



Release Notes for PTC Tempo Thermal Cyclers

PTC Tempo Thermal Cyclers Software Version 3.0

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Introduction

PTC Tempo is the newest generation of thermal cyclers from Bio-Rad™. Thermal cyclers are essential laboratory equipment for laboratories that run polymerase chain reaction (PCR) for sequencing, cloning, mutagenesis, and many other applications. The fully adjustable heated lid supports a wide range of vessels and sealers, including low-profile and standard-height PCR plates.

Bio-Rad's newest thermal cyclers include:

- PTC Tempo 96 Thermal Cycler
- PTC Tempo 384 Thermal Cycler
- PTC Tempo Deepwell Thermal Cycler
- PTC Tempo 48/48 Thermal Cycler

Main Features

The main features of the PTC Tempo thermal cyclers include:

- Connectivity to Bio-Rad's BR.io app to manage PCR protocol files and view run status. Using the BR.io app, you can
 - Create PCR protocols in the app
 - Run them on your linked PTC Tempo thermal cycler,
 - View run status remotely
 - Upload the run report to the BR.io app
 - Share data, such as protocols and protocol runs, with authorized users within a designated group
 - Reserve and control multiple PTC Tempo instruments from the BR.io app

For more information about Bio-Rad's BR.io app, go to [BR.io](https://br.io). From the BR.io Home page, you can

- Create a BR.io account
- Explore the BR.io app via video
- Access helpful BR.io user assistance pages
- Ability to integrate with laboratory automation systems using the PTC Tempo Automation API

For more information see the PTC Tempo 96, PTC Tempo 384, and PTC Tempo Deepwell API Reference Guide.

- Wireless and WLAN Ethernet network compatibility enables connectivity to your internal network for unlimited data access and storage on shared network drives as well as connectivity to your BR.io cloud account
- USB drive compatibility provides an optional medium for protocol transfer and storage
- Programmable temperature gradient to quickly and easily identify optimal annealing temperatures
- The ability to activate PTC Tempo, Security Edition. For more information about PTC Tempo, Security Edition, see Enhancements and Changes, below.

Updating PTC Tempo Thermal Cyclers

This section explains how to update PTC Tempo thermal cyclers.

Note: Only Admin users can perform software and firmware updates on PTC Tempo thermal cyclers. Updates are performed via USB only.

You can access updates from Bio-Rad's Firmware & Software Updates web site. The update file for PTC Tempo thermal cyclers can include operating system and software and firmware updates. All updates for the PTC Tempo thermal cycler are distributed in a single file. thermal cyclers can include operating

Before updating the system, Bio-Rad recommends that you verify the current version installed on the PTC Tempo thermal cyclers. This section explains how to verify the installed version and how to update the thermal cycler.

To verify the current version of the PTC Tempo thermal cycler software

1. Log in as any user.
2. On the Home screen, do one of the following:
 - a. Locate the currently installed version in the lower left of the screen.
 - b. Tap Tools to view the Tools screen, then tap About and note the currently installed software version on the About screen.
 - c. Ensure the version you are updating to is newer than the version currently installed.

To update PTC Tempo thermal cyclers

Note: Depending on the type of update, this process can take several minutes to complete.

1. In a browser, log in to the Firmware & Software Updates page at bio-rad.com/pcrupdates and download the update file onto a USB drive.

Note: Copy the update file into the root directory of the empty USB drive. Supported file system formats include exFAT, FAT32, and NTFS.

2. Insert the USB drive into a USB port on the PTC Tempo thermal cyclers.
3. On the Home screen, log in as an Admin user and tap Tools to open the Admin tools screen.
4. On the Admin tools screen, tap System Update to open the Software and Instrument Updates screen.

The System Update screen appears prompting you to confirm that a USB drive containing the upgrade file is inserted.

5. Tap Continue.

The thermal cyclers verify that the update file is newer than the software version currently installed. When the update file is verified, you are prompted to confirm the update.

6. Do one of the following:

- To cancel the update, tap No.
- To update the system, tap Yes and follow the prompts.

Important: While the update is in progress, do not shut down the thermal cyclers and do not remove the USB drive.

Notes:

- Determining the operating system version can take time.
- When the update completes, the system automatically restarts. If a Firmware update is required, the system restarts twice.

PTC Tempo Thermal Cyclers Documentation

Bio-Rad's PTC Tempo Thermal Cyclers web site provides access to:

- PTC Tempo Thermal Cyclers Release Notes (this document)
- PTC Tempo Thermal Cyclers Instrument Guide
- Training videos to guide you through basic conventional PCR experiments

Important: The PTC Tempo Thermal Cyclers Instrument Guide provides specific information about installing, setting up, and using the thermal cyclers.

To access PTC Tempo Thermal Cyclers documentation

1. In a web browser, log in to Bio-Rad.com and navigate to bio-rad.com/PTCTempo.
2. Scroll to the Documents section and select the PDF icon for document of choice.

The PDF opens in your web browser. You can then download the document to your computer.

PTC Tempo Thermal Cyclers Additional Information

Cybersecurity and PTC Tempo Thermal Cyclers

Important: Cybersecurity is the protection of assets in cyberspace from cyberattacks. Cybersecurity is Bio-Rad's ability to secure its people, information, systems, and reputation in cyberspace. Cyberspace is the always-on, technologically interconnected world; it consists of people, organizations, information, and technology.

Fast reaction is important with cybersecurity issues! If you suspect that there may be a cybersecurity issue concerning your instrument or that cybersecurity has been breached at your site, contact your Bio-Rad representative for technical support immediately.

Running PTC Tempo Protocols on C1000 Touch Thermal Cyclers

You can run PTC Tempo protocols on C1000 Touch thermal cyclers as well as CFX Opus real-time PCR instruments.

To run PTC Tempo protocols on C1000 Touch thermal cyclers

1. On the PTC Tempo thermal cycler, ensure the file name meets the requirements for C1000 Touch thermal cyclers. See the C1000 Touch Operation Manual for specific information.
2. Export the protocol file to an attached USB drive.
3. On a Windows computer, move the protocol to a subfolder on the USB drive.
4. Insert the USB drive into a USB port on the C1000 Touch thermal cycler and navigate to that subfolder.

Using Write-Protected (Read-Only) USB Drives with PTC Tempo Thermal Cyclers

PTC Tempo thermal cyclers do not recognize USB drives that are set as read-only through a computer's operating system.

That is, USB drives that a user has inserted into a computer and used the computer's operating system to set the properties of the USB drive to Read-only are not recognized as read-only when inserted into the PTC Thermal cycler. Users can copy and save protocols to, and delete protocols from, such USB drives.

PTC Tempo thermal cyclers recognize only those USB drives that have an external manual switch as write-protected.

Running BR.io Protocols with Long Protocol Names or Names that Contain Single Quotes in the Name

The PTC Tempo thermal cycler considers single quote marks (') as invalid characters. If your protocol name contains a single quote mark, it will be substituted with an underscore (_). The PTC Tempo thermal cycler does not support protocols names greater than 32 characters in length. If your protocol name contains more than 32 characters, the PTC Tempo thermal cycler truncates all characters after the 32nd.

Running Legacy Protocols with Long Protocol Names or that Contain Single Quotes in the Name

The PTC Tempo thermal cycler considers single quote marks (') as invalid characters. As well, the PTC Tempo thermal cycler does not support protocols names greater than 32 characters in length. If you are running a protocol from an attached USB drive or a shared network drive that contains a single quote mark and/or more than 32 characters in its name, you must return to the location of the original protocol and rename it before starting the run.

Note: In the case of running from a USB drive:

1. Remove the USB drive from the PTC Tempo thermal cycler.
2. Insert the USB drive into the computer from which you copied the original protocol and rename the protocol.
3. Copy the renamed protocol onto the USB drive.
4. Reinsert the USB drive into the PTC Tempo thermal cycler and start your run again.

The PTC Tempo Thermal Cycler Continues a Run In Progress after Power is Restored Though Plate Has Been Removed

The PTC Tempo thermal cycler continues the run that was in progress when power is restored after a power failure. This is as designed.

If the user manually opens the lid and removes the plate during the power failure and does not close the lid, the instrument does not detect that the lid is open and attempts to continue the run.

In this case, when power is restored to the instrument, tap Run Status on the Home screen. On the Run Status screen tap Stop Run to stop the run.

If the user manually opens the lid and removes the plate during the power failure and does not close the lid, the instrument does not detect that the lid is open and attempts to continue the run.

In this case, when power is restored to the instrument, tap Run Status on the Home screen. On the Run Status screen tap Stop Run to stop the run.

System Logs Display the Adjusted Date when the System Date is Changed

If the system date is changed in the PTC Tempo instrument, the logs will show the newly adjusted date in the "Date" column. For example, changing the date from October 11 to October 10 will display October 10 in the logs.

Starting a Protocol Run in BR.io When the PTC Tempo Instrument is Locked

You cannot start a run in BR.io if you are logged in to an unlocked instrument. Locking the instrument will keep you logged in. To start a new run, unlock the instrument and log out.

Enhancements and Changes

Version 3.0 of the PTC Tempo includes the following enhancements and changes.

PTC Tempo, Security Edition

Introducing PTC Tempo, Security Edition, a software with features that allow customers to comply with regulations set by the Food and Drug Administration's Title 21 U.S. Code of Federal Regulations Part 11 (21 CFR part 11). Authorized users can activate Security Edition on their PTC Tempo instrument using an activation license key. For more information, refer to the PTC Tempo Security Edition User Guide.

The Security Edition environment includes:

- The ability to run and copy protocols, generate and export run reports, export logs as a PDF for audit purposes, and manage users based on user role (Administrator, Principal, or Operator)
- The ability to lock protocols to protect them from unauthorized modifications
- Authorization verification through user IDs and passwords to ensure appropriate permissions for specific functions
- Time- and date-stamped run reports and system logs that record user activity, run activity, and thermal cycler operations (such as pausing, skipping, and stopping a run)
- Electronic signature capability for run reports to ensure authenticity
- The ability to lock the PTC Tempo system to protect in-progress protocol runs (this feature is also available for PTC Tempo, version 3.0)
- The ability to disable the PTC Tempo Thermal Cycler USB drive

Note: Enabling Security Edition also enables the “Disable USB Drive” option in the System Settings. Deselect the “Disable USB Drive” checkbox of the System Settings after enabling Security Edition.

PTC Tempo Fleet Management

Introducing PTC Tempo Fleet Management, an application that enables you to remotely reserve one or more PTC Tempo instruments in BR.io to:

- Assign protocols to instruments
- Open and close instrument lids
- Start and stop protocol runs as well as skip steps during a run on one or more instruments

Note: Fleet Management is currently not available for PTC Tempo 48/48, CFX Opus, and ChemiDoc Go.

Screen Lock Feature

Logged-in users can now lock the PTC Tempo thermal cycler screen to prevent others from logging in while a protocol is running. An Admin user or user assigned an Administrator role can unlock the screen with their credentials if the logged-in user is not available.

Additionally, Admin users or Administrators can configure the PTC Tempo to automatically lock the screen by selecting the Enable System Lock checkbox and adjusting the idle time before the system locks in the System Settings. For more information, refer to the PTC Tempo Instrument Guide or the PTC Tempo Security Edition User Guide.

Enable Screen Saver

Administrators or Admin users can configure the PTC Tempo to automatically display a screen saver by selecting the Enable Screen Saver check box and adjusting the idle time before the screen saver appears in System Settings. For more information, refer to the PTC Tempo Instrument Guide or the PTC Tempo Security Edition User Guide.

Run Report Export Enhancements

Users can now export run reports to a USB or network from the Run Status screen. For more information, refer to the PTC Tempo instrument guide.

Create Subfolders Feature

PTC Tempo version 3.0 now enables you to create subfolders and in your My Files, the Public folder, or in any subfolders you create in those locations. You can also save, copy, or run protocols from those subfolders.

BR.io Protocol Visibility

PTC Tempo version 3.0 enables you to scroll through a complete list of BR.io protocols in the instrument Protocol Browser if you have more than 25 BR.io protocols.

PTC Tempo Thermal Cycler Fixed Defects

Version 3.0 of the PTC Tempo thermal cycler includes these defect fixes.

Incorrect Error Message No Longer Appears when Attempting to Set a Static IP Address with No Network Connection

- If an Admin user attempts to set a Static IP when a network connection cannot be found, The PTC Tempo now displays the correct error message “A Bio-Rad-supplied Ethernet cable is not inserted. Insert the Ethernet cable and try again.”

Invalid IP Addresses Now Display Correct Error Message

- If an Admin user enters an invalid Static IP address on the Network Settings screen and taps Apply to save the settings, the system now displays the correct error message informing the user that the static address is invalid.

PTC Tempo No Longer Freezes after Attempting to Load Protocols from a Shared Network Drive

- After connecting to a shared network file by tapping Network in the Protocols Browser, the PTC Tempo thermal cycler no longer freezes.

PTC

Tempo Now Displays an Error Message when Copying to a Write-Protected USB Drive

- An error message now appears when a user attempts to copy a protocol to a write-protected USB drive.
- **Note:** Users can copy and save to and delete protocols from USB drives whose Properties are set to Read-only. To ensure the write-protection of your USB drive, use only USB drives that have an exterior write-protection switch.

Protocols Are Now Deleted from NTFS or exFAT Formatted USB Drives

- The PTC Tempo thermal cycler now allows users to delete protocols from attached NTFS or exFAT-formatted USB drives. Deleted protocols no longer reappear in the Protocol Browser within 35 seconds of deletion when the USB drive is reinserted and USB is selected in the Protocol Browser.
- **Note:** If necessary, the user can also insert the USB drive into a compatible computer and follow its file-deletion process.

System Log Entry Corrected when Admin User Exports Run Reports

- After an Admin user exports a run report, the PTC Tempo System log now correctly displays that an Admin user exported the run report.

PTC Tempo No Longer Freezes if the User Attempts to Load BR.io Protocols and the System Is Not Connected to the Network

- The PTC Tempo thermal cyclers are no longer unresponsive if the user taps BR.io on the Protocol Browser when it is not connected to the network.

PTC Tempo Thermal Cyclers Known Issues

Power Button Blinks Red after Software Update and System Reboot

- The PTC Tempo instrument power button might blink red if you do the following:
 - Update the PTC Tempo software
 - Perform a factory reset
 - Disable and reconfigure the USB drive

Workaround: Reboot the instrument by turning the instrument off using either the soft power button in the front or the power button in the back, then turning it back on.

Admin Unable to Delete a Non-BR.io Linked Account if Other Accounts are Linked

- An Admin might be unable to delete an account that is not linked to BR.io if other accounts are linked to BR.io.

Workaround: Admins should first unlink all accounts from Br.io, delete the intended account, then relink the remaining accounts to Br.io.

PTC Tempo Reboots if User Returns to the Home Screen Out While BR.io Protocols are Loading

- The PTC Tempo instrument reboots if you navigate back to the Home screen before all protocols created in BR.io have completely loaded onto the instrument.

Workaround: Wait for all BR.io-created protocols to load before navigating back to the Home screen.

PTC Tempo Unlinks Admin User from BR.io when Automation API is Activated

- Activating the PTC Tempo automation API unlinks the user from Br.io, but the instrument still appears in the user's BR.io account.

Workaround: To remove the instrument from BR.io, relink the user account to BR.io, and then unlink.

PTC Tempo Run Report Does Not Upload to BR.io after a Run Completes

- A reserved PTC Tempo might fail to upload a run report to BR.io after completing a protocol run. In this case, BR.io might display an "In Progress" status, and attempting to view the report in BR.io

generates a "Report cannot be viewed" message. The system log on the instrument might also indicate that the instrument did not upload the run report to BR.io.

Workaround: To retrieve the run report, cancel the instrument reservation in BR.io or on the instrument, log out of the instrument, and log back in.

PTC Tempo Instrument Displays Error after Removing a Fleet Management Protocol Assignment

- The PTC Tempo Instrument might display an error if you remove a Fleet Management protocol assignment in BR.io after assigning a protocol to multiple instruments, and then either stopping or skipping a step during a protocol run.

Workaround: You can unassign or reassign a protocol in BR.io after the run is completed.

System Logs Do Not Display a Description after Failed Run Report Upload to BR.io Due to Network Interruption

- The PTC Tempo instrument system log might not display a description after failing to upload a run report to BR.io following a network disconnection. In this case, there is no loss of data.

Workaround: None. Refer to other log entries for the description.

System Log Descriptions Become Illegible after Network Disconnection

- System log descriptions might become illegible if a network disruption occurs while the instrument exports logs to PDF.

Workaround: Export the log files as .txt to ensure the descriptions remain legible.

System Log Displays Incorrect Instrument Reservation Description after Network Disconnection

- The system log might incorrectly display the message: "Network connection lost and restored. System canceled the reservation because another user logged in," when a user tries to link to BR.io and a network connection is lost and restored.

Workaround: None. Disregard the part of the message regarding the canceled reservation.

Protocols Disappear from Protocol Browser after Exporting a Run Report to a USB

- Protocols might disappear from the Protocol Browser after exporting a run report to a USB.

Workaround: Removing and reinserting the USB into the instrument will display the protocols.

Run Report Displays Incorrect Time after Instrument Power Failure

- PTC Tempo run reports might not display the correct elapsed run time if the instrument shuts down after a power failure. However, the report Run Details section displays the correct start and end run times.

Workaround: Calculate the elapsed run time by subtracting the run's start time from the end time.

Instrument Shutdown Delay Occurs after Fleet Management Run During Network Disconnection

- If a network disconnection occurs after a Fleet Management protocol run completes, pressing the power button to shut down the instrument results in a delay.

Workaround: None. The instrument will eventually shut down

Network Disconnection Interrupts Run Report Export

- A network disconnection causes PTC Tempo to crash and interrupts the Export All process. After reconnecting, you can view exported run reports and export any unexported ones. No data is lost during the interruption.

Workaround: When the instrument is reconnected to the network, reboot the instrument and export the run reports again.

Network Disconnection Freezes Tempo Security Edition Screen at "Export in Progress"

- A network disconnection that interrupts the Export All process to a network drive causes the PTC Tempo to crash. After reconnecting, you can view exported run reports and complete any remaining exports. No data is lost during the interruption.

Workaround: To clear the frozen screen, turn the instrument off and then back on after a network disconnection.

Remaining Protocol Run Time Does Not Update Correctly on 48/48 Block A in BR.io

- If you run protocols on both blocks of the PTC Tempo 48/48 simultaneously, the "Time Remaining" for Block A on the BR.io Instruments page might not update properly, showing a delay. Block B updates in real time.

Workaround: This issue does not impact the protocol run or result in data loss. Refresh the BR.io page to update the time for Block A.

Run Report Viewer Back Button is Unresponsive for Longer Reports

- The Run Report viewer back button might become unresponsive after navigating to the end of a report that is longer than four pages.

Workaround: Scroll to the top of the report and tap the Back button.

Run Report Appears Empty for Second User if First User Logs Out Without Clearing Error

- If an error occurs during a protocol run for User A, and User A logs out of the PTC Tempo instrument without clearing the error, the run report will appear empty when User B logs in and views the report from the Run Status screen.

Workaround: Restart the PTC Tempo instrument to clear the error message and run report.

Run Status Screen and Run Report Generated after a Lid Error Are Incorrect

- If a lid error occurs during a run, the thermal cycler stops the run. This is as designed.

However, the Run Status screen does not indicate that the run was stopped because an error occurred. Instead, the Run Status screen indicates that the run was stopped.

The associated run report does not indicate that an error occurred during the run. Instead, the run report indicates that the run completed with no errors and was stopped by the user.

Run Reports Do Not Upload to BR.io if a Power Failure Occurs During the Run

- If a user is connected to BR.io and a power failure occurs during a protocol run, the run report is not uploaded to BR.io. When power is restored, the run will continue. When the run completes the Run Status screen displays that a power failure occurred.

Note: The run report is saved on the instrument and can be exported to an attached USB drive.

The Gateway Details Do Not Appear on the Network Settings Screen when Connected to Both a Wi-Fi Dongle and Ethernet Cable

- The PTC Tempo can connect to the Internet by a Bio-Rad-supplied Wi-Fi dongle or by Ethernet cable. If you have connected to the Internet by Wi-Fi dongle and then inserted an Ethernet cable into your PTC Tempo thermal cycler, the instrument defaults to Ethernet connection. However, the Gateway details do not appear on the Network Settings screen.

Workaround: Remove the Wi-Fi dongle to view the Gateway details.

PTC Tempo Appears to Freeze when Opening Very Large Run Reports

- The PTC Tempo thermal cycler software becomes unresponsive when opening run reports that might be longer than 35 pages.

Workaround: If your run report might be longer than 35 pages, export the run report to an attached USB drive and open the report on a compatible computer.

Exported Run Reports More Than Several Pages in Length Display Formatting Issues

- The top margin on the PDF of exported run reports that are greater than several pages in length gets smaller with each successive page. If the report is greater than 10 pages, the rows in the Run Details table are cut off.

PTC Tempo Appears to Freeze after Tapping the Back Button on the Edit Protocol Screen

- If a user selects a network protocol to edit and taps the Back button on the Edit Protocol screen, the PTC Tempo thermal cycler's appears disabled, and the screen is unresponsive.

After a period of time, the thermal cycler displays the Protocol Browser and the screen responds to touch commands.

An Error Message Appears after Clearing a Failure to Connect Message and then Tapping the Back Button

- The PTC Tempo thermal cycler displays a Failure to Connect error message when the user attempts to save a protocol from the Save Protocol screen after network connection is lost. When the user taps OK to clear the error message and then taps Back on the Save Protocol screen to return to the Protocol Browser, the same error message appears again.

Workaround: Tapping OK on the second error message returns the user to the Protocol Browser correctly.

Contacting Technical Support

Phone: 1-800-424-6723, option 2

E-mail: Support@bio-rad.com

For technical assistance outside the U.S. and Canada, contact your local technical support office or click the Contact us link at [bio-rad.com](https://www.bio-rad.com).

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