

## AMPLIFICATION

# CFX384™ Real-Time PCR System Installation Quick Guide

### Unpacking the Instruments

The CFX384 optical reaction module and the C1000™ thermal cycler chassis are shipped in separate containers. Unpack each box carefully. The included power cable, USB cable, and CFX Manager™ software CD are required for installation. The CFX384 optical reaction module may also be placed on a previously purchased C1000 thermal cycler for a quick upgrade to a real-time PCR detection system.

**Important:** Carefully read the safety information and instrument operating specifications provided in the CFX384 system instruction manual before using the system.

### Setting Up the CFX384 Real-Time PCR System

The CFX384 real-time PCR detection system should be installed on a clean, dry, level surface with sufficient cool airflow to run properly.

To insert the CFX384 optical reaction module into the reaction module bay of the C1000 chassis:

1. Place the C1000 chassis in a suitable location with the locking bar down.
2. Remove the instructions overlay from the C1000 chassis. Lift the CFX384 module using the handle indents above the side air vents, as shown in Figure 1.
3. Position the CFX384 module in the reaction module bay of the C1000 chassis, leaving about 2 cm of space in the front.
4. Reach around the thermal cycler and pull up the locking bar (Figure 2) until it is flush with the sides of the module bay. This action moves the reaction module forward, locking it into place (Figure 3).
5. Use the supplied power cord to plug the chassis into an appropriate electrical outlet.
6. Turn on the CFX384 system using the power switch on the back of the chassis.

### Removing the Red Shipping Screw

The CFX384 optical reaction module is shipped with a red screw in place in the inner lid in the hole to the left of the hole corresponding to well B1 (see Figure 4). Follow the instructions on the C1000 color screen to remove this shipping screw before beginning operation.

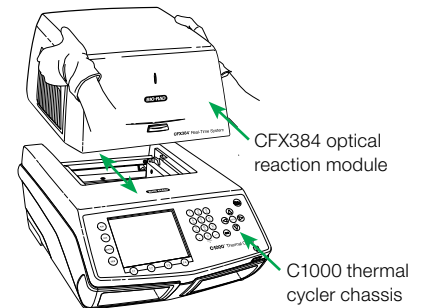


Fig. 1. Lifting the CFX384 optical reaction module onto the C1000 thermal cycler chassis.

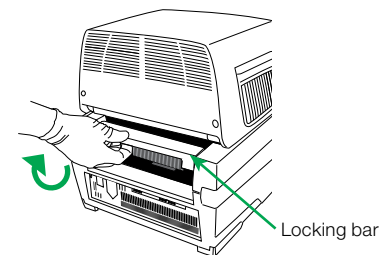


Fig. 2. Locking the CFX384 module into place.

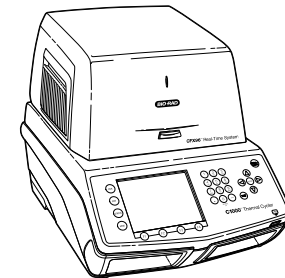


Fig. 3. The CFX384 module positioned on the C1000 chassis.

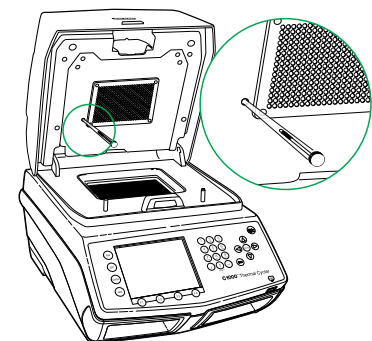


Fig. 4. Red shipping screw included with the CFX384 optical reaction module.

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# Operating Under Software Control

## Installing CFX Manager Software

A computer with either the Windows XP or Windows Vista operating system is required to run the software. Minimum computer specifications are listed in the CFX384 system instruction manual. The software must be installed on the computer by a user with administrative privileges. To install CFX Manager software:

1. Place the CFX Manager software CD in the computer's CD drive. The software launch page should appear automatically.
2. Double click **Install Software** on the software launch page.
3. Follow the instructions onscreen to complete installation.
4. If the launch page does not appear automatically, double click on **(CD drive):\Bio-Rad CFX**, then open and follow instructions in the **Readme.txt** file.

## Installing the Drivers

With the instrument powered off, plug the supplied USB cable into the USB B port (Figure 5) located on the back of the C1000 chassis and into a USB 2.0 A port on the computer. Turn on the CFX384 system using the power switch on the back of the chassis. To install the drivers for the CFX384 system, follow the instructions in the Found New Hardware Wizard that launches after the instrument is first detected by the computer:

1. On the first screen, select **Yes, this time only** to instruct Windows to connect to Windows Update to search for software (Figure 6). Click **Next**.
2. Instruct the wizard to **Install the software automatically** (Figure 7). Click **Next** to continue installing the drivers.
3. Click **Finish** when the drivers are installed (Figure 8).



After installation — open CFX Manager software by double clicking the Shortcut icon located on the Windows desktop.

## Creating, Running, and Analyzing an Experiment

The Experiment Setup window provides quick access to the files and settings needed to set up and run an experiment. To open the Experiment Setup window, follow one of these options:

- Click the **Create a New Experiment** option in the Startup Wizard
- Click the **Experiment Setup** button in the main software toolbar

The Experiment Setup window includes three tabs (Figure 9):

- Click the **Protocol** tab to select an existing protocol to run or edit, or to create a new protocol in the Protocol Editor window
- Click the **Plate** tab to select an existing plate to run or edit, or to create a new plate in the Plate Editor window
- Click the **Start Run** tab to check run settings, select one or more instrument blocks, and begin a run

CFX Manager software processes real-time PCR data automatically at the end of each run, and opens the data analysis window. The data file can be analyzed or saved to the folder of your choice, and it can be emailed from the software. (Refer to the CFX384 system instruction manual for detailed information about experiment setup and data analysis.)

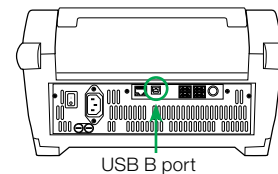


Fig. 5. USB B port on the back of the C1000 chassis.



Fig. 6. Windows Update screen.



Fig. 7. Software installation screen.



Fig. 8. Software installation completion screen.

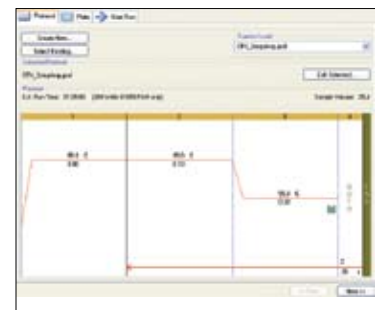


Fig. 9. Experiment Setup window, including the Protocol, Plate, and Start Run tabs.

# Stand-Alone Operation

The CFX384 system can also be operated as a stand-alone instrument that can run a real-time PCR protocol without a computer attached. However, data analysis requires the use of CFX Manager software installed on a PC.

## Creating a Protocol

- To create a new experiment, select **New Protocol** (F4) in the main menu to open a new protocol template (Figure 10); use the arrow keys to navigate to the Protocol Name field, then press the alphanumeric keys to enter a protocol name to save
- To edit and run an existing protocol, press the EDIT key to open the file library and select a protocol to edit
- For more information about creating, editing, and running protocols, refer to the CFX384 system instruction manual

## Exporting Data

When a run is finished, the fluorescence data needs to be transferred to a computer running CFX Manager software for analysis. At the end of a run, the data file is automatically saved to the RT\_DATA folder located in the SYSTEM folder (Figure 11). Up to 20 real-time PCR experiment runs are stored in this folder.

### Exporting Data Using a USB Key

- If a USB key is in a USB key port on the C1000 chassis at the end of a run, the data file (.zpcr) will automatically be saved to the root directory of the USB key
- If a USB key is not in the C1000 chassis, follow these instructions to transfer a data file to the USB key:
  1. Press the Files (F2) button on the main screen to access the Files folders.
  2. Use the arrow keys to navigate to the RT\_DATA folder and select the file.
  3. Press the Export File (F1) button to export a copy of the data file to the USB key.
  4. Use the arrow keys to navigate to a folder on the USB key in which to save the file.
  5. Click **Yes** (F1) to confirm the export.

### Exporting Data Using Email

You can choose to email your data from the C1000 chassis after configuring your email settings (see the Setting Up Email on the C1000 Chassis section).

To send an email with an attached data file (.zpcr) from the C1000 chassis at the end of a run:

1. After saving the name of the protocol or selecting a protocol from the File Library using the Run command key, select **Options** (F4) in the Run Information screen (this is done prior to initiating an experiment run).
2. Use the arrow keys to select the **Send email notification** option (Figure 12).
3. Click **OK** (F1) to return to the Run Information Screen.
4. Use the arrow keys to navigate to the Email Address field, then use the alphanumeric keys or virtual keypad to enter an email address (Figure 13).
5. Click **OK** (F1) to continue to start a run.

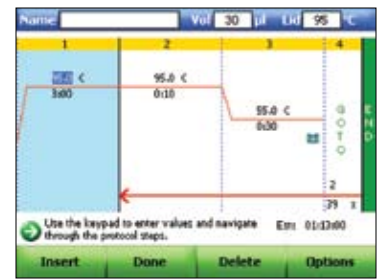


Fig. 10. Default real-time PCR protocol.

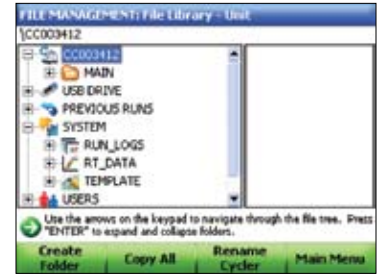


Fig. 11. RT\_DATA folder stores real-time PCR runs.

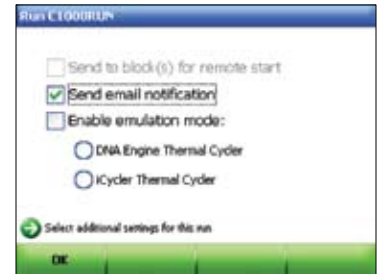


Fig. 12. Selecting email notification.

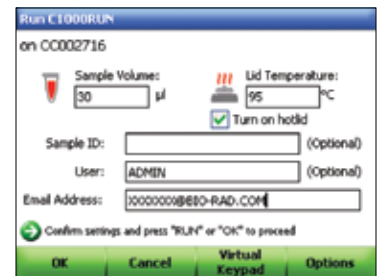


Fig. 13. Run information screen enabled to enter an email address.

## Analyzing a Data File

The stand-alone run data file (.zpcr) needs to be converted into a data analysis file (.pcrd) by CFX Manager software in order to be analyzed. Create a data analysis file from a stand-alone run using one of the following options:

- Click and drag the .zpcr file over the main software window
- Select **File > Open > Stand-alone Run** from the main software window menu options

After the file has been created, click the **Select Plate** button to import the name of the plate file the software will use to name and analyze the data file. The scan mode and plate size for the plate file must match the run settings that were used for the experiment. You can load a Quick Plate file to quickly access data from all the wells. Refer to the CFX384 system instruction manual for detailed information about data analysis.

## Setting Up Email on the C1000 Chassis

To configure the outgoing email from the C1000 chassis, follow these instructions:

1. From the main menu, select **Log In (F1)** to log in as the administrator.
2. Select **Utilities (F3)** on the main screen to launch the Utilities Menu.
3. In the Utilities Menu, select **5: Administrator Settings**.
4. In the Administrator Settings Menu, select **9: SMTP Server Settings** (Figure 14).
5. Select **Add Server Name (F1)**.
6. Type the name of the server in the text field using the Virtual Keypad.
7. Click **Save (F1)** to save the name of the SMTP server (Figure 15); the added server name will appear in the SMTP Server Names pull-down menu.
8. Select **Set Current Server (F3)** to set the current server to be used for email.
9. Use the arrow keys to select the **Test Current Server** button and click **Enter**.
10. Type the email address in the text field and select **Test Server (F1)** (Figure 16).
11. The C1000 chassis will send a test email to the entered address. Some SMTP servers do not allow attachments, and others allow attachments only up to certain sizes. You may want to test your server's ability to email attachments by selecting **Test Attachment**, and setting the Attachment Size with up to 5 megabytes (MB) or more.
12. Once the test is complete and functional, the system will be able to email stand-alone data after a run.

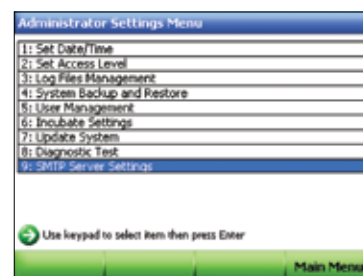


Fig. 14. Administrator Settings Menu.



Fig. 15. Saving the SMTP server name.



Fig. 16. Enter an email address to test the current server.

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