

S-24 Satellite

S-96 Satellite

Instruction Manual

Release Information

This document is protected by copyright. All Rights Reserved.

Quanta Biotech Ltd

Unit 4 Byfleet Technical Centre
Canada Road
Byfleet
Surrey
KT14 7JX
United Kingdom

Tel +44 (0) 1932 344550 • **Fax** +44 (0) 1932 353108

Email: info@quantadirect.com

Web: www.Quantabiotech.com

Manual Version: 1.0

Trademark Information

All product and brand names used in this document are trademarks or registered trademarks of their respective holders.

Copyright © 2010 Quanta Biotech Ltd

Contents

Contents	III
General Information.....	1
Policy Statement	1
Warranty Statement	1
1 Safety Warnings and Precautions	3
1.1 What you should know	3
1.1.1 Instrument Safety	4
1.1.2 Symbols and Conventions	4
1.1.3 Potential Safety Hazard	5
1.1.3.1 ELECTRICAL.....	5
1.1.3.2 EXPLOSIVE SUBSTANCES	5
1.1.3.3 PINCHING HAZARD.....	5
1.1.3.4 FLUIDS	6
1.1.3.5 DANGER OF BURNS	6
1.1.3.6 OPERATING ENVIRONMENT	6
2 Installation	7
2.1 Requirements.....	7
2.1.1 Site.....	7
2.1.2 Electrical	7
2.1.3 Thermal Block.....	8
2.2 Unpacking the Thermal Cycler.....	9
2.2.1 Package Contents.....	9
2.2.2 Initial Inspection	9
2.3 Functional Overview.....	10
2.4 Hardware and Software Installation	11
2.4.1 Starting up the S-24 or S-96 Thermal Cycler	11
2.4.2 Networking the Thermal Cycler.....	12
2.5 AC Power Connection.....	13
2.5.1 Operating Power Requirements.....	13

2.5.2	Fuses.....	13
2.5.3	Grounding Requirements	13
3	Software Operation.....	14
3.1	PCQB Software	14
3.2	Required Computer Skills	14
3.3	Start Screen.....	15
3.4	Administrator Settings.....	18
3.4.1	Cycler Management	18
3.4.1.1	Adding a Cycler	18
3.4.1.2	Editing Cycler Data.....	18
3.4.1.3	Setting Time and Date.....	18
3.4.2	User Management.....	19
3.4.2.1	User Levels	19
3.4.2.2	First Start-up.....	19
3.4.2.3	Logging in as Administrator.....	20
3.4.2.4	Adding or Modifying User Accounts	20
4	Programming	22
4.1	Creating PCR Programs	22
4.1.1	DND Programming	22
4.1.1.1	Program Steps	24
4.1.2	Program Wizard	28
4.2	General Programming Guidelines	28
4.3	Editing Programs	29
4.3.1	Editing Program Parameters	29
4.3.2	Deleting a Program Step	30
4.3.3	Converting a Gradient Step.....	31
4.4	Deleting Programs	31
5	PCR Run / Operation	32
5.1	User Login	32
5.1.1	Guest Users	32
5.1.2	Registered Users.....	32
5.2	Changing Users.....	32

5.3	Making an Instrument Reservation	33
5.3.1.1	Cancelling a Reservation	33
5.4	Selecting a PCR Program	33
5.5	Viewing Script Temperature Profiles Prior to Run.....	34
5.6	Opening and Closing the Lid (S-24 and S-96)	34
5.7	Loading the Cyclor	34
5.8	Setting the Lid Pressure (S-96 Units Only)	35
5.9	Program Execution.....	36
5.9.1	Starting a Run	36
5.9.2	Viewing Current Program Step Information	36
5.9.3	Terminating a Run	37
5.10	Reports	38
5.10.1	Viewing Reports.....	38
5.10.2	Deleting Reports	39
5.11	Switching Off the Instrument.....	39
6	USB Memory Stick Operation	40
6.1.1	Importing and Exporting PCR Data Files	40
7	Maintenance	42
7.1	Cleaning	42
8	Trouble-Shooting	43
8.1	If a Power Failure Occurs.....	43
8.2	Troubleshooting Information	44
9	Block Exchange (S-96 units only)	46
	Removing the Block	46
	Inserting the Block.....	46
Appendix	47
	Instrument Specifications	47
	Thermal Blocks	47
	Heated Lid.....	47
	Ambient temperature.....	47
	10°C to 30°C	47

User & File Management	48
Reports and Validation	48
Networking & Barcode Option	48
Thermal Engine Characteristics.....	48
Power & Dimensions	49
Compatible Barcodes	49
Compatible Plate Formats	51
Sales & Service	52
Index	53

General Information

Policy Statement

It is the policy of Quanta Biotech to improve products as new techniques and components become available. Quanta Biotech reserves the right to change specifications at any time.

Warranty Statement

Quanta Biotech guarantees that the thermal cycler you have received has been thoroughly tested and meets its published specification.

This guarantee is valid for 24 months only if the product and functions have been used according to the instruction manual. No liability is accepted for loss or damage arising from the incorrect use of the thermal cycler. Quanta Biotech's liability is limited to the repair or replacement of the unit or refund of the purchase price at Quanta Biotech's option. Quanta Biotech is not liable for any consequential damages.

Quanta Biotech's thermal cyclers are for research use only.

Read the Instruction Manual carefully before using the thermal cycler to ensure that you obtain the best possible results from the machine.

Quanta Biotech thermal cyclers should only be used by suitably qualified and trained people. If the thermal cycler is not used as specified in this Manual, the protection provided by the equipment may be impaired.

1 Safety Warnings and Precautions

1.1 What you should know

Before Operating the Instrument

Ensure that anyone involved with the operation of the instrument is instructed in both general safety practices for laboratories and specific safety practices for the instrument.

Always place the instrument in a location where, if necessary, the main power supply can be disconnected immediately.




1.1.1 Instrument Safety

Please read this section before operating the thermal cycler. Operators of this instrument must be trained in both general laboratory safety practices and the specific safety requirements of the thermal cycler. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

All functions performed within the context of preparing, performing and completing a run should be done with caution and care, and with general respect both to the instrumentation and to associated chemicals, samples and other devices.

1.1.2 Symbols and Conventions

The following chart is an illustrated glossary of the symbols that are used in this manual.

	CAUTION This symbol indicates a potential risk and alerts you to proceed with caution
	CAUTION This symbol indicates the presence of high voltage and warns the user to proceed with caution
	CAUTION This symbol indicates risks associated with hot surfaces

1.1.3 Potential Safety Hazard

1.1.3.1 ELECTRICAL

Standard electrical safety precautions should be applied.

- 1 Ensure that the proper voltage is supplied before turning the instrument on for the first time.
- 2 The device must be connected to a grounded socket.
- 3 Do not touch any switches or outlets with wet hands.
- 4 Switch the instrument off before disconnecting the AC power cord.
- 5 Unplug the instrument prior to cleaning up any major liquid spills and prior to servicing any of the electrical or internal components.

Only qualified personnel should perform electrical servicing.

1.1.3.2 EXPLOSIVE SUBSTANCES

Explosive, flammable and reactive substances should never be cycled or incubated in any The thermal cycler.

Do not operate the The thermal cycler in a hazardous or potentially explosive environment.

You must observe the relevant safety regulations when handling pathogenic material, radioactive substances or other substances hazardous to health.

1.1.3.3 PINCHING HAZARD

The lid presents a potential pinching hazard. Do not place hands or fingers into the cycler when the lid is being opened or closed.

1.1.3.4 FLUIDS

Reaction vessels should be filled outside the cycler so that no fluids penetrate the instrument.

Do not submerge the instrument in any liquid.

1.1.3.5 DANGER OF BURNS



Thermal block, inner side of heated lid and reaction vessels quickly attain temperatures of greater than 50°C. **Do not touch – Risk of Burns!** Keep the heated lid closed until temperatures of 30°C or lower are reached.

Do not use any materials (plates, sealings, foils, mats) which are not sufficiently temperature-stable (up to 120 °C).

1.1.3.6 OPERATING ENVIRONMENT

Please ensure that the ventilation slots of the device remain free to vent at all times. A space of at least 10cm should be left around the thermal cycler

The ambient temperature should be between 10°C and 30°C, the humidity between 0% and 95%.

WARNING:

All repair work must be carried out by Quanta Biotech service engineers!

Only original Quanta Biotech replacement parts must be used.

Disconnect the instrument from the mains supply before opening.

2 Installation

2.1 Requirements

The following steps must be followed for optimal and safe operation of the thermal cycler:

2.1.1 Site

- ❖ The thermal cycler should be placed on a rigid, flat, clean surface. Make sure that the instrument stands completely stable.
- ❖ Adequate ventilation is important. Make sure there is sufficient space so that the rear and side air slots are not covered and to allow cooling air to circulate freely around the instrument.
- ❖ There should be no paper under the device as this may block the ventilation path. The unit should always have at least **10cm** distance to the next wall or neighbouring instrument.
- ❖ Quanta Biotech thermal cycler instruments were developed for operation in laboratories in which there is normal ambient temperature and no explosive atmosphere. The ambient temperature should be between 10°C and 30°C the humidity between 0% and 95%.

2.1.2 Electrical

- ❖ the thermal cycler must be connected to a grounded socket.

2.1.3 Thermal Block

- ❖ Reaction vessels should be filled outside the thermal block so that no fluids penetrate the instrument.
- ❖ To prevent damage to the block and the heated lid make sure you use only recommended sample tubes. Unsuitable tubes can be damaged causing the escape of sample material. This may present a serious health hazard, especially when working with infectious materials.
- ❖ Make sure the PCR plates are positioned correctly in the block to prevent damage to the block and the lid.
- ❖ Ensure that the heated lid is closed when heating tubes in the block. Otherwise tubes may burst due to high temperatures thus causing the escape of sample material.
- ❖ The lid presents a potential pinching hazard. Do not place hands or fingers into the cyclor when the lid closes otherwise hands or fingers may be caught between the lid and housing.

2.2 Unpacking the Thermal Cycler

2.2.1 Package Contents

The following parts are included in delivery:

	S-96	S-24
Thermal Cycler	X	X
USB Cable	X	X
Power Cable 110 or 220V	X	X
Quanta Biotech Thermal Cycler User Manual on CD or memory stick	X	X

2.2.2 Initial Inspection

All parts of the instrument were thoroughly inspected and tested before the unit was shipped, therefore the instrument should be in good operating order. Carefully inspect the instrument and its accessories for any physical damage sustained in transit.

If the instrument is received in a damaged condition, please file a claim with the transport carrier immediately and contact Quanta Biotech for advice.

If the inspection has passed the thermal cyclers are ready for use.

2.3 Functional Overview

Quanta Biotech thermal cyclers are automated instruments designed for carrying out the Polymerase Chain Reaction (PCR) and related methods for amplification of DNA templates.

The S-96 has a manually operated lid with the ability to be adjusted to achieve tube or microplate pressure. The S-24 has a manual lid which supplies tube pressure. The lids in all units automatically adjust for the height of the tube and create a non condensing atmosphere by heating to 112°C.



The S-96 and S-24 thermal cyclers are controlled from an external PC running Quanta Biotech's PCQB application software through a simple usb network. Up to 15 thermal cyclers of any combination of S-96 and S-24 satellite thermal cyclers can be controlled from a single PC.



Custom PC software can be developed for large networks of > 20 thermal cyclers to suit individual customer needs.

2.4 Hardware and Software Installation

2.4.1 Starting up the S-24 or S-96 Thermal Cycler

Once you have set up the Thermal Cycler as explained in section 2.1 and 2.2 you can connect it to the mains.

- 1 Install The PCQB on a Pentium PC running windows XP using the software disc provided.
- 2 Plug the AC power cord into the main power connector at the rear of the instrument and connect the other end of the cable into a grounded AC outlet.
- 3 Connect the USB lead to the side/rear of the instrument and to the PC
- 4 Press the power switch on the rear of the instrument (S-24) or front of the instrument (S-96).
- 5 Launch the application. it will search for S-96 or S-24 thermal cyclers that have been connected and display them in the cycle monitor section of the application. The process can take up to two minutes depending on the number of USB ports in use.



Once found you can configure the thermal cyclers via the **Settings** menu in the navigation bar. For details on software configuration of additional cyclers refer to section Adding a Cycler on page 19.

2.4.2 Networking the Thermal Cycler

A network of up to 15 Q-Cycler, S-96 and S-24 thermal cyclers connected to a single PC can be established.

USB ports are provided at the back of the instruments to connect units to a PC via standard USB instrument cables and hub.

Optional input devices such as barcode reader, keyboard, mouse or printer can be connected in the same way.

Connecting Optional Devices

Optional input devices such as keyboard, mouse, printer and barcode reader can be connected to the the thermal cycler systems via a USB connection.

- 1 Plug the USB cable into the USB port of the input device.
- 2 Connect the other end of the USB cable to a USB hub, if you wish to connect several input devices to a PC
- 3 When connecting several devices plug the cable connector of the USB hub into the USB port of the PC For further configuration of the device consult the manufacturer's instruction manual.

2.5 AC Power Connection

2.5.1 Operating Power Requirements

All Quanta biotech thermal cycler models have self-regulating power. See Instrument Specifications, Power & Dimensions on page 56 for power specifications.

2.5.2 Fuses

WARNING: Disconnect the AC power cord before removing or installing a fuse to avoid the possibility of serious injury from electrical shock!

Fuse compartments are located on the rear of the instrument, above the main power connection. Check the voltage rating label to verify that the instrument is compatible with the AC voltage available at the installation site.

2.5.3 Grounding Requirements

DANGER: please read carefully!

To protect operating personnel, the National Electrical Manufacturers Association (NEMA) recommends that the instrument be correctly grounded. The instrument is equipped with a 3 conductor AC power cord that, when connected to an appropriate AC power outlet, grounds the instrument. To preserve this protection feature, do not operate the instrument from an AC power outlet that has no ground connection.

3 Software Operation

3.1 PCQB Software

S-96 and S-24 satellite thermal cyclers can be controlled from an external PC running Windows XP

The unique Cycle Wizard™ function enables stepwise protocol definition, with no tedious calculations required. Drag-and-drop icon-based commands make all steps quick, clear and intuitive throughout. Optimized conditions from gradient protocols are converted to standard protocols with only a single point and click.

The software can be installed additionally on any laptop or desktop PC running WIN 2000 or XP.

3.2 Required Computer Skills

Users should have basic computing knowledge including using the mouse, selecting items, and drag and drop.

3.3 Start Screen

Once PCQB has been launched the start screen will be shown

The start screen is the main location for entering and displaying information.

It is divided into the following areas:

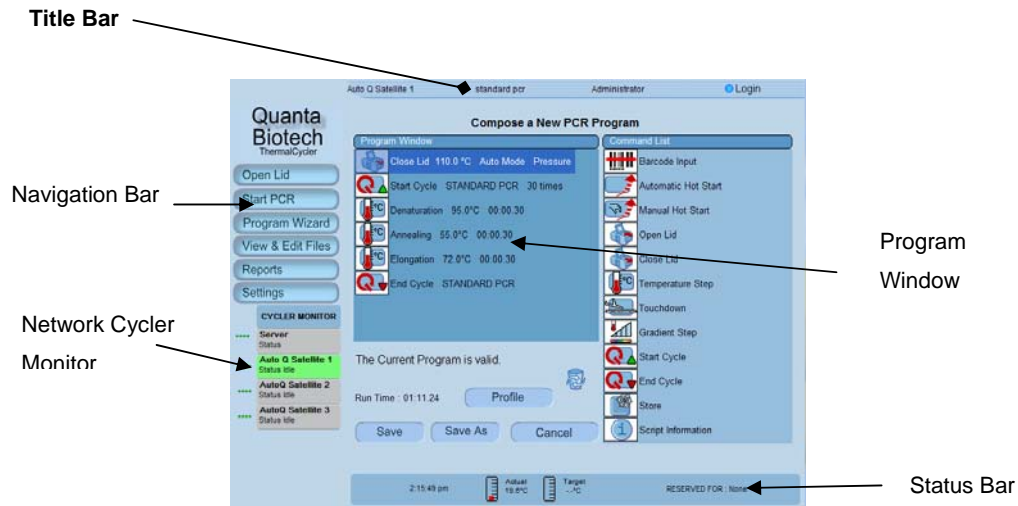


Figure 3-1: Automated and PCQB start screen with navigation elements

Title Bar: The Title Bar displays useful general information:

Cycler Displays the selected network cycler.

Program Displays the loaded program of the selected network cycler.

User Displays the currently logged in user.

Login Opens the Login dialog window.

Navigation Bar: The Navigation bar helps you to navigate between the different tasks that you want to perform with the thermal cycler.

Each button describes a task that can be performed upon clicking on it:

Open Lid Opens the lid of Automated thermal cyclers.

Start PCR Starts the loaded PCR program. You can view the name of the currently loaded program in the top status bar.

Program Opens the Program Wizard dialog window where you can define

Wizard	specific PCR information.
View and Edit Files	Opens the Explorer to browse stored PCR programs. Use this button to create, edit or load programs.
Reports	Opens the report browser where you can search for stored reports.
Settings	Opens the User Settings dialog window where you can configure user settings such as defining the default start screen and manage cycler or user data.

PCQB: The logo above the Navigation Bar serves as a Home button. Clicking on it returns you to the Start Screen.

CYCLER MONITOR: Below the navigation bar you find the CYCLER MONITOR buttons which can be used to view brief status information of all network cyclers both in graphical representation and text.

Clicking on the buttons allows you to change between the connected cyclers to view the respective operation status.

Clicking on Cycle monitor displays summary run information of all connected thermal cyclers.

NOTE: The name of the selected unit will be displayed in the top status bar.

Program Window with Direct Access Buttons: The Program Window comprises command buttons providing quick access to the most commonly used functions such as editing and executing scripts.



Open Lid Opens the lid of Automated thermal cyclers.



Start Start the loaded program visible in the Top Status Bar.



New Opens the *Compose a New PCR Program* dialog.



Edit Opens the Explorer to browse PCR programs.



Wizard Opens the *Program Wizard* dialog where you can define specific PCR information.

Status Bar: The Status bar gives you a quick answer about the current temperature and defined set temperature of a program step. It also contains the RESERVED FOR button providing access to the thermal cyclers reservation function.

Actual	Displays the current temperature of a PCR step.
Target	Displays the set temperature for the current PCR step.
RESERVED FOR	Opens the Reservation dialog window where you can reserve the thermal cycler for the next run. Upon successful reservation, the name of the subsequent user is displayed in the status bar.

3.4 Administrator Settings

Specific user settings can be defined in the **Settings** menu in the navigation bar. Use the **Settings** menu to add new thermal cycler devices or edit existing units, set time and date, or manage user data such as setting up new users, and editing or deleting existing accounts.

3.4.1 Cyclers Management

PCQB software is designed for use with up to 15 thermal cyclers, connected to a PC. Before you can set up additional cyclers in the software, make sure that the new thermal unit is connected to the PC (for information on connecting additional units refer to section 2.4.2.1 Connecting S-96 and S-24 Thermal Cyclers).

3.4.1.1 Adding a Cycler

- 1 To add a cycler simply connect the new cycler to a PC , power up both units and launch the application. The new cycler will be automatically recognized and installed ready to run. The name and details of the newly connected unit can be changed by an administrator via the settings tab.

3.4.1.2 Editing Cycler Data

- 1 The name and details of the newly connected unit can be changed by an administrator via the settings tab
- 2 Click on **Cycler Management**
- 3 Click on the thermal cycler you wish to edit and make the changes
- 4 Confirm your changes by clicking **OK**.

3.4.1.3 Setting Time and Date

- 1 To set the instrument time and date select **Settings** from the navigation bar. Then select **Cycler Settings**.
- 2 Enter the system time and date by pressing the up and down arrow keys.
- 3 Confirm your changes by clicking **OK**.

3.4.2 User Management

3.4.2.1 User Levels

With the thermal cyclers three different user levels can be distinguished:

- Administrator
- Registered User
- Guest User

Each level has specific user rights. Only administrators are authorized to set up new users and to change and/or assign user rights and passwords.

By default, the thermal cycler starts with Guest user rights.

User Rights	Functions allowed
Guest User	<ul style="list-style-type: none">• Access rights to the Guest folder• Creating, copying, editing and executing programs stored in the Guest folder
Registered User	<ul style="list-style-type: none">• Access rights to the Guest and personal user folders• Creating, copying, editing and executing programs stored in the Guest and personal folders• Access to GLP reports denied
Administrator	<ul style="list-style-type: none">• Access rights to all Guest and user folders• Setup and maintenance of users• Setup and maintenance of cyclers• Archiving/maintenance of all reports

3.4.2.2 First Start-up

Only the administrator is authorized to set up new users and to change or assign user rights and passwords.

As a first-time user you will be logged in as "Guest" user visible in the top status bar. Guest users usually have only restricted user rights and work from the unprotected Guest folder, which can be accessed by all users.

Before you can operate the thermal cycler as a regular user, your administrator has to set you up as a new user. Once you are a registered

user, you have a personal, encrypted file folder where you can administer your own PCR program files.

3.4.2.3 Logging in as Administrator

After starting the thermal cycler, the Start screen appears displaying the thermal cycler's navigation elements.

- 1 Click on the **Login** button in the top status bar.
- 2 Select *Administrator* from the **Username** drop-down list and enter the administrator password. The default administrator password is admin
- 6 Click **Login** to confirm your settings.
- 7 You are now logged in as Administrator (visible in the top status bar).

IMPORTANT: It is recommended that the factory-set login password be changed to prevent unauthorized access to the instrument

3.4.2.4 Adding or Modifying User Accounts

NOTE: Only the administrator can set up new users or modify existing user accounts.

Adding New User Accounts

- 1 To add a new user, click **Settings**. The **User Settings** dialog opens.
- 8 In the **User Management** section click **OK**.
The **User Management** dialog opens listing the available user names and corresponding user levels.
- 9 Click **New User** to open the **Add a new User** dialog.
- 10 Assign a user name and password..
- 11 Select the required user level (Guest, User, Administrator) from the drop-down list.
- 12 Now you can define the user's script reading and writing privileges by checking the appropriate boxes:

Edit/Rename Script The user has the right to edit or rename a program file

Delete Script The user has the right to delete program files

Create Script The user has the right to create program files

- 13 Once you have entered all data, click on **Create User** to save the settings. After successful setup, a confirmation message will be displayed and the new user name will be added in the **User Management** list.

Modifying User Accounts

- 1 To modify an existing user account click **Settings**. The **User Settings** dialog opens.
- 14 In the **User Management** section click **OK**.
The **User Management** dialog opens listing the available user names and corresponding user levels.
- 15 Click **Edit User** to open the **Edit a User** dialog.
- 2 Here you can modify user data such as name, user level, password, user privileges and script directory protection.
- 3 Click **OK** to save the changes.
A confirmation message will be displayed after successful update of the user data.

Deleting User Accounts

NOTE: User accounts can only be deleted by the administrator.

- 1 To delete an existing user account click **Settings**. The **User Settings** dialog opens.
- 2 In the **User Management** section click **OK**.
The **User Management** dialog opens listing the available user names and corresponding user levels.
- 3 Select the user name you wish to remove.
- 4 Click on **Remove User** to remove the user name from the user list. It removes all user permissions that the user has and does not allow that user to access any the thermal cyclers device. It also deletes all scripts and GLP reports associated with that user.

NOTE: The Remove User command also deletes all scripts and GLP reports associated with that user. The Administrator user account cannot be deleted.

4 Programming

4.1 Creating PCR Programs

Automated and PCQB software offers two innovative ways of composing PCR programs: *Drop-and-Drag Programming* (DND Programming) and the *Program Wizard*.


4.1.1 DND Programming

Drop-and-Drag programming (DND programming) is an easy and intuitive method for conveniently creating PCR programs step-by-step.

The basic idea of DND programming is that you simply choose the required command from a command list, drag it with the mouse into the program window on the left and drop it into the desired program position. This opens a dialog window where you can define further command-specific settings such as time, temperature, lid pressure, etc. In this way you can create your PCR program command by command according to the planned programming sequence.

The command order can be changed easily any time just by dragging the selected command on the desired position within the program window.

Once the program is started the cycler will process the commands from top to bottom according to the defined programming sequence.

- 1 To generate a new PCR program using DND, just click  on the Start screen. This will open the **Compose a New PCR Program** dialog with its drag-and-drop functions:

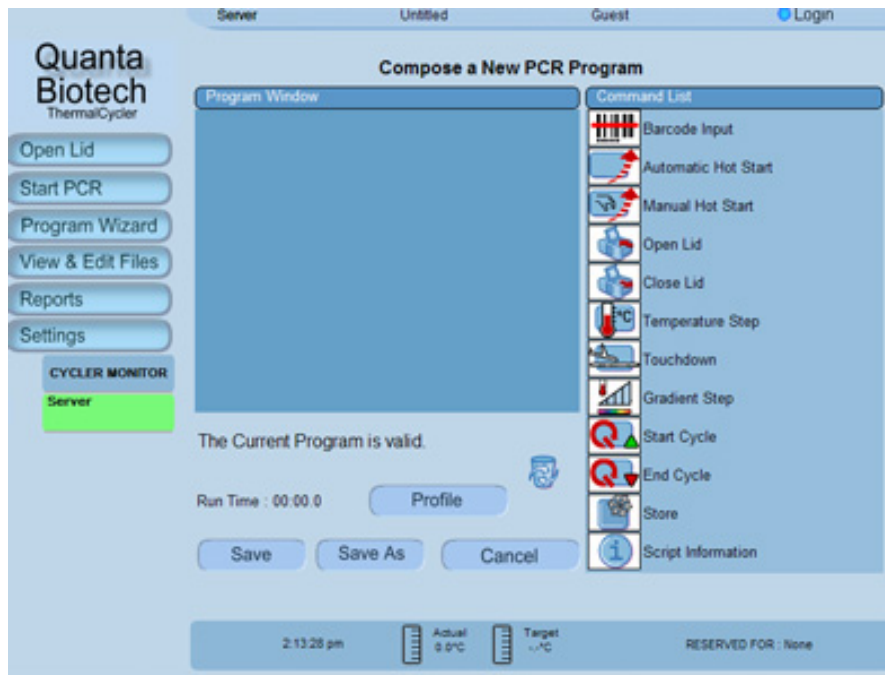


Figure 4-1: Compose a New PCR Program dialog

The dialog window consists of the *Command List*, which contains all available program steps, and the *Program Window* where you can create or edit PCR programs.

- 16 Select a command from the *Command List*, then drag and drop it into the *Program Window*. This will open the dialog window of the selected command.
- 17 Enter your settings in the dialog fields of the selected command.
- 18 Confirm your settings by clicking **OK**. This will return you to the **Compose a New PCR Program** window.
- 19 To add another command to your program repeat steps 2–4 for each required command.
- 20 Once you have finished creating your program, save it by clicking on **Save As** and you will be prompted for a file name.
- 21 Name your file whatever you like within Windows naming conventions.
- 22 Click on **Profile**, if you wish to view a graphical representation of the defined temperature profile.

4.1.1.1 Program Steps

The following program steps are available in the Command List for creating customized PCR programs in the DND environment:



Barcode Input

Use this command to define barcode settings. When composing the program, it is recommended to place the barcode command at the beginning. During program run you will be asked to read the plate's barcode. You may do this with a handheld USB barcode scanner or by manually entering the barcode. If you use the barcode scanner, the barcode cannot be edited after reading. The program will continue after you have placed the plate into the cyclor and pressed *OK*. The barcode will be recorded in the GLP and LabBook report and displayed in the *Info* section of the Cyclor screen.

Scan Using Barcode Entry: Barcode reading using the barcode scanner

Scan Using Keyboard Entry: Manual entry of the barcode via keyboard

Path for worklist: Specifies the path for the worklist.



Automatic Hot Start

Automatic Hot Start takes advantage of novel Polymerase technology, which enables the performance of an extended hot start without degrading the enzyme at high temperature. This is realized e.g. using a bead or antibody protection. The protection is released after the extended denaturation is elapsed and the enzyme starts working.

When using the *Automatic Hot Start*, you just have to select the denaturation temperature and time. Running the program, the next command will be executed immediately after the denaturation time is elapsed.

Denaturation Temperature: Specified denaturation temperature

Hold for: Specified time of the program step

Use with automatic Hot Start Polymerase: Examples for denaturation times

Confirmation Change Polymerase 900 sec denaturation

Please also refer to the polymerase manufacturer's recommendations



Manual Hot Start

When selecting the *Manual Hot Start* command, you just have to supply the denaturation temperature and time. The instrument will notify you after the denaturation time is elapsed. You will then be asked to open the cycler and add the enzyme. The instrument timer is now on hold and will continue only after you have pressed *OK* in the displayed *Hot Start* information window.



Temperature Step

Use this command to increment the processing temperature (in °C) by a preset value and to define the step duration.

Processing Temperature: Specified processing temperature in °C.

Hold for: Specified time of the temperature step.

Temperature Ramp: Rate of change of the sample temperature. Rates can be from 0.1°C to 3°C per second. When setting the ramp to zero, the instrument ramps with maximum capacity.

Temperature Increment: Temperature increment and decrement per cycle. Steps can be from 0.1 °C to 10 °C.

NOTE:For decrement use negative figures (e.g. -2)!

Time Increment: Time increment per cycle in seconds.

Step Type: Indicates the selected PCR step type for information purposes. The supplied step type information will then be displayed in the online cycler monitor.



Touchdown

Touchdown is an advanced PCR technique used to reduce unspecific binding. With the thermal cycler, Touchdown PCR is provided as a one-step command for easy implementation in the programming sequence.

Denaturation Temperature: Defined denaturation temperature.

Maximum Annealing Temperature: Sets the maximum annealing temperature.

Minimum Annealing Temperature: Sets the minimum annealing temperature.

Hint: The temperature difference is commonly between 5°C and 10°C starting with a temperature that is 2°C above the higher Primer melting temperature. Example: if T_m Primer 1 is 60°C and T_m Primer 2 is 54°C, the resulting Touchdown will be from 62°C to 52°C.

Elongation Temperature: Sets the elongation temperature.

Cycles: Number of required cycles for the Touchdown section.

Duration: Duration of the temperature step in seconds.



Gradient Step (Not available in S-24)

Use this command to define settings for the gradient function. Just enter the required minimum and maximum temperature gradient and time.

Minimum Temperature Gradient: To set the minimum temperature of the gradient step. Min. temperature must not be below 30°C.

Maximum Temperature Gradient: To set the maximum temperature of the gradient step. Max. temperature must not exceed 80°C.

NOTE: The maximum / minimum gradient span is 20°C / 4°C.

Hold for: Duration of the Gradient step.

Convert Gradient Step to a standard temperature step: The Gradient step can be converted easily to a temperature step after the annealing temperature optimization experiment. To do so, just check the checkbox and select the temperature column with the best result of your optimization experiment. The converted gradient step will then automatically use the temperature of this best-performing column.

Gradient steps are not available for the S-24 thermal cycler

NOTE: Resulting temperature steps may be reconverted to gradient steps any time by disabling the *Conversion* option



Start Cycle

Starts a PCR cycle.

Cycle Name: Enter the name of the cycle.

Number of Loops: Enter the required number of loops.



End Cycle

Insert this command to terminate a PCR cycle.



Store

Cools the thermal cycler down to a temperature between 4°-12°C for a specified period of time.

Store Temperature: Storage temperature in °C.

Hold for: Duration of the Store step.

Infinite: Holds the specified temperature for an unlimited period of time.

NOTE: When executing the *Store* command, the lid pressure is set to zero Newton



Script Information

Use this command to record your comments about the PCR program.

4.1.2 Program Wizard

The Program Wizard™ is a unique feature that makes it easy for first-time PCR users to write their own protocol. The Program Wizard takes care of the calculations required for generating a PCR program. All you need is to supply the biological data of the Primer and template DNA such as Primer sequence or melting temperature, template length and origin of DNA.

The Program Wizard is also an ideal tool for first shot PCRs as it uses proven calculations, e.g. for the Annealing Temperature.

- 1 To generate a new PCR program using biological data, click on **Program Wizard** in the start screen.
- 2 The **Primer Information** dialog opens from where you will be guided step by step through the programming procedure.
- 3 After you have supplied all required data click on *Generate PCR Program*. The **Compose a New PCR Program** dialog window opens where you can view and edit the previously defined program steps.
- 4 To edit a program step, double-click the respective command.
- 5 To view a graphical representation of the defined temperature profile, click **Profile**.

4.2 General Programming Guidelines

To ensure a correct PCR run, the following guidelines should be followed when composing a new program:

- A program must contain at least one *Temperature Step*.
- Cycles cannot be nested. A started cycle must have an *End Cycle* command before starting the next *Start Cycle* command.
- *Open Lid*, *Close Lid* and *Barcode Input* commands cannot be programmed inside a cycle.

- Only a single *Script Information* command is valid within a program.

The following commands or command combinations are considered "stages":

- ▶ Automatic Hot Start
- ▶ Manual Hot Start
- ▶ A string of up to ten single Temperature steps
- ▶ Single Gradient steps
- ▶ A complete cycle including Temperature or Gradient steps within a start cycle / end cycle pair.
- ▶ A Touchdown command
- ▶ A Store command

When using these stages in a script, the following rules apply:

- The maximum number of stages within a script must not exceed 10.
- The maximum number of Temperature and Gradient commands inside a cycle must not exceed 10.
- The maximum number of cycles/loops within a stage is 99.

4.3 Editing Programs

4.3.1 Editing Program Parameters

You can edit the parameters of existing programs and store the program with the same name or rename the edited program.


1 To edit an existing PCR program use one of the methods below:

- Click  in the start screen

OR

- Select **View & Edit Files** from the navigation bar on the left side of the window pane
- 23 Depending on your user level (guest or registered user), the specific user directory or guest directory is displayed listing all existing PCR program files.
 - 24 Select the program you wish to edit.
 - 25 Click **Open**.
Opening the file automatically loads the PCR program and the program steps are displayed in the Program Window of the **Compose a new PCR Program** dialog.
 - 26 Double-click the command you wish to edit. This will open the dialog window of the respective command.
 - 27 Edit the parameters as needed.
 - 28 Click **Save** to save your changes and to return to the **Compose a new PCR Program** window.
 - 29 Repeat steps 4–6 for each command you wish to edit.
 - 30 After you have modified all data, click **Save** in the **Compose a new PCR Program** dialog, if you wish to store your changes in the existing PCR program. OR
Click **Save As**, if you wish to rename the program. You will then be prompted for a file name.

4.3.2 Deleting a Program Step

- 1 To remove a program step from the program just drag it from the Program Window and drop it into the recycle bin  icon located below the Program Window.
- 2 Save the program as described above.

4.3.3 Converting a Gradient Step

A gradient step can be converted to a standard temperature step with a few mouse clicks.

- 1 After performing the gradient experiment, have a look at the gel image and select the best-performing column.
- 2 Double-click the Gradient Step command to open its dialog window.
- 3 Select the **Convert Gradient Step to a standard temperature step** checkbox.
- 4 Select the appropriate column from the drop-down list in the Conversion section.
the thermal cycler software will now convert the gradient step into a temperature step and automatically select the right temperature in the chosen column.

NOTE: If it is required to repeat the gradient experiment, the converted temperature step can be set back to a gradient command just by unchecking the Conversion option

4.4 Deleting Programs

- 1 To delete an existing PCR program use one of the methods below:



- Click  in the start screen

OR

- Select **View & Edit Files** from the navigation bar on the left side of the window pane.
- 31 Depending on your user level (guest or registered user), the specific user directory or guest directory is displayed listing all existing PCR program files.
 - 32 Select the program you wish to remove.
 - 33 Click **Delete**. This will remove the program from the script folder.

5 PCR Run / Operation

5.1 User Login

5.1.1 Guest Users

When powering up the instrument the default user level is Guest. If you wish to continue to operate the cycler with Guest user rights, no special login procedure is required. In this case you can access the unrestricted Guest folder and operate the cycler as described in the relevant chapters.

5.1.2 Registered Users

Once the administrator has set you up as a registered user (see 3.4.2.4), you can operate the thermal cycler using your personal data and file folders.

To log into the system as a registered user proceed as follows:

- 1 Click on **Login** in the top status bar – the **Login** dialog opens.
- 2 Select your user name from the Username drop-down list and enter your password.
- 3 Click on the **Login** button. This will log you into the system giving you reading and writing rights as specified for your user level.
- 4 After successful login your user name is displayed in the top status bar.

NOTE: In case a user forgets his or her password, the logged-on administrator can assign him/her a new one.

5.2 Changing Users

In order to log into the system when another user is already logged in, proceed as described in section *Registered Users* above.

5.3 Making an Instrument Reservation

The thermal cycler is equipped with a visual reservation function. The reservation is not blocking or restricting the instrument to any user. It only indicates that the instrument is needed for a certain user after the current run.

- 1 Click on the RESERVED FOR field in the right corner of the bottom status bar.
- 2 Select **Reserve next run for Current User**, if you are already logged in.
- 3 If you are not logged in, select **Reserve next run for User** to reserve the subsequent run.
- 4 Select your user name from the **Username** drop-down list and enter your password.
- 5 Click on **Reserve** to confirm the reservation.


5.3.1.1 Cancelling a Reservation

To cancel an existing reservation, check the **Clear Reservation** button.

To quit the reservation window without saving any changes, click **Cancel**.

5.4 Selecting a PCR Program

- 1 To select an existing PCR program use one of the methods below:

- Click  in the start screen

OR

- Select **View & Edit Files** from the navigation bar on the left side of the window pane.
- 2 Your personal file folder opens or, if you are logged in as a guest, the guest folder opens displaying the available PCR programs.
 - 3 Select the program you wish to run.
 - 4 Click **Run selected** on the right-hand side of the window to start the selected program.

NOTE: The *Start PCR* command button in the navigation bar on the left-hand side of the screen will start the currently loaded program, e.g. the previously used program, but not the selected program!

- 5 If you wish to view the PCR program steps, click **Open**.
Opening the file automatically loads the PCR program. The name of the loaded program is displayed in the top status bar.
- 6 After a program is loaded you may view its script parameters prior to run by clicking on **Profile**.

5.5 Viewing Script Temperature Profiles Prior to Run


Before starting a run, you can view the temperature profile of a new or stored program.

- 1 If not yet displayed, open the desired program as described in section 5.4, *Selecting a PCR Program*.
- 2 Click on **Profile** in the **Compose a New PCR Program** dialog window.
An information screen is displayed detailing all the parameters of the selected program.

5.6 Opening and Closing the Lid (S-24 and S-96)

For S-24 and S-96 thermal cyclers the lid can be opened and closed manually at any stage.

5.7 Loading the Cycler

For S-24 and S-96 thermal cyclers open the lid manually. For Automated Satellites and Servers press the **Open/Close button** on the front of the instrument or click  on the start screen to access the block.

WARNING:



Danger of Burns! The thermal block, test tubes and plates may reach temperatures as high as 100°C! Before

loading or unloading the cycler, keep hands away until temperature reaches 30°C or less

Pinching Hazard! The automatic sliding lid presents a potential pinching hazard

Do not place hands or fingers in to the cycler when the lid closes

Loading Plates

Depending upon the thermal block installed, the thermal cycler can be loaded with one 96-well PCR plate or one 384-well PCR plate.

Put your plate on the block and ensure that it is correctly positioned in the provided space. This is not applicable for S-24 thermal cyclers.

Loading Tubes

S-96 thermal cyclers can be loaded with up to 96 PCR tubes (0.2 ml) or 48 PCR tubes (0.5 ml) when using the 96-well combi block.

S-24 thermal cyclers can be loaded with up to 24 PCR tubes.

Distribute tubes equally over the block.

NOTE: When using a Gradient step inside your program, use the central rows in the block (rows D + E).

5.8 Setting the Lid Pressure (S-96 Units Only)

Simply close the lid and turn the knob to the tube or plate symbol. This sets the pressure to low pressure for tubes and high pressure for plates.

5.9 Program Execution

5.9.1 Starting a Run

1 To start a run use one of the methods below:



- Click  in the start screen

OR

- Select **View & Edit Files** from the navigation bar on the left side of the window pane.

Your personal file folder opens or, if you are logged in as a guest, the guest folder opens displaying all available PCR programs.

34 Select the program you wish to run.

35 Click **Run** on the right-hand side of the window to start the selected program.

NOTE: The *Start PCR* command button in the navigation bar on the left-hand side of the screen will start the currently loaded program, e.g. the previously used program, but not the selected program!

After a run is started, a graphical representation of the temperature parameters is displayed. In addition, detailed program and instrument information can be viewed using the **Program** or **Info** buttons located in the right-upper corner of the information screen.

Click **Program** to display the program steps of the running protocol. The executed step is highlighted.

Click **Info** to view detailed instrument information such as temperature sensor values, lid status, remaining time and step time or GLP file name.

5.9.2 Viewing Current Program Step Information

When operating a cycler network, you can view current program step information of all connected thermal cycler devices any time during the run.

Just click on the **Cycler Monitor** section header below the navigation bar. This will display an information screen listing the following details:

Cycler Name:	Lists all connected cyclers by name
End Time:	Informs about the end time of a run
Current User:	Lists the logged in user(s)
Run Program:	Specifies the current program
Run Information:	Specifies current system status information
Reservation:	Informs about reservations made for that instrument

5.9.3 Terminating a Run

After a run is started, the **Start PCR** buttons in the navigation bar and in the start screen change to **Stop PCR**.

- 1 To stop a program manually before it completes, ensure the appropriate thermal cycler is selected and press **Stop PCR**.

5.10 Reports

5.10.1 Viewing Reports

Depending on the assigned user level, you are allowed to view and print LabBook reports stored in the following file folders:

User rights	File folder	Action
Guest users	Guest folder	Viewing and printing Lab Book reports The access to GLP reports is denied .
Registered users	Guest folder & Personal file folder	Viewing and printing Lab Book reports The access to GLP reports is denied
Administrator	All guest and user folders	Viewing Lab Book reports Access to GLP reports permitted

To view reports proceed as follows:

1 Click **Reports** in the navigation bar. This will open the **Browse Generated Reports** window listing the generated reports.

2 Group the displayed reports by selecting one of the sorting criteria below:

Group by Date: Sorts records in ascending order by date.

Group by Cyclers: Sorts records by cyclers name.

Group by Program: Sorts records by program name.

3 For viewing GLP and/or LabBook reports select one of the following options:

Show GLP: Displays the generated GLP records (only for users with administrator rights)

Show LabBooks: Displays the generated LabBooks

5.10.2 Deleting Reports

To delete reports proceed as follows:

- 1 Open the **Reports** dialog window as described above.
- 2 Select the report you wish to remove.
- 3 Click **Delete** to remove the report from the reports list.

NOTE: Only users with administrator rights are authorized to delete reports.

5.11 Switching Off the Instrument

The unit can be switched off at any time during operation using the power button on the instrument. There is no need to exit the thermal cycler software prior to switching off the instrument.

6 USB Memory Stick Operation

6.1.1 Importing and Exporting PCR Data Files

You can import Primer sequences and PCR programs created on a different thermal cycler or on a PC to the Automated thermal cycler and PCQB software, or export PCR programs and reports that have been created using a USB memory stick.

Exporting Program Files to a USB Archive

- 1 Make sure the USB memory stick is inserted in the USB slot on the front of the instrument.
- 2 Click **View & Edit Files** to display your personal file folder. Select the desired PCR program as described in section 5.4 Selecting a PCR program.
- 3 Click **Save As** to open the **Save Program** dialog window.
- 4 Enter the name of the program.
- 5 Activate the **Save to USB** checkbox. The file is then saved to the USB archive.

NOTE: the lock button on the memory stick may prevent data access. Please ensure the lock button is in the unlocked position.

Importing Files from a USB Archive to the Thermal Cycler

- 1 Make sure the USB memory stick is inserted in the USB slot on the front of the instrument.
- 2 Click **View & Edit Files** to display your personal file folder. Click **View USB** to access the USB archive.
- 3 Select the desired file from the archive.
- 4 Click **Save As** to select a file name and path.
- 5 Confirm with **OK** to save the file.

Uploading Primer Sequences from a USB Archive

Automated and PCQB software offers the option to upload Primer sequences stored in an external memory using the Program Wizard™ function.

- 1 Click **Program Wizard** in the navigation bar.
- 2 The first step of the procedure, the **Primer Information** dialog is displayed.
- 3 Click **Browse** in the Sequence Primer One/Sequence Primer Two section and browse for the required files in the **Upload Sequence from USB Memory Stick** dialog window.
- 4 Select the desired file and click **Open** to upload the file to the thermal cycler.

NOTE: Primer Sequence files must have *.txt file format.

7 Maintenance

7.1 Cleaning

Quanta Biotech thermal cyclers are designed to require a minimum amount of maintenance by the user. They can be cleaned using water or a mild laboratory-cleaning agent.

The instrument should not come into contact with organic solvents or aggressive solutions. Ensure that no liquid enters the thermal cycler. For safety reasons, the device must be switched off and disconnected from the power supply prior to cleaning.

The electrical safety fuses are located above the main power switch and the main power plug at the rear of the device. Before the fuses are replaced, the device must be switched off and disconnected from the mains supply. Only fuses with the correct voltage values may be used.

Only qualified service personnel should perform servicing of the thermal cycler.

No warranty obligation is assumed by Quanta Biotech in the event of damage caused by unauthorized servicing.

8 Trouble-Shooting

8.1 If a Power Failure Occurs

All Quanta Biotech thermal cyclers are equipped with an autopower fail restart function that allows for power failures and safe continuation of a PCR run after resumption of power if set to do so in the cycler settings.

The autopower fail restart function restarts the script from the beginning of the temperature step in which it failed.

The following table lists the three power failure scenarios and the actions the instrument takes if the power is interrupted during operation.

Observation	Explanation / Remedy / Actions
The computer fails but the thermal cycler unit still has power	In this case the thermal engine will continue to execute the script without any interruption.
The thermal cycler fails but the computer still has power	The execution of the script will be affected and will halt whilst the power is off. Once the power resumes, restart the unit and the script will resume from the beginning of the step it was executing when the power failed.
Both the computer and the thermal cycler unit lose power	The execution of the script will be affected and will halt whilst the power is off. Once the power resumes the script will resume from the beginning of the step it was executing when the power failed. Corrective action: Restart the application and the connection will be restored.

8.2 Troubleshooting Information

Refer to the following table for a description of potential problems and recommended actions that you should take.

Observation	Explanation / Remedy / Actions
No actual temperature displayed at the bottom of the application	Block not correctly inserted in the machine. Corrective action: Check that the block is inserted correctly and reboot the machine.
One thermal engine thermistor does not agree with the others	Run Thermal Engineer OQ test ⁽¹⁾ to assess whether performance is within specified limits.
Poor experimental yield	1. Run Thermal Engine OQ test test ⁽¹⁾ to check that thermal engine operation is within specification. 2. If transferring protocol from a different make of thermal cycler, use TAS ⁽²⁾ system to determine new protocol parameters.
Program does not start	Block not correctly inserted in the machine. Corrective action: Check that the block is inserted correctly and reboot the machine.
Condensation in tubes during a run	Condensation will appear naturally at the end of a run and has no deleterious effects. Simply spin or flick the liquid back to the bottom of the tube and continue with the post PCR steps. However, condensation during a run will result in sub-optimal cycling. If this is experienced try increasing the lid temperature.
USB devices including memory stock and barcode scanner not recognised	Reboot machine.
Satellites are not recognized by the application	Check all satellites are powered and connected. reboot Server.

Abnormal block heating/cooling performance	Run Thermal Engine OQ test ⁽¹⁾ to check performance.
--	---

(1) Please refer to the thermal cycler IQ/OQ Protocol document for instructions on performing instrument qualification tests.

(2) The Temperature Acquisition System (TAS) can be purchased separately from Quanta Biotech Ltd.

9 Block Exchange (S-96 units only)

Block exchange can be performed within seconds. No tools are required for this purpose.

CAUTION:



Turn power off and interrupt power line before changing the block



Removing the Block

Remove the block by simply holding it with two hands on the left and right side and lift it up.



Figure 9-1: Exchanging the block

Inserting the Block

Hold the block with two hands on the left and right side, with the block connector at the back of the block, and place it into position in the the thermal cycler.

Appendix

Instrument Specifications

Thermal Blocks

Block Materials	Modular anodized aluminium blocks with 4 sensors
Traceability	NIST traceable temperature calibration
Blocks Available	<ul style="list-style-type: none">- 24 x 0.2ml block for S-24 Systems- 96 well gradient block: For 96 well PCR plates or 96x 0.2 ml tubes (S-96)- 96 well gradient combi block: For 96 well PCR plates, 96 x 0.2 ml tubes/ 48 x 0.5 ml tubes (S-96)- 384 well high throughput block: for 384 well plates (S-96)

Heated Lid

Lid Temperature Range	112°C,
Ambient temperature	10°C to 30°C
Relative Humidity	0% to 95%

User & File Management

User Level Management	3 levels: Administrator, User with administrator selectable restricted rights, Guest
User File Protection	Yes, for programs and reports
File Organization	Windows® Explorer, user-defined folders & subfolders
Program Storage	Minimum 99 (internal memory or USB stick). Unlimited PC program storage

Reports and Validation

Report Function	Encrypted GLP report, LabBook report
Validation	Internal auto validation prior to each program start Lid and thermal engine validation function

Networking & Barcode Option

Networking	PC controlled cycler network up to 15 units
Barcode Option	Barcode documentation via handheld barcode scanner

Thermal Engine Characteristics

Temperature Control	4°C - 99.9°C with simulated volume dependent control algorithm
Sample Volume Range	5-100µl
Sample Accuracy	+/- 0.4°C (20-99°C), +/- 1°C (4-20°C)

Sample Homogeneity	+/- 0.4°C
Heating	Up to 2.5°C per second
Cooling	Up to 2°C per second
Sample Overshoot	< 1°C
Gradient Temperature Range	30°C - 80°C (96 well only)
Maximum/minimum Gradient Span	30°C / 4°C

Power & Dimensions

Electronic Power Supply	100V to 240V (frequency 48 to 62Hz)
Dimensions	(WxDxH) 40cm x 40cm x 25cm
Weight	20kg approx
Operating conditions	10°C - 30°C, 0 - 95% relative humidity
Regulatory	CE, UL, CSA compliant
Warranty	2 years on all systems

Compatible Barcodes

The following barcodes are compatible with THEQ's documentation system:

- 2 of 5 interleaved
- Codabar
- Code 128
- Code 39
- Code 39 full ASCII
- Code 93 full ASCII
- EAN-13, EAN -13 with 2 supplement, EAN -13 with 5 supplement
- EAN-8, EAN -8 with 2 supplement, EAN -8 with 5 supplement

- EAN-128
- UPA, UPA -13 with 2 supplement, UPA -13 with 5 supplement
- UPE, UPE -13 with 2 supplement, UPE -13 with 5 supplement
- MSI
- C.I.P

Compatible Plate Formats

The following plate formats are compatible with the thermal cycler:

Manufacturer	Art. No. & Product Name	Type
ABgene		
	AB 800	96 well, skirted
	AB 900	96 well, semi-skirted
	AB 1111	384 well
	TF-0384	384 well
Bilatec		
	THERMOSPRINT® 96 PP, transparent, 311296; only w/o workstation	96 well, non-skirted
	THERMOSPRINT® 384 PP, transparent, 310384	384 well
NUNC		
	Art. No.: 240600, 96 well, non-skirted.	96
	Art. No.: 230013, 96 well, semi-skirted	96
	Art. No.: 230012, 96 well, skirted	96
	Art. No.: 230584, 384 well	384
Eppendorf		
	Art. No.: 0030 128.648, twin tec PCR plate, 96 skirted	
	Art. No.: 0030 128.575, twin tec PCR plate, 96 semi-skirted	
	Art. No.: 0030 128.508, twin tec PCR plate, 384	
Corning		
	Thermowell®96 Well Polypropylene PCR Microplate, Natural (#6551)	
	Thermowell™ 96 Well Polycarbonate PCR Microplate, Model M (#6511)	
	Corning® 384 Well Polypropylene PCR Microplate (#6500)	
	Corning® 384 Well Polyethylene PCR Microplate (#6502)	

Sales & Service

Quanta Biotech Ltd

Unit 4 Byfleet Technical Centre
Canada Road
Byfleet
Surrey
KT14 7JX
United Kingdom

Tel +44 (0) 1932 344550 • **Fax** +44 (0) 1932 353108

Email: info@quantadirect.com

Web: www.Quantabiotech.com

For Technical Support, please contact:

Technical Support:

Tel +44 (0) 1932 344550

techsupport@quantabiotech.com

Index

- AC Power Connection, 13
- Adding a Cyclер, 18
- Adding New User Accounts, 20
- Adding or Modifying User Accounts, 20
- Administrator Login, 20
- Administrator Settings, 18
- Automatic Hot Start command, 24
- Barcode Input command, 24
- Block Exchange, 46
- Changing Users, 32
- Cleaning, 42
- Connecting Optional Devices, 12
- Creating PCR Programs, 22
- Cyclер Management, 18
- Deleting a Program Step, 30
- Deleting Programs, 31
- DND Programming, 22
- Editing Cyclер Data, 18
- Editing Programs, 29
- Electrical, 7
- End Cycle command, 27
- First start-up, 19
- Functional Overview, 10
- Fuses, 13
- Gradient Step command, 26
- Gradient Step Conversion, 31
- Grounding Requirements., 13
- Hardware Installation, 11
- Initial Inspection, 9
- Installation, 7
- Instrument Reservation, 33
- Loading the Cyclер, 34
- Maintenance, 42
- Manual Hot Start command, 25
- Modifying User Accounts, 21
- Networking the Thermal Cyclер, 12
- Operating Power Requirements, 13
- Operation, 32
 - Cancelling a Reservation, 33
 - Changing Users, 32
 - Instrument Reservation, 33
 - Opening and Closing the Lid (QB-24 and QB96), 34
 - Running a Program, 36
 - Sample Loading, 34
 - Selecting Programs, 33
 - Setting the Lid Pressure, 35
 - Terminating a Run, 37
 - User Login, 32
 - Viewing Script Temperature Profiles
 - Prior to Run, 34
- Package Contents, 9
- Program Execution, 36
- Program Steps, 24
 - Automatic Hot Start, 24
 - Barcode Input, 24
 - End Cycle, 27
 - Gradient Step, 26
 - Manual Hotstart, 25
 - Script Information, 27
 - Start Cycle, 27
 - Store, 27
 - Temperature Step, 25
 - Touchdown, 26
- Program Wizard, 28
- Programming, 22
 - Converting a Gradient Step, 31
 - Deleting a Program Step, 30
 - Deleting Programs, 31
 - Editing Programs, 29
 - General Guidelines, 28
 - Program Wizard, 28
- Reports, 38
 - Deleting Reports, 39

- Viewing Reports, 38
- Requirements, 7
- Running a Program
 - Starting a Run, 36
- Safety
 - Instrument ~, 4
 - Symbols and Conventions, 4
- Safety Warnings, 3
- Sales & Service Centers, 52
- Script Information command, 27
- Setting Time and Date, 18
- Site, 7
- Software Operation, 14
 - Auto-Q and QBPC Software, 14
 - Required Computer Skills, 14
- Specifications, 47
 - Compatible Barcodes, 49
 - Compatible Plate Formats, 51
 - Networking & Barcode Options, 48
 - Power & Dimensions, 49
 - Reports and Validation, 48
 - Thermal Engine Characteristics, 48
 - User & File Management, 48
- User Interfaces, 48
- Start Cycle command, 27
- Start Screen, 15
- Starting a Run, 36
- Store command, 27
- Switching Off the Instrument, 39
- Symbols and Conventions, 4
- Temperature Step command, 25
- Terminating a Run, 37
- Thermal Block, 8
- Touchdown command, 26
- Trouble Shooting
 - If a Power Failure Occurs, 43
- Trouble-Shooting, 43
- UnPacking the Thermal Cycler, 9
- USB Memory Stick Operation, 40
- User Accounts
 - Deleting Accounts, 21
- User Levels, 19
- User Login, 32
- User Management, 19
- Viewing Current Program Step Information, 36