



## AMPLIFICATION

# CFX Automation System Installation Quick Guide

### Unpacking the CFX Automation System

The CFX automation system and the mounting plate kit are shipped in separate containers. Unpack each box carefully. The bar code scanner, power cables, 9-pin communication cable, USB to serial converter cable, and CFX automation control software included with the CFX automation system are required for installation.

**Important:** Carefully read the safety information and instrument operating specifications provided in the CFX Automation System Instruction Manual before using the system.

### Changing the Fuse Configuration

The CFX automation system is factory set for 100–120 V operation using a single 1.5 A fuse. If it is necessary to convert the unit from the single 1.5 A fuse configuration used for 100–120 V operation to the dual 1.0 A fuse configuration used for 200–240 V operation, refer to the diagrams and instructions in the manual before proceeding.

**WARNING! Danger of electrical shock hazard.** Disconnect the power cord before changing the fuses. For continued fire protection and correct functioning of the unit, only replace fuses with fuses of the same type and rating.

### Setting Up the CFX Automation System

#### Seating the CFX Automation System on the CFX Mounting Plate

1. Install the CFX automation system on a clean, dry, level surface with sufficient cool airflow to run properly.
2. Remove any packing materials from around the CFX automation system and the CFX mounting plate.
3. Place the CFX mounting plate on the right side of the bench with either short edge facing the front of the bench.

**WARNING!** The CFX automation system weighs approximately 14.53 kg (32 lb) and should be carefully lifted. Take the proper precautions to avoid injury.

4. Lift the CFX automation system and carefully place it onto the white-tipped locating pins on the CFX mounting plate. When the CFX automation system is fully seated on the pins, it should rest flat on the mounting plate.

### Connecting the Communication Cable and Power Cord

1. Locate the 9-pin to 9-pin, 1.8 m (6 ft) communication cable included with the CFX automation system.
2. Insert the 9-pin male end of the communication cable into the 9-pin female COM port (C) on the rear panel of the CFX automation system (Figure 1).

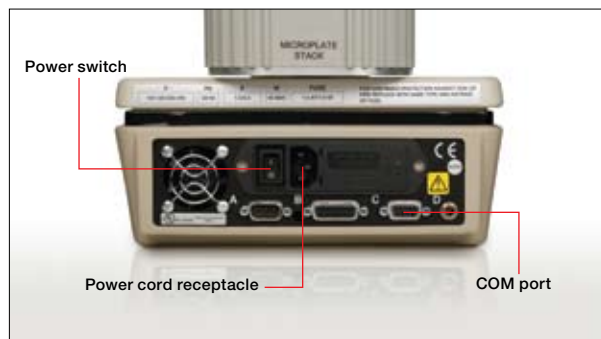


Fig. 1. Rear panel of the CFX automation system.

3. Connect the female end of the cable into the serial port on the PC. If no serial ports are available on the PC, connect the female end of the cable into the serial port end of the USB to serial converter cable. Connect the USB end of the cable to an open USB port on the computer. (The CFX automation control software will automatically detect which COM port the CFX automation system is connected to.)
4. Locate the power cord for the CFX automation system and connect it to the receptacle on the rear panel of the CFX automation system.
5. Plug the CFX automation system power cord into a grounded 100–240 V AC power outlet. (If you are using 220/240 V AC, be sure the CFX automation system's fuse configuration has been changed.)

**Note:** Verify that the communication cable and power cord are securely plugged into the CFX automation system.

### Installing the Bar Code Scanner Platform

1. Locate the bar code scanner platform and the three bar code scanner platform screws. Remove the packing material from around the bar code scanner platform.

2. The bar code scanner platform will be located at the rear of the CFX automation system on the left side (Figure 2).



Fig. 2. Bar code scanner platform.

3. Position the bar code scanner platform so the screw holes in the platform are aligned with the holes in the CFX automation system base, and the rubber mat is facing up.
4. Insert the three screws through the bar code scanner platform into the holes in the CFX automation system and tighten them using a long Phillips head screwdriver.
5. Insert the 9-pin female end of the bar code scanner communication cable into the 9-pin male COM port (A) on the rear panel of the CFX automation system.
6. On the same bar code scanner communication cable, connect the phone jack cable to the power supply cable. Plug the power cord into a grounded 100–240 V AC power outlet.

### Installing the Input and Output Racks

1. Locate the hole for the rack locating pin in the bottom of the rack (see Figure 3).

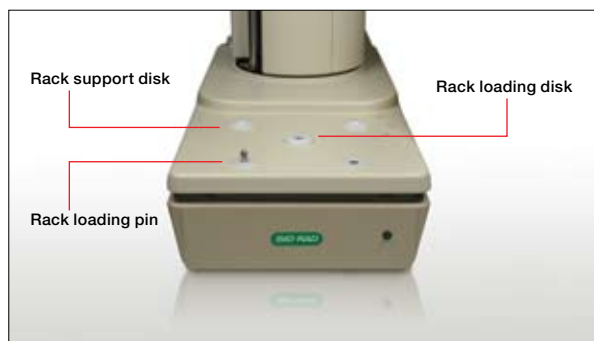


Fig. 3. Front view of input rack (portrait orientation).

- Place the rack on the white rack locating disk so the rack locating pin fits into the hole on the bottom of the rack. The racks should be in portrait orientation (short edge of the plate closest to the CFX automation system) with the channel for the CFX automation system arm facing the center of the CFX automation system.
- Place all racks on the CFX automation system in the same manner.

#### Changing the Grippers on the CFX Automation System

The CFX automation system comes equipped with standard portrait fingers installed on the gripper for use with a 384-well plate.

If a CFX96™ real-time PCR detection system is used, the grippers on the fingers must be changed to 96-well grippers. To change from 384-well to 96-well grippers:

- Move the CFX automation system arm into any position where it is easy to access the screws.
- Remove the head screws from the metal plate (one on each side of the metal plate) using a small Phillips head screwdriver.
- Remove the metal plate from the gripper (Figure 4).



Fig. 4. Metal plate on the grippers.

#### Installing the CFX96 or CFX384™ Real-Time PCR Detection System

The CFX96 or CFX384 system can now be positioned next to the CFX automation system. Please refer to the CFX96™ and CFX384™ Real-Time PCR Detection Systems Instruction Manual for the installation procedure.

#### Seating the CFX96 or CFX384 Real-Time PCR Detection System on the CFX Mounting Plate

**WARNING!** The CFX96 and CFX384 real-time PCR detection systems each weigh approximately 21 kg (47 lb) and should be carefully lifted. Take the proper precautions to avoid injury.

Lift the CFX96 or CFX384 system and carefully place it onto the front locating holes on the CFX mounting plate (Figure 5). When the CFX96 or CFX384 system is fully seated on the front holes, it should rest flat on the mounting plate.



Fig. 5. CFX96 or CFX384 system seated on the mounting plate.

#### Installing the Software

CFX Manager™ software must be installed and launched before installing CFX automation control software. Please refer to the CFX96™ and CFX384™ Real-Time PCR Detection Systems Instruction Manual for the installation procedure.

CFX automation control software is run on a PC computer with either the Windows XP or Windows Vista operating system. Computer system requirements for CFX automation control software are listed in Table 1.

Table 1. Computer system requirements for CFX automation control software.

System	Minimum	Recommended
Operating system	Windows XP Professional SP2 and above or Windows Vista Home Premium and above	Windows XP Professional SP2 and above or Windows Vista Home Premium and above
Drive	CD-ROM	CD-ROM
Hard drive	10 GB	20 GB
Processor speed	2 GHz	2 GHz
RAM	1 GB (2 GB for Windows Vista)	2 GB
Screen resolution	1,024 x 768 with true-color mode	1,280 x 1,024 with true-color mode
USB port	2.0 Hi-Speed	2.0 Hi-Speed
Internet browser	Internet Explorer	Internet Explorer
Software	—	Microsoft Office Suite

To install CFX automation control software:

1. The software must be installed on the computer by a user with administrative privileges. Make sure you are logged in with administrative privileges.
2. Place the CFX automation control software CD in the computer's CD drive. The CFX automation control software installation screen will appear.
3. Click **Next** in the software installation window (Figure 6).



Fig. 6. Software installation window in Installation Wizard.

4. When the software installation is complete, click **Finish** to exit the Installation Wizard (Figure 7).



Fig. 7. Installation Wizard window showing software installation is complete.

### Installing the USB to Serial Converter Driver

With the CFX automation system powered off, install the driver for the USB to serial converter cable if it is being used. To install the driver:

1. Place the CFX automation control software CD in the computer's CD drive.
2. Double click on the file labeled "CDM 2.04.16.exe" to start the driver installation program. The installation window screen will appear and the file will be automatically installed (Figure 8).



Fig. 8. Driver installation window prompt.

### Calibrating the CFX Automation System

Before running the first automation batch run on the CFX96 or CFX384 real-time PCR detection system, the CFX automation system positions must be calibrated. Offsets identify the rotary and vertical arm positions of the input and output racks, bar code scanner platform, and the CFX96 or CFX384 system. The positions of the input and output rack are factory set, but may need to be slightly adjusted. The offsets for the bar code scanner platform and CFX96 or CFX384 system are not set at the factory, and must be set before running the CFX automation system.

Before using the CFX automation control software to calibrate the positions, the CFX Manager software must be installed and launched on the same PC.

When calibrating the CFX automation system, always use the same brand and model of PCR plates for each calibration. Place sealing film on the plates used in the calibration. Trim any excess sealing film that hangs over the edge of the PCR plates.

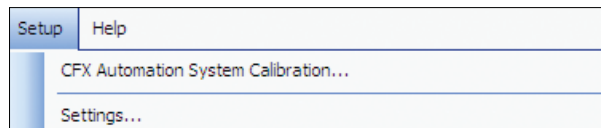
**WARNING!** Always keep all objects out of the path of the CFX automation system arm. If the CFX automation system arm encounters an object in its path, the CFX automation system will lose its proper orientation.

#### Starting a Calibration

Follow these instructions for a CFX96 or CFX384 system without an obstruction above the thermal block:

1. Turn on the CFX96 or CFX384 system and launch the CFX Manager software.
2. Turn on the CFX automation system.
3. Double click the CFX automation control software desktop icon to launch the software.

- In the menu bar, select **Setup > CFX Automation System Calibration** (Figure 9).

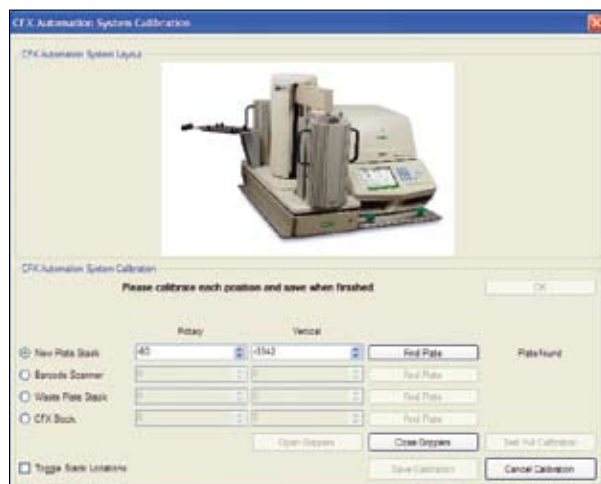


**Fig. 9. Navigating to CFX Automation System Calibration in the menu bar.**

- The software will check all COM ports and attempt to communicate with the CFX automation system.
- When the CFX automation control software establishes communication with the CFX automation system, a message will appear prompting the user to load an empty plate into each position, CFX block, input stacker, output stacker, and bar code scanner platform.
- If there is an error in communication, the error message “Connection Failed” will be displayed. If this error message displays, check that the CFX automation system is plugged in and turned on, and check the connections.

#### Calibrating the Input and Output Rack Positions

- Place one PCR plate in each input and output rack. Use the same brand and model of PCR plates for each calibration.
- In the CFX Automation System Calibration window, select **New Plate Stack** to display the Find Plate button (Figure 10).



**Fig. 10. CFX Automation System Calibration window.**

- Click the **Find Plate** button (Figure 10). The CFX automation system arm moves to the input stack position (rear stack by default) and the rotary offset is displayed. The arm then moves down until the plate sensor switch is activated by the lip of the PCR plate, and the vertical offset text box is recorded. A “Plate found” message will display to the right of the Find Plate button.
- Verify the CFX automation system grips the PCR plates and correctly places them in the racks. If the PCR plates rub against the sides of either rack or are not correctly placed in the racks, reset the rotary or vertical offset for the applicable position(s).

- Repeat the same steps for the output rack.

#### Calibrating the Bar Code Scanner Platform Position

If the bar code scanner platform has been installed, calibrate the position offsets as follows:

- Place a PCR plate on the bar code scanner platform.
- In the CFX Automation System Calibration window, select **Barcode Scanner**, then click the **Find Plate** button (Figure 10); the CFX automation system arm moves to the bar code scanner position, which is centered over the platform.

**Note:** If the arm is not centered over the platform, use the arrow buttons in the Rotary offset drop-down menu to adjust the position of the CFX automation arm until it is centered over the bar code scanner platform.

- The arm then moves down until the plate sensor switch is activated by the lip of the PCR plate, and the vertical offset text box is recorded. A “Plate found” message will display to the right of the Find Plate button.

#### Calibrating the CFX Block Position

- Open the CFX96 or CFX384 system lid.
- Place a PCR plate in the thermal block.
- In the CFX Automation System Calibration window, select **CFX Block**, then click the **Find Plate** button (Figure 10); the CFX automation system arm moves to the CFX block position, which is centered over the block.

**Note:** If the arm is not centered over the block, use the arrow buttons in the Rotary offset drop-down menu to adjust the position of the CFX automation arm until it is centered over the CFX block.

- The arm then moves down until the plate sensor switch is activated by the lip of the PCR plate, and the vertical offset text box is recorded. A “Plate found” message will display to the right of the Find Plate button.

### Performing a Test Full Calibration

After the positions of the input and output racks, the bar code scanner platform, and the CFX block have been calibrated, the user must perform a Test Full Calibration to verify the offsets are correct. To perform a Test Full Calibration:

1. Click on the **Test Full Calibration** button; a message will be displayed prompting the user to remove all PCR plates from the CFX automation system and the CFX block, and to add a single PCR plate in the new plate stack position (Figure 11).
2. Add a PCR plate into the new plate stack position.
3. Click **OK** to proceed.
4. Once the test run is completed, click the **Save Calibration** button (Figure 11) to save the offsets.
5. The CFX automation system is calibrated and ready for use.

**Note:** Before loading plates into the CFX automation system, make sure to trim any excess sealing film that hangs over the edge of the PCR plates.

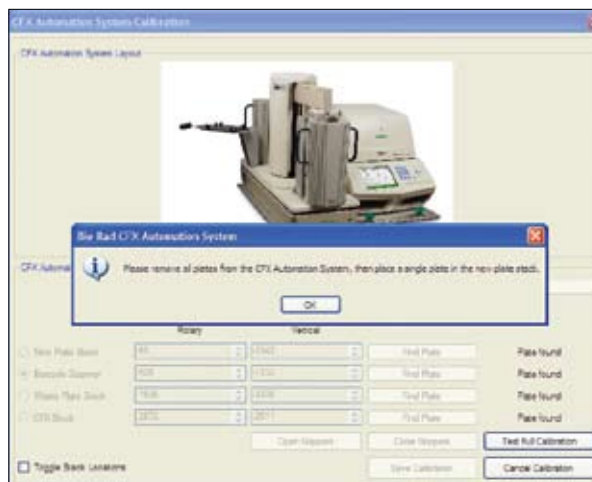


Fig. 11. Performing a Test Full Calibration in the CFX Automation System Calibration window.

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