

# CFX Opus Real-Time PCR Systems



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# CONSISTENCY MODERNIZED



The CFX Opus Real-Time PCR Systems are the next evolution in quantitative PCR (qPCR) from Bio-Rad Laboratories. With improved thermal performance and our proprietary, accurate optical shuttle system, your data will be more consistent. A sleek, modern design includes a refreshed and easy-to-use interface with more flexible connectivity options for data management and instrument control.

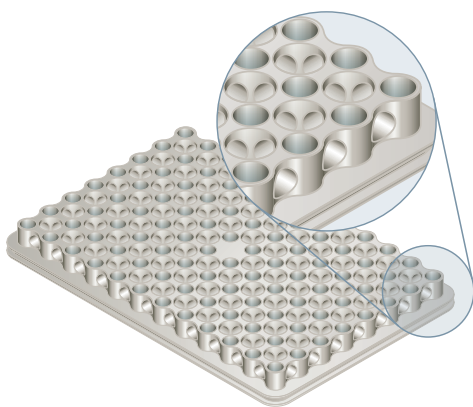
Search your mobile app store for **CFX Opus** to see, using augmented reality, how the system fits into your lab, or visit [bio-rad.com/CFXOpus](http://bio-rad.com/CFXOpus) for links and details.



# UNIFORM THERMAL CYCLING

## Superior Uniformity

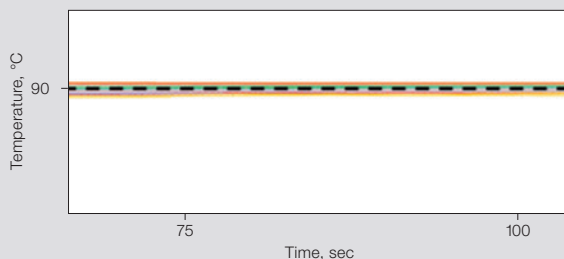
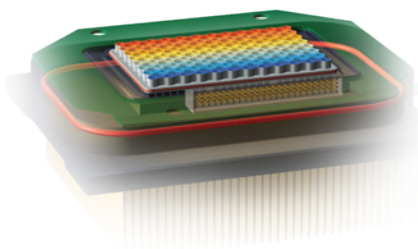
We took a great block and made it even better. The CFX Opus Systems use an improved version of the CFX Touch Systems' block to offer exceptional performance and uniformity while keeping compatibility with our consumables. With the best thermal uniformity and accuracy Bio-Rad has ever produced, you'll never worry about using the block from edge to edge again, even with highly sensitive assays.



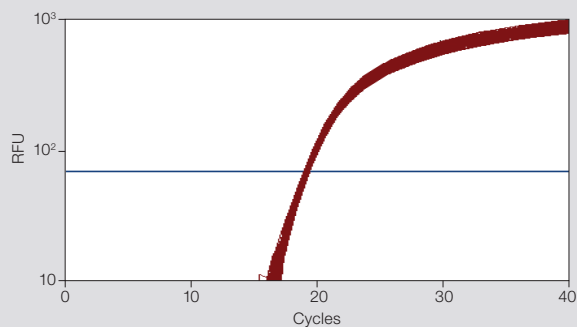
Bio-Rad's patented reduced-mass sample block heats and cools more quickly than standard blocks, improving thermal uniformity and minimizing edge effects.

## Efficient Optimization

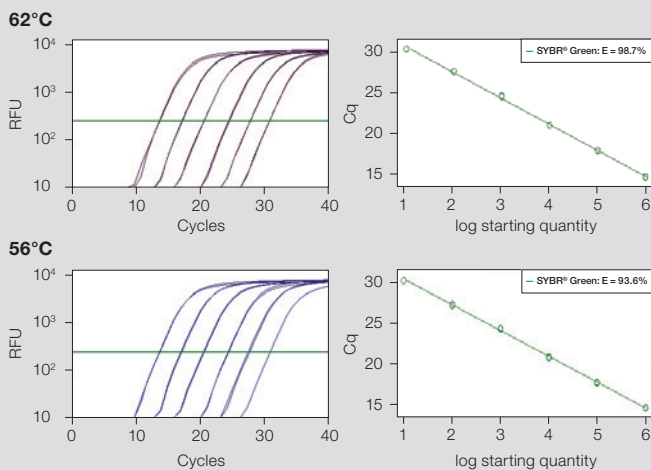
Determining the optimal temperature for primer annealing is crucial for efficient and specific target amplification. The thermal gradient feature of the CFX Opus Systems allows you to optimize your assay in a single experiment, minimizing the use of precious samples and reagents and saving valuable research time. At any step in a protocol, users can program a temperature gradient of up to 24°C across the reaction block, with exceptional temperature uniformity and reproducibility within each gradient zone.



**Superior thermal uniformity for reproducible results.** The temperatures measured by probes in 15 wells across a sample block vary by  $\pm 0.3^\circ\text{C}$  for the CFX Opus 96 and CFX Opus Deepwell Systems.



**Excellent uniformity.** *IL-1 $\beta$*  plasmid template diluted to  $10^5$  copies/reaction amplified in the presence of a FAM Dye-labeled detection probe with iQ Supermix. Graph shows 96 replicates of 10  $\mu\text{l}$  reactions. Average quantification cycle ( $C_q$ ) =  $19.81 \pm 0.10$ . RFU, relative fluorescence units.



**Thermal gradient experiment for optimizing annealing temperature.** A tenfold dilution series ( $10^6$  to 10 copies) of plasmid containing *GAPDH* template was amplified in the presence of SYBR<sup>®</sup> Green using a protocol with an annealing thermal gradient ranging from 55 to 68°C. Results are presented for two temperatures, showing 62°C as optimal in this case.  $C_q$ , quantification cycle; RFU, relative fluorescence units.

# ROBUST OPTICAL DESIGN

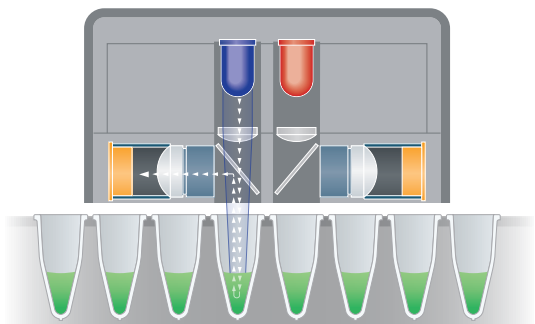
The solid-state optical technology of the CFX Opus Systems provides sensitive detection for precise quantification and target discrimination. Scanning just above the sample plate, the optics shuttle individually illuminates and detects fluorescence from each well with high sensitivity and consistency. In either acquisition mode, the optical system automatically collects data from all wells, so you can enter or edit well information on your own schedule without fear of losing data to annotation mistakes.

## Five-Target Multiplexing

The CFX Opus Systems can discriminate among up to five targets in a single reaction well. The optical filter sets are designed to maximize fluorescence detection for specific dyes in specific channels. At every position and with every scan, the optics shuttle is reproducibly centered above each well so the light path is always fixed and optimal. There is no need to sacrifice data collection in one of the channels to normalize to a passive reference.

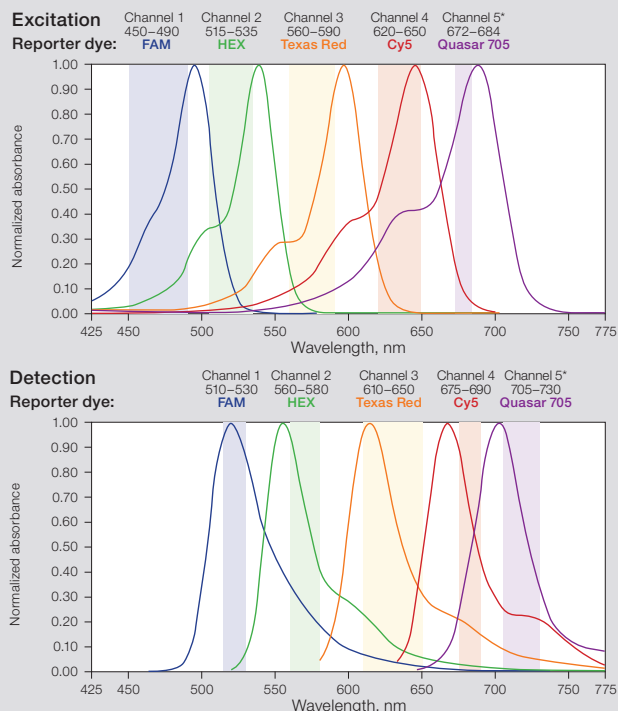
## Multiple Data Acquisition Modes

The CFX Opus Systems can acquire data using several modes. Choose to acquire data for SYBR® Green I, EvaGreen®, and single-color FAM protocols using the fast scan mode or choose to acquire data from all channels when performing multiplex protocols. The CFX Opus Systems include one channel with an LED-filter photodiode combination designated for single-color fluorescence resonance energy transfer (FRET) experiments, further expanding your experimental options. FRET mode can expand your experimental options to applications such as protein thermal shift (melt) analysis.



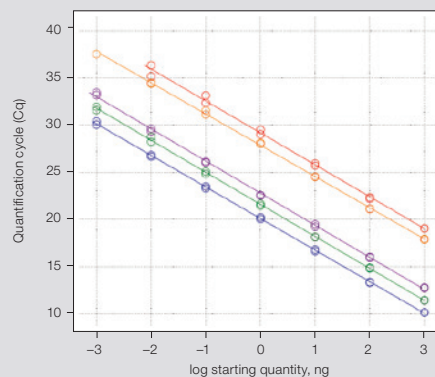
As the CFX Opus Systems' optics shuttle travels across the plate, light is focused into the center of each sample well. Side view of the optics shuttle shows the 450–490 nm LED firing and SYBR® Green emitting at 520 nm into the detector.

## Discrete Channels for Multiplex Data Acquisition



\* Channel available only on the CFX Opus 96 and CFX Opus Deepwell Systems.

## Exceptional Performance of Five-Target Multiplex



Reporter Dye	Assays	Efficiency, %	R <sup>2</sup>	Slope
— FAM	<i>ACTB</i>	99.0	1.000	-3.346
— HEX	<i>NGFRP</i>	100.5	0.999	-3.311
— Texas Red	<i>TBP</i>	97.6	0.997	-3.382
— Cy5	<i>EF1a</i>	96.6	0.999	-3.406
— Cy5.5	<i>GAPDH</i>	96.9	1.000	-3.397

**The linear dynamic range in 5-plex one-step reverse transcription qPCR (RT-qPCR) reactions.** Five targets across 7 orders of magnitude (1 pg to 1 µg input RNA) were amplified using Reliance One-Step Multiplex Supermix on a CFX Opus 96 Real-Time PCR System. The results demonstrated exceptional performance with superior efficiency and linearity over a wide dynamic range.

# POWERFUL SOFTWARE



CFX Manager Software, Industrial Diagnostic Edition (IDE), controls all operations for the CFX Opus 96 and CFX Opus Deepwell Real-Time PCR Systems. Globally validated by international bodies, this powerful software delivers the flexibility and ease of use to run all of our food, beverage, and water assays while providing you with the confidence you require for your testing needs.



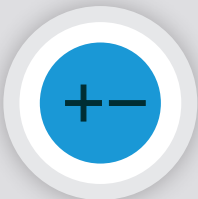
### Intuitive User Interface

- Predefined applications for target analytes
- Multiple assays on the same plate
- Batch and lot traceability
- Full integration with the iQ-Check Prep Solution



### Secure and Customizable Reports

- Reports with all sample and control data
- Automatic email of reports
- Color customization of results
- Addition of company logos to reports



### Automated Analysis and Interpretation

- Simple start-and-go analysis
- Automatic qualitative and quantitative interpretation
- Accurate and reliable results
- Bidirectional communication with a laboratory information management system (LIMS)



### Open Platform with CFX Maestro Software

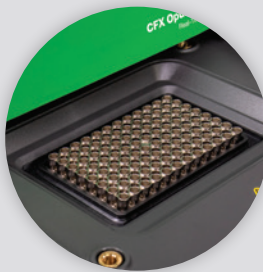
- Advanced analytical capabilities
- Ability to run customized/homebrew PCR assays
- Compatibility with iQ-Design Assays
- Freedom to operate

# GET THE SPECIALIZED BLOCK FOR YOUR WORKFLOW



## 96 Well

This is our most common block for general throughput and maximized multiplexing. This six-LED system allows five channels for multiplexing and an additional channel for FRET applications.



## Deepwell

Our Deepwell format is a 96-well block with one of the largest supported reaction volumes on the market. Its compatibility with consumables is similar to our other 96-well system, but its deeper wells improve nucleic acid detection in workflows that require larger reaction volumes. The Deepwell format can also multiplex up to five targets simultaneously and supports FRET applications.

Talk to your representative about which format is best for you and see our specifications sheet for more details on reaction volumes and plastic consumables compatibility.

## Ordering Information

Catalog #	Description
17007992	<b>CFX Opus 96 Real-Time PCR System</b> , includes CFX Opus 96 System and communication cables
17007991	<b>CFX Opus Deepwell Real-Time PCR System</b> , includes CFX Opus Deepwell System and communication cables
3593893	<b>CFX Manager Software, Industrial Diagnostic Edition (IDE)</b> , 1 unit
12013758	<b>CFX Maestro Software 2.3 for Windows PC</b> , 1 license, for real-time PCR plate setup, data collection, statistics, and graphing of results; for Windows PCs
12012832	<b>CFX Maestro Software 2.3 for Windows PC, Security Edition</b> , 1 license, for real-time PCR plate setup, data collection, statistics, and graphing of results in a regulated environment; for Windows PCs
12013028	<b>CFX Maestro Software 2.3 for Windows PC, Security Edition</b> , 5 licenses, for real-time PCR plate setup, data collection, statistics, and graphing of results in a regulated environment; for Windows PCs

Visit [bio-rad.com/FoodScienceCFXOpus](http://bio-rad.com/FoodScienceCFXOpus) for more information about the CFX Opus Real-Time PCR Systems, PCR consumables, and reagents.

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