applied
biosystems®
by *life* technologies™

ProFlex™ PCR System User Guide

Installation, Use, and Maintenance

for use with: PCR reagents from Invitrogen™ and Applied Biosystems®

life technologies™

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About this Guide

Revision History

Revi-sion	Date	Description
01	May 2013	New document
02	August 2013	Added information about the ProFlex™ Dual 96-Well PCR System and the ProFlex™ Dual Flat PCR System

Purpose

The ProFlex™ PCR System User Guide provides information about installing, using, and maintaining the ProFlex™ PCR System.

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1   About the ProFlex™ PCR System

The ProFlex™ PCR System is an end-point thermal cycler, specifically designed for the amplification of nucleic acids using the Polymerase Chain Reaction (PCR) process. The user interface consists of a touchscreen with a graphical display that shows the time, status, and temperature profile for each run. A touchscreen keypad allows you to enter information into fields on the display screen.

About the system

There are four models of the ProFlex™ PCR System:

Description	Cat. No.
ProFlex™ 96-Well PCR System	4484075
ProFlex™ 3x32-Well PCR System	4484073
ProFlex™ Dual 96-Well PCR System	4484076
ProFlex™ Dual Flat PCR System	4484078

Four interchangeable ProFlex™ Sample Blocks are available:

Description	Cat. No.
ProFlex™ 96-Well Sample Block	4483637
ProFlex™ 3x32-Well Sample Block	4483638
ProFlex™ Dual 96-Well Sample Block	4484071
ProFlex™ Dual Flat Sample Block	4484074

The ProFlex™ PCR System allows you to:

- Run three experiments at a time with the 3x32-well, 0.2-mL block
- Interchange the blocks (e.g. exchange the ProFlex™ 3x32-Well Sample Block with the ProFlex™ 96-Well Sample Block, the ProFlex™ Dual 96-Well Sample Block, the ProFlex™ Dual Flat Sample Block, and vice-versa)
- Access the system remotely through a mobile application
- Program the instrument from the touchscreen interface
- Simulate other PCR instruments with Thermal Simulation modes
- Optimize your PCR with the help of the Veriflex™ blocks

Figure 1   ProFlex™ 3x32-Well PCR System

Figure 2   ProFlex™ 96-Well PCR System
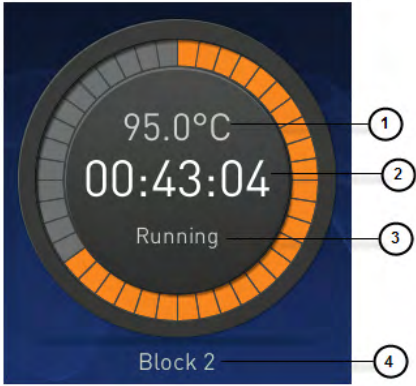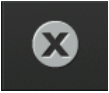
This user guide provides information on how to maximize the capabilities of your ProFlex™ PCR System. This user guide provides unique instructions for the different ProFlex™ block types at the beginning of each section.

Detailed specifications for the ProFlex™ PCR System are found in Appendix C, "Instrument specifications".

Using the ProFlex™ System Touchscreen

You interact with the ProFlex™ System using a touchscreen. Table 1 describes the several buttons common to many of the screens in the ProFlex™ System.

Table 1 Buttons in the ProFlex™ System touchscreen

Button	Function
	Returns to the previous screen
	1. Current temperature 2. Time remaining (displays time elapsed if the block is in an infinite incubation stage) 3. Status of the block (pre-heating, running, and so on) 4. Block number (in case of the ProFlex™ 3x32-Well Sample Block)
	Scrolls up and down through a list of items.
and buttons.	View other stages
	Closes the current modal window.
	Indicates whether the Wi-Fi is on or off.

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Entering text

When you touch a field that requires the input of text, the text editor, as seen in the following figure, opens. Table 2 displays the buttons to touch to enter different information types.
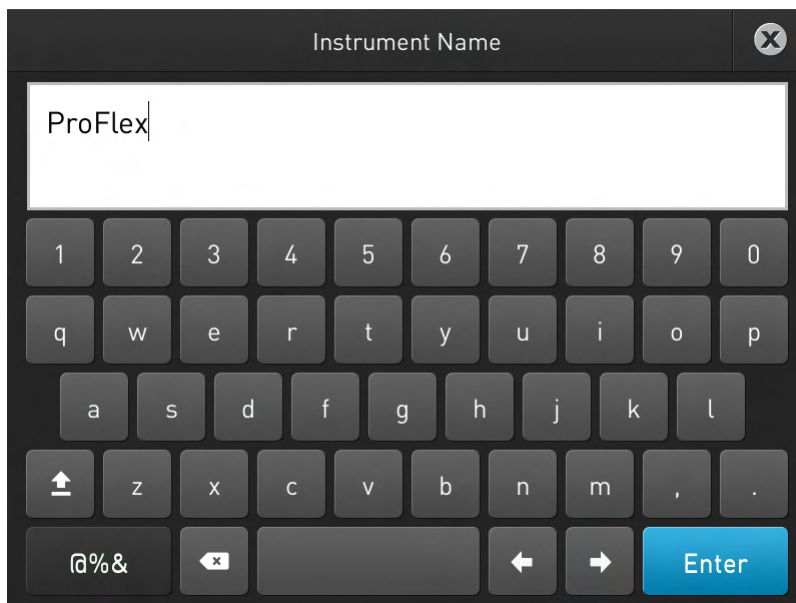
Table 2 Buttons to enter different information

To...	Touch
Enter a lowercase letter	A letter button.
Enter an uppercase letter	⬆, then the letter (s). When you are done, touch ⬆ again.
Enter punctuation or other symbols	@%&, then the symbol(s). When you are done, touch @%& again.
Delete the last letter	⬅
Close the editor and save any changes	Enter to accept the entry and close the editor.
Close the editor and discard any changes	⊗

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Entering numerals

When you touch a field that requires a numerical input, the numeric editor, as seen in the following figure, opens. Table 3 displays the buttons to touch to perform different functions while entering numbers.
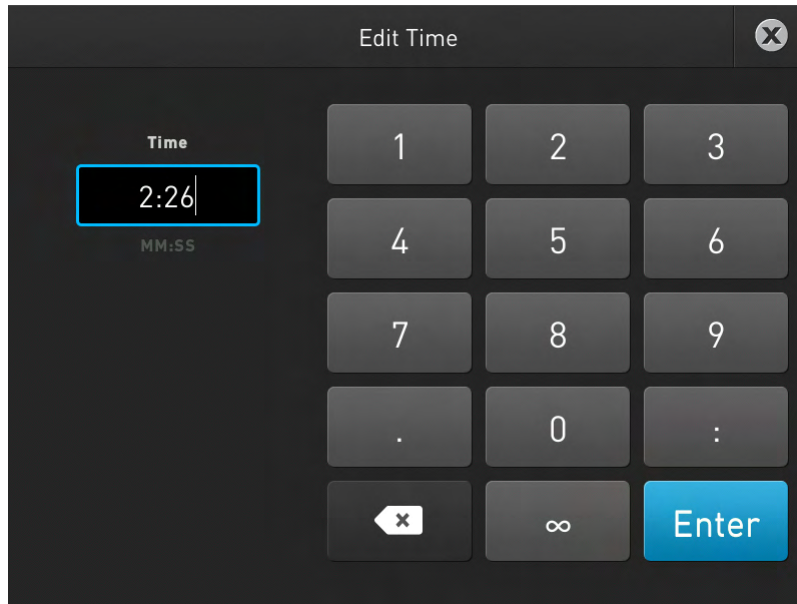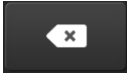
Table 3 Functions performed by entering numbers

To...	Touch
Enter a number	A number button.
Enter decimal, colon, or infinity symbol	the button with the respective symbol.
Delete the last number	
Close the editor and save any changes	

ProFlex™ Touchscreen menu overview

On powering on the ProFlex™ PCR System, you will first see the following Splash screen.

Figure 3 ProFlex™ PCR System Splash screen

After the Splash screen, the Home screen appears. The ProFlex™ PCR System has interchangeable blocks, and detects which module is present on the system automatically. After the block completes initializing, depending on the block in use, the Home screen displays status dials; three for the ProFlex™ 3x32-Well Sample Block and one for the ProFlex™ 1x96-Well Sample Block, the ProFlex™ Dual 96-Well Sample Block, and the ProFlex™ Dual Flat Sample Block.

Figure 4   ProFlex™ 3x32-Well PCR System Home screen

The Home screen includes the following features:

1. **Status dial**: The number of dials appearing on the Home screen varies with the block module in use. While the ProFlex™ System is in use, the status dial displays the current temperature of the block, the time elapsed for a run, and the run status.

   When the ProFlex™ System is not in use, the status dial/s will show the 'Set Up Run' display. You can start a run by touching the status dial where it says Set Up Run. For instructions on starting a run by this method, see "Performing a run" on page 40.

2. **My Account**: Touch **My Account** to enter or edit the account information.

3. **New Method**: Touch **New Method** to create a new run method with the help of the default templates that are pre-loaded with the ProFlex™ System. Touching New Method takes you to the Setup Run screen that allows you to create a new run method by using the default templates or existing methods. You can also create a run method for incubation from the Setup Run screen.

4. **Open Method**: Touch **Open Method** to select an existing run method to start a run. Touching Open Method takes you to the Select Method screen that displays the existing run methods. The run methods are sorted and stored in various folders. Select a folder to display the run methods within the folder. Touch a run method under the Method name to edit that run method in the edit mode.

5. **Incubate**: Touch **Incubate** to use the ProFlex™ instrument as a precise incubator for non-PCR workflows.

6. **Settings**: Touch **Settings** to configure the ProFlex™ Instrument.

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Initial Set-up

This chapter includes the procedures for installing the ProFlex™PCR System.

Site requirements

The ProFlex™ PCR System is for indoor use. Ensure that the installation site:

- Meets the spatial and weight requirements (see "System specifications" on page 59)
- Meets environmental requirements (see "Environmental requirements" on page 14)
- Is within 1 m (3 ft.) of an AC power source receptacle
- Is away from water

Environmental requirements

Temperature and humidity requirements

Ensure that the installation site is maintained under the following conditions:

Table 4 Temperature and humidity requirements

Condition	Acceptable range
Temperature	15 to 30°C (59 to 86°F)
Humidity	15 to 80% relative humidity, non-condensing

Avoid placing the instrument adjacent to heaters, cooling ducts, or in direct sunlight. Fluctuations between day and night temperatures can cause system instability. Place away from any equipment that vibrates, such as a refrigerator or centrifuge.

Pollution

The ProFlex™ PCR System has a Pollution Degree rating of 2. It may be installed in an environment that has non-conductive pollutants only, such as dust particles or wood chips. Typical environments with a Pollution Degree II rating are laboratories and sales and commercial areas.

Altitude

The safety of ProFlex™ PCR System use was tested for altitudes up to 6000 ft.

Materials

Required materials

- Scissors, pocket knife, or box cutter
- Compressed air
- Protective hardware, as appropriate (see below)

Optional protective hardware

Life Technologies supports the use of the following devices to protect the ProFlex™ PCR System from damage resulting from electrical hazards and the resultant loss of data. Before installing the system, decide what additional hardware (if any) you want to install.

- Power line regulator (1.5-kVA)
- Surge protector/line conditioner (10-kVA)
- Uninterruptible power supply (1.5-kVA)

Unpacking the ProFlex™ System

> **IMPORTANT!** Save the packing materials and box in case you need to ship the instrument to Life Technologies for service.

1. To unpack the ProFlex™ System:

   a. Cut the straps securing the instrument box.

   b. Cut the tape securing the top flaps of the instrument crate, then open the flaps.

   c. Remove the ProFlex™ System Accessories from the instrument and set them aside.

   d. Lift and remove the cover from the instrument crate.

   e. Remove the packing material from the ProFlex™ System, then inspect the instrument for shipping damage.

   > **IMPORTANT!** If the ProFlex™ System is damaged, note the location and appearance of the damage, then contact Life Technologies Technical Support or your service representative (see "Obtaining support" on page 83).

2. Move the ProFlex™ System to the desired installation site. Follow these guidelines for lifting and moving:

   - Make sure that you have a secure, comfortable grip.

   - Keep your spine in a neutral position.

   - Bend at the knees and lift with your legs.

   - Do not lift and twist your torso at the same time.

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3. Verify that the package containing the ProFlex™ System Accessories includes:

- Power cord cable

- ProFlex™ System Starter Kit

- USB-enabled Wi-Fi Card (Part no. 4483658)

Setting up the ProFlex™ System

1. Remove the packing material:
   a. Open the ProFlex™ System heated cover.

   b. Remove the packing material from the ProFlex™ sample block(s) (ProFlex™ 96-Well Sample Block or ProFlex™ 3x32-Well Sample Block).

   c. Using a can of compressed air, deliver a blast of air into each well of the sample block(s) to remove any particles that may have collected during transportation.

2. Install the sample block. To place the sample block into the instrument base:
   a. Facing the ProFlex™ Base unit away from you, pull the lever all the way to the right hand side.
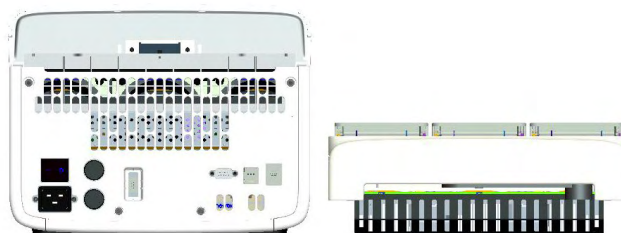
Figure 5 ProFlex™ System Base unit and the ProFlex™ 3x32-Well Sample Block)

   b. Place the sample block onto the ProFlex™ Base with the latching mechanism to the right.
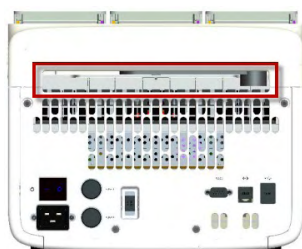
Figure 6 ProFlex™ System Base unit with the latching mechanism to the right

   c. Push the latching mechanism all the way to the left to secure the block onto the base.

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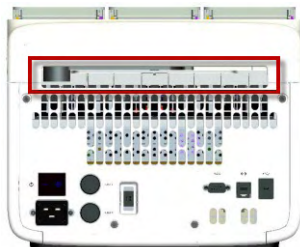
Figure 7 ProFlex™ System Base unit with the latching mechanism to the left

Note: If the sample block module is not seated in place correctly, the instrument will not be able to detect the block type.

Note: To change the sample block from one type to the other, see "Changing sample blocks" on page 23.

3. Close the heated cover.

4. Connect the power cable to the ProFlex™ System.
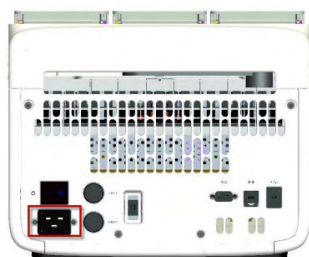
Figure 8 Power cable port in the ProFlex™ System Base unit

5. (Optional) Install any of the recommended protective devices (see "Optional protective hardware" on page 15).

6. Connect the power cable to the AC power source receptacle.

7. Connect the instrument to the network by inserting the ethernet cable into the ethernet port at the back of the ProFlex™ System. For instructions on setting up the wired connection, see "How to set up the wired connection in the ProFlex System" on page 19.

   In the absence of the ethernet cable or the ethernet port, you can connect the instrument to the network via the USB-enabled Wi-Fi Card (Part no. 4483658) as shown in the following graphic.

   Insert the Wi-Fi Card into the USB port at the back of ProFlex™ System. For instructions on setting up the wireless connection, see "How to set up the wireless connection in the ProFlex System" on page 21

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Figure 9 USB port in the ProFlex™ System Base unit

8. Press the power button, then wait for the instrument to start up. Proceed with the installation after the touchscreen displays the Main Menu, indicating that the ProFlex™ System startup is complete. When you power on the instrument, the instrument may require about 45 seconds to start up.

   Note: See "Recommended instrument settings" on page 22 for instructions on completing the installation process of the ProFlex™ System from the Instrument touchscreen.

   The Home screen will display following successful installation.

Figure 10 ProFlex™ 3x32-Well System Touchscreen Home

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How to set up the wired connection in the ProFlex™ System

See "Setting up the ProFlex System" on page 16 for instructions on connecting the ProFlex™ System to the network. To set up the wired connection:

1. On the Home screen, touch **Settings**.
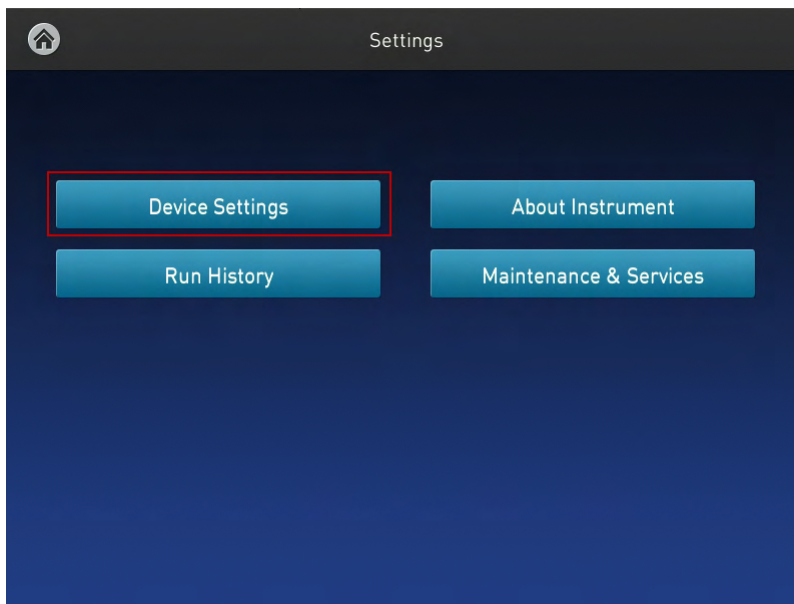
Figure 11 ProFlex™ PCR System Settings screen

2. In the Settings screen, touch **Device Settings**.
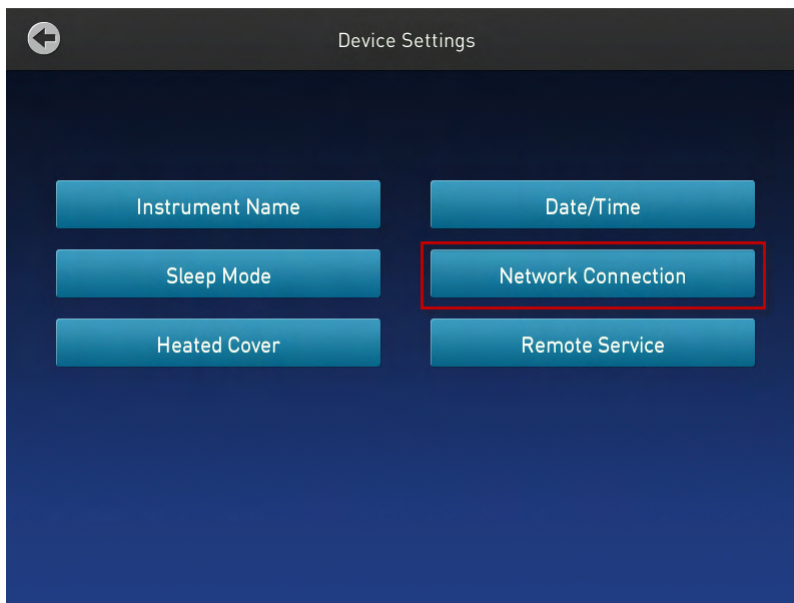
Figure 12 ProFlex™ PCR System Device Settings screen

3. In the Device Settings screen, touch **Network Connection**.
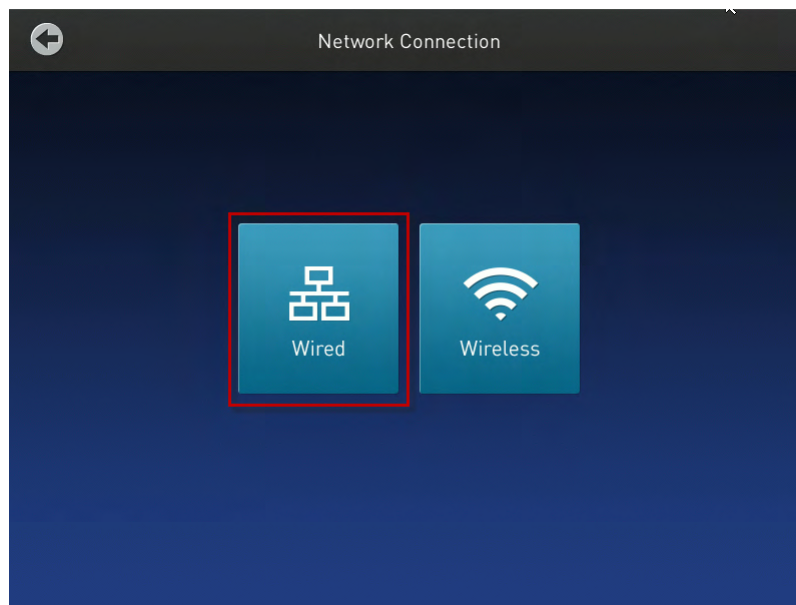
Figure 13 ProFlex™ PCR System Network Connection screen

4. In the Network Connection screen, touch **Wired**.
    The Network Configuration screen opens up.
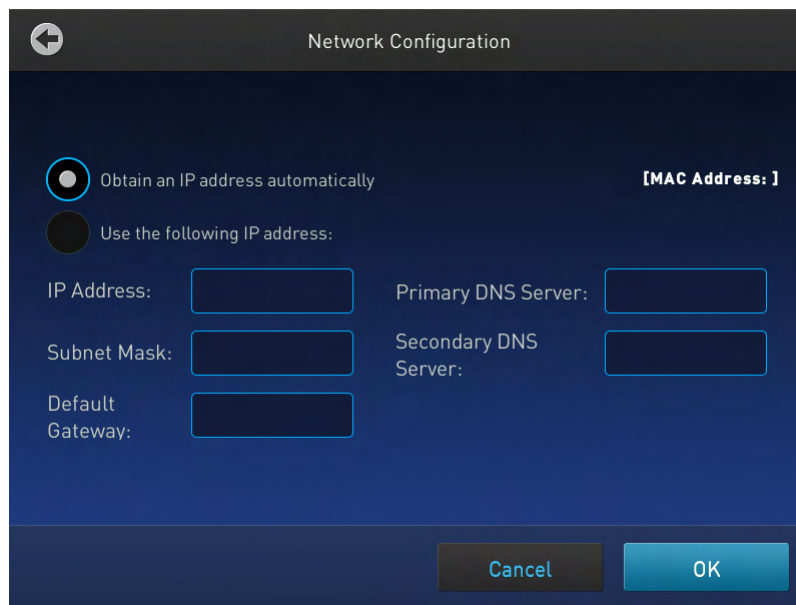
Figure 14 ProFlex™ PCR System Network Configuration screen

In the Network Configuration screen, you can choose to connect to the network by obtaining the IP address either automatically (using DHCP) or manually. If your instrument is not on a network, you do not need to set the IP address.

Note: Ask your system administrator if the IP address is assigned statically or dynamically. For static addresses, you need to know the IP address for the instrument, the subnet mask, and the default gateway.

• Automatically:

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Touch **Obtain an IP address automatically** (using DHCP). A check mark appears when DHCP is selected.

or

- Manually:

  Touch **Use the following IP Address**, then enter the appropriate IP addresses for the instrument, the Subnet Mask, and, optionally, the Default Gateway, the Primary DNS Server, and the Secondary DNS Server using the numeric editor. Addresses are in the form of X.X.X.X, where each X is a 3- digit number, from 001 to 255.

5. Touch **OK** to save the changes and go back to the Network Connection screen. Touch **Cancel** to exit the screen without saving the changes.

How to set up the wireless connection in the ProFlex™ System

See "Setting up the ProFlex System" on page 16 on connecting the USB-enabled Wi-Fi Card into the ProFlex™ System. To set up the wireless connection:

1. Refer to "How to set up the wired connection in the ProFlex System" on page 19 through step 3 to arrive at the Network Connection screen.

2. In the Network Connection Type screen, touch **Wireless**.
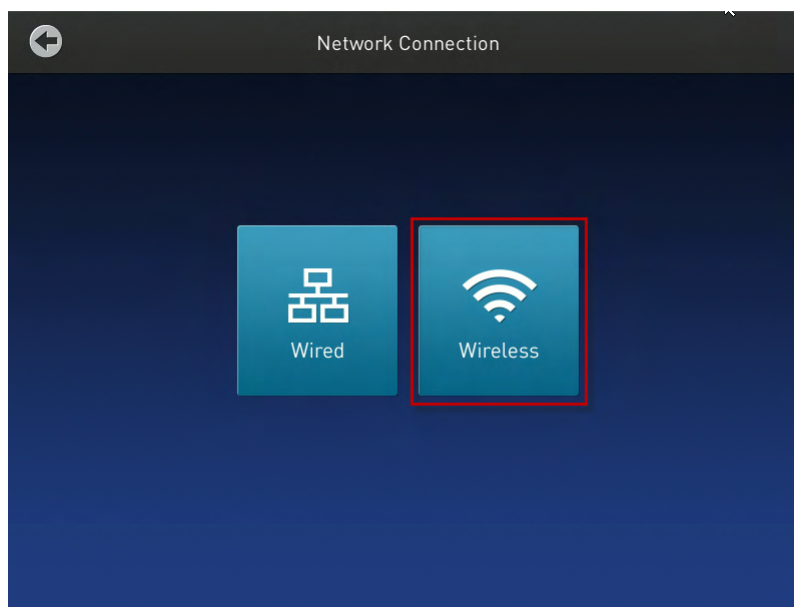
Figure 15 ProFlex™ PCR System Network Connection screen

The Search Wireless Network screen will come up and the wireless symbol will appear active. Touch **Cancel** to exit the screen.

Note: During initial setup, if you selected the Wired option in the Network Connection Type screen, you will be required to enter your IP address if you selected the Static IP wired option. If you selected the Dynamic IP wired option, the IP address is automatically populated.

3. Once a wireless connection has been detected, a list of the available networks will be displayed in the Choose Network screen. Touch the network name of your choice or touch **Join Other Network**.

4. In the Find and Join a Network screen, enter the name and security type of the network.

    Note: When you touch in the Network Name field, a keypad will come up to facilitate making the entry.

5. From the Security type drop-down menu, touch to select the security type and enter the relevant information in the screen.

    Note: Contact your IT Systems Administrator for information on security type.

    You can select from the following options:
    *   WEP
    *   WPA Personal
    *   WPA2 Personal
    *   WPA Enterprise
    *   WPA2 Enterprise

6. Touch the Remember this network checkbox if you want the ProFlex™ System to remember the network.
    Touch **Join** to continue or **Cancel** to exit from the Find and Join a Network screen.

7. Depending on the security type you have selected, enter the appropriate passwords and touch **Join**.
    If you entered the correct information, the Network Connection Complete screen will appear. Touch **OK** to continue. If you entered incorrect information, the Network Connection Failed screen will come up and you will require to go back to security type screen to resolve the issue. Touch **OK** to continue.

Recommended instrument settings

You can configure the following instrument settings by touching Settings on the Home screen:

*   **Device Settings**: Touch **Device Settings** to set various additional parameters:
    Set the following in the Device Settings screen:
    –   **Instrument Name**: Touch the Instrument Name field and, using the text editor, enter up to 25 alphanumeric or 10 numeric characters to identify the instrument.

        Note: The instrument name cannot have spaces. Separate consecutive characters with a hyphen or underscore; for example, *My_Instrument*.
    –   **Date/ Time**: Touch **Date/ Time** to set the date and time for a run.
        1. Enter the date and time in the Date/Time field using the numerical editor that comes up when you place the cursor in the respective fields.
            You can toggle between AM and PM by touching in the field directly.
        2. Touch **OK** to save the date and time changes or **Cancel** to exit.
    –   **Sleep Mode**: In the Sleep Mode screen, touch the Off and On toggle button to disable or enable, respectively, the sleep mode.
        In the 'On' mode, you can edit the time (in minutes) after which the instrument will go from the idling state into standby mode.
    –   **Network Connection**: Touch **Network Connection** to select the type of network connection. You can select from the Wireless and Ethernet options. For

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details on using the Wireless and Ethernet options, see "How to set up the wired connection in the ProFlex System" on page 19 and "How to set up the wireless connection in the ProFlex System" on page 21, respectively.

– **Heated Cover**:

1. In the Heated Cover screen, touch the On and Off button to enable or disable, respectively, the heated cover idling temperature.

2. Edit the idling temperature if the button is in the 'On' mode.

   Note: The temperature for the heated cover must be between 30 and 110°C.

3. Click **OK** to save the changes or **Cancel** to exit the screen.

– **Remote Service**: In the Remote Service screen, use the On and Off toggle button to enable or disable, respectively, remote service. The feature allows the instrument to upload data, periodically, to a remote server.

   Note: Ensure that you are connected to a network if you want to enable the Remote Service feature.

   After you have set the toggle button, touch **OK** to save the change or **Cancel** to exit the screen.

- **About Instrument**: Touching About Instrument will take you to the About Instrument screen where you can find out more information about the instrument as well as view the End User License Agreement (EULA).

  – Touch **About Instrument** to find out more about the ProFlex™ PCR System. In the About Instrument screen, you can view information like firmware version and instrument statistics.

  – Touch **EULA** to view the End User License Agreement. You can also save the EULA document to a USB drive.

- **Run History**: The Run History screen displays the entire list of runs performed using a particular ProFlex™ PCR System.

  a. In the Run History screen, touch a particular Run ID to view the details of that run.

  b. Touch **Export** to save the run details to a USB device.

- **Maintenance & Services**: You can perform the following in the Maintenance & Services screen:

  – **Software Updates**: Touch **Software Updates** to update the ProFlex™ System firmware. See "Upgrading system firmware" on page 47 for instructions on updating the firmware.

  – **Self Verification Test**: Touch **Self Verification Test** for the ProFlex™ instrument to conduct a check on the instrument hardware. The check includes testing the block, heated cover, and other components. See Chapter 4, "Routine Maintenance" for instructions on conducting the self-verification test.

Changing sample blocks

IMPORTANT! Ensure that you don't change the block while the ProFlex™ Instrument is powered on. This can cause extreme damage to the hardware itself.

The ProFlex™ System features an interchangeable sample block module allowing portability and versatility in sample configuration.

The ProFlex™ System supports the following sample blocks:

- ProFlex™ 96-Well Sample Block
- ProFlex™ 3x32-Well Sample Block
- ProFlex™ Dual 96-Well Sample Block
- ProFlex™ Dual Flat Sample Block

To change the sample block:

1. Power down the instrument using the main power switch on the back of the instrument.

2. Pull the lever out from the sample block module and move it towards the right to loosen the block from the base.

3. Remove the current sample block from the base.

4. Place the sample of block of your choice onto the base.

5. Pull the lever towards the left and into the instrument to secure the module.

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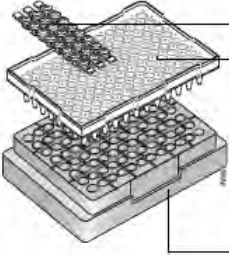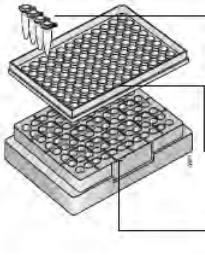
3 Operating the ProFlex™ PCR System

Loading samples into the instrument

Loading samples in the ProFlex™ 96-Well PCR System

This section describes how to load samples in:

- Tubes with attached caps
- 96-well reaction plates
- 96-well tray/retainer assemblies

Consumable
MicroAmp® Optical 96-Well Reaction Plate (0.2mL) MicroAmp® 8-Cap Strip (N8011535) / MicroAmp® Optical 96-Well Reaction Plate (0.2-mL) (N8010560/ 4316813) / MicroAmp® Splash Free 96-Well Base (4312063)
MicroAmp® Reaction Tube with Cap MicroAmp® Reaction Tube with Cap (0.2-mL) (N8010540/ N8011540) / MicroAmp® 96-Well Tray for VeriFlex™ Blocks (4379983) / MicroAmp® Splash Free 96-Well Base (4312063)

Consumable	
MicroAmp® 8-Tube Strip *or* MicroAmp® Reaction Tube without Cap	
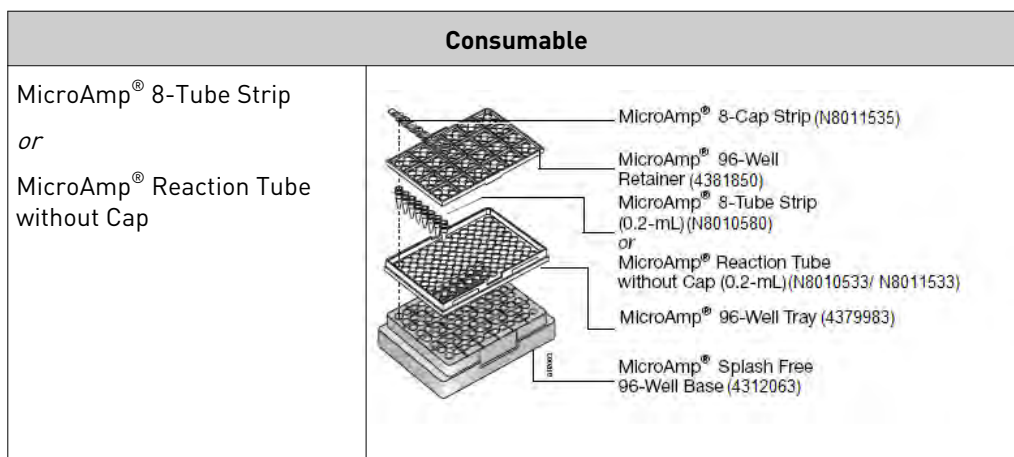
Loading tubes with attached caps

There is no need to use mineral oil or glycerine in the sample wells or as a vapor barrier over the PCR reaction mixture in the tubes. The MicroAmp® Reaction Tubes fit tightly in the wells, and the heated cover exerts an even pressure on all tubes, eliminating condensation on the tubes.

1. Set the 96-well tray on a splash-free 96-well base.

2. Place the reaction tubes in the tray.

3. Pipette the samples into the reaction tubes.

4. Cap the tubes.

5. See "Placing the sample tray or plate onto the sample block(s)" on page 27.

Loading the reaction plate

1. Place the reaction plate on a splash-free 96-well base.

2. Pipette the samples into the sample wells.

3. Cap the plates using the MicroAmp® 8-Cap Strips, or cover the plates with MicroAmp® Clear Adhesive Film.

4. See "Placing the sample tray or plate onto the sample block(s)" on page 27.

Loading tubes without caps

To load the 96-well tray/retainer:

1. Place the tray on the splash-free 96-well base.

2. Load tubes onto the tray using either single tubes or the 8-tube strips.

3. Place the retainer over the tubes.

4. Pipette the sample into the tubes.

5. Cap the tubes using a MicroAmp® 8-Cap Strip.

6. See "Placing the sample tray or plate onto the sample block(s)" on page 27.

Placing the sample tray or plate onto the sample block(s)

The steps for placing the sample tray in the sample block(s) are the same for:

- A sample tray/retainer
- A sample tray without a retainer
- A 96-well plate.

1. Lift the sample tray from the splash-free 96-well base and place it in the sample block(s).

2. Place the MicroAmp® Tray or Plate onto the sample block(s) so that well A1 is at the upper left corner of the tray, as shown in the following figure:

MicroAmp® Optical 96-Well Reaction Plate (0.2-mL)
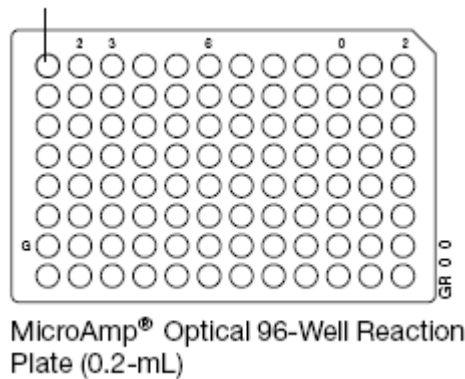
3. Close the heated cover.

Loading samples in the ProFlex™ 3x32-Well PCR System

This section describes how to load samples into the MicroAmp® reaction tubes or the MicroAmp® tube strips into a ProFlex™ 3X32-Well Sample Block.

1. Pipette the samples into the MicroAmp® reaction tubes or the MicroAmp® tube strips.

2. If you are using the MicroAmp® tube strips, secure the tube strip with the MicroAmp® cap strip. You can use the MicroAmp® Cap Installing Tool (Handle) to fix and remove the cap or cap strip.

3. Place the MicroAmp® 3x32-Well Retainer for VeriFlex™ Systems onto the sample block.

IMPORTANT! The retainer is essential and Life Technologies recommends its usage at all times along with the ProFlex™ 3x32-Well PCR System.

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Figure 16 MicroAmp® 3x32-Well Retainer (Part number 4481669)

4. Place the MicroAmp® reaction tubes or the MicroAmp® tube strips within the retainer that's been placed on the sample block.

5. Close the heated cover.

Creating a new run method

1. In the Home screen, touch **New Method**.
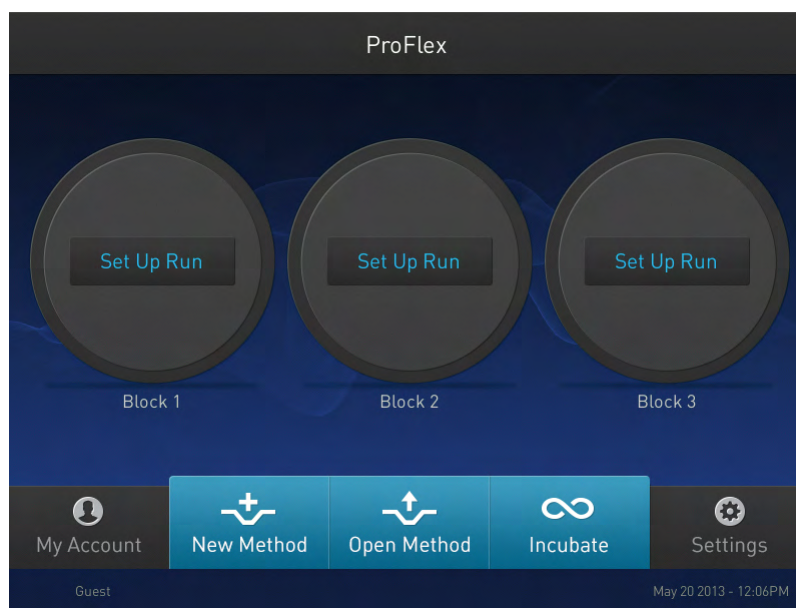
Figure 17 ProFlex™ 3x32-Well System Touchscreen Home

The Setup Run screen opens up.

2. In the Setup Run screen, touch **Open Template**, **Open Method**, or **Incubate**.

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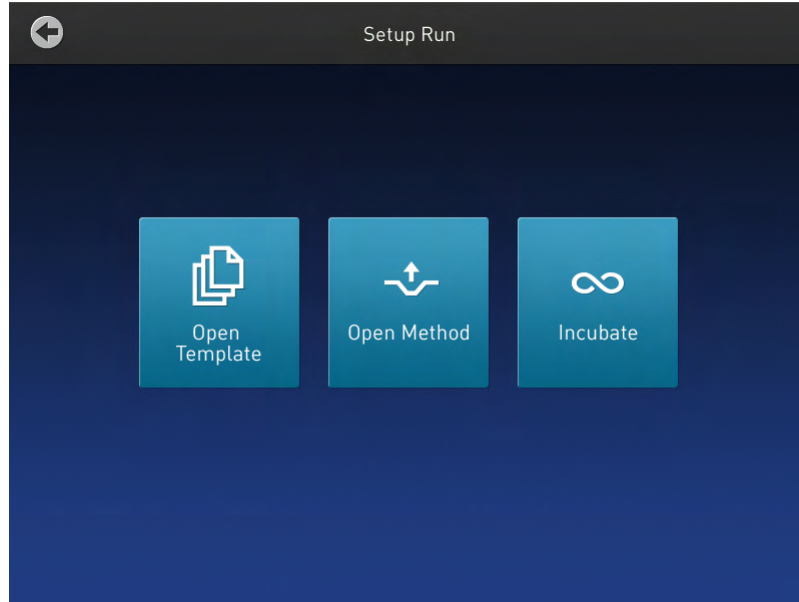
Figure 18 ProFlex™ System Setup Run screen

a. Touch **Open Template** to create a new method using an existing template. Select from the categories listed in the Select Method Template screen.
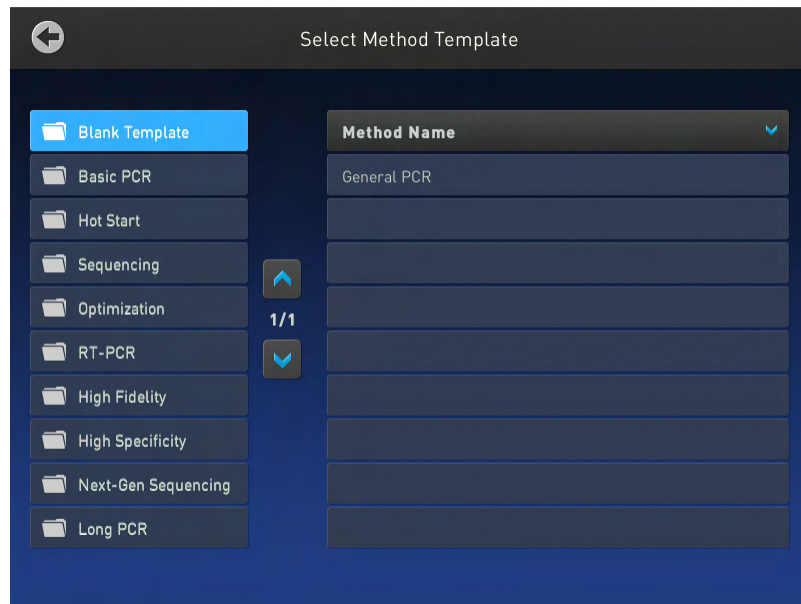
Figure 19 ProFlex™ System Select Method Template screen

b. Touch **Open Method** to create a new method using an existing run method. Select from the methods listed in the Select Method screen.

Note: The Select Method screen opens up if you touch Open Method in the Home screen or in the Setup Run screen.

Figure 20 ProFlex™ System Select Method screen

3. Irrespective of the source for creating a new run method, once you select one of the methods, you will come to the Method Edit screen.

Figure 21 Preview of Run Method

See "Editing a run method" on page 31 for instructions on editing a run method.

Note: You can choose to directly start a run without editing a run method. To start a run, touch **Choose Block** (for the ProFlex™ 3x32-Well PCR System) or **Start Run** (for the ProFlex™ 96-Well PCR System).

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Editing a run method

The Edit Method screen serves as a preview of the run method you have selected. If you do not want to edit any of the parameters, you can start a run directly by touching **Choose Block** (for the ProFlex™ 3x32-Well PCR System) or **Start Run** (for the ProFlex™ 96-Well PCR System).

1. In the Edit Method screen for the run method that you have selected, touch **Edit** or anywhere on the graphical temperature profile to start editing the parameters.

Figure 22   Options available in the Run Method preview screen

You will see that each of the numbers are surrounded by black fields indicating that they are editable. At this point, you can edit any of the temperatures, times, heated cover, number of cycles, and other parameters seen on the screen.

2. Touch **Manage Steps** to manage the steps; for example, add or delete a stage or step, or set more advanced parameters.

   a. Touch **Add Steps** to add a step.

   b. Touch **Remove Steps** to delete a step.

   c. Touch **Add Stages** to add a stage.

   d. Touch **Remove Stages** to delete a stage.

   The '+' buttons appear while adding a step or stage, while the '–' buttons appear while deleting a step or stage.
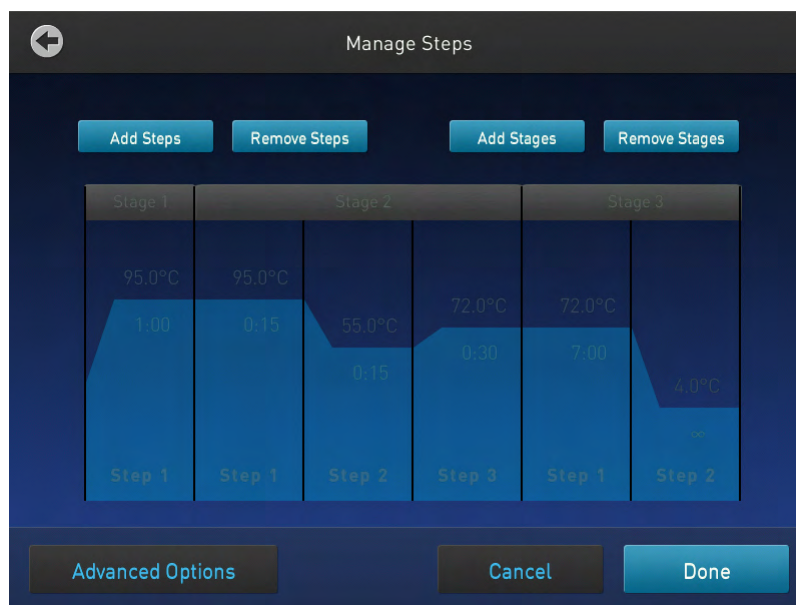
Figure 23 Manage Steps screen

Touch **Done** to finish managing the steps or **Advanced Options** to modify the advanced parameters.

3. Touch **Advanced Options** to edit the VeriFlex™, AutoDelta, Ramp Rates, and Simulation Mode parameters.
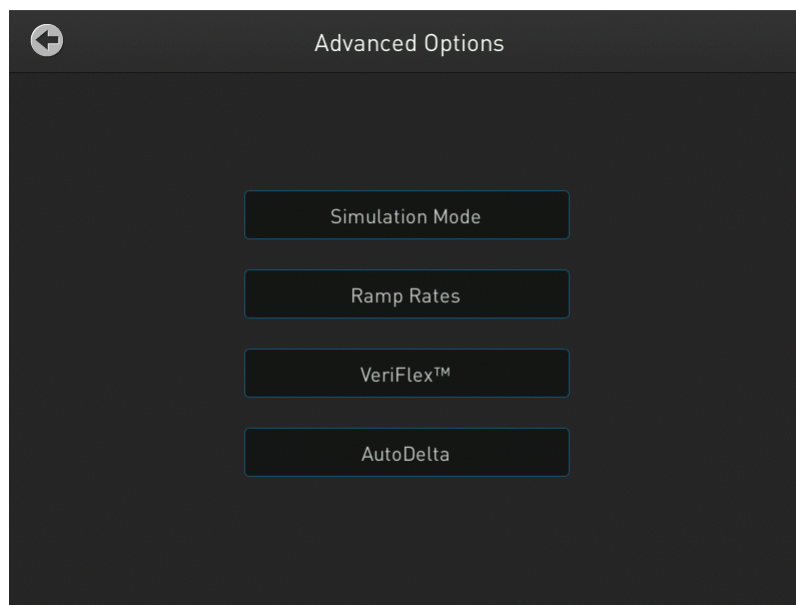
Figure 24 Advanced Options screen

• Touch **Simulation Mode** to set the simulation mode.

  Note: Simulation modes make ProFlex™ System perform like another instrument. This is done my simulating the ramp rate of another instrument.

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Figure 25 Advanced Options — Simulation Mode

In the Simulation Mode screen:

a. Select the instrument you would like to simulate.

Touch **No Simulation** to run the ProFlex™ instrument in the default mode

b. Touch **Done** to save the selection or **Cancel** to exit the screen.

c. Use the button in the top right corner of the screen to return to the Advanced Options screen.

• Touch **Ramp Rates** to edit the ramp rate of the individual steps.

Figure 26   Advanced Options — Ramp Rates

   a.   Touch a particular ramp rate to open the editor to edit the ramp rate.

   b.   Touch **Done** to save the selection or **Cancel** to exit the screen.

   c.   Use the button in the top right corner of the screen to return to the Advanced Options screen.

Note: If you set a simulation mode other than No Simulation, then the ramp rate will be locked and unavailable for editing.

Note: Editable ramp rates are shown in the sample ramp rate. This sample rate is a more accurate depiction of the block's thermal performance, however it is slower than the maximum block ramp rates shown in the specifications section of this user guide.

- Touch **VeriFlex**™ to edit the VeriFlex™ parameter.
   a.   Touch the icon to choose the steps you want to apply VeriFlex™.
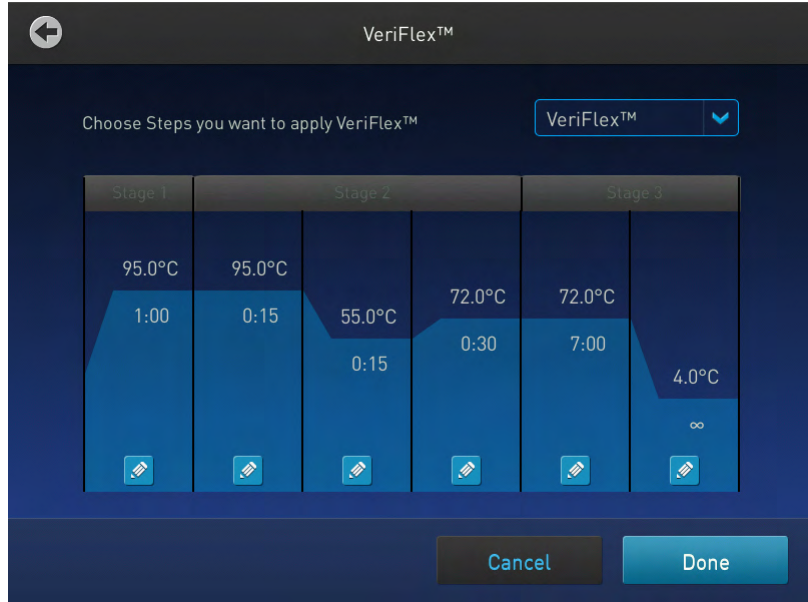
Figure 27 Advanced Options — VeriFlex

b. In the Edit VeriFlex™ screen, adjust the temperature range across the block for the selected steps.
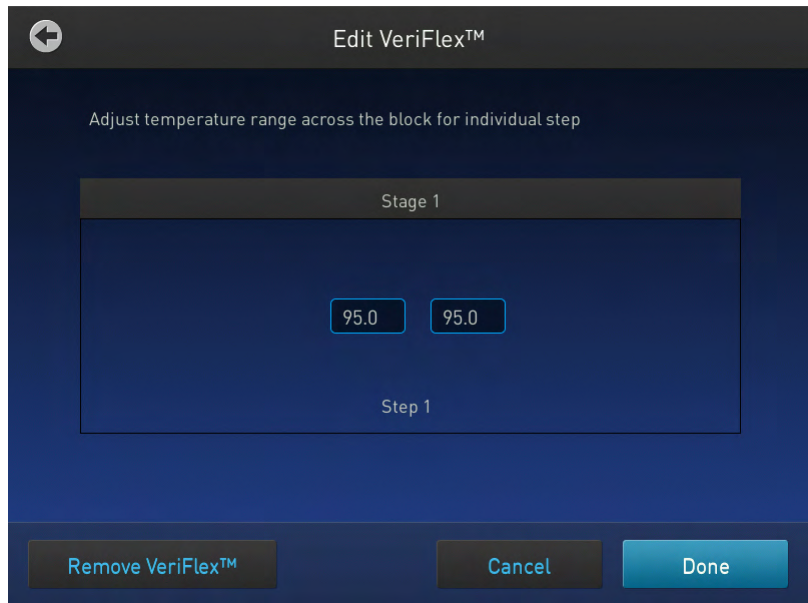
Figure 28 Edit VeriFlex™

– Touch **Remove VeriFlex**™ to remove the VeriFlex™ setting.

– Touch **Done** when finished or **Cancel** to exit the screen.

c. Touch **Done** to return to the Edit Method screen.

d. Use the button in the top right corner of the screen to return to the Advanced Options screen.

• Touch **AutoDelta** to apply the AutoDelta setting to a step.

a. Touch the [pencil] icon to choose the steps you want to apply AutoDelta.

Figure 29 Advanced Options — AutoDelta

b. In the Edit AutoDelta screen, enter the information for setting up Auto-Delta.

– Enter the Starting Cycle.

– Enter the DELTA temperature and/or time. Use the + and – buttons set the DELTA values to be either positive or negative, respectively.

– Touch **Remove AutoDelta** to remove the AutoDelta setting.

– Touch **Done** when finished or **Cancel** to exit the screen.
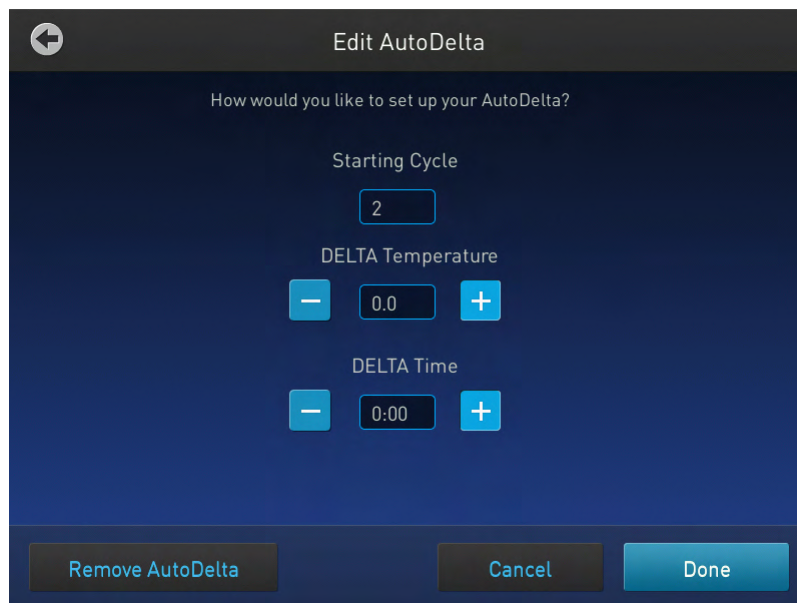
Figure 30 Edit AutoDelta

c. Touch **Done** to return to the Edit Method screen.

Once you have edited a run method, you can save the method to the destination folder by touching **Save** in the Run Method preview screen or choose to start a run without saving the run method.

4. Touch **Save** to save the edited run method.

Figure 31 ProFlex™ System Run Method preview screen

a. In the Save screen, enter a name of the edited run method.

Note: Names can be up to 100 characters. Names may not contain any of the following characters: %*?|;:,!@#$.()<>/\"'`~{}[]=+&^ (tab). Spaces, underscores, and dashes are allowed.

b. Touch a folder (for example, [🗁 Public])to select a destination folder where you want to save the run method.

5. Touch **Save** when you are done.

Managing methods and folders

Use this feature to copy a run method from one folder to another, rename a particular method name, or delete a method.

1. In the ProFlex™ System Home screen, touch **Open Method**.
   Touching Open Method takes you to the Select Method Screen.

Figure 32 ProFlex™ System Home screen

2. In the Select Method screen, touch **Manage Folders**.

Figure 33 ProFlex™ System Select Method screen

Figure 34 ProFlex™ System Manage Folders screen

3. In the Manage Folders screen,

- Touch **Copy** to copy a run method from one existing folder to another. For example, you can copy a run method from the Public folder into the USB folder. You can also copy a run method from an existing folder into a new folder.

  Note: Back up your method files to a USB drive frequently, or before sending in your ProFlex™ System for service.

  To create a new folder:

  1. Select a run method(s) that you want to copy by touching the one or more run methods name under Method Name, then touch **Copy**.

  2. In the Copy Method screen, select the folder you would like to copy the methods to, or touch **New Folder**.

Figure 35 ProFlex™ System Copy Method screen

3. If you touched 'New Folder', you will be prompted to edit the name of the new folder in the alphanumeric editor. Touch **Enter** after editing the name.

4. Touch **Paste Method**.

• Touch **Rename** to rename a particular method/ folder name.

• Touch **Delete** to delete a particular method/ folder.

• Touch **Done** to save the changes and return to the Select Method screen.

Performing a run

Prepare your samples and load the sample block(s) as described in "Loading samples into the instrument" on page 25.

1. Close the cover.

2. Start a run from the Home screen in one of the following ways. Touch:

   • **New Method**

   • **Open Method**

   • **Incubate**

   • **Status dials**

   Note: See "Creating a new run method" on page 28 to create a new run method or see "Editing a run method" on page 31 to edit an existing run method.

3. Based on the block type you are using, touch **Choose Block** (for the ProFlex™ 3x32-Well Sample Block) or **Start Run** (for the ProFlex™ 96-Well Sample Block). The Run Parameters screen is displayed:

Figure 36 ProFlex™ System Run Parameters screen

Verify the name of the run method that you have selected, and in case of the ProFlex™ 3x32 Well PCR System touch the dial corresponding to the block that you are using to perform the run.

Reaction volumes are specific to the type of instrument:

- ProFlex™ 1x96 Well PCR System: 10 to 80 μL
- ProFlex™ 3x32 Well PCR System: 10 to 80 μL

4. Touch **Run ID**, then enter the applicable information.
   The default Run ID is YYYYMMDDHHMM, where "YYYYMMDD" is the date and "HHMM" is the current time.
   You can choose to retain the default Run ID.

5. Touch **Start Run**. The cover is heated to the required temperature, then the run begins.
   While the run is in progress, the Home screen is displayed. When the run is complete, the Status Dial/s on the Home screen displays Done and Remove Samples.

6. Touch **Done** once you have removed the samples.
   The Status Dial is now ready for another run and displays Set Up Run.

Monitoring a run

Monitoring via the Home screen

After a run has started, the Home screen appears again with the dials updated with current information on the run. The dials display the following run information:

- Current block temperature
- Time remaining since the run started
- Run status

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To monitor the run progress, touch the dial that is running to go the Run Monitoring screen.
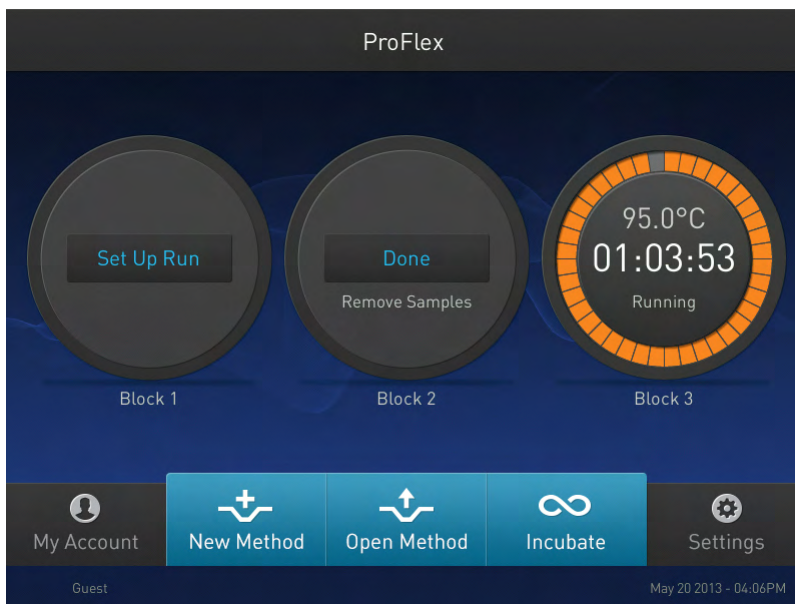
Figure 37 ProFlex™ System Home screen

Monitoring via the run monitor screen
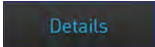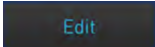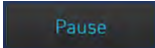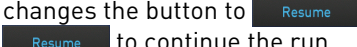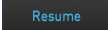
You can follow the status of a run using the Run Monitoring screen as shown in the following figure:

Figure 38 ProFlex™ System Run Monitoring screen

The screen shows the run method profile and additional information that does not appear in the Dial on the Home screen.

Table 5 Elements of the Run Monitor screen

Element	Description
Start Time	Displays the time a run started.
Time Remaining	Displays the time remaining for a run.
~ End Time	Displays the approximate time at which the run will end.
Details	Provides more details about the run. Touching Details brings up the Progress Details screen with the following run information: • Run ID • Simulation Mode • Start time • Estimated End time • Sample Temperature • Heated Cover • Reaction Volume
Edit	Helps skip the current holding step. However, if the run is currently ramping, the Skip button will not function.
Pause	Helps pause a run. Touching Pause changes the button to Resume . Touch Resume to continue the run.
Stop Run	Helps stop a run. After a run has completed or been aborted, the Home screen appears again.

If the power fails   If a power failure occurs during a run, the instrument attempts to continue the run when the power returns. The run begins at the first step of the stage where the power failed.

Note: If the time between the initial power failure and the time the power returns is more than 12 hours, the run is not continued.

Viewing and exporting the run report

To view a report:

1. In the Home screen, touch **Settings**.

2. In the Settings screen, touch **Run History**.

3. In the Run History screen, touch the Run ID of the run you want to view. The report is displayed.

4. Touch **Export** to save the report on a USB drive.

Removing the samples from the instrument

Grasp the sample tray/retainer assembly or reaction plate firmly with both hands and gently rock it back and forth until the tubes (or plate) are free.

⚠ **CAUTION!** Sample caps may pop off if the cover is opened when the sample block(s) temperature is above 27 °C.

Routine Maintenance

As-needed maintenance

Cleaning the instrument

Preparation

Before cleaning the instrument:

1. Power off the ProFlex™ Instrument by disconnecting the power.

2. Allow the instrument to cool until the heated cover and sample block(s) reach room temperature.

Cleaning the touchscreen

Clean the touchscreen with any commercially available LCD cleaning product. Be careful not to scratch the screen.

Cleaning the sample wells

If you use any cleaning or decontamination method, except those recommended in the manual, you risk damaging the equipment. Clean the sample wells once a month or as needed.

> ⚠ **WARNING!** Always wear protective glasses and gloves when servicing the instrument. Also, make sure you disconnect the instrument from AC line power before you begin any service procedure. Always wear protective glasses and gloves when servicing the instrument. Also, make sure you disconnect the instrument from AC line power before you begin any service procedure.

> ⚠ **CAUTION!** During instrument operation, the temperature of the heated cover can be as high as 113°C, and the temperature of the sample block(s) can be as high as 100°C. Before performing the procedure, keep hands away until the heated cover and sample block(s) reach room temperature.

To clean the sample wells:

1. Follow the steps in "Preparation" on page 45.

2. Open the heated cover.

3. Remove the sample tray from the sample block(s) and set it aside.

4. Use a cotton swab soaked in isopropanol to clean the sample wells thoroughly. Make certain that the isopropanol has evaporated completely before reloading a sample tray.

Decontaminating the sample wells

If the sample wells become contaminated with any biological agents, clean the wells thoroughly with a cotton swab soaked in 1:10 v/v dilution of 5.25% sodium hypochlorite (Clorox® bleach).

IMPORTANT! **Use bleach solution in moderation.** Life Technologies recommends the use of 10% bleach solution for removing contamination from the Veriti™ instrument sample block(s); excessive use of the solution, however, can corrode the sample block(s) material. To prevent damage to the sample block(s):

- Avoid applying excessive amounts of bleach solution. If possible, instead of using a squeeze bottle or soaked cloth, use an atomizer to deliver the solution to the wells of the block(s).
- After treating with bleach solution, rinse the sample block(s) thoroughly using deionized water.

Note: Removing residual bleach from the surfaces of the ProFlex™ instrument using water minimizes the long-term effects of bleach treatments.

If the sample block(s) become contaminated with radioactivity, use a commercially available decontaminant to remove the contamination. If the block(s) cannot be decontaminated, the instrument cannot be returned to Life Technologies for service.

Cleaning the heated cover

Clean the heated cover once a month or as needed.

⚠ **CAUTION!** During instrument operation, the temperature of the heated cover can be as high as 113°C, and the temperature of the sample block(s) can be as high as 100°C. Before performing the procedure, keep hands away until the heated cover and sample block(s) reach room temperature.

To clean the heated cover:

1. Follow the steps in "Preparation" on page 45.

2. Open the heated cover.

3. Soak a cotton swab or piece of clean cloth with isopropanol and gently wipe the heated platen.

   ⚠ **WARNING!** **CHEMICAL HAZARD. Isopropanol** is a flammable liquid and vapor. Exposure may cause eye, skin, and upper respiratory tract irritation. Prolonged or repeated contact may dry skin and cause irritation. Exposure may cause central nervous system effects such as drowsiness, dizziness, and headache. Read the MSDS, and follow the handling instructions.

   ---

4. Remove any remaining isopropanol from the cover.

   Note: If the platen becomes contaminated with amplified DNA, then raise the heated cover to the cleaning position, wipe the platen with a cloth or cotton swab soaked in bleach, then rinse with water.
   Clean the heated platen once a month or as needed.

Decontaminate the heated cover

If the heated cover become contaminated with amplified DNA, raise the heated cover to the cleaning position and wipe the cover with a cloth or cotton swab soaked in 1:10 v/v dilution of 5.25% sodium hypochlorite (Clorox® bleach), then wipe the cover with a damp cloth.

Replacing fuses

Required materials

- Two UL Recognized 12.5 A Type Time Lag, 5 x 20 mm, 250 VAC

    Note: *For Australia and New Zealand only:* Two 10 A Type Time Lag, 5 x 20 mm, 250 VAC

- Fine flat-tip screwdriver

Procedure

1. Power off the ProFlex™ instrument by disconnecting the power.

    ⚠ **DANGER! ELECTRICAL SHOCK HAZARD.** Severe electrical shock, which could cause physical injury or death, can result from working on an instrument when the high voltage power supply is operating. To avoid electrical shock, disconnect the power supply to the instrument, unplug the power cord, and wait at least 1 minute before working on the instrument.

    The fuses are in the fuse holder (F1, F2).

2. Insert a small flat-tip screwdriver into the slot in the upper portion of the power entry module, and open the door.

3. Pull out the fuse compartment to inspect the two fuses in the fuse compartment:

4. Pull out the blown fuse(s) from the fuse compartment and replace with new two UL Recognized 12.5 A Type Time Lag, 5 x 20 mm, 250 VAC.

    Note: *For Australia and New Zealand,* use new two 10 A Type Time Lag, 5 x 20 mm, 250 VAC.

5. Place the fuse compartment back into the power entry module (there is only one orientation) and close the door.

6. Press the door until it locks in place.

7. Connect the instrument power cord.

Upgrading system firmware

About the upgrade

If Life Technologies provides a new version of the firmware for the ProFlex™ PCR System, you may be required to load the new firmware on the instrument.

You will need a USB drive and, if your instrument requires login, Administrator access to upgrade the firmware.

IMPORTANT! You cannot upgrade the firmware while a run is in progress.

Upgrading the ProFlex™ PCR System firmware

1. Open the About Instrument screen to determine the version number of the existing firmware. To open the About Instrument screen, in the Home screen, touch **Settings**. In the Settings screen, touch **About Instrument**.

2. Record the version number of the firmware, then touch **Done**.

3. On a computer connected to the Internet, go to **www.lifetechnologies.com** to determine the version number of the new firmware.

4. Click **Support**, then **Software Downloads**.

5. Select ProFlex™ PCR System in the list, then click **Updates & Patches**.

6. Find the appropriate file. If the version number is:
   - The same as the current version (from step 3), you do not need to upgrade the firmware.
   - Different from the current version (from step 3), follow the steps below to download and upgrade the firmware.

7. Insert a USB drive into the USB port on the computer to download the new firmware to the USB drive.

8. Click the link in the Software column to download the file. Select the USB drive as the location for the saved file.

9. Remove the USB drive from the computer when the download is complete.

To upgrade the ProFlex™ Instrument with the new firmware:

1. Insert the USB drive with the new firmware in the USB port at the rear end of the ProFlex™ PCR System.

2. In the Home screen, touch **Settings**.

3. In the Settings screen, touch **Maintenance & Services**.

4. In the Maintenance & Services screen, touch **Software Updates**.
   The Upgrade Firmware screen opens:
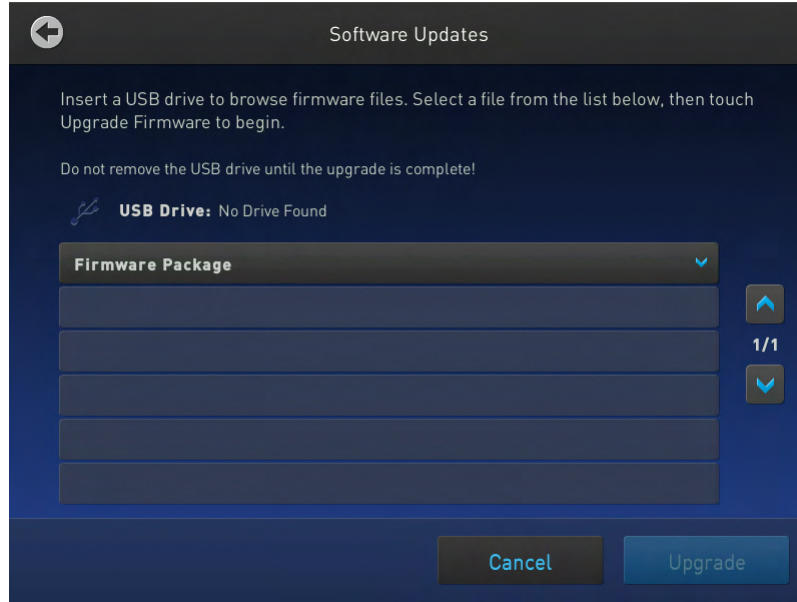
Figure 39 ProFlex™ PCR System Software Updates screen

5. Touch the name of the file with the new firmware, then touch **Upgrade**.

6. Touch **Yes** to confirm that you want to upgrade.

IMPORTANT! Ensure that you do not turn of the instrument when the upgrade is in progress.

When the upgrade process is complete, the instrument will restart automatically.

Self Verification test

Use the Self Verification Test feature for the instrument to check the ProFlex™ instrument hardware. The check includes testing the block, heated cover, and other components.

Note: Carry out the Self Verification test periodically or whenever there is an intermittent instrument error.
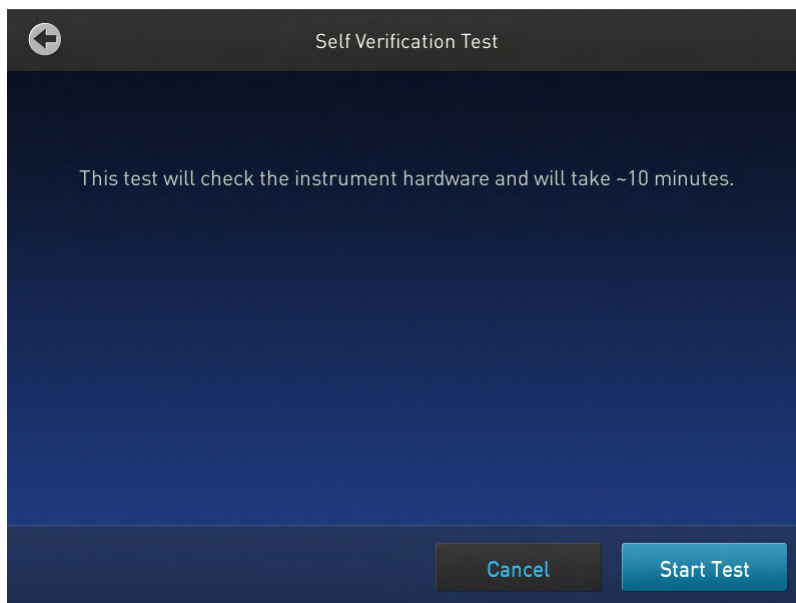
Figure 40 ProFlex™ PCR System Self Verification Test screen

Procedure

To carry out the Self Verification test:

1. In the Home screen, touch **Settings**.

2. In the Settings screen, touch **Maintenance & Settings**.

3. In the Maintenance & Settings screen, touch **Self Verification Test**.

4. In the Self Verification Test screen, touch **Start Test** to begin testing or **Cancel** to exit the screen
   The test takes about 10 minutes. Once the test is completed the test results will be displayed in the form of a report.

   Note: For the ProFlex™ 3x32-Well PCR System, all the blocks are tested at the same time. Ensure that no run is on at the time of the Self Verification test.

   Note: Contact your Life Technologies service representative in case of block failure.

5. Touch **Export** to save the test report to a USB drive or **Close** to exit the screen.

Ordering kits and replacement parts

Refer to Appendix A "Consumables" on page 51 to obtain part numbers for kits and replacement parts.

Ordering Information

Instrument part numbers

Contact your regional Life Technologies sales office to order kits, accessories, consumables, and spare parts for the ProFlex™ System.

Table 6   ProFlex™ PCR Systems

Description	Cat. No.
ProFlex™ 96-Well PCR System	4484075
ProFlex™ 3x32-Well PCR System	4484073
ProFlex™ Dual 96-Well PCR System	4484076
ProFlex™ Dual Flat PCR System	4484078

Table 7   ProFlex™ Sample Blocks

Description	Cat. No.
ProFlex™ 96-Well Sample Block	4483637
ProFlex™ 3x32-Well Sample Block	4483638
ProFlex™ Dual 96-Well Sample Block	4484071
ProFlex™ Dual Flat Sample Block	4484074

Consumables

IMPORTANT! In Table 8, the Model/ Format column indicates the model(s) of the ProFlex™ System that are compatible with the associated kit or disposable. Before ordering, verify that your ProFlex™ System supports the kit or disposable.

Table 8   ProFlex™ PCR System Consumables

Consumable	Model/ Format	Cat. No.
Single Tubes [1]		

Consumable	Model/ For-mat	Cat. No.
MicroAmp® Reaction Tube with Cap, 0.2-mL	32 Well and 96 Well	N8010540/ N8011540
MicroAmp® Reaction Tube with Cap, Assorted Colors, 0.2-mL		N8010840
MicroAmp® Reaction Tube with Cap, Autoclaved, 0.2-mL		N8010612
MicroAmp® Reaction Tube without Cap, 0.2-mL		N8010533/ N8011533
MicroAmp® Reaction Tube without Cap, Assorted Colors, 0.2-mL		N8010833
MicroAmp® Optical Tube without Cap, 0.2-mL		N8010933
MicroAmp® 96-Well Reaction Tube/Tray/Retainer Set, 0.2-mL	96 Well	403083/ 403086
Reaction Trays		
MicroAmp® 96-Well Reaction Tray for VeriFlex™ Systems	0.2 (96 Well)	4379983
MicroAmp® 96-Well Reaction Tray/ Retainer for VeriFlex™ Systems		4381850
MicroAmp® 3x32-Well Retainer for VeriFlex™ Systems		4481669
Seals and Covers		
MicroAmp® Clear Adhesive Film	0.2 (96 Well)	4306311
MicroAmp® Optical Adhesive Film		4360954/ 4311971
MicroAmp® Optical Adhesive Film Kit		4313663
96-Well Plates		
MicroAmp® Optical 96-Well Reaction Plate	0.2 (96 Well)	N8010560/ 4316813
MicroAmp® Optical 96-Well Reaction Plate with Bar-code		4306737/ 4326659
MicroAmp® Optical 96-Well Reaction Plate with Bar-code and Optical Caps		403012
MicroAmp® Optical 96-Well Reaction Plate with Bar-code and Optical Adhesive Films		403012
8-Well Strips [2]		

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Consumable	Model/ Format	Cat. No.
MicroAmp® 8-Tube Strip, 0.2-mL	0.2 (32 Well and 96 Well)	N8010580
MicroAmp® 8-Tube Strip, Assorted Colors, 0.2-mL		N8010838
MicroAmp® Optical 8-Tube Strip, 0.2-mL		4316567
MicroAmp® 8-Cap Strip		N8011535
MicroAmp® 8-Cap Strip, Assorted Colors		N8010835
MicroAmp® Optical 8-Cap Strip		4323032

[1]

There are no 32-well Microplates available for use with the ProFlex™ 3x32-Well PCR System. Instead, single tubes with caps are used for running the PCR samples.

[2]

There are no 32-well Microplates available for use with the ProFlex™ 3x32-Well PCR System. Instead, tube strips with caps or cap strips are used for running the PCR samples.

Table 9 ProFlex™ PCR System sample handling supplies

Part Name	Cat. No.
MicroAmp® Adhesive Film Applicator	4333183
MicroAmp® Multi-Removal Tool	4313950
MicroAmp® Cap Installing Tool (Handle)	4330015
MicroAmp® 96-Well Base	N8010531
MicroAmp® Splash Free 96-Well Base	4312063
MicroAmp® Centrifuge Adapter	N8013822

Troubleshooting

Troubleshooting problems

Use the following table to help troubleshoot problems with your ProFlex™ System.

Problem	Possible cause	Check and/or remedy
Cooling rate too slow	Peltier assembly failure	Run the Cycle Performance Test.
Temperature does not match specified temperature	Instrument may require calibration	Run the Temperature Verification Test.
Heating rate too slow	Peltier failure	Run the Cycle Performance Test.
Printing fails	• Printer incorrectly configured on instrument • Printer not connected to network • Instrument not connected to network • Ethernet cable bad	• Make sure the printer IP address on the instrument matches the IP address from the system administrator. • Is Ethernet cable connected to the printer? • Is Ethernet cable connected to the instrument? • Is network functioning? • Try a different Ethernet cable.
Cycling time too long	Peltier assembly failure	Run the Cycle Performance Test.
When running on multiple instruments, cannot see instruments in "Select Instruments" screen	• Instrument(s) not connected to network • Switch powered off • Ethernet cable bad • IP address conflict • Allow Remote Runs setting in Instrument Name screen set to No.	• Are all Ethernet cables connected to the instruments? • Are all Ethernet cables connected to the network switch? • Try a different Ethernet cable. • Change the IP addresses on the instruments. • In Instrument Name screen, change Allow Remote Runs to **Yes**.

Problem	Possible cause	Check and/or remedy
No screen display No response when you power on the instrument	Blown fuse Not connected to power source	Check fuses. Is power switch on? Is power cord connected?
Screen display is missing characters or is illegible	LCD screen failure	Request service.
Sample tubes melt during run	Incompatible consumables used Heated cover too hot Sample block(s) too hot	Use recommended consumables (see Appendix A, "Ordering Information"). Run the Heated Cover Verification Test.
Heating cover stuck	Cam, platen, or cover assembly malfunctioning	Request service
Heated cover not responsive	Heated cover failure	Run the Heated Cover Verification Test.
Sample tubes are crushed or deformed after run	Incompatible consumables used, or proper trays/retainer accessories not used	Use recommended consumables (see Appendix A, "Ordering Information").

Returning an instrument for service

Before returning an instrument for service, back up the run methods and instrument settings, as described in "Managing methods and folders" on page 37. This practice ensures that if the service center sends you a replacement instrument, you can restore the run methods and other settings.

To return an instrument for service:

1. Contact your local customer care center or technical support group to obtain a copy of the Certificate of Instrument Decontamination, a service notification, a service call number, and, if required, packaging.

2. Decontaminate the instrument.

   IMPORTANT! If the sample block(s) become contaminated with radioactivity, use a commercially available decontaminant to remove the contamination. If the block(s) cannot be decontaminated, the instrument cannot be returned to Life Technologies for service.

3. Complete and sign a copy of the Certificate of Instrument Decontamination.

4. Fax the Certificate of Instrument Decontamination to the customer care center.

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5. Pack the instrument in the provided packaging, without any accessories or power cords. Include a hard copy of the Certificate of Instrument Decontamination in the box.

   Note: Repairs for instruments without the Certificate of Instrument Decontamination are delayed.

6. Affix the provided postage to the box, then ship the instrument to the designated facility.
   The repair process requires 2 to 3 weeks.

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Instrument specifications

This chapter lists the instrument specifications for the ProFlex™ PCR System using the ProFlex™ 96-Well Sample Block, the ProFlex™ 3x32-Well Sample Block, the ProFlex™ Dual 96-Well Sample Block, and the ProFlex™ Dual Flat Sample Block.

Technical specifications

The following table displays the system specifications for the ProFlex™ PCR System using the ProFlex™ 96-Well Sample Block and the ProFlex™ 3x32-Well Sample Block.

Table 10 ProFlex™ PCR System technical specifications: ProFlex™ 96-Well Sample Block and the ProFlex™ 3x32-Well Sample Block

Block format	Specification
Maximum block ramp rate	6.00°C/sec
Maximum sample ramp rate	4.40°C/sec
Temperature accuracy	±0.25°C (35 to 99.9°C)
Temperature range for protocol run	0°C to 100.0°C
Temperature uniformity	<0.5°C (30 seconds after reaching 95°C)
Dimensions	Height: 27.2 cm (10.7 in) Width: 33.0 cm (13 in) Depth: 56.5 cm (22 in)
Weight	18.75 kg (41 lb)
PCR volume range	10 - 80 µL
Instrument memory	USB, on-board
Display interface	8.4" color TFT LCD
Power	100-240 V, 50-60 Hz Max: 950 W, Max Current: 12 A **Note:** *For Australia (AU) / New Zealand (NZ) only:* 230 VAC, 50 Hz, Max: 950 W, Max Current: 10 A
VeriFlex™ blocks	• **3 x 32-well, 0.2 mL independent control**: 5°C, 2 VeriFlex™ zones • **96-well, 0.2 mL VeriFlex™ block**: 25°C (5°C zone-to-zone), 6 VeriFlex™ zones

Block format	Specification
Ambient humidity	15% - 80% Relative Humidity, non-condensing (acceptable range)
Ambient operating temperature	15°C to 30°C (acceptable range)

The following table displays the system specifications for the ProFlex™ PCR System using the ProFlex™ Dual 96-Well Sample Block and the ProFlex™ Dual Flat Sample Block.

Table 11 ProFlex™ PCR System technical specifications: ProFlex™ Dual 96-Well Sample Block and the ProFlex™ Dual Flat Sample Block

Block format	Specification	
	ProFlex™ Dual 96-Well Sample Block	**ProFlex™ Dual Flat Sample Block**
Maximum block ramp rate	3.00°C/sec	1.60°C/sec
Maximum sample ramp rate	1.60°C/sec	N/A
Temperature accuracy	±0.25°C (35 to 99.9°C)	
Temperature range for protocol run	0°C to 100.0°C	
Temperature uniformity	**For each block:** <0.5°C (30 seconds after reaching 95°C) **Overall (across two blocks):** <0.75°C (30 seconds after reaching 95°C)	
Dimensions	Height: 27.2 cm (10.7 in) Width: 33.0 cm (13 in) Depth: 56.5 cm (22 in)	
Weight	19.3 kg (42.5 lb)	19.6 kg (43.2 lb)
PCR volume range	10 - 100 µL	<1 µL
Instrument memory	USB, on-board	
Display interface	8.4" color TFT LCD	
Power	100-240 V, 50-60 Hz Max: 950 W, Max Current: 12 A **Note:** *For Australia (AU) / New Zealand (NZ) only:* 230 VAC, 50 Hz, Max: 950 W, Max Current: 10 A	
Ambient humidity	15% - 80% Relative Humidity, non-condensing (acceptable range)	
Ambient operating temperature	15°C to 30°C (acceptable range)	

Table 12 Power and communication ports

Port	Description
$\sim$	AC power cable port
	10/100 Fast Ethernet port for connecting to a network
	USB v1.0 port for connecting to an external network drive, jump drive, or other USB storage device
RS232	RS232 serial communication port for connecting the probe for the Temperature Verification Kit
	USB v1.0 port for connecting to USB-enabled Wi-Fi Card

System specifications

Table 13 Physical dimensions, weight, and power consumption

Parameter	Instrument foot-print	Recommended clear-ance	Total
Height	27.2 cm (10.7 in)	15.5 cm (6.1 in)[1]	42.5 cm (16.7 in)
Width	33.0 cm (13 in)	0 cm (0 in)	33.0 cm (13 in)
Depth	56.5 cm (22 in)	23.0 cm (9 in)[2]	79.5 cm (31 in)
Weight	**ProFlex™ PCR System with the:** **ProFlex™ 96-Well Sample Block or the ProFlex™ 3x32-Well Sample Block:** 18.75 kg (41 lb) **ProFlex™ Dual 96-Well Sample Block:** 19.3 kg (42.5 lb) **ProFlex™ Dual Flat Sample Block:** 19.6 kg (43.2 lb)		
Power consumption	950 W - Maximum consumption		
	300 W - Average during thermal cycling		
	10 W - During sleep/ standby		

[1] With the heated cover open
[2] At the rear of the instrument to ensure adequate airflow and cooling

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Location of power point and ports on the instrument

The following graphic displays the location of the power cord insertion point as well as the various ports provided in the ProFlex™ instrument.

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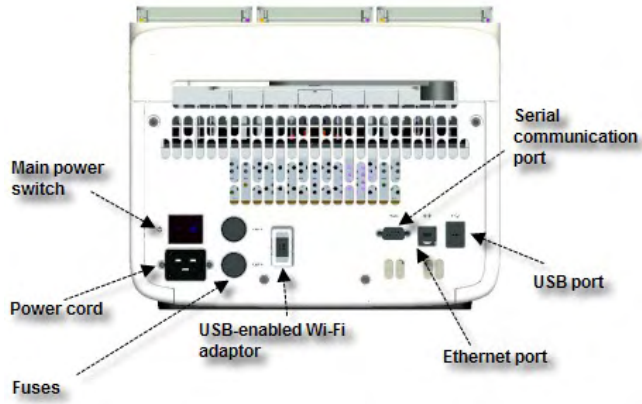
D Predefined Run Methods

The following run methods (distributed across ten categories) are supplied with the ProFlex™ PCR System. A particular run method can appear in more than one category. These run methods are based on recommended protocols from Life Technologies and should be considered as starting points for the different applications. Your results may vary between instrument models, so some optimization may be needed. Please note that the ramp rates of these methods are set at 100%.

The following table lists the categories and the run methods they include.

Table 14 Pre-defined categories and run methods

Category	Run method
Blank Template	General PCR Run Method
Basic PCR	• AmpliTaq® 360 Method • AmpliTaq® Method • Basic PCR Taq Method
Hot Start	• AmpliTaq® 360 Method • AmpliTaq Gold® Method • AmpliTaq Gold® Fast PCR Run Method • Platinum® Taq DNA Polymerase Method • Platinum® Taq SuperMix Method
Sequencing	• BigDye® Direct Cycle Sequence Method • BigDye® Direct PCR Run Method • BigDye® Kit Fast Run Method • BigDye® Kit Standard Run Method
Optimization	• Time Release Run Method • Touchdown PCR Run Method
RT-PCR	SuperScript® III 1-Step System Method
High Fidelity	• AccuPrime™ PFX 2-Step Method • AccuPrime™ PFX 3-Step Method • AccuPrime™ Taq High Fidelity Method • Platinum® PFX 2-Step Method • Platinum® PFX 3-Step Method • Platinum® Taq High Fidelity Method

Category	Run method
High Specificity	• AccuPrime™ PFX 2-Step Method • AccuPrime™ PFX 3-Step Method • AccuPrime™ Taq DNA Polymerase Method • AccuPrime™ Taq High Fidelity Method
Next-Gen Sequencing	TargetSeq™ Exome Enrichment Method
Long PCR	• Elongase® 2-Step Method • Elongase® 3-Step Method • AccuPrime™ Taq High Fidelity Method • Platinum® Taq High Fidelity Method

These run methods cannot be edited or deleted, but if you save them with a different name or to a different folder, you can edit them.

The following sections provide the method details:

AccuPrime™ PFX 2-Step Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	60	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

AccuPrime™ PFX 3-Step Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	25	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	120	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
	Hold Time		15				
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

AccuPrime™ Taq DNA Polymerase Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	25	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	120	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				
	Hold Time		15				
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

AccuPrime™ Taq High Fidelity Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	25	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	15	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		52.0				
	Hold Time		15				
Step 3	RampRate	—	2.3	—	—		

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Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
	Temperature		68.0				
	Hold Time		60				

AmpliTaq® 360 Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	25	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	15	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		52.0				
	Hold Time		15				
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

AmpliTaq Gold® 360 Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	95.0	72.0			
	Hold Time	300	15	420			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		52.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

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AmpliTaq Gold® Fast PCR Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	96.0	72.0			
	Hold Time	600	3	10			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		62.0	4.0			
	Hold Time		3	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		5				

AmpliTaq Gold® Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	95.0	72.0			
	Hold Time	300	15	420			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		55.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		72.0				
	Hold Time		30				

AmpliTaq® Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	95.0	72.0			
	Hold Time	60	15	420			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		55.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		72.0				
	Hold Time		30				

Basic PCR Taq Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	95.0	72.0			
	Hold Time	60	15	420			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		55.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		72.0				
	Hold Time		30				

BigDye® Direct Cycle Sequence Method

Cycle/Step		Stage					Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4	5		
Cycles		1	1	1	25	1	50	105.0
Step 1	Ramp-Rate	2.3	2.3	2.3	2.3	2.3		

Cycle/Step		Stage					Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4	5		
	Temperature	37.0	80.0	96.0	96.0	4.0		
	Hold Time	900	120	10	10	Infinite		
Step 2	Ramp-Rate	—	—	—	2.3	—		
	Temperature				50.0			
	Hold Time				5			
Step 3	Ramp-Rate	—	—	—	2.3	—		
	Temperature				60.0			
	Hold Time				75			

BigDye® Direct PCR Run Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	96.0	72.0			
	Hold Time	600	3	120			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		62.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		30				

BigDye® Kit Fast Run Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	25	1	—	50	105.0

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Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	96.0	96.0	4.0			
	Hold Time	60	10	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		50.0				
	Hold Time		5				
Step 3	RampRate	—	2.3	—	—		
	Temperature		60.0				
	Hold Time		75				

BigDye® Kit Standard Run Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	25	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	96.0	96.0	4.0			
	Hold Time	60	10	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		50.0				
	Hold Time		5				
Step 3	RampRate	—	2.3	—	—		
	Temperature		60.0				
	Hold Time		240				

Elongase® 2-Step Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	30	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
	Hold Time	60	30	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

Elongase® 3-Step Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	30	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	30	30	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				
	Hold Time		30				
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

General PCR Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	95.0	72.0			
	Hold Time	60	15	420			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		55.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		

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Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
	Temperature		55.0				
	Hold Time		15				

Platinium® PFX 2-Step Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	120	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				
Step 3	RampRate	—	—	—	—		
	Temperature						
	Hold Time						

Platinium® PFX 3-Step Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	120	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				
	Hold Time		30				
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

Platinium® Taq DNA Polymerase Method

Cycle/Step		Stage				Reaction volume (μL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	30	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	30	30	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				
	Hold Time		30				
Step 3	RampRate	—	2.3	—	—		
	Temperature		72.0				
	Hold Time		60				

Platinium® Taq High Fidelity Method

Cycle/Step		Stage				Reaction volume (μL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	35	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	30	15	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				
	Hold Time		15				
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

Platinium® Taq SuperMix Method

Cycle/Step		Stage				Reaction volume (μL)	Cover temp. (°C)
		1	2	3	4		
Cycles		1	30	1	—	50	105.0

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	94.0	4.0			
	Hold Time	30	30	Infinite			
Step 2	RampRate	—	2.3	—	—		
	Temperature		55.0				
	Hold Time		15				
Step 3	RampRate	—	2.3	—	—		
	Temperature		72.0				
	Hold Time		60				

SuperScript® III 1-Step System Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Cycles		1	40	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	60.0	94.0	68.0			
	Hold Time	900	15	60			
Step 2	RampRate	2.3	2.3	2.3	—		
	Temperature	94.0	55.0	4.0			
	Hold Time	120	30	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		68.0				
	Hold Time		60				

TargetSeq™ Exome Enrichment Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Cycles		72	–	–	–	50	105.0
Step 1	RampRate	2.3	–	–	–		
	Temperature	47.0					

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Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
	Hold Time	3600					

Time Release Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Cycles		1	40	1	—	50	105.0
Step 1	RampRate	2.3	2.3	2.3	—		
	Temperature	95.0	95.0	72.0			
	Hold Time	60	15	420			
Step 2	RampRate	—	2.3	2.3	—		
	Temperature		55.0	4.0			
	Hold Time		15	Infinite			
Step 3	RampRate	—	2.3	—	—		
	Temperature		72.0				
	Hold Time		30				

Touchdown PCR Method

Cycle/Step		Stage				Reaction volume (µL)	Cover temp. (°C)
		1	**2**	**3**	**4**		
Cycles		20	10			50	105.0
Step 1	RampRate	2.3	2.3				
	Temperature	94.0	94.0				
	Hold Time	15	15				
Step 2	RampRate	2.3	2.3	—	—		
	Temperature	65.0	55.0				
	Hold Time	30	30				
	AutoDelta Temperature	-0.5	—				
	AutoDelta Starting Cycle	1	—				

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Safety

> ⚠ **WARNING! GENERAL SAFETY.** Using this product in a manner not specified in the user documentation may result in personal injury or damage to the instrument or device. Ensure that anyone using this product has received instructions in general safety practices for laboratories and the safety information provided in this document.
>
> · Before using an instrument or device, read and understand the safety information provided in the user documentation provided by the manufacturer of the instrument or device.
> · Before handling chemicals, read and understand all applicable Safety Data Sheets (SDSs) and use appropriate personal protective equipment (gloves, gowns, eye protection, etc). To obtain SDSs, see the "Documentation and Support" section in this document.

Symbols on this instrument

Symbols may be found on the instrument to warn against potential hazards or convey important safety information. In this document, the hazard symbol is used along with one of the following user attention words:

* **CAUTION!** – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
* **WARNING!** – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.
* **DANGER!** – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

Symbol	English	Français
⚠	Caution, risk of danger Consult the manual for further safety information.	Attention, risque de danger Consulter le manuel pour d'autres renseignements de sécurité.
⚡	Caution, risk of electrical shock	Attention, risque de choc électrique
⚠	Moving parts	Parties mobiles
⚠	Caution, sharp edges	Attention, bords coupants

Symbol	English	Français
⚠	Caution, hot surface	Attention, surface chaude
⚠	Potential biohazard	Danger biologique potentiel
⚠	Potential slipping hazard	Danger de glisser potentiel
⏻	Standby	En attente
⏚	Protective conductor terminal (main ground)	Borne de conducteur de protection (mise à la terre principale)
≈	Terminal that can receive or supply alternating or direct current or voltage	Borne pouvant recevoir ou envoyer une tension ou un courant continu ou alternatif
🗙	Do not dispose of this product in unsorted municipal waste ⚠ **CAUTION!** To minimize negative environmental impact from disposal of electronic waste, do not dispose of electronic waste in unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provision and contact customer service for information about responsible disposal options.	Ne pas éliminer ce produit avec les déchets usuels non soumis au tri sélectif. ⚠ **CAUTION!** Pour minimiser les conséquences négatives sur l'environnement à la suite de l'élimination de déchets électroniques, ne pas éliminer ce déchet électronique avec les déchets usuels non soumis au tri sélectif. Se conformer aux ordonnances locales sur les déchets municipaux pour les dispositions d'élimination et communiquer avec le service à la clientèle pour des renseignements sur les options d'élimination responsable.

Safety alerts on this instrument

Additional text may be used with one of the symbols described above when more specific information is needed to avoid exposure to a hazard. See the following table for safety alerts found on the instrument.

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English	French translation
⚠ **CAUTION! Hazardous chemicals.** Read the Safety Data Sheets (SDSs) before handling.	**ATTENTION! Produits chimiques danger-eux.** Lire les fiches signalétiques (FS) avant de manipuler les produits.
⚠ **CAUTION! Hazardous waste.** Refer to SDS(s) and local regulations for handling and disposal.	**ATTENTION! Déchets dangereux.** Lire les fiches signalétiques (FS) et la réglementa-tion locale associées à la manipulation et à l'élimination des déchets.

Location of safety labels on this instrument

Figure 41 Location of the safety label on the rear panel of the ProFlex™ System

Figure 42 Location of the safety label on the ProFlex™ System 3x32-Well Sample Block

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Figure 43 Location of the safety label on the ProFlex™ System96-Well Sample Block

Figure 44 Location of the safety label on the ProFlex™ Dual 96-Well Sample Block

Figure 45 Location of the safety label on the ProFlex™ Dual Flat Sample Block

Safety information for instruments not manufactured by Life Technologies Corporation

Some of the accessories provided as part of the instrument system are not designed or built by Life Technologies Corporation. Consult the manufacturer's documentation for the information needed for the safe use of these products.

Instrument safety

General

⚠ **CAUTION! Do not remove instrument protective covers.** If you remove the protective instrument panels or disable interlock devices, you may be exposed to serious hazards including, but not limited to, severe electrical shock, laser exposure, crushing, or chemical exposure.

Physical injury

CAUTION! Moving Parts. Moving parts can crush, pinch and cut. Keep hands clear of moving parts while operating the instrument. Disconnect power before servicing.

WARNING! Sharp Edges. The edges of this container are sharp.

Electrical

WARNING! Ensure appropriate electrical supply. For safe operation of the instrument:

- Plug the system into a properly grounded receptacle with adequate current capacity.
- Ensure the electrical supply is of suitable voltage.
- Never operate the instrument with the ground disconnected. Grounding continuity is required for safe operation of the instrument.

WARNING! Power Supply Line Cords. Use properly configured and approved line cords for the power supply in your facility.

WARNING! Disconnecting Power. To fully disconnect power either detach or unplug the power cord, positioning the instrument such that the power cord is accessible.

Cleaning and decontamination

CAUTION! Cleaning and Decontamination. Use only the cleaning and decontamination methods specified in the manufacturer's user documentation. It is the responsibility of the operator (or other responsible person) to ensure the following requirements are met:

- No decontamination or cleaning agents are used that could cause a HAZARD as a result of a reaction with parts of the equipment or with material contained in the equipment.
- The instrument is properly decontaminated a) if hazardous material is spilled onto or into the equipment, and/or b) prior to having the instrument serviced at your facility or sending the instrument for repair, maintenance, trade-in, disposal, or termination of a loan (decontamination forms may be requested from customer service).
- Before using any cleaning or decontamination methods (except those recommended by the manufacturer), users should confirm with the manufacturer that the proposed method will not damage the equipment

Laser

CAUTION! LASER HAZARD, Bar Code Scanner. The bar code scanner included with the instrument system is a Class 2 laser. To avoid damage to eyes, do not stare directly into the beam or point into another person's eyes.

Safety and electromagnetic compatibility (EMC) standards

The instrument design and manufacture complies with the standards and requirements for safety and electromagnetic compatibility as noted in the following table:

Safety

Reference	Description
EU Directive 2006/95/EC	European Union "Low Voltage Directive"
IEC 61010-1 EN 61010-1 UL 61010-1 CSA C22.2 No. 61010-1	*Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements*
IEC 61010-2-010 EN 61010-2-010	*Safety requirements for electrical equipment for measurement, control and laboratory use – Part 2-010: Particular requirements for laboratory equipment for the heating of materials*
21 CFR 1040.10 and 1040.11 as applicable	*U.S. FDA Health and Human Services (HHS) "Radiological health performance standards for laser products" and "Radiological health performance standards for specific purpose laser products"*

EMC

Reference	Description
Directive 2004/108/EC	European Union "EMC Directive"
EN 61326-1	*Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements – Part 1: General Requirements*
FCC Part 18 (47 CFR)	U.S. Standard "Industrial, Scientific, and Medical Equipment"
AS/NZS 2064	*Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific, and Medical (ISM) Radiofrequency Equipment*
ICES-001, Issue 3	*Industrial, Scientific and Medical (ISM) Radio Frequency Generators*

Environmental design

Reference	Description
Directive 2012/19/EU	European Union "WEEE Directive" – Waste electrical and electronic equipment

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Reference	Description
Directive 2011/65/EU	European Union ˝RoHS Directive˝ – Restriction of hazardous substances in electrical and electronic equipment
Directive 2006/66/EC	European Union ˝Battery Directive˝
MII Order #39	PRC ˝Management Methods for Controlling Pollution by Electronic Information Products˝

Chemical safety

⚠ **WARNING! GENERAL CHEMICAL HANDLING.** To minimize hazards, ensure laboratory personnel read and practice the general safety guidelines for chemical usage, storage, and waste provided below, and consult the relevant SDS for specific precautions and instructions:

· Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. To obtain SDSs, see the "Documentation and Support" section in this document.

· Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing).

· Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood).

· Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended in the SDS.

· Handle chemical wastes in a fume hood.

· Ensure use of primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)

· After emptying a waste container, seal it with the cap provided.

· Characterize (by analysis if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.

· Ensure that the waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.

· **IMPORTANT!** Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Biological hazard safety

WARNING! BIOHAZARD. Biological samples such as tissues, body fluids, infectious agents, and blood of humans and other animals have the potential to transmit infectious diseases. All work should be conducted in properly equipped facilities using the appropriate safety equipment (for example, physical containment devices). Safety equipment also may include items for personal protection, such as gloves, coats, gowns, shoe covers, boots, respirators, face shields, safety glasses, or goggles. Individuals should be trained according to applicable regulatory and company/ institution requirements before working with potentially biohazardous materials. Follow all applicable local, state/ provincial, and/or national regulations. The following references provide general guidelines when handling biological samples in laboratory environment.

- U.S. Department of Health and Human Services, *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*, 5th Edition, HHS Publication No. (CDC) 21-1112, Revised December 2009; found at:
  www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf
- World Health Organization, *Laboratory Biosafety Manual*, 3rd Edition, WHO/CDS/CSR/LYO/2004.11; found at:
  www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf

Documentation and Support

Related documentation

The following related documents are shipped with the system:

Document	Publication number	Description
ProFlex™ PCR System Installation and Operation Quick Reference	4483807	Describes the procedures for installing and using the ProFlex™ PCR System that is described in detail in the ProFlex™ PCR System User Guide.
ProFlex™ PCR System System Documentation	4483803	Provides the reference for accessing user documentation from the product website and contact details for service and technical support.

Note: For additional documentation, see "Obtaining support" on page 83.

Obtaining SDSs

Safety Data Sheets (SDSs) are available from **www.lifetechnologies.com/support**.

Note: For the SDSs of chemicals not distributed by Life Technologies Corporation, contact the chemical manufacturer.

Obtaining Certificates of Analysis

The Certificate of Analysis provides detailed quality control and product qualification information for each product. Certificates of Analysis are available on our website. Go to **www.lifetechnologies.com/support** and search for the Certificate of Analysis by product lot number, which is printed on the box.

Obtaining support

For the latest services and support information for all locations, go to:

www.lifetechnologies.com/support

At the website, you can:

- Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities
- Search through frequently asked questions (FAQs)
- Submit a question directly to Technical Support (**techsupport@lifetech.com**)
- Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents
- Obtain information about customer training
- Download software updates and patches

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale found on Life Technologies' website at **www.lifetechnologies.com/termsandconditions**. If you have any questions, please contact Life Technologies at **www.lifetechnologies.com/support**.

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