument.

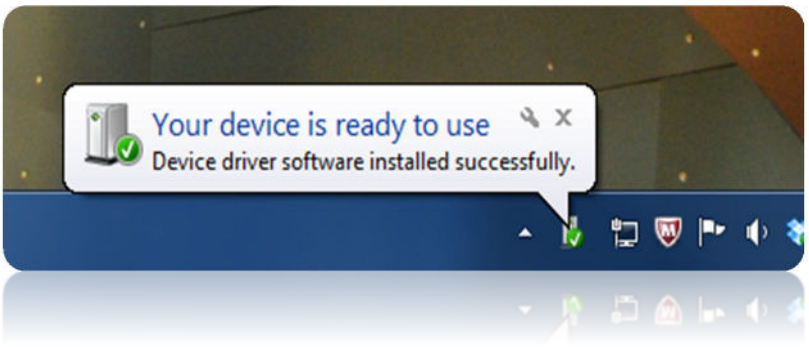


6: Click "Enter the devices pairing code" in the “Add a device” screen.



7: Enter the pairing code "0000".

Make sure the IQ remains switched on throughout this process, to disable or extend auto power off refer to instructions detailed in Instrument Setup Screen that follow.



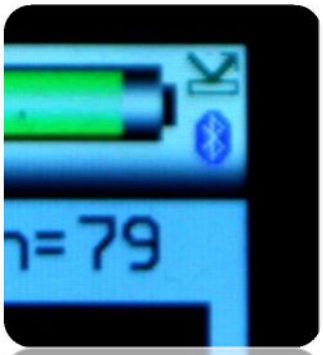
8. The IQ is now installed on your PC and ready for connection to the Bluetooth Data Widget.

It is important to wait until windows displays the “Your device is ready to use” message before starting the data widget.

Bluetooth Data Widget Installation Instructions

The Bluetooth (BT) Data Widget software supplied with the instrument is a mini program that converts transmitted measurement data into keystrokes that are automatically input into any open PC program.

1. Install the BT Data Widget software (BTdatawidget.exe) found on the cd supplied with the instrument.



2. Check Bluetooth is switched on and that the instrument has been paired correctly

3. On the desktop click on the “Data Widget” icon to start

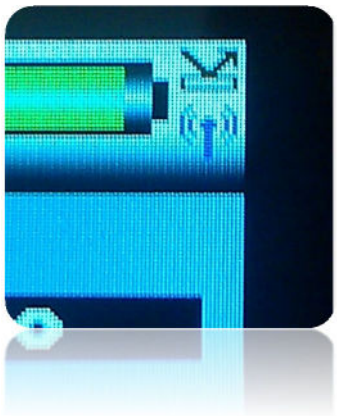
4. Click on the blue "refresh "arrow to search for paired IQ(s).

5. The buttons are greyed out while the DATA widget searches for SWITCHED ON IQ(s) that have been PAIRED to the PC.

6. Look in the data widget drop down box to see discovered instruments.

7. Select the instrument required.

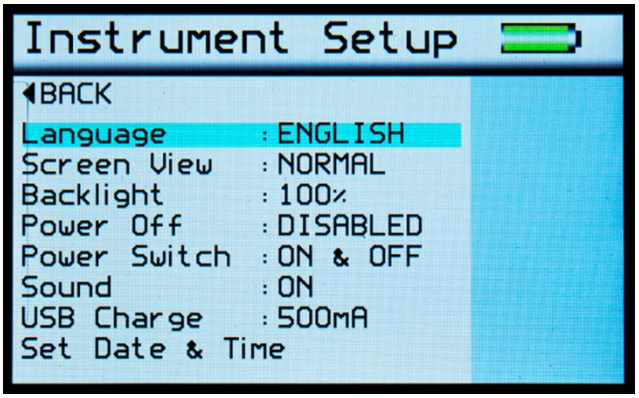
8. Click the tick to connect the instrument.



9. The transmitter icon now appears on the IQ.

All readings will now be automatically transferred to any open windows package.
Download example EXCEL spreadsheets from Rhopoint's website.

Instrument Setup Screen



The Instrument Setup screen is used to configure the instruments basic operating environment to the user's preference. Pressing the Up and Down buttons navigates through the options, pressing the Enter button selects that option.

Selectable settings in the Instrument Setup screen are:-

Language – Set instrument language to English (default), Spanish, Italian, French, German, Chinese

Screen View – Set the orientation of the screen as NORMAL, or INVERTED

Backlight – Set screen intensity to either 20%, 40%, 60%, 80% or 100% brightness

Power Off – Set instrument to automatically power off after either 30sec, 60sec, 90 sec or 120 sec or inactivity or DISABLE this feature

Power Switch – Set On/Off button to switch the instrument ON ONLY or to switch the instrument ON & OFF.

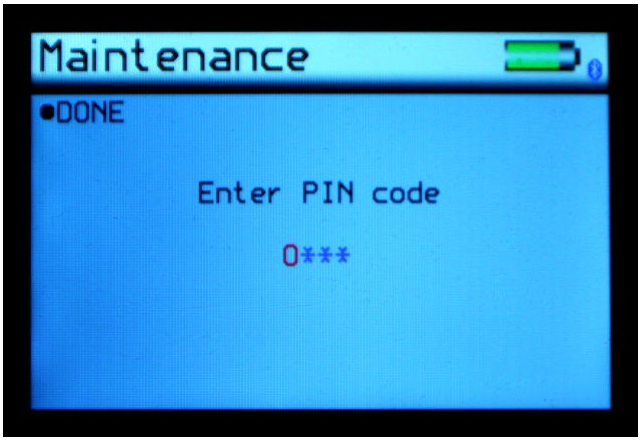
Sound – Enable or disable button press sound

USB Charge – Set the USB charge current to either 500mA or 100/500mA

Set Date & Time – Set the date and time on the instrument. Press the Down button to set time. Pressing the Left and Right buttons selects the date or time and the Up and Down buttons increment / decrement the value. Pressing the Enter button again saves the value.

Pressing the Left button returns the display to the home screen

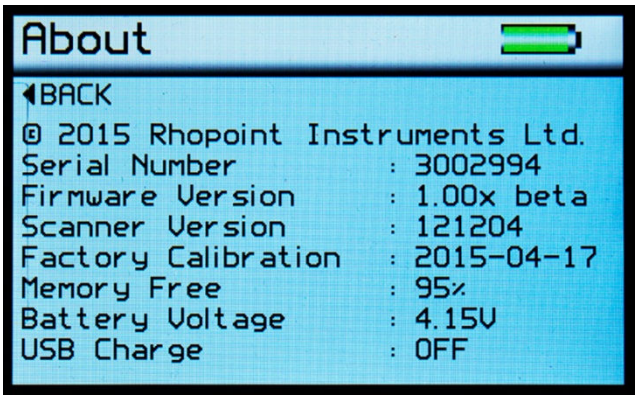
Maintenance Screen



The Maintenance screen is used by Rhopoint Approved Service Centres.
It is PIN locked to prevented unauthorised access.
There are no user configurable settings available.

Pressing the Enter button returns

About Screen



The About screen is for information only.
It is provides information relating to the instruments software, the instrument serial number and last date of Factory Calibration.
It also shows the amount of free memory available and battery power status.

Notes

Instrument Specification

Colour Screen

• Adjustable Brightness 6 Button Touch Sensitive Interface

Statistical Analysis

• Max, Min, Mean, S.D.

Graphical Analysis

• On board trend analysis

Power

• Rechargeable Lithium Ion
• >17 Hours operation
• >20,000+ Readings/Charge

Recharge Time

• USB Mains Charger 4 Hrs.

Standards

• ISO 2814, 6504, BS 3900-D4, D7, ASTM E97, E1347, D4214,ASTM D2805, D589

Memory

• 8 MB = 999 readings
• User definable alphanumeric batching

Data Transfer

• Bluetooth
• PC compatible
• USB connection, no software installation required

Performance

• Resolution 0.1
• Repeatability 0.2%
• Reproduceability 0.5%
• Operating temperature 15 - 40° C (60 - 104° F)
• Humidity up to 85%, non-condensing

Dimensions & Weights

• 65mm x 140mm x 50mm (H x W x D)
• 790g
• Packed weight: 1.75kg
• Packed dimensions: 180mm x 330mm x 280mm (H x W x D)
• Commodity code: 9027 5000
• Order Code: A4000-005

Measurement Units

Shade mode -

0 = black – no reflectance
100 = brilliant white – full reflectance

Opacity mode -

0 = completely transparent
100 = fully opaque

Cleanliness mode -

0 = No change
100 = Maximum change