Genie® III

User Manual

(Instrument Software Version v3.11)

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SAFETY NOTICES

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

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.

The instrument carries an IP62 rating. This means it is protected from total dust ingress and protected from water spray less than 15 degrees from vertical. This only applies when the lid on the top and the lip on the back are closed. If fluids are spilt on the instrument when the lid is open 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® III 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 block and heated lid are hot, so allow to cool before touching the surfaces.

Safe removal of fluids from Genie® III 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 which 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 liquid solutions 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® III instrument.

IMPORTANT! If a Genie® III 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® III 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® III:

- Genie® III 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® III

Genie® III has been designed to be used at point-of-care, and so not necessarily in a laboratory. When it is being used, the instrument should be placed on a level and stable surface 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 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.

Genie® III is rated to IP62 which means that it is splash proof, but only when the lid on top and the lip on the back are closed. It is recommended that the instrument is kept away from sinks and other wet areas when running.

CONNECTIONS

Genie® III 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® III 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® III will power up and progress through its checks.

USB (TO PC)   POWER INLET   POWER SWITCH
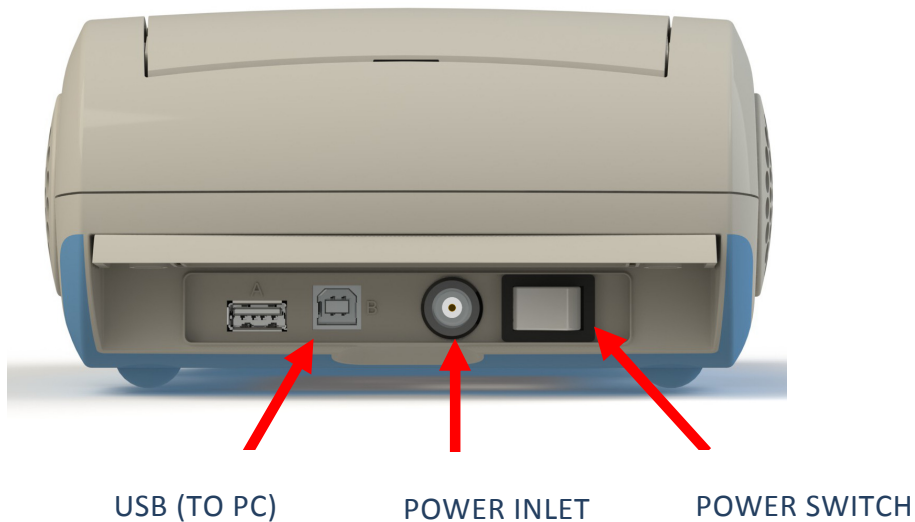
OPENING & CLOSING THE LID

Press the button on the front of the unit and the lid should open upwards. Close the lid by lowering and pressing down firmly.

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

INSERTING TUBES

IMPORTANT! Genie® III 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.
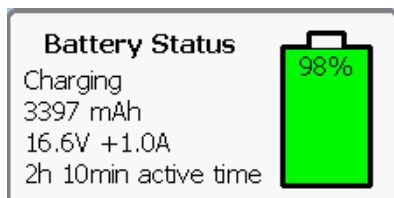
BATTERY

Genie® III has an internal rechargeable battery. When Genie® III 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® III's internal battery will only charge when the instrument is plugged into mains electricity and the instrument is switched on. Genie® III can be shut down 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® III can be switched off using the switch on the rear.
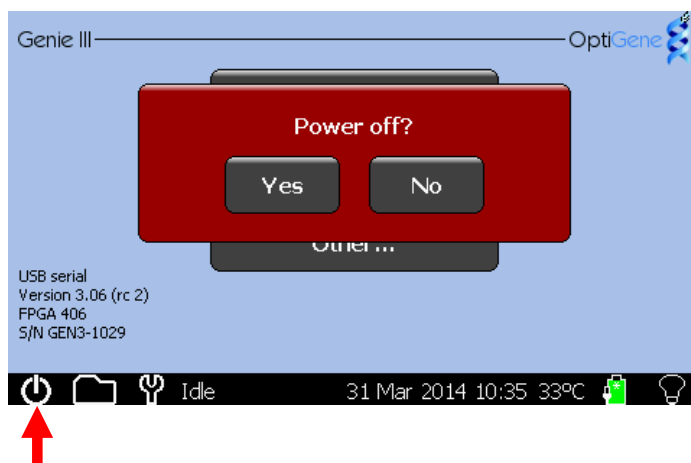
Note: If this button is pressed during a run, Genie® III will not enter standby.

When in standby, normal operation can be resumed by pressing anywhere on the screen.
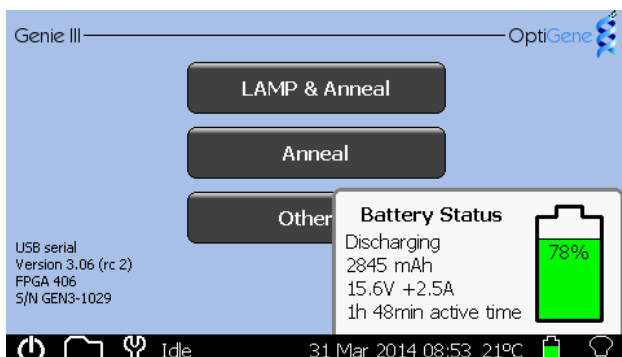
BATTERY MONITOR
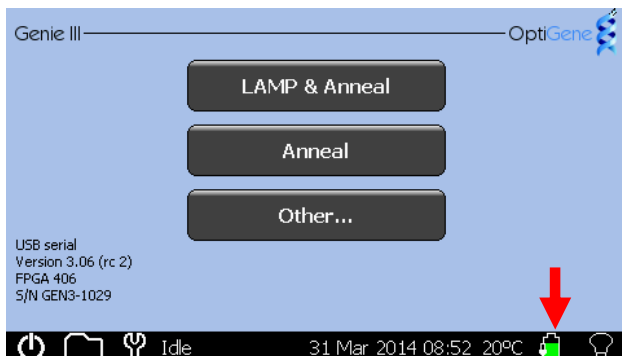
The battery status can be seen but there is no pop-up.
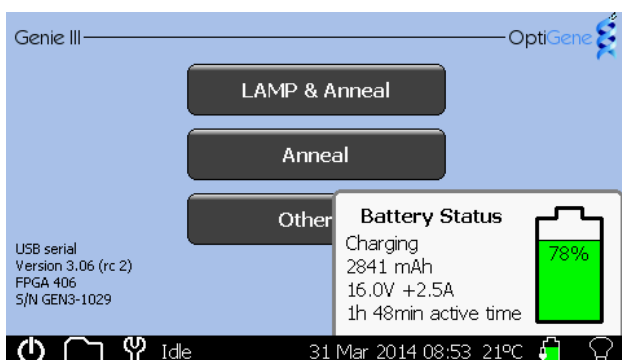
Here the pop-up shows that the battery is currently charging.
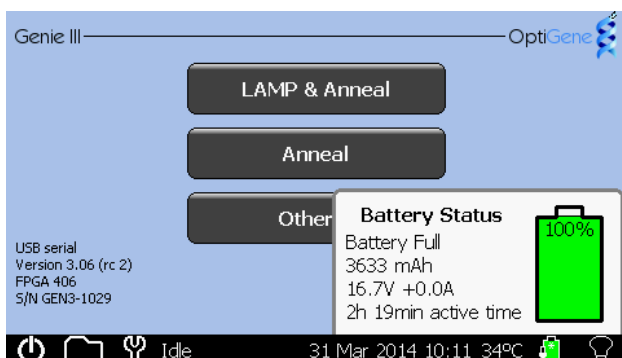
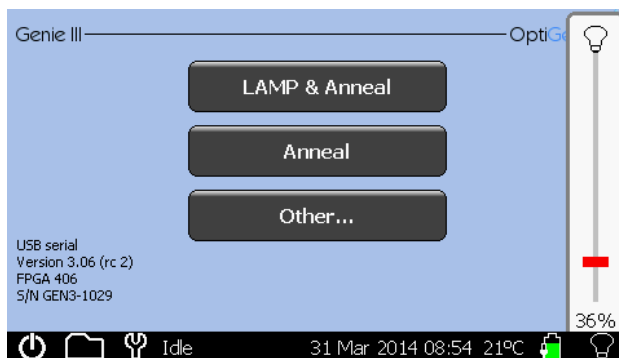Here the pop-up shows that the battery is fully charged.

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® III 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® III 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 time and date on the status bar are correct. These can be changed from the 'Utilities' screen in the toolbox.

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 in the 'ASSAYS' directory 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.

Peltier Enable: Enable active cooling of the block during a run. Turning this off will save power when running on battery.

Autocool Enable: Enable active cooling of the block after a run has finished. Turning this off will save power when running on battery.
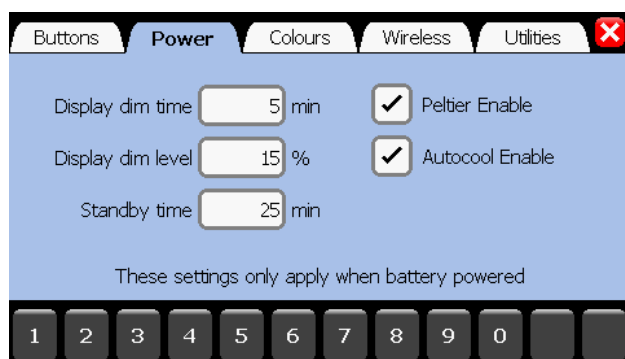
COLOURS

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.
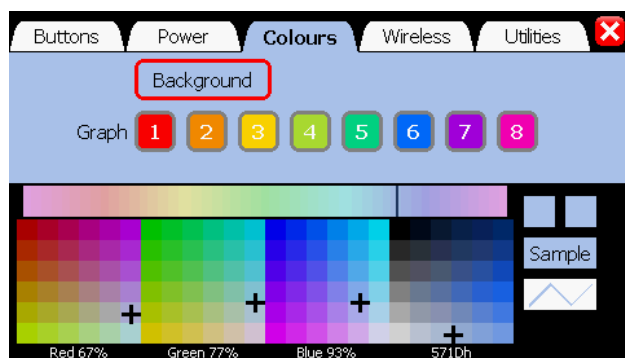
WIRELESS
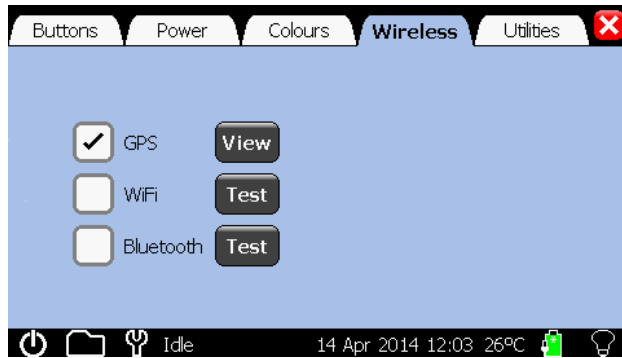
GPS, WiFi & Bluetooth: Ticking the corresponding box will turn this feature on.*

Click the View button next to GPS and the status will be shown, giving universal identities of time, latitude, longitude and the current satellites being used.

WiFi and Bluetooth features are currently in development.
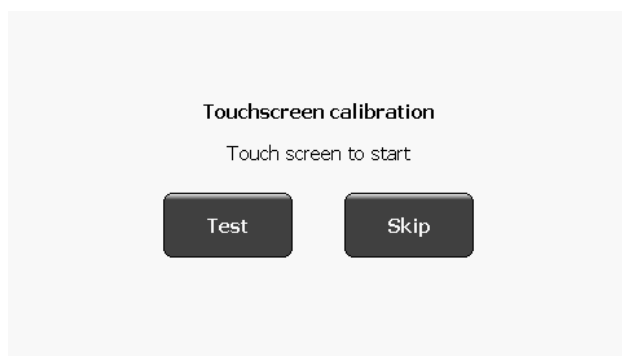
UTILITIES

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.

Touchscreen calibration

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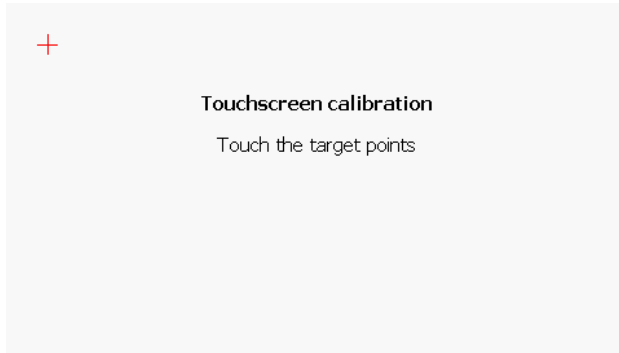
Calibrate the touchscreen by touching the target points shown on the screen (the stylus should be used for this).

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

Set Date and Time

Date [14/04/14]   Time [14:21:18]

Set

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | : | / |
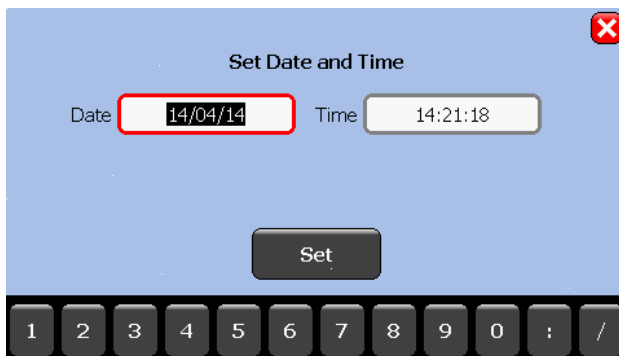
Date: click in the white box for date and enter in the format DD/MM/YY.

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® III, 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 in the ASSAYS directory in the instrument file system.

QUICK START
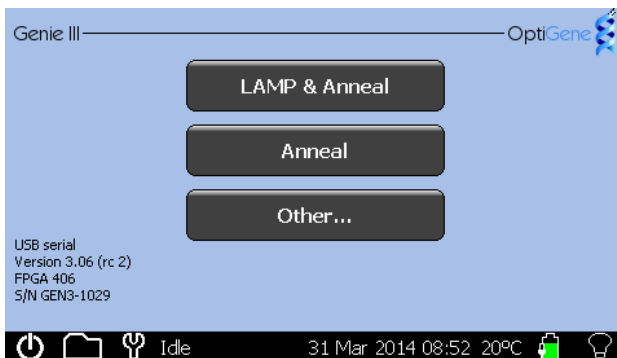
Up to four saved profiles can be shown on the main screen to allow quick starting of an assay. The four profiles are selected from the 'Buttons' page in the Toolbox.
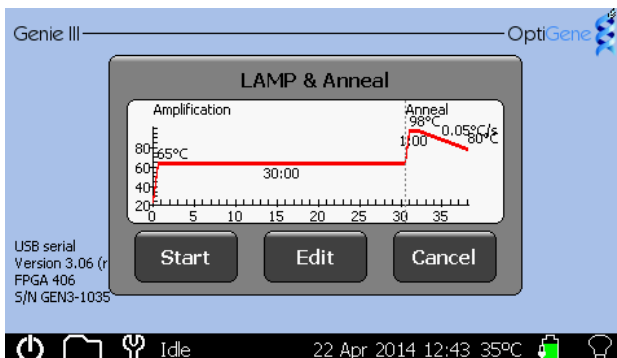
Pressing one of buttons on the main menu will pop-up a preview of the profile, and allows the user to start, edit or cancel the run.

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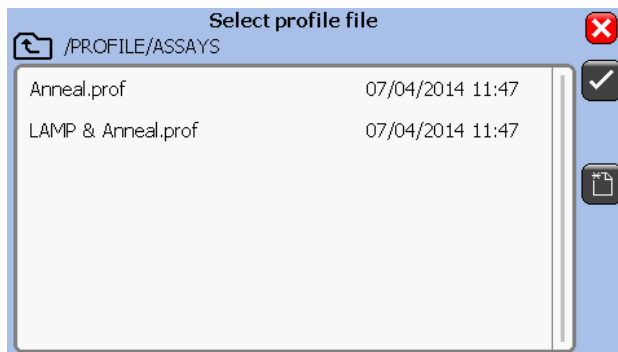
To create a new profile, press the 'Other…' button on the main screen. This allows access to any predefined profiles or creation of a new one. Cancel to return to the main menu.

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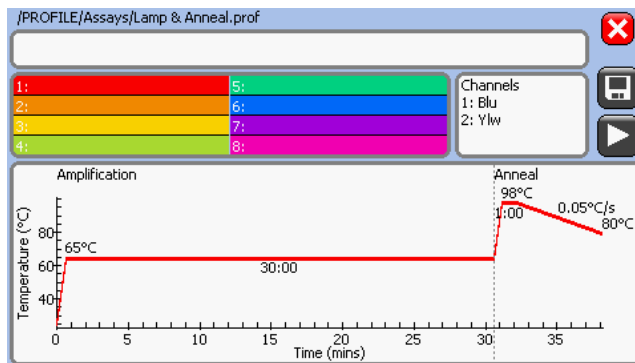
Press the 'New' button on the profile screen. Click the graph to adjust the profile by touching the appropriate temperature or time box.

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.

Saving into the 'ASSAYS' directory will allow the profile to be set up as a quick start button on the main menu.
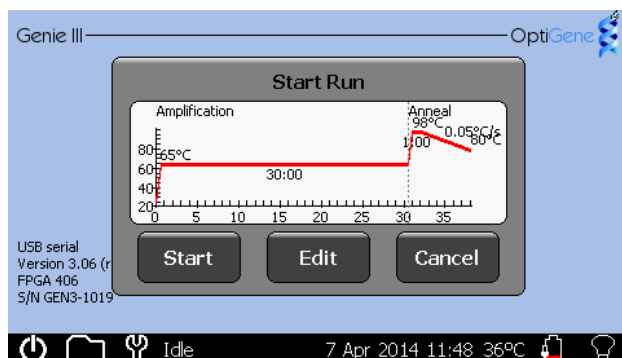
Pressing one of the quick start buttons on the main menu will pop-up a preview of the profile and give the user the choice to start, edit or cancel the run.
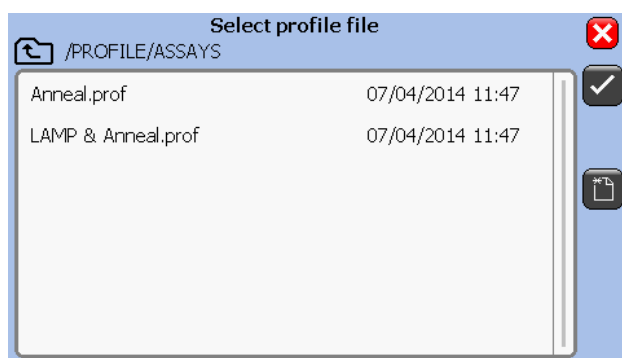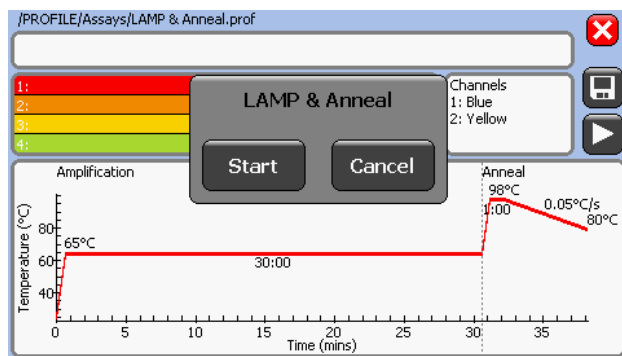
Alternatively, press the 'Other…' button and a file browser will be displayed. Choose the profile to be loaded and press the 'Open' button.

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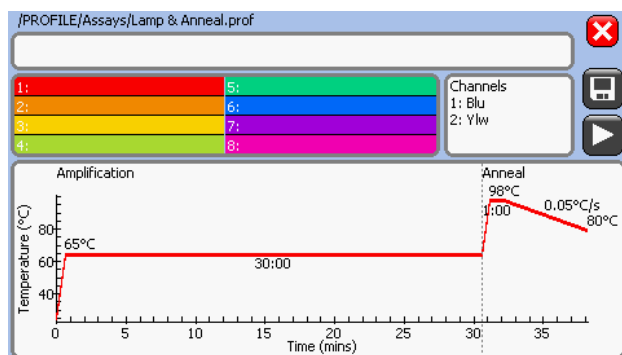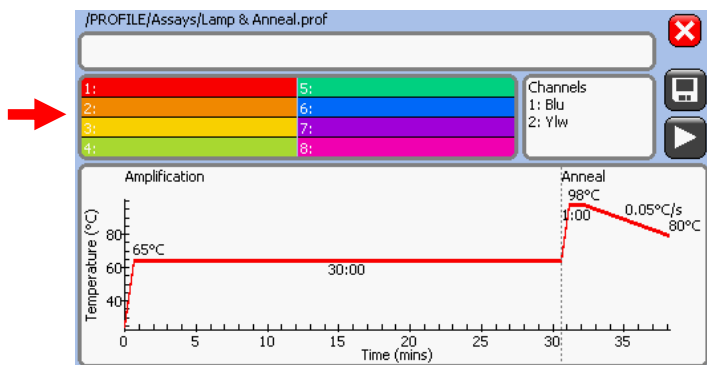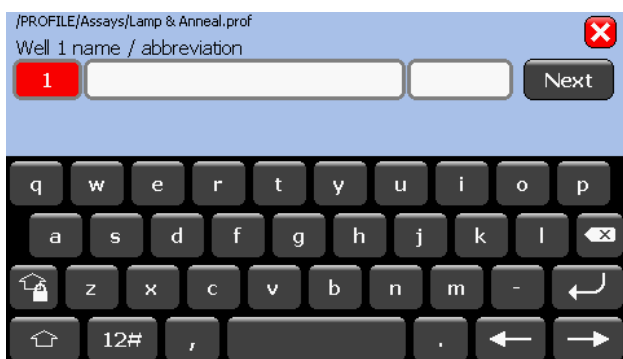

Changes can be made as required. To begin the run, press the play icon.

A prompt will be displayed. Select 'Start' to run or 'Cancel' to abort.

WELL NAMES

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

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

'Next' switches to the next name and saves the current well name.

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

Pressing the return button on the keyboard 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.
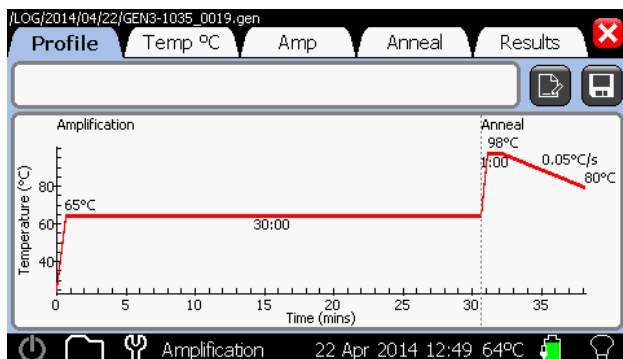
CHANNELS
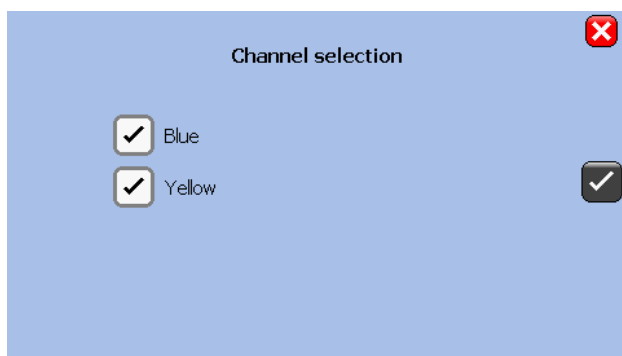
Touching the 'Channels' area will bring up this window allowing selection of the channels to be used.
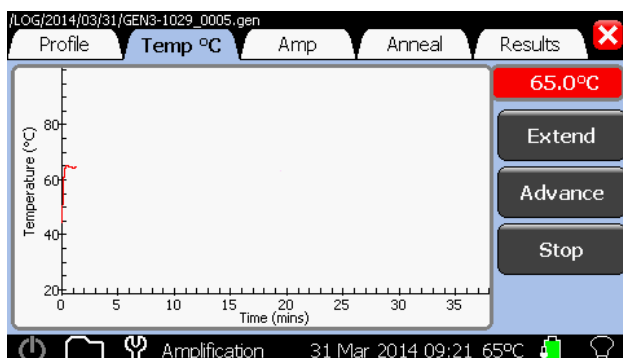
ACTIVE

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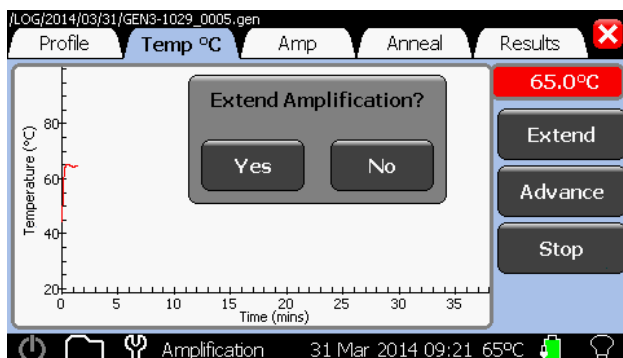

PROFILE

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.
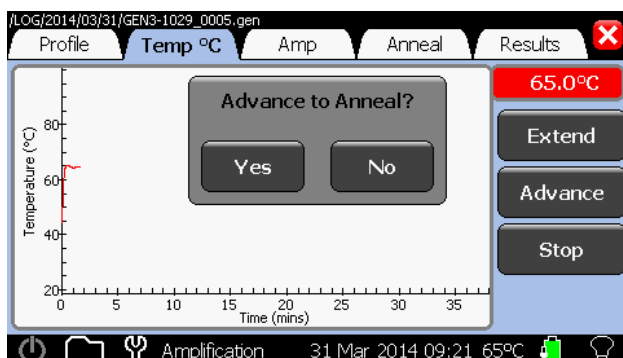

TEMPERATURE

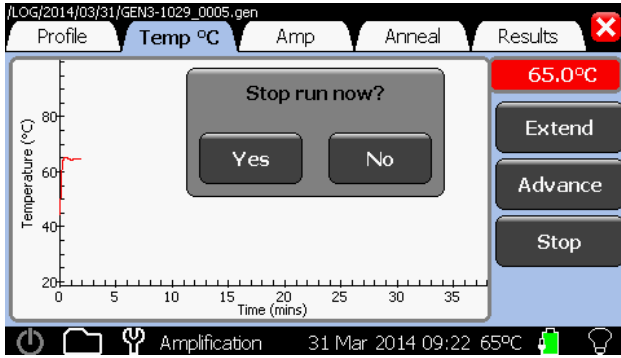This shows the current temperature of the block as the experiment is progressing.

EXTEND

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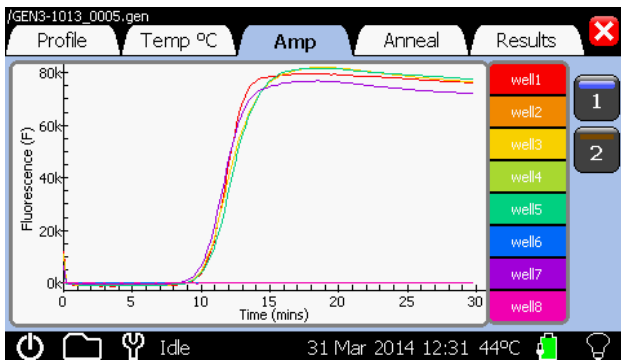

ADVANCE

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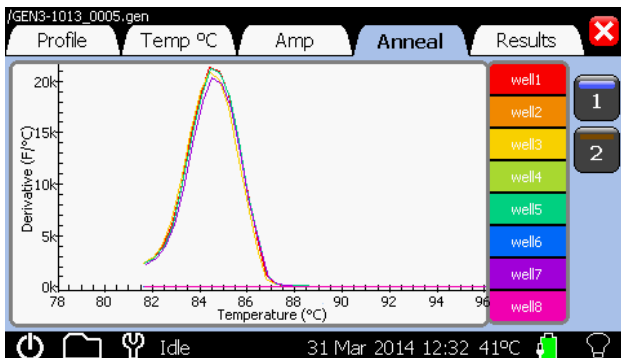
STOP

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.
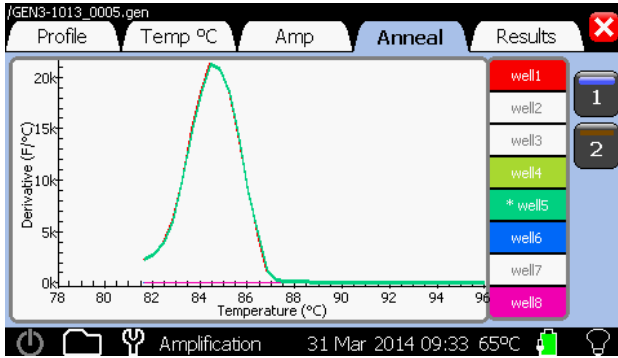
ANNEAL

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

MULTIPLE CHANNEL OPTIONS

Genie® III uses two different channels depending on the profile being run.

These buttons allow either the first or second channel to be selected. The graphs will update by pressing the relevant button on the 'Amplification' and 'Anneal' pages.

SELECTION OF GRAPHS

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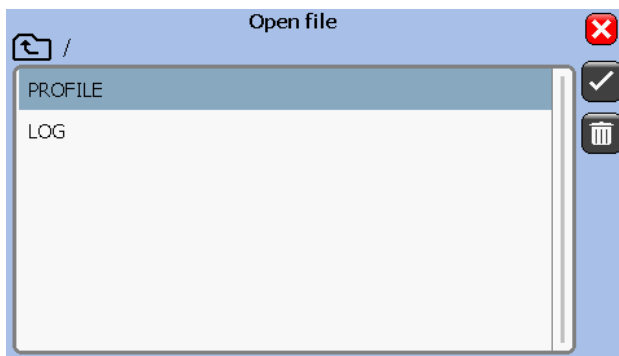

RESULTS

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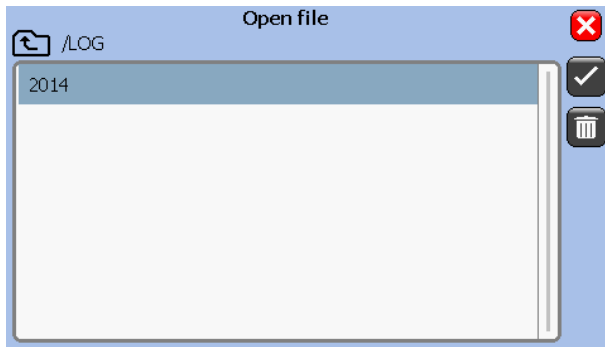
VIEW

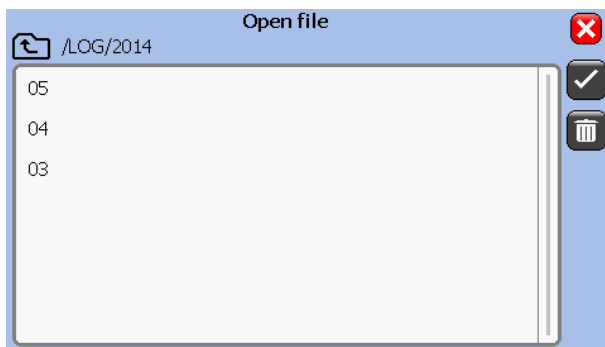To view previous runs press the folder icon on the status bar.

This will display a file browser window.

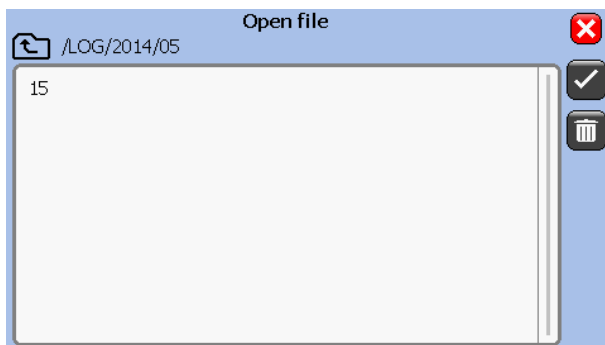All Genie® III runs are saved in the 'LOG' folder.

To open, click on 'LOG' and then tick icon, or double press on the folder name.
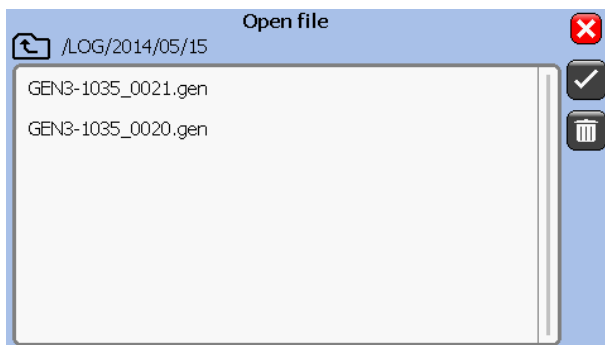
Each run is stored in a folder by date order: **Year**/Month/Day.

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, then tick icon to load a file. To delete a file, touch the trash can icon.
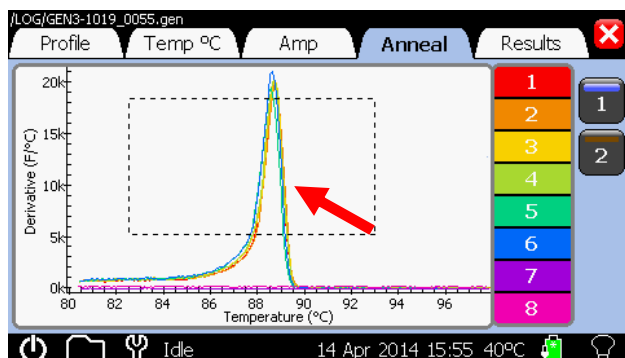
When the file has opened, Genie® III will display the profile that was run, the temperature log, amplification data, anneal data and the results table.

ZOOMING FUNCTION

Zooming is available on temperature, fluorescence and anneal graphs.
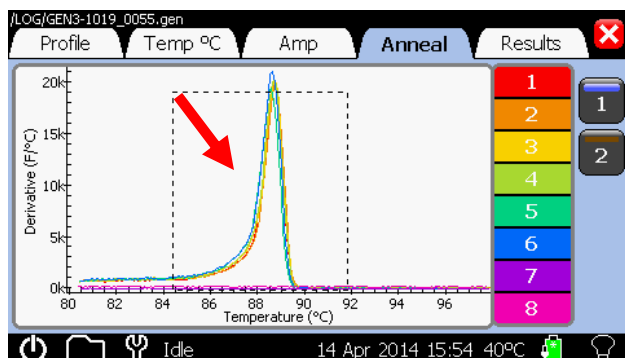
To zoom in on the area of interest, touch the plot area and drag to the right and/or down.

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® III is a standalone instrument; however, for software updates, data upload and 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.
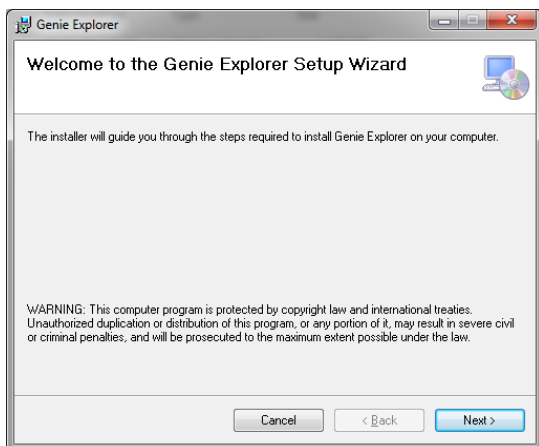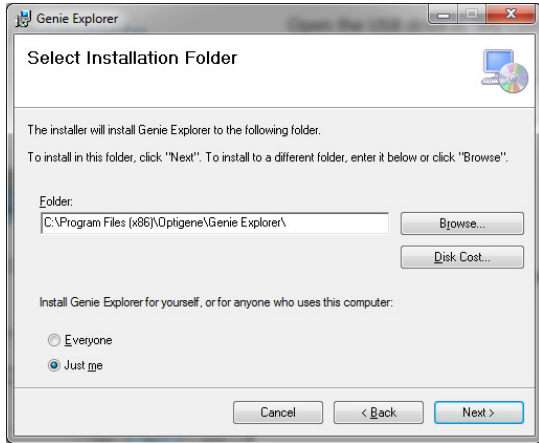

Open the USB drive in 'My Computer'.

Run the file 'GenieInstall.msi'.

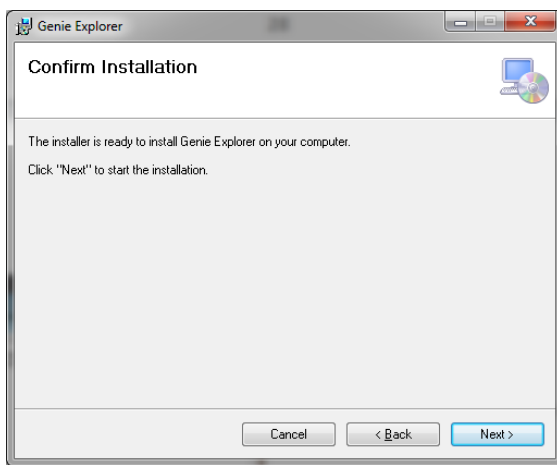Follow the onscreen instructions.

*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

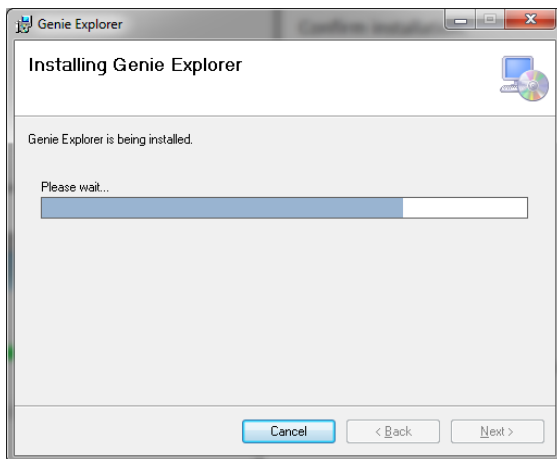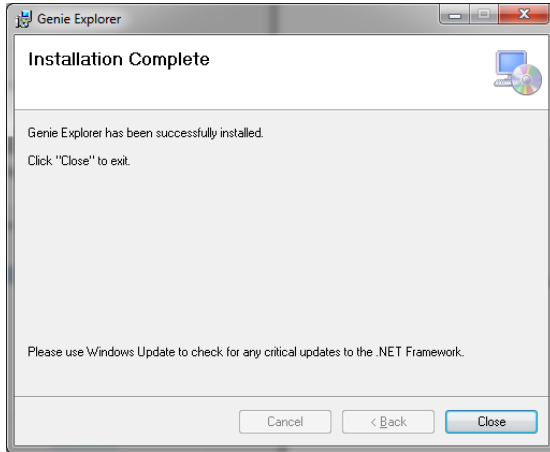Choose a location for the installed program.

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.
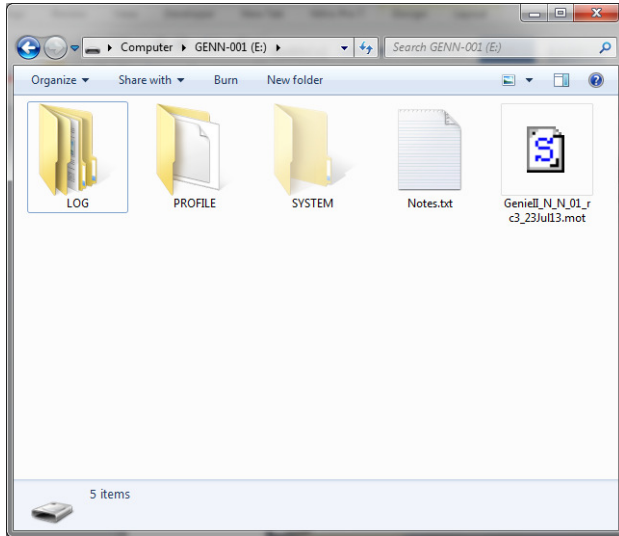
GENIE® III SOFTWARE UPDATES

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

There are two types of software on Genie® III; the firmware, and the FPGA software. The current versions of firmware and FPGA software that are installed on Genie® III are displayed in the bottom left hand corner of the main menu screen.
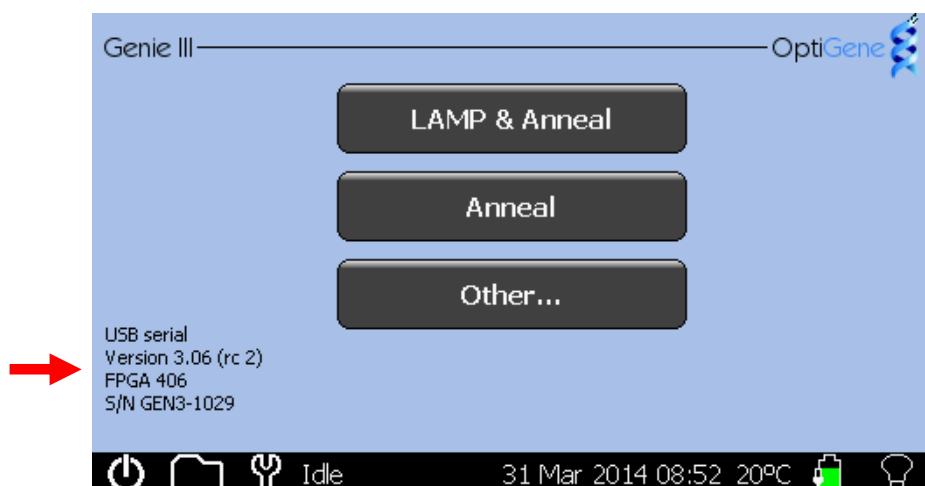
- To download the latest firmware, visit the OptiGene website (http://www.optigene.co.uk). Click on 'Support' and click on the appropriate link on the right hand side of the page and download the '.zip' file.

- 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® III 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® III to a computer. Navigate to 'My Computer' and open the Genie® III drive. The drive is named with the instrument serial number, e.g. GEN3-1001. Copy and paste (or drag) the firmware or FPGA software files onto the Genie® III drive.
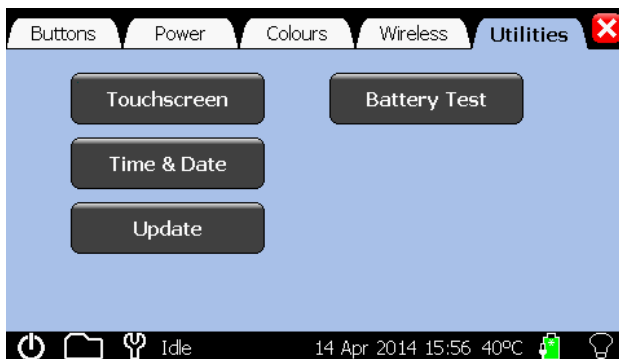
Now on Genie® III select the Toolbox, touch the 'Utilities' tab and press 'Update'. Genie® III will prompt for a file to use for the update.
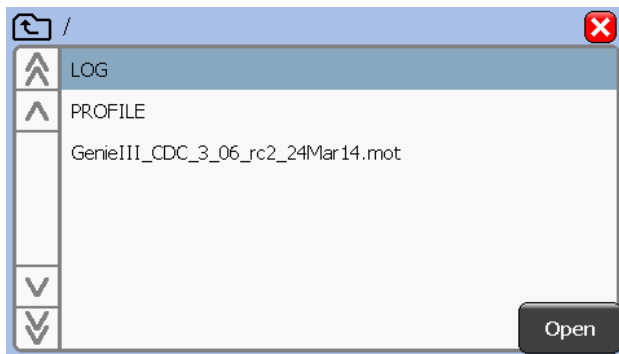
Touch on the file, and touch 'Open'. Genie® III will then install the updated software. Please wait for it to finish before trying to do anything else.

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

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

GENIE® III TECHNICAL SPECIFICATION

Operational	
Detection method	Dual-channel Fluorescence 470 nm excitation, 510-560 nm emission 590 nm excitation, > 620 nm emission
Temperature control method	Block with 4-zone independent digital PID and heated lid
Temperature control range and accuracy	Ambient—100°C, ±0.1°C
Sample number	Single strip of 8 tubes
Sample volume	10—150 µl
Physical	
Size	250 (L) x 165 (W) x 85 (H) mm [10" x 6.5" x 3.5"]
Weight	1.75 kg [4 lb]
Operating temperature	0°C—40°C
Storage temperature	20°C—70°C
Environmental protection	IP62
Interfaces	
Display / keyboard	Colour LCD 480 x 272 with resistive touchscreen
Positioning	GPS
Wireless data (1)	Bluetooth 2.0
Wireless data (2)	Wi-Fi
Wired data	USB 2.0
Electrical	
Battery type	Lithium Polymer
Battery capacity	40 Wh
Battery charge time	< 1.5 hrs
External supply	19 VDC

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If you have any feedback or comments about the instrument please email:

feedback@optigene.co.uk

Version	Date	Changes	Approved
V1.00	10/02/14	Initial Release	SUL
V1.01	14/03/14	Spelling errors.	SUL
V1.02	10/06/14	Updated Genie Explorer	SUL
V1.03	10/11/14	Additional features added to main software	SUL
V1.04	01/04/15	Added disclaimer about Genie Explorer.	SUL
V1.05	17/09/15	Added instrument cleaning guidelines and feedback email address.	SUL
V1.06	03/11/15	Separating Genie Explorer to own manual	SUL