

Genie[®] II

User Manual

(Instrument Software Version v2.25)



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Table of Contents

SAFETY NOTICES	3	To load a saved profile	18
SUPPORT	5	Active	20
How to obtain support.....	5	Profile	20
Supported consumables	5	Temperature.....	20
BOX CONTENTS.....	6	Amplification	21
SITE PREPARATION	7	Anneal.....	21
How to set up Genie® II	7	Results	22
Connections	8	View	22
Opening & Closing the Lids.....	8	CONNECTING TO A COMPUTER.....	25
Inserting Tubes	9	Genie® II Software updates	28
Battery	9	GENIE® II TECHNICAL SPECIFICATION	
Battery monitor	10	30
Screen Brightness Control	11		
USER INTERFACE	12		
Genie® II Welcome Screen.....	12		
Main Menu	13		
Toolbox	13		
Buttons.....	13		
Power.....	14		
Colours	14		
Utilities.....	14		
Touchscreen calibration	15		
Date and Time.....	15		
Run	16		
Quick Start	16		
Profile Screen.....	16		
To create a new profile.....	17		

SAFETY NOTICES

Please read the following notices carefully before using Genie® II.

The equipment supplied has been designed to be completely safe to use. However to avoid any risk to the safety of the equipment, operator, or anybody in the vicinity of the equipment, please read this chapter before unpacking and using the instrument. If there is any doubt as to the correct use of the equipment contact the vendor.

Notices



Using the instrument in a manner not specified by OptiGene may result in personal injury or damage to the instrument.



Always ensure that the surface on which the instrument is placed is level and stable and will not cause the instrument to topple over. Ensure that the surface is suitable for the weight and size of the instrument. If the instrument is dropped it may be damaged.



The instrument should never be lifted by its covers. Always ensure that the base or sides are used as the lifting point.



The instrument is electrically powered. Please ensure that the correct voltage settings have been applied before applying power to the instrument. If in doubt consult a qualified electrician. The instrument has a rating label affixed to the rear. Please consult this if needed.



Always disconnect the equipment before moving or removing any guards or covers. Switch off at the mains, remove the mains plug from the wall socket and remove the cable from the inlet socket on the rear.



While every effort has been made to protect the inside of the instrument against splashes, the instrument carries no IP rating. If fluids are spilt on the instrument they may cause damage and cause an electrical hazard.



If a spill occurs, remove power from the instrument. Do not touch the instrument or any fluid flowing from it while it is connected to the mains supply. Always follow local health and safety guidelines.

Normal safe local operating standards should be applied at all times. The warnings above are for guidance only. Please consult the instrument supplier if there is any doubt.

Disconnection Method



Genie® II is disconnected by removal of incoming mains power source to the unit. Following disconnection the unit should be left for a period of at least 5 minutes before any internal assemblies are removed or examined.



When in use the heating blocks and heated lids are hot, so allow to cool before touching the surfaces.



Safe removal of fluids from Genie® II will depend on the chemistry used. This will also require knowledge of the fluids used in the system to adhere with local health and safety and COSHH regulations. If in doubt, consult the person responsible for the equipment in the laboratory.

Cleaning Method

The Genie® II can be disinfected using the following procedure. This same procedure can be used as a safety measure if this equipment is routinely exposed to bio-hazardous materials.

1. Wipe all outside surfaces of the Genie® II with a 10% bleach solution.
2. After 10 minutes wipe all the same surfaces with a 70% ethanol solution.

CAUTION: Do not allow any of the bleach or alcohol solution to enter the wells as this can cause damage.

SUPPORT

HOW TO OBTAIN SUPPORT

For the latest services and support information go to <http://www.optigene.co.uk/support.htm>

IMPORTANT! When directed to do so, contact OptiGene Ltd. to schedule maintenance or calibration of a Genie® II instrument.

IMPORTANT! If a Genie® II instrument is kept in a very cold environment, the battery will not begin charging until the internal temperature has reached 15°C.

SUPPORTED CONSUMABLES

IMPORTANT! Genie® II uses a proprietary tube strip that maximises optical and thermal efficiencies. **Other tubes and strips will not fit.**

IMPORTANT! Forcing non-supported consumables will cause damage to the instrument and invalidate the warranty.

IMPORTANT! The shape of the tubes is such that they will only fit in one way round. The locating pins on the block have corresponding holes in the strips.

BOX CONTENTS

The following is a list of contents in the box for Genie® II:

- Genie® II instrument
- Power supply
- Power lead
- USB connection lead
- Stylus
- USB memory stick containing Genie® Explorer and this manual as a '.PDF' file

SITE PREPARATION

HOW TO SET UP GENIE® II

The laboratory bench should be level and stable. The instrument should be placed centrally on the lab bench and the surfaces surrounding the instrument must be clear of obstructions at all times.

Care must be taken not to unduly restrict the air at the front of the instrument and the outlet vents at the rear. Restricting airflow may impede operation and could affect performance.

Electrical points should be close to the instrument to avoid injury from trailing wires.

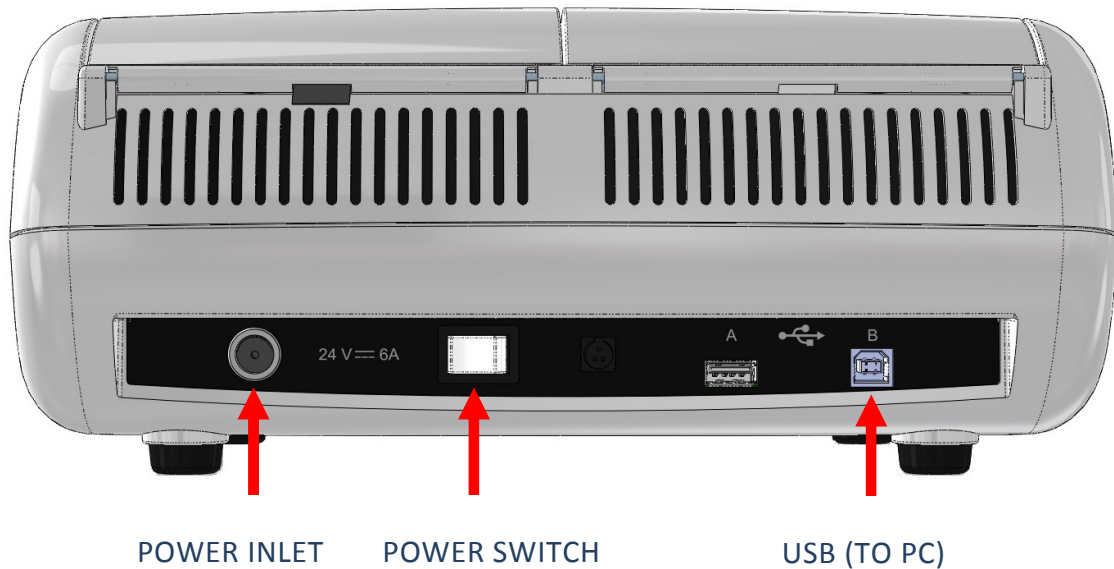
It is recommended that the instrument is kept away from sinks and other wet areas. Genie® II is an electrical instrument and care should be taken not to operate if there is a risk of water damage.

CONNECTIONS

Genie® II is ready to use straight out of the box without any external connections. It can be operated standalone, taking power from its internal battery. In order to charge the battery or to use Genie® II with a computer, some connections must be made.

Connect the power supply plug into the back of the instrument and then attach the power cable to the supply.

Located at the rear of the instrument is an on/off power switch. When in the on position Genie® II will power up and progress through its checks.



OPENING & CLOSING THE LIDS

Gently lift the lids upwards. Close the lids by lowering gently.



Care must be taken to ensure that objects are not obstructing the lids when trying to close it and under no circumstances should the lids be forced open or closed.

INSERTING TUBES

IMPORTANT! Genie® II uses a proprietary tube strip that maximises optical and thermal efficiencies. Other tubes and strips will not fit.

IMPORTANT! The shape of the tubes is such that they will only fit in one way round. The locating pins on the block have corresponding holes in the strips.

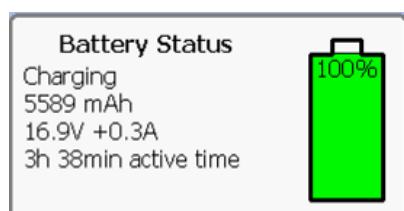
BATTERY

Genie® II has an internal rechargeable battery. When Genie® II is delivered the battery should be fully charged and ready for use.

The battery monitor is on the status bar next to the block temperature reading.



To see more details on the battery, press the battery icon and the monitor will appear as a pop-up in the bottom right hand corner of the screen. To remove the pop-up press on the status bar indicator again.



Battery monitor pop-up

IMPORTANT! Genie® II's internal battery will only charge when the instrument is plugged into mains electricity and the instrument is switched on. Genie® II can be placed into standby using the power button in the bottom left corner. The LED above the display will glow brightly until the battery is fully charged. At this point Genie® II can be switched off using the switch on the rear.



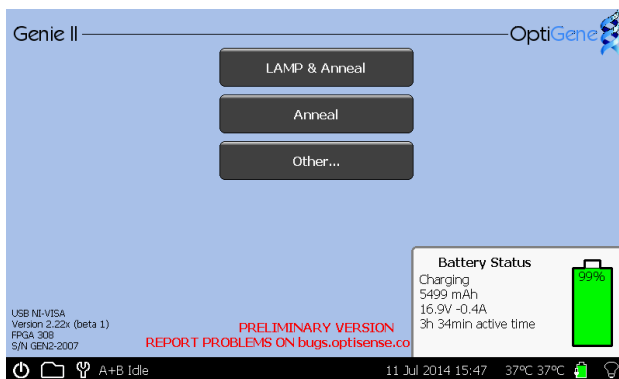
Note: If this button is pressed during a run, Genie® II will not enter standby.

When in standby, normal operation can be resumed by pressing anywhere on the screen.

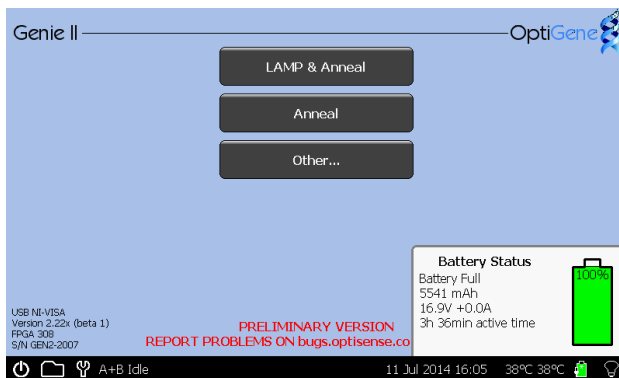
BATTERY MONITOR



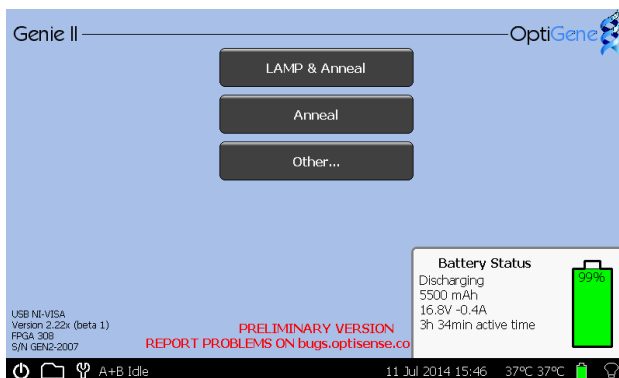
The battery status can be seen but there is no pop-up.



Here the pop-up shows that the battery is currently charging.



Here the pop-up shows that the battery is fully charged.



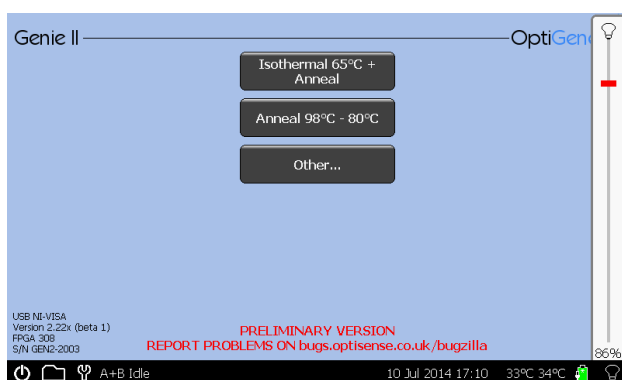
Here the pop-up shows that the instrument is discharging.

SCREEN BRIGHTNESS CONTROL

Next to the battery icon is the brightness control.



Touch the icon and a slider will appear on the right hand side of the screen. Move the slider to the desired position. Press the icon again to remove the slider.



It is not recommended to set the brightness at 100% for long periods of time, as this will significantly decrease battery life.

USER INTERFACE

Genie® II uses a touchscreen for viewing and inputting data.

Touch the screen gently and press the appropriate keys when required. The touch screen can be operated while wearing protective gloves or by using the stylus included with the instrument.

IMPORTANT! Do not use a pen or any other sharp implements to touch the screen.

GENIE® II WELCOME SCREEN


When switching on, the LED above the screen will be **amber** in colour. Wait for the light to change to **green**, then touch the screen to access the main menu.




MAIN MENU



To start a predefined run, touch the name of the assay and it will begin. Alternatively, touch 'Other...' to create a new profile, or open a saved profile.

To view profiles or data from previous runs touch the folder icon  on the status bar.

To access the toolbox touch the spanner icon  on the status bar.

IMPORTANT! When running for the first time check that the date and time on the status bar are correct. These can be changed by clicking on the date and time.

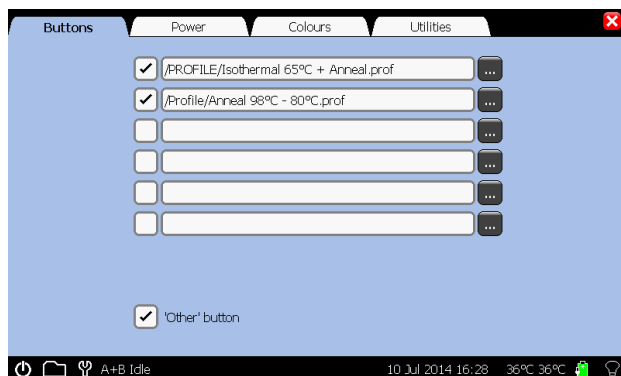


TOOLBOX

Pressing the spanner icon in the taskbar will load the toolbox.



BUTTONS

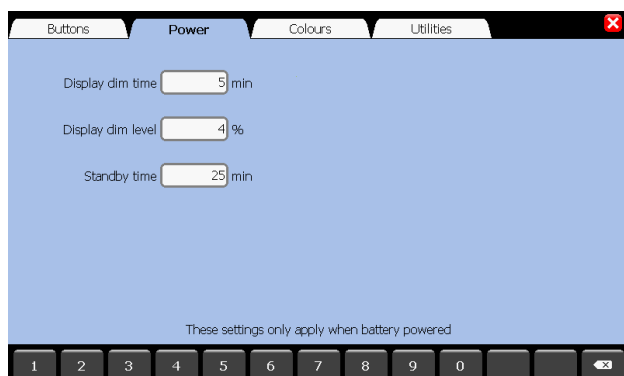


Set up the quick start buttons on the main screen.

Touching '...' will allow the user to browse the saved profiles on the instrument and assign that profile to the corresponding quick start button on the main screen.

To remove the buttons, untick the box next to the profile name.

POWER



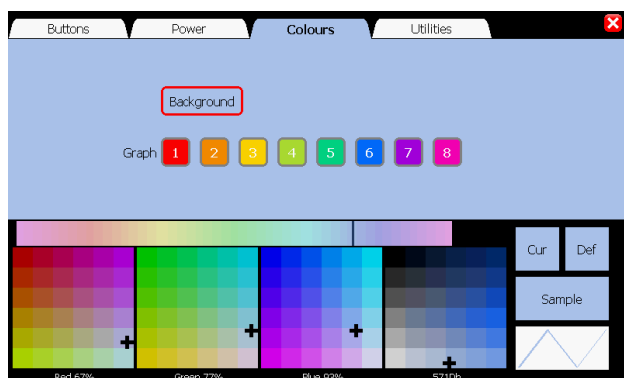
These settings only apply when battery powered.

Display dim time: how long the instrument waits without input before dimming the display.

Display dim level: the brightness level the instrument will use after the specified idle time.

Standby time: how long the instrument waits before turning off the display.

COLOURS

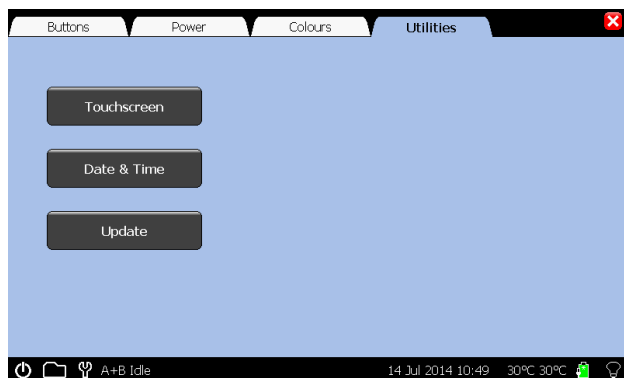


The background colour and the default colours of the lines on graphs can be changed here.

Click the background button or a graph number and then drag the cursor on the colour chart to select a colour.

The two small coloured boxes on the right show the colour that is currently set (Cur.) and the default (Def.) colour. Pressing on either will set the colour.

UTILITIES

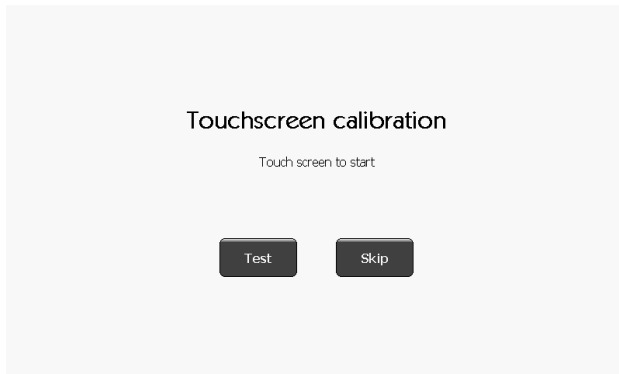


Touchscreen: This will start the touchscreen calibration (see below).

Date & Time: Set the time and date within the instrument.

Update: Allows updating of the instrument software (See Chapter 6).

TOUCHSCREEN CALIBRATION



Touching anywhere on the screen with the exception of 'Test' or 'Skip' will invoke the touchscreen calibration.

To check the sensitivity of the screen press 'Test'. Any point pressed on the screen will then be marked.



Calibrate the touchscreen by touching the target points shown on the screen (the stylus should be used for this).

It is also possible to run the touchscreen calibration when the instrument first starts. Press and hold down on the welcome screen for 5 seconds to initiate.

DATE AND TIME



Date: click in the white box for date and enter in the format DD/MM/YY.

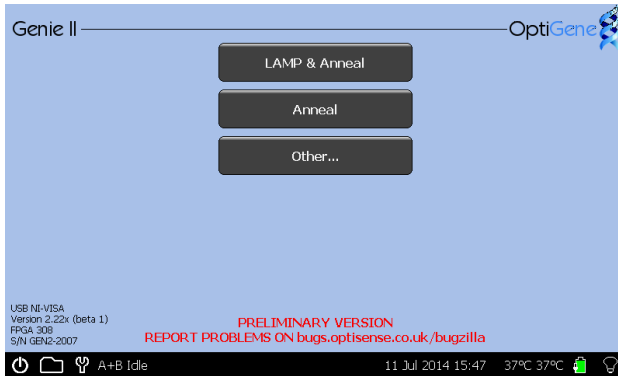
Time: click in the white box for time and enter in the format HH:MM:SS.

Press 'Set' to save or click the cross to cancel.

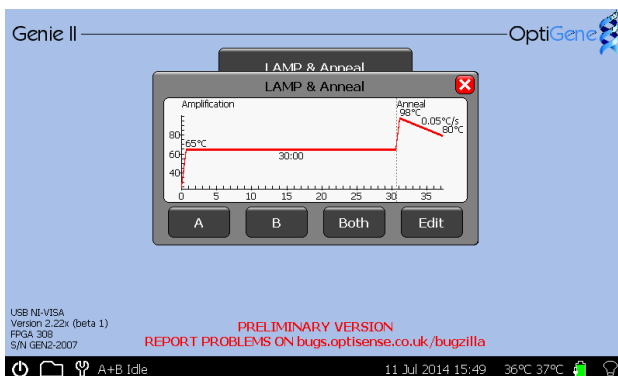
RUN

On Genie® II, there are two ways to start a run: either quick start, by touching one of the predefined profiles saved on the instrument or by creating a new profile. Predefined profiles can only be selected for quick start if they are saved anywhere on the instrument file system.

QUICK START

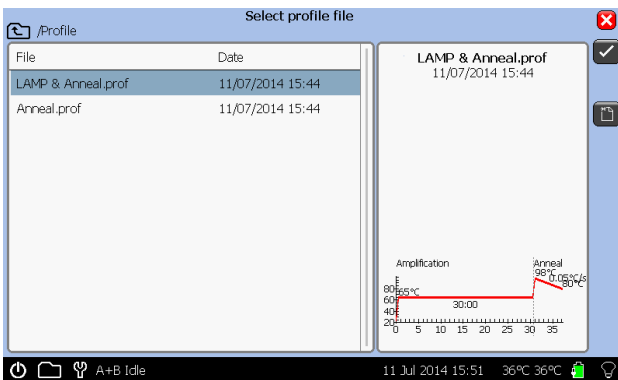


Up to six saved profiles can be shown on the main screen to allow quick starting of an assay. The six profiles are selected from the 'Buttons' page in the Toolbox.




Pressing one of buttons on the main menu will pop-up a preview of the profile, and allows the user to start, edit or cancel the run.

PROFILE SCREEN

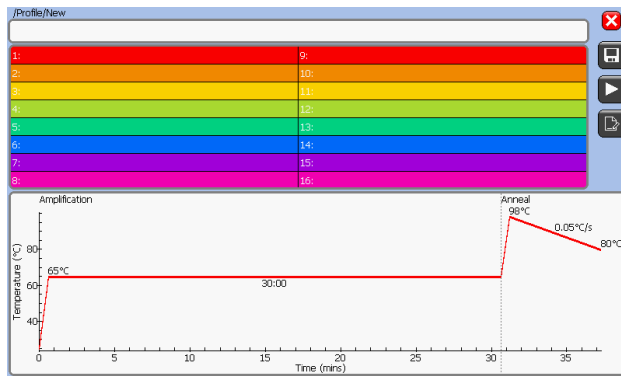


To create a new profile, press the 'Other...' button on the main screen. This allows access to any predefined profiles or creation of a new one. Cancel to return to the main menu.

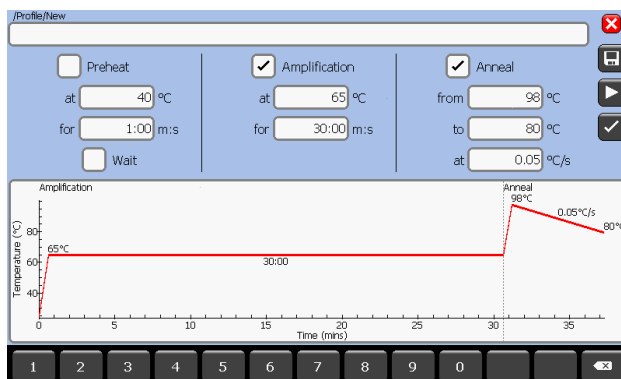
Press the tick to select a file, or  to create a new profile.

If there are many profiles, scroll down by dragging on the window.

TO CREATE A NEW PROFILE

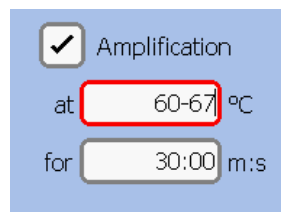


Press the 'New' button on the profile screen. Click the graph to adjust the profile by touching the appropriate temperature or time box.

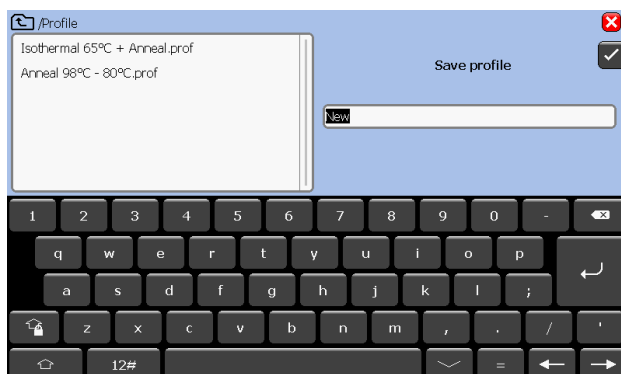


Once the required changes have been made, pressing the tick button will accept the changes. Clicking the cross in the top corner will cancel any changes.

Pressing the play icon will accept the changes and prompt the user to start the run.

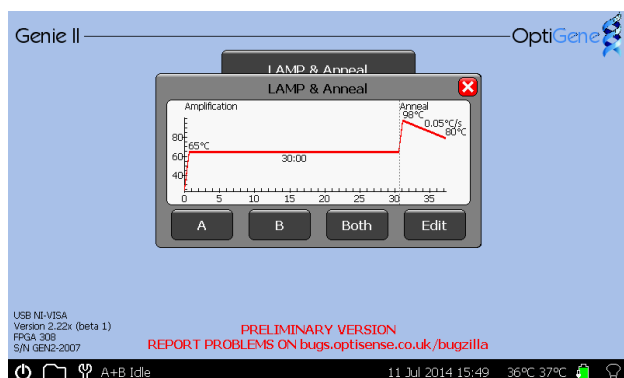


To set a thermal gradient across a block, enter a range of temperatures in the 'Amplification' temperature box. The range of temperatures should be entered separated by a hyphen, as shown below.



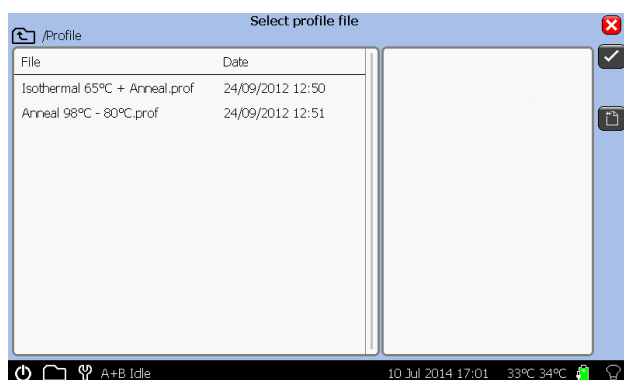
Pressing the save icon will save the profile. Name the profile, press the tick button and it will be saved within the 'PROFILE' directory in the on-board memory allowing it to be loaded for future runs.

TO LOAD A SAVED PROFILE

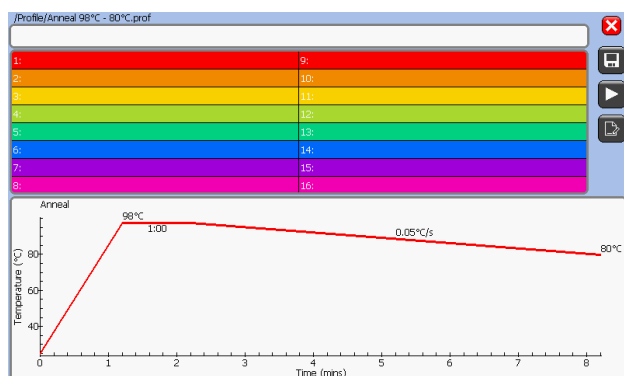


Pressing one of the quick start buttons on the main menu will pop-up a preview of the profile and give the user the choice to start, edit or cancel the run.

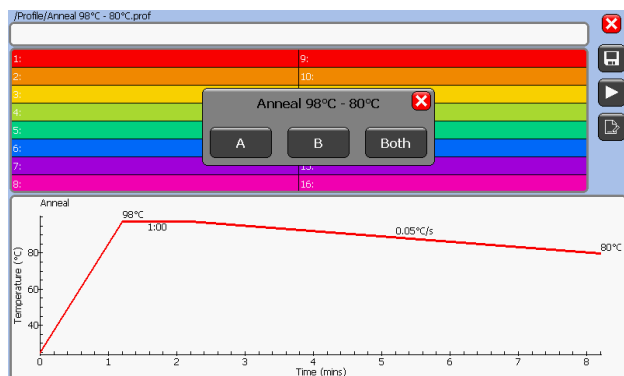
Alternatively, press the 'Other...' button and a file browser will be displayed. Choose the profile to be loaded and press the 'Open' button.



A preview graph will appear, and allow the user to start, edit or cancel the run. Pressing 'Edit' will open the main profile screen.

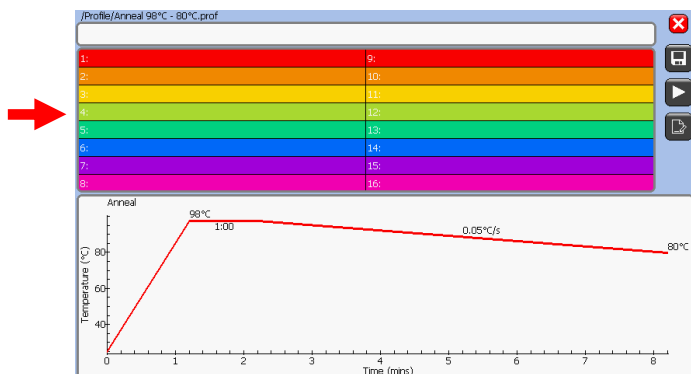


Changes can be made as required. To begin the run, press the play icon.



A prompt will be displayed. Select 'A', 'B' or 'Both' to run or 'Cancel' to abort.

WELL NAMES



To assign names to the block wells, click on the well names area.

The screenshot shows the 'First Block well names & abbreviations' screen. It features a table with columns for 'Well Name' and 'Abbreviation' for wells 1 through 8. A keyboard is visible below the table, indicating that text input is possible.

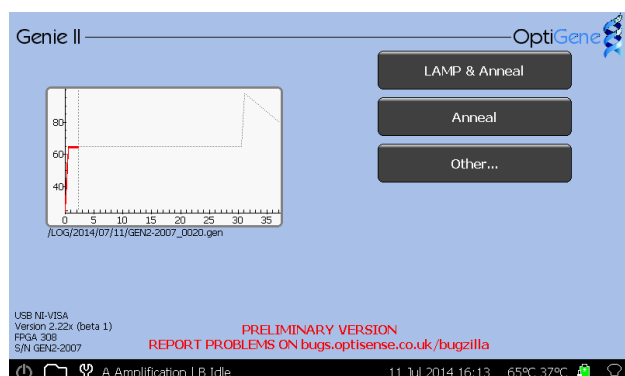
To change a well name, press on the text box and type a name and abbreviation if desired.

The 'AB' button will switch to the second block.

Pressing the cross returns back to the run screen with no changes made to that well.

Pressing the tick button returns to the run screen with changes saved.

If the profile is saved at this point the well names and abbreviations will also be saved as part of the profile. The well names screen can be accessed at any time the instrument is running by clicking on the 'Results' tab and clicking anywhere on the well names column.



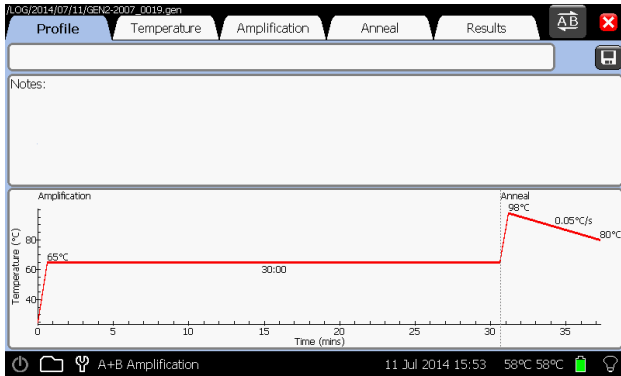
When a run is started, the main screen will display a preview of the run that is active. As the run progresses, the grey line showing the profile will turn red.

Block A will appear on the left, and Block B on the right. If both are started, then the preview will appear in the middle of the page.

Touching the graph will take you to the active screens.

ACTIVE

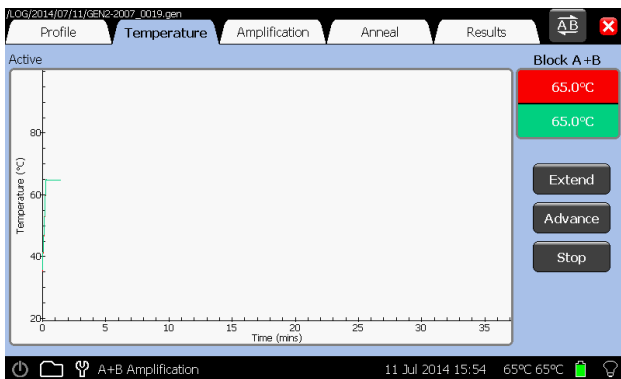
Once a run is started, the software will go to the 'Temperature' screen initially. The other screens can be accessed using the tabs.



PROFILE

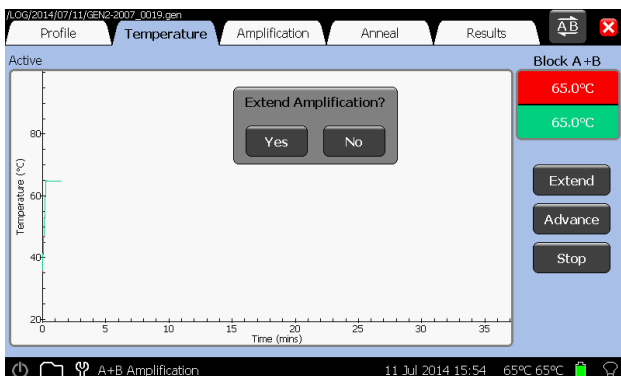
This shows the temperature profile that is running.

At the top of this screen, there is a text box to edit the run description, a button to add notes about the run and a button to save the profile.



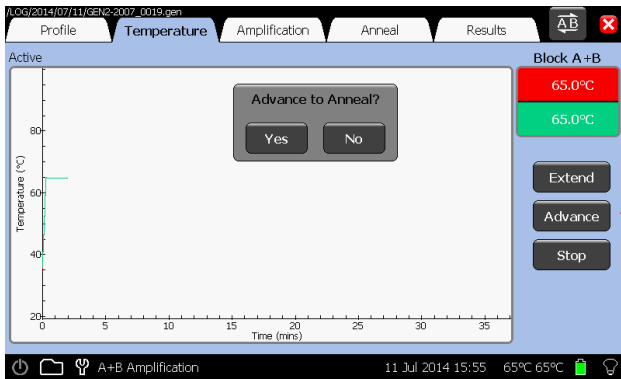
TEMPERATURE

This shows the current temperature of the block as the experiment is progressing.



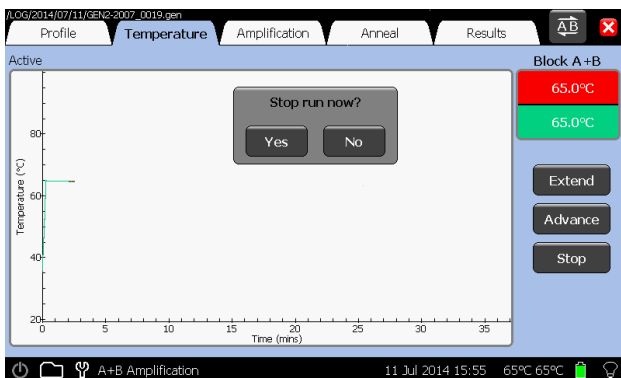
EXTEND

This adds 10 minutes to the current phase of the run.



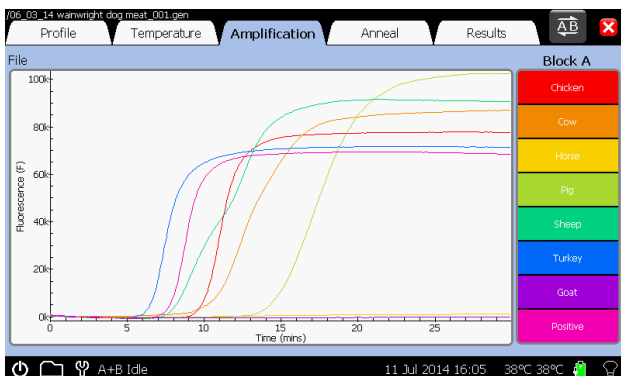
ADVANCE

Advances to the next phase of the run (Preheat to Amplification or Amplification to Anneal).



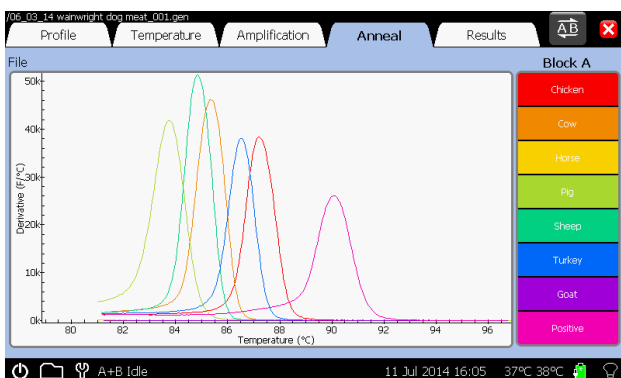
STOP

The 'Stop' button will abort a run in progress. A confirmation pop up box will prompt 'Yes' or 'No'.



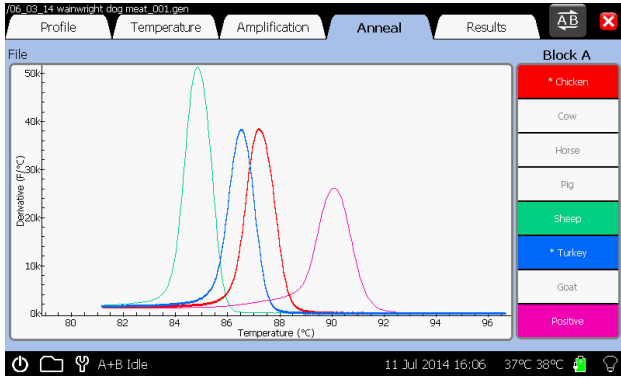
AMPLIFICATION

This shows the fluorescence data that is being acquired during the amplification phase of the experiment.



ANNEAL

This shows the fluorescence derivative data that is being acquired during the anneal phase of the experiment.



SELECTION OF GRAPHS

Pressing the well name on either the 'Amplification' or the 'Anneal' page cycles the state of the related curve on the graph between normal, highlighted and off.

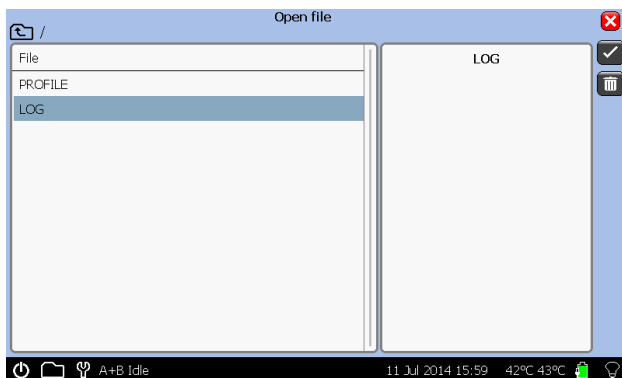
Well	Amplification mm:ss	Anneal °C
A1 Chicken	10:40	87.21
A2 Cow	11:50	85.35
A3 Horse		
A4 Pig	15:50	83.71
A5 Sheep	8:35	84.85
A6 Turkey	7:10	86.54
A7 Goat		
A8 Positive	8:30	90.07

RESULTS

This shows the results of the experiment. Each sample name is shown along with amplification time and anneal temperature.

VIEW

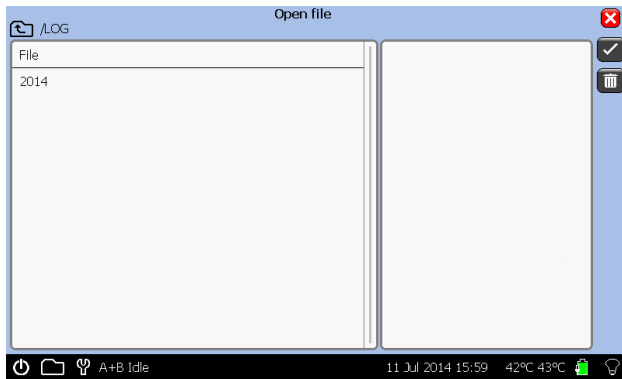
To view previous runs press the folder icon on the status bar.



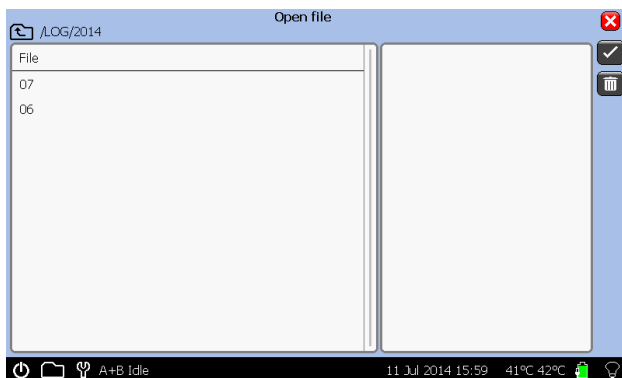
This will display a file browser window.

All Genie® II runs are saved in the 'LOG' folder.

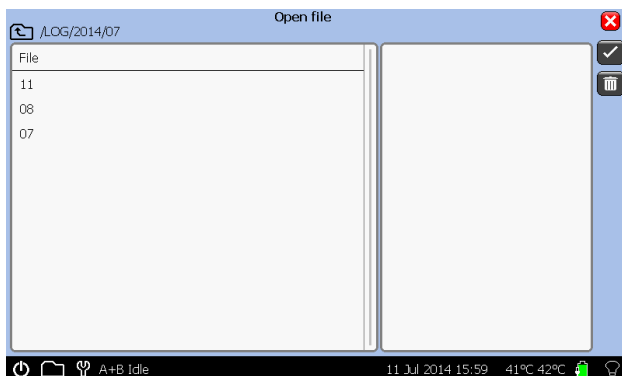
To open, click on 'LOG' and then tick icon, or double press on the folder name.



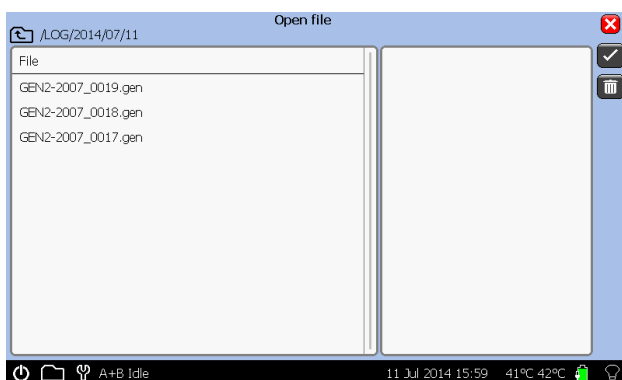
Each run is stored in a folder by date order: **Year**/Month/Day.



Each run is stored in a folder by date order: Year/**Month**/Day.



Each run is stored in a folder by date order: Year/Month/**Day**.



The default filename for the each run is the instrument serial number followed by a sequential number.

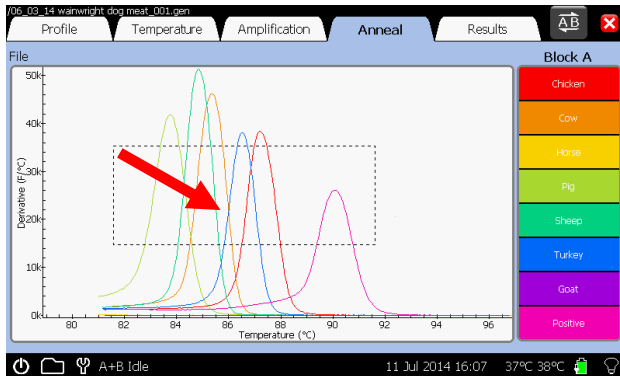
Touch on a file, a preview will appear in the right hand pane, then touch the tick icon to load it.

To delete a file, touch the trash can icon.

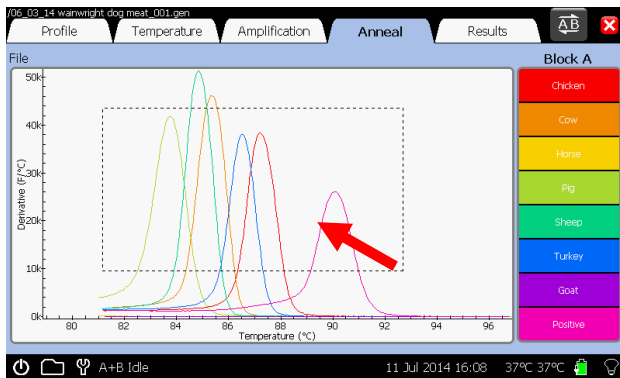
When the file has opened, Genie® II will display the profile that was run, the temperature log, amplification data, anneal data and the results table.

ZOOMING FUNCTION

Zooming is available on temperature, fluorescence and anneal graphs.



To zoom in on the area of interest, touch the plot area and drag to the right and/or down.



To zoom out, touch on the plot area and drag to the left and/or up.

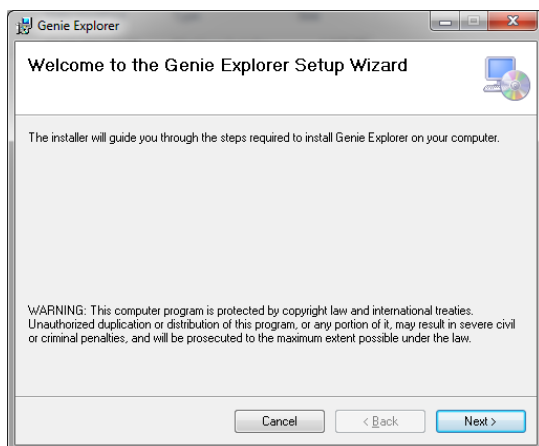
A double press on the screen will zoom out to the full extent of the graphs.

CONNECTING TO A COMPUTER

Genie® II is a standalone instrument; however, for software updates, data upload and additional analysis, it will need to be connected to a PC running Microsoft Windows (XP, Vista & 7).

Disclaimer: Genie® Explorer is an additional tool and should not be used for patient care or clinical analysis.

IMPORTANT! Do not plug any Genie® instrument into the computer before installing Genie® Explorer. Genie® Explorer can be installed from the USB drive included with any Genie® Instrument.



Open the USB drive in 'My Computer'.

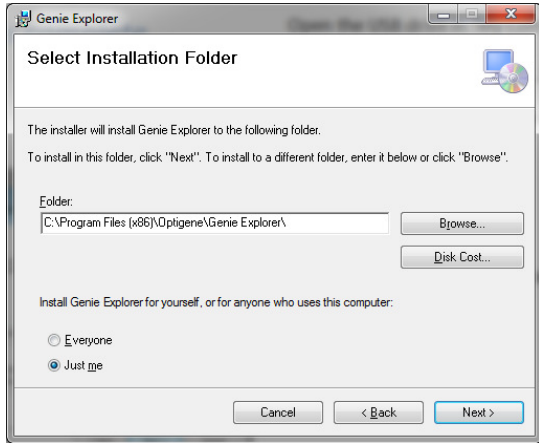
Run the file 'GenieInstall.msi'.

Follow the onscreen instructions.

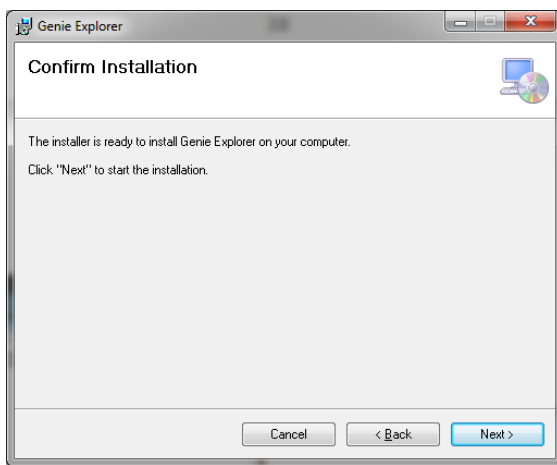
*A prompt may appear requesting installation of .NET Framework 4.0. This must be installed prior to installation.

Follow the link to the Microsoft download page.

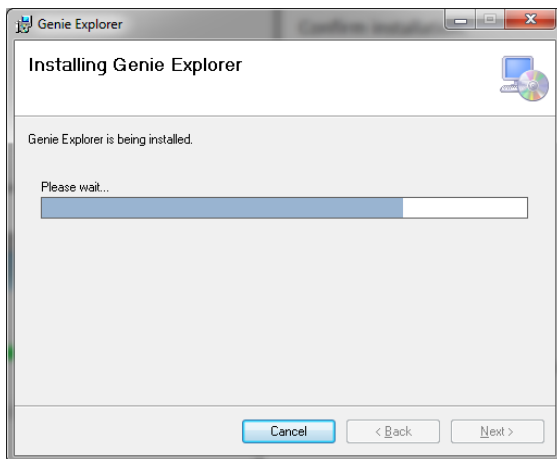
<http://www.microsoft.com/en-gb/download/details.aspx?id=17718>



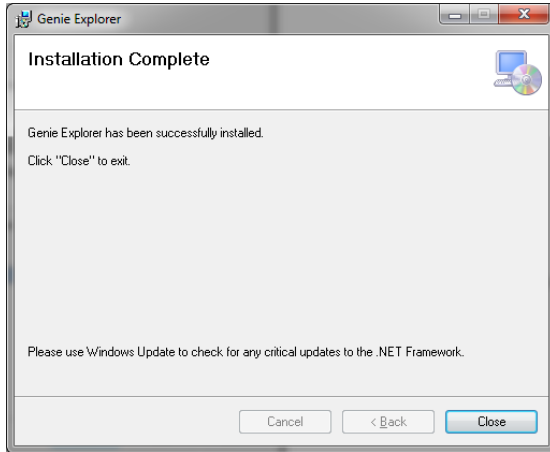
Choose a location for the installed program.



Confirm to start the installation.



The installer will copy all necessary files to the computer.



Once the installation is complete, exit by clicking 'Close'.

A Genie® instrument can now be connected to the computer. When connected via USB and switched on, the Genie® instrument will appear as a USB drive and will be accessible from Genie® Explorer.

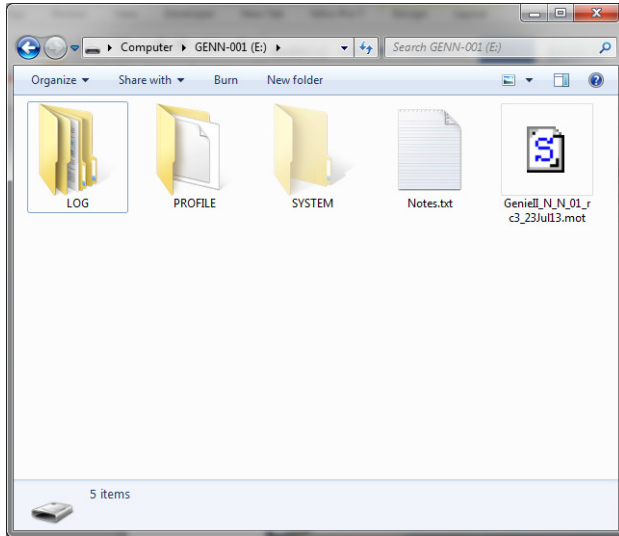
GENIE® II SOFTWARE UPDATES

It is recommended to keep the software on Genie® II up-to-date. Upgrading may improve performance and add new features to Genie® II.

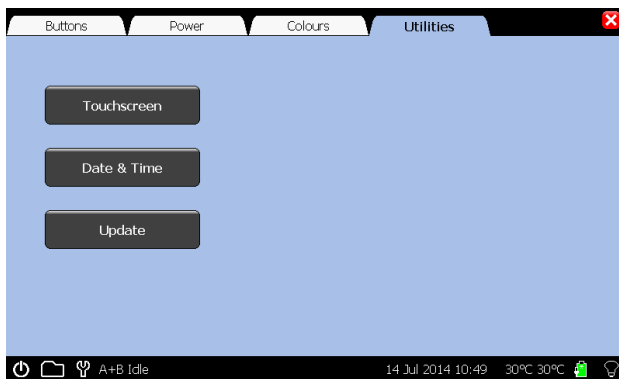
There are two types of software on Genie® II; the firmware, and the FPGA software. The current versions of firmware and FPGA software that are installed on Genie® II are displayed in the bottom left hand corner of the main menu screen.



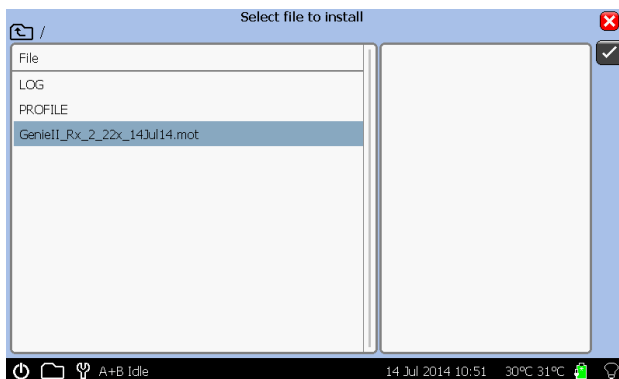
- To download the latest firmware, visit the OptiGene website (<http://www.optigene.co.uk>). Click on 'Support' and click on the appropriate link on the right hand side of the page and download the '.zip' file.
- Open the '.zip' file and extract the contents to a new folder. The contents of the folder will include the latest firmware, FPGA software and this manual.
- If Genie® II already has the latest FPGA software only the firmware will need to be updated.
- If both firmware and FPGA software updates are required, update the FPGA software first, followed by the firmware.
- If it is a firmware update, the file will be a '.mot' file, whereas if it is an FPGA software update it will be a '.rbf' file.



To install the updates, connect Genie® II to a computer. Navigate to 'My Computer' and open the Genie® II drive. The drive is named with the instrument serial number, e.g. GEN2-2001. Copy and paste (or drag) the firmware or FPGA software files onto the Genie® II drive.



Now on Genie® II select the Toolbox, touch the 'Utilities' tab and press 'Update'. Genie® II will prompt for a file to use for the update.



Touch on the file, and touch 'Open'. Genie® II will then install the updated software. Please wait for it to finish before trying to do anything else.

If the update was a firmware update, Genie® II will restart when completed. If an FPGA software update was performed, Genie® II will require a manual restart by turning the instrument off and on from the switch on the rear of the unit.

Genie® II will automatically delete the files when the update has completed.

GENIE[®] II TECHNICAL SPECIFICATION

Sample Number	16 wells (2x8 strips)
Sample Volume	10 μ l to 150 μ l
Touchscreen	High-brightness TFT / LCD module (800x480)
Heater technology	Ceramic substrate with resistive coating
Cooling method	Forced convection
Temperature sensor	High-precision thermistor
Temperature control type	Multi-zone independent digital PID
Temperature control range	ambient - 100 °C
Temperature accuracy	\pm 0.1 °C
Temperature uniformity across block	\pm 0.2 °C
Temperature gradient	Programmable up to 8 °C
Optics source	470 nm LED with high-quality interference filter 40 nm band pass
Detection optics	Photodiode with high-quality interference filter 510 nm long pass
Operating temperature	10 °C - 40 °C
Approvals	CE
Power consumption (maximum)	150W
Dimensions	20cm (H) X 21cm (D) X 30cm (W)
Weight	2kg / 4.4 lb



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Version	Date	Changes	Approved
V1.00	10/07/14	Initial Release	SUL
V1.01	01/04/15	Added disclaimer about Genie Explorer.	SUL
V1.02	17/09/15	Added instrument cleaning guidelines and feedback email address.	SUL
V1.03	03/11/15	Separating Genie Explorer into own manual	SUL