



CFX96 Touch Real-Time PCR System



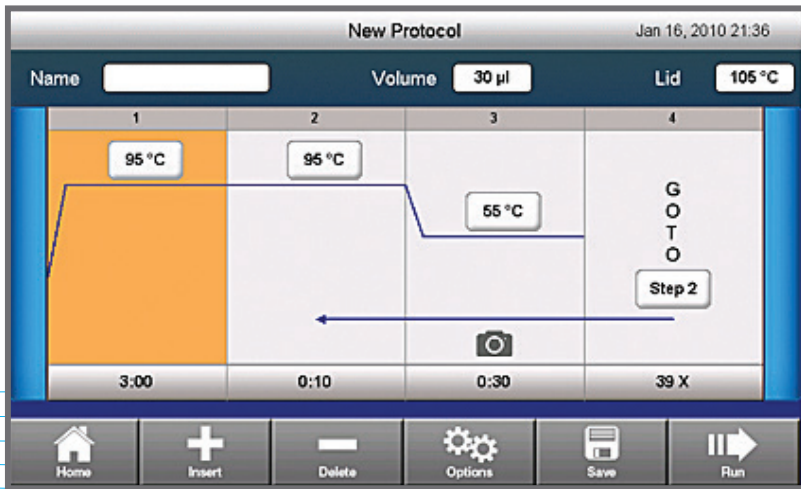
CFX96 TOUCH REAL-TIME PCR SYSTEM

ADVANCING qPCR TOGETHER

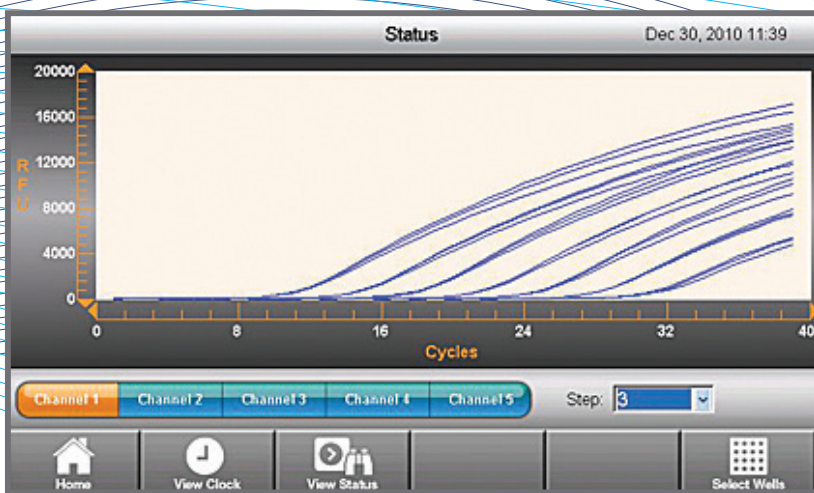


Easily start runs using the intuitive touch screen.

The CFX96 Touch Real-Time PCR System is a flexible and precise real-time PCR instrument. Its unsurpassed thermal cycler performance and innovative optical design produce accurate, reliable data. The powerful and intuitive software accelerates every step of your real-time PCR research, shortening the time between getting started and obtaining great results.



Quickly customize run parameters.



Monitor run progress in real time by viewing the amplification traces on the LCD display.



qPCR That Stands Alone

Real-time PCR runs can be performed in stand-alone mode without the CFX96 Touch System being attached to a computer. Easily set up runs using the intuitive touch screen. The amplification data traces can be viewed on the touch screen while a run is in progress so you can quickly decide your next experimental step even before your run has finished. When a run is complete, export the data using a USB flash drive, or directly email the data from the C1000 Touch Chassis. The CFX96 Touch System truly stands alone.

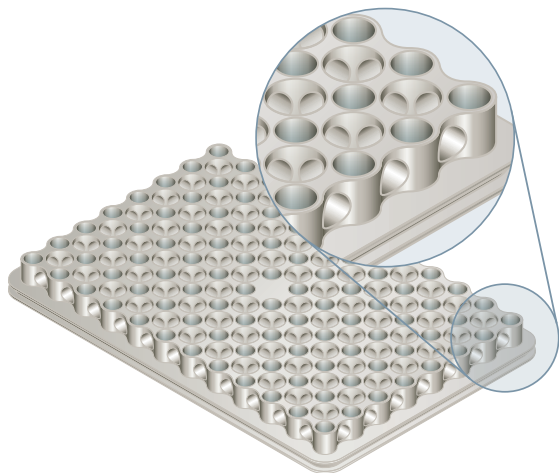
With the CFX96 Touch System you can:

- **Get great results right away** — quick installation and factory-calibrated optics let you set up the system in seconds
- **Fit experiments into your schedule** — fast thermal cycling produces results in <30 min
- **Save research time** — thermal gradient feature lets you optimize reactions in a single experiment
- **Minimize sample and reagent usage** — perform up to 5-target multiplexing and use low sample volumes
- **Rely on performance** — innovative technology with long-lasting LEDs and solid-state components provides maximum reliability and optimal quantitative results
- **Analyze results when and where you want** — receive email notification with an attached data file when a run is finished
- **Configure the system to fit your laboratory needs** — run without a computer, run up to 4 instruments from 1 computer, or integrate with the CFX Automation System II for higher throughput

UNIFORM THERMAL CYCLING

Superior Uniformity

Precision of the temperature steps is critical for the rate and efficiency of PCR. To obtain reliable, consistent results, all sample wells must maintain proper temperature throughout each incubation step. The CFX96 Touch System uses six independently controlled thermal electric modules, the heating and cooling elements of the thermal cycler, to maintain tight temperature uniformity at all points during a run — even while ramping.

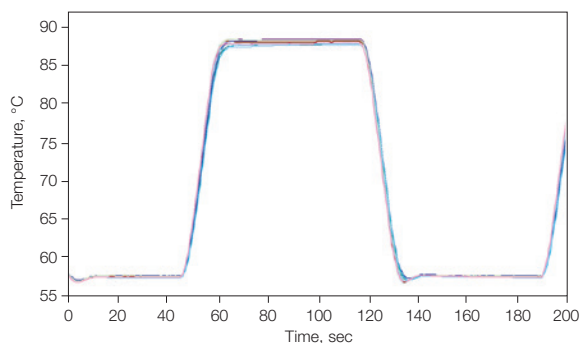


The patented* reduced-mass sample block heats and cools more quickly than standard blocks, so average ramp rates are increased and overall run times are reduced.

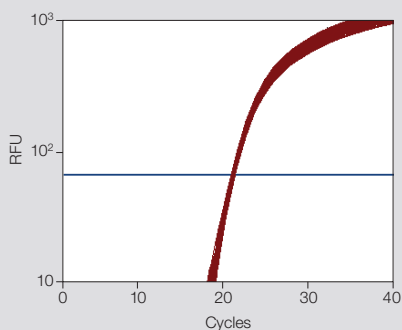
* U.S. patent 7,632,464.

Rapid Arrival at Target Temperature

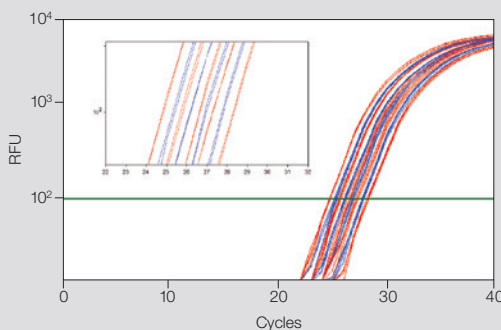
A key component of overall protocol run time is the time required to reach target temperature, which is determined by the average ramp rate and the time needed for the sample block to reach thermal uniformity. Maximum ramp rate is less important because it can fluctuate significantly during the ramp. The CFX96 Touch System produces high average ramp rates and tight uniformity during ramping to yield fast time to target temperature and faster protocol run times. Run times can be dramatically shortened — to less than 30 minutes — while still producing accurate quantitative results. Now you can tailor your runs around your schedule instead of tailoring your schedule around your runs.



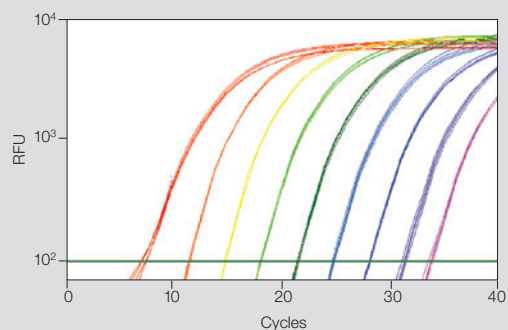
Superior uniformity with rapid arrival at target temperature. Bio-Rad 1000-series thermal cyclers exhibit high average ramp rates, rapid settling time, and tight thermal uniformity throughout the ramp. This graph shows the temperature measured by probes in 15 wells across a sample block. The traces are nearly indistinguishable due to the tight uniformity. Note the consistent high average ramp rate throughout heating and cooling.



Excellent uniformity. *IL-1 β* plasmid template diluted to 10^5 copies/reaction amplified in the presence of a FAM-labeled detection probe with iQ Supermix. Graph shows 96 replicates of 10 μ l reactions. Average quantification cycle (Cq) = 19.81 ± 0.10 . RFU, relative fluorescence units.



Exceptional reproducibility can be achieved with SsoFast EvaGreen[®] Supermix. Efficient discrimination and reliable quantification can be obtained from 1.33-fold serial dilutions of input template. The *CBP* gene was amplified from varying amounts of human genomic DNA (5 ng–511 pg). From left to right: (■) 5 ng, 2.83 ng, 1.60 ng, 903 pg, and 511 pg; (■) 3.76 ng, 2.13 ng, 1.20 ng, and 679 pg. *CBP* efficiency = 96.5%, $r = 0.996$. Inset is a magnified view showing robust discrimination and reproducible amplification. RFU, relative fluorescence units.



The unique fusion polymerase in SsoFast EvaGreen[®] Supermix delivers extreme speed and generates exceptional quantitative PCR (qPCR) results in less than 30 minutes. Tenfold serial dilutions of 10 nanograms to 100 attograms cDNA from human spleen were used in each 20 μ l reaction to detect 18S rRNA. 18S rRNA efficiency = 101.8%, $r = 0.997$. Total qPCR run time = 29 min. RFU, relative fluorescence units.

INNOVATIVE OPTICAL DESIGN

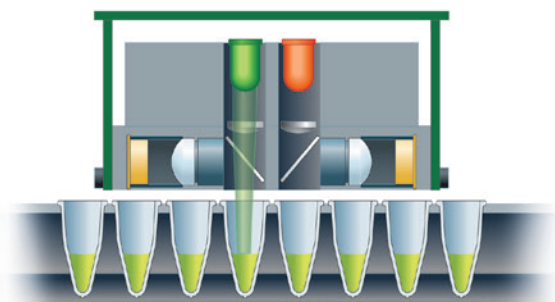
The solid-state optical technology of the CFX96 Touch System provides sensitive detection for precise quantification and target discrimination. Scanning just above the sample plate, the optics shuttle individually illuminates and detects fluorescence from each well with high sensitivity and no cross talk. The optical system automatically collects data from all wells during data acquisition, so you can enter or edit well information on your own schedule.

Five-Target Multiplexing

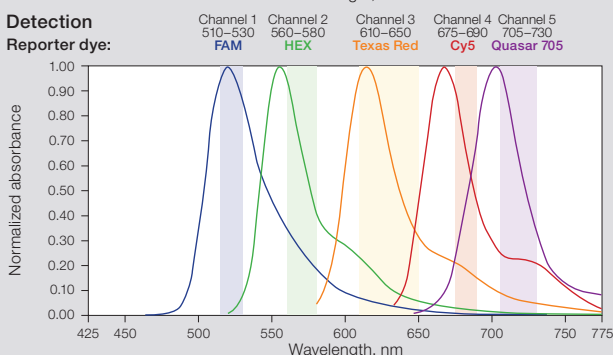
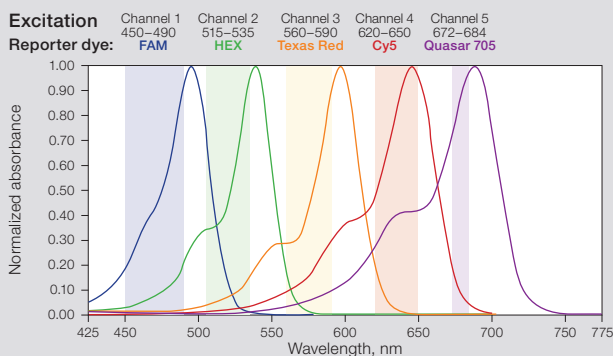
The CFX96 Touch System can discriminate up to five targets in a single reaction well. The optical filter sets are designed to maximize fluorescence detection for specific dyes in specific channels. At every position and with every scan, the optics shuttle is reproducibly centered above each well, so the light path is always fixed and optimal, and there is no need to sacrifice data collection in one of the channels to normalize to a passive reference.

Multiple Data Acquisition Modes

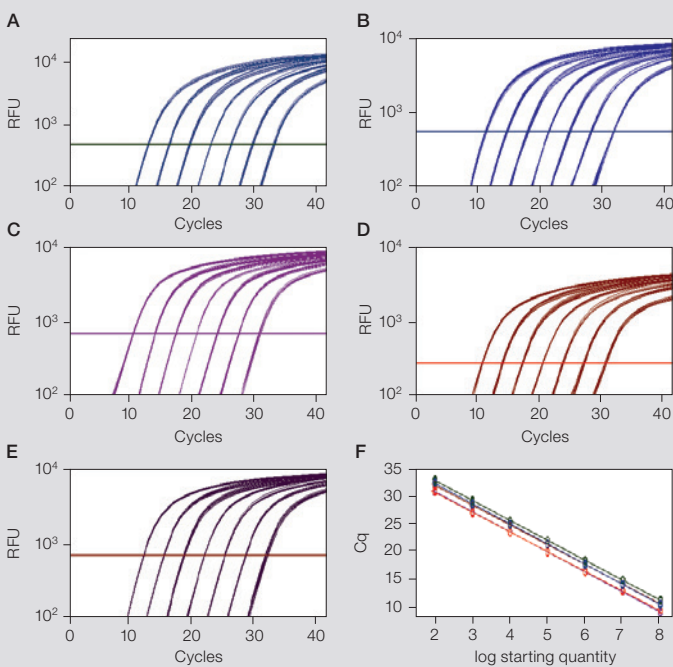
The CFX96 Touch System can acquire data using several modes. Choose to acquire data for SYBR® Green I, EvaGreen®, and single-color FAM protocols using the fast scan mode, or choose to acquire data from all channels when performing multiplex protocols. The CFX96 Touch System includes one channel with an LED-filter photodiode combination designated for single-color fluorescence resonance energy transfer (FRET) experiments, further expanding your experimental options.



As the optics shuttle of the CFX96 Touch System travels across the plate, light is focused directly into the center of each sample well. Side view of the optics shuttle shows the green LED firing over a well.



Discrete excitation and detection wavelengths for the CFX96 Touch System enable through data discrimination.



Confidently analyze data from a broad range of sample concentrations even when multiplexing five targets. A–E, fluorescence data from a series of tenfold dilutions of plasmid DNA (10^8 – 10^2 copies) amplified using reporter dyes to monitor five targets: ■, FAM/actin; ■, HEX/GAPDH; ■, Texas Red/cyclophilin; ■, Cy5/tubulin; ■, Quasar 705/IL-1 β ; F, standard curves generated from data in A–E, reaction efficiencies range from 97 to 103%. Cq, quantification cycle; RFU, relative fluorescence units.

POWERFUL SOFTWARE

CFX Maestro Software

CFX Maestro Software for CFX Real-Time PCR Systems is easy-to-use, yet flexible and powerful software for data collection, data analysis, and graphing of real-time PCR data.

With CFX Maestro Software you can:

- **Perform automatic statistical analysis in seconds** — with just a few mouse clicks you can perform *t*-tests or analyze your data with one-way analysis of variance (ANOVA)
- **Extract more meaningful information from your run** — analyze data using a bar chart, box and whisker plot, dot plot, clustergram, scatter plot, or volcano plot
- **Create and export publication-ready graphics** — annotate graphs with *P* values, text, and arrows to call out specific data. Change colors, fonts, and legends. Export graphs at any size or resolution for presentations, posters, or for publication
- **Easily integrate PrimePCR Assays** — use PrimePCR Primers and Plates to save time on primer design with pre-designed and validated primers. Post-run, use the PrimePCR controls analysis tool to ensure run quality from integrated controls
- **Work anywhere, on a PC or Mac** — with both PC and Mac versions of CFX Maestro, you can analyze your data on your own computer, anytime, without the need for an internet connection (Mac version is for data analysis only and does not provide instrument control)
- **Perform further data analysis using: qbase+ Software** — CFX Maestro Software comes with a premium license for qbase+ Software to further enhance your data analysis capabilities

Precision Melt Analysis Software

Precision Melt Analysis Software imports and analyzes data files generated by the CFX96 Touch, CFX96 Touch Deep Well, CFX Connect, or CFX384 Touch Real-Time PCR System to genotype samples based on their DNA thermal denaturation properties. The software can be used for a variety of applications, including scanning for new gene variants, screening DNA samples for single nucleotide polymorphisms (SNPs), identifying insertions/deletions or other unknown mutations, and determining the percentage of methylated DNA in unknown samples.

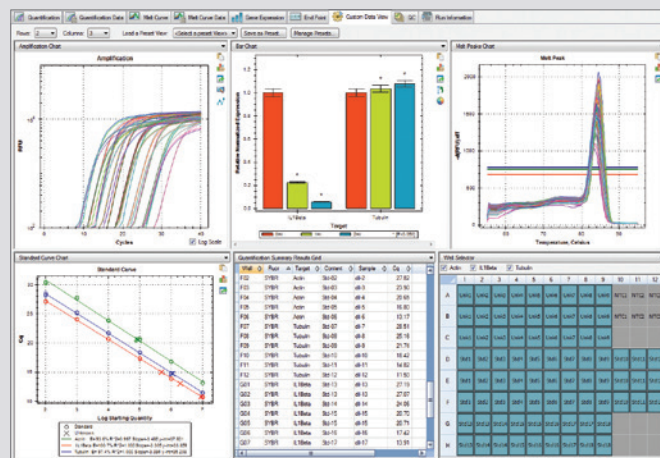
The Security You Need

The Security Edition of CFX Maestro Software integrates the power of the CFX96 Touch Real-Time PCR System with tools that allow for U.S. FDA 21 CFR Part 11 compliance.

Have confidence in the security of your data:

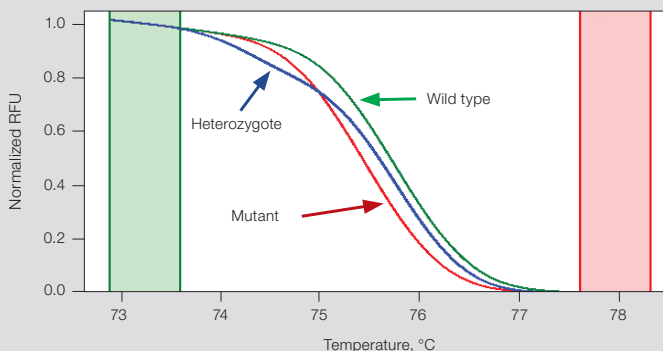
- **Mandatory password-protected log-in** — valid Windows 7 or 10 user name and password are required
- **Hardware protection key (HASP HL key)** — key must be attached to a USB port on the computer to use the software

CFX Maestro Software



Custom data view. With custom data view, your most relevant data can be viewed and analyzed in one screen.

Precision Melt Analysis Software



Quickly and accurately genotype samples using Precision Melt Analysis Software. Discrimination of human factor V coagulation SNP genotypes (C to T substitution) using SsoFast EvaGreen® Supermix. Data from homozygous wild type (■), mutant (■), and heterozygote (■) samples are shown on a normalized melt curve plot. RFU, relative fluorescence units.

- **File encryption** — files cannot be opened or edited using other programs
- **Automatic file checking** — integrity and validity are checked each time a file is opened
- **Electronic signatures** — more than one electronic signature can be applied to any file that can be opened within the software
- **Time- and date-stamped audit trails** — read-only information displayed in the audit trail can be viewed only while the data file of interest is open

EFFICIENT OPTIMIZATION

Thermal Gradient

Determining the optimal temperature for primer annealing is crucial for efficient and specific amplification of product. With the thermal gradient feature of the CFX96 Touch System, you can determine the optimal temperature for primer annealing in a single experiment, minimizing the use of precious samples and reagents, and saving valuable research time. At any step in a protocol you can program a temperature gradient of up to 24°C across the reaction block. The thermal cycler provides exceptional temperature uniformity and reproducibility within each gradient zone, and the temperatures can easily be programmed and viewed onscreen in the software so you can quickly identify the optimal incubation temperature.



CFX Automation System II

Expanding Your Throughput

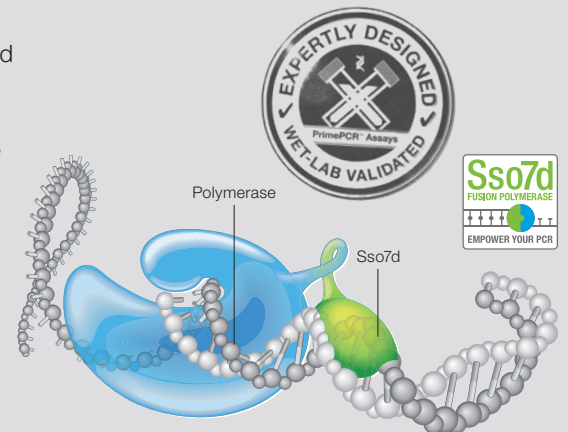
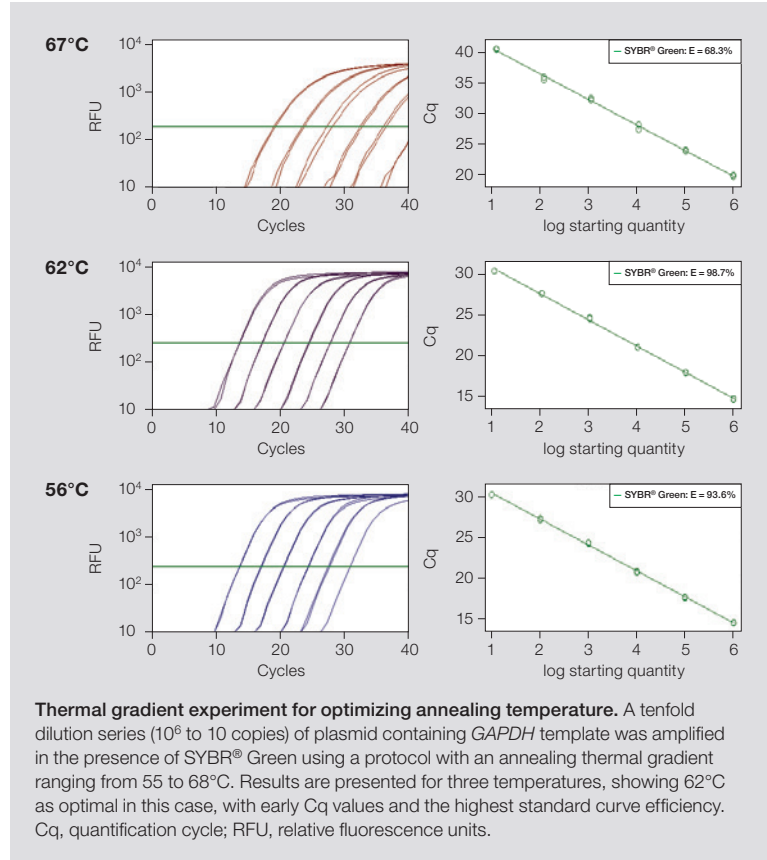
The flexibility of the Bio-Rad 1000-series thermal cycling platform allows you to adjust your setup as your needs change. CFX Maestro Software can independently run up to four instruments. You can easily maximize your work efficiency by integrating one or two CFX Systems with the CFX Automation System II. This automated plate handler comes with an easy-to-use software package that makes running and analyzing large-volume experiments simple.

Consumables That Provide Optimal Performance

Optimal real-time PCR results rely on the synergy of all the products, so Bio-Rad created optimized components for each step of your experiment. The advanced formulation of the Bio-Rad reverse transcription kits ensures ultrasensitive and highly unbiased cDNA synthesis. Our patented* Sso7d fusion DNA polymerase provides superior performance with complex samples and difficult-to-amplify targets. PrimePCR Assays are expertly designed and wet-lab validated for proven performance. Each assay for the human, mouse, and rat genomes was experimentally tested for optimal efficiency, specificity, sensitivity, and linear dynamic range. Plastics are manufactured for optimal fit and cycling performance and warp-free Hard-Shell Plates are ideal for automation.

Together, these products provide unmatched real-time PCR results. What will you discover when you can see details you could not before?

* U.S. patents 6,627,424; 7,541,170; and 7,560,260.



Specifications

Thermal Cycler

Chassis	C1000 Touch
Maximum ramp rate	5°C/sec
Average ramp rate	3.3°C/sec
Heating and cooling method	Peltier
Lid	Heats up to 105°C
Temperature	
Range	0–100°C
Accuracy	±0.2°C of programmed target at 90°C
Uniformity	±0.4°C well-to-well within 10 sec of arrival at 90°C
Gradient	
Operational range	30–100°C
Programmable span	1–24°C

Optical Detection

Excitation	6 filtered LEDs
Detection	6 filtered photodiodes
Range of excitation/emission wavelengths	450–730 nm
Sensitivity	Detects 1 copy of target sequence in human genomic DNA
Dynamic range	10 orders of magnitude
Scan time	
All channels	12 sec
Single channel fast scan	3 sec

CFX Maestro Software

Operating systems	Windows 7 (64-bit), Windows 10 (64-bit), macOS Mojave 10.14 (for analysis only)
Memory	Minimum 4 GB
Data analysis modes	PCR quantification with standard curve Melt curve analysis Gene expression analysis by relative quantity (ΔC_q) or normalized expression ($\Delta\Delta C_q$) with multiple reference genes and individual reaction efficiencies Data analysis options include bar chart, box and whisker plot, dot plot, clustergram, scatter plot, volcano plot Statistical analysis with <i>t</i> -tests and one-way ANOVA Multiple file gene expression analysis for comparison of an unlimited number of C_q values for multiplate studies Allelic discrimination End-point analysis
Image export	Image size: any Resolution: 72–600 dpi Image format: .jpg, .png, .bmp
Data export	Save, copy, and print all spreadsheets and data from right-click menu Export specified data in multiple formats Copy and paste into Microsoft Word, Excel, or PowerPoint file Customizable reports containing run settings, data graphs, and spreadsheets can be printed directly or saved as PDFs

Ordering Information

Catalog #	Description
Instruments	
1855196	CFX96 Touch Real-Time PCR System with Starter Package , includes C1000 Touch Thermal Cycler Chassis, CFX96 Optical Reaction Module, CFX Maestro Software, qbase+ Software license, cables, reagents, consumables
1845096	CFX96 Optical Reaction Module for Real-Time PCR Systems with Starter Package , 96-well optical module for real-time PCR, includes CFX Maestro Software, qbase+ Software license, cables, reagents, consumables, for use with C1000 Touch Thermal Cycler Chassis
1814000	PX1 PCR Plate Sealer , includes heat sealing instrument
1845075	CFX Automation System II , includes plate handler and barcode scanner, mounting plate, automation software
Software	All software for Windows unless otherwise noted.
12013758	CFX Maestro Software 2.0
12004128	CFX Maestro Software for Mac
12012832	CFX Maestro Software 2.0 , Security Edition, 1 license
12013028	CFX Maestro Software 2.0 , Security Edition, 5 licenses
12012834	CFX Maestro Software 2.0 , Chinese Edition
12012833	CFX Maestro Software 2.0 , Russian Edition
1845025	Precision Melt Analysis Software , 2 user licenses, data analysis software, 2 HASP HL keys, calibration kit
Reagents	
1708841	iScript Reverse Transcription Supermix , 400 μ l (4 x 100 μ l vials), 100 x 20 μ l reactions
1725035	iScript gDNA Clear cDNA Synthesis Kit , 100 x 20 μ l reactions
1725038	iScript Advanced cDNA Synthesis Kit , 100 x 20 μ l reactions
1708891	iScript cDNA Synthesis Kit , 100 x 20 μ l reactions
1725271	SsoAdvanced Universal SYBR® Green Supermix , 5 ml (5 x 1 ml vials), 500 x 20 μ l reactions
1725281	SsoAdvanced Universal Probes Supermix , 5 ml (5 x 1 ml vials), 500 x 20 μ l reactions
1725160	SsoAdvanced PreAmp Supermix , 1.25 ml (1 x 1.25 ml vial), 50 x 50 μ l reactions
12010220	Reliance One-Step Multiplex Supermix , 5 ml (5 x 1 ml vials), 1,000 x 20 μ l reactions
12010221	Reliance One-Step Multiplex Supermix , 10 ml (2 x 5 ml vials), 2,000 x 20 μ l reactions
1725120	iTaq Universal SYBR® Green Supermix , 2 ml (2 x 1 ml vials), 200 x 20 μ l reactions
1725151	iTaq Universal SYBR® Green One-Step Kit , 500 x 20 μ l reactions
1725130	iTaq Universal Probes Supermix , 2 ml (2 x 1 ml vials), 200 x 20 μ l reactions
1725141	iTaq Universal Probes One-Step Kit , 500 x 20 μ l reactions
Consumables	
HSP9601	Hard-Shell Low-Profile 96-Well Skirted PCR Plates , white shell/clear well, 50
MSB1001	Microseal 'B' Adhesive Seals , optically clear, 100
MSF1001	Microseal 'F' PCR Plate Seals , foil, pierceable, 100

Visit bio-rad.com/CFX96TouchMore for more information.

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Bio-Rad PCR reagents and analytical instruments are manufactured under an ISO 13485:2016 certified Quality Management System and are quality control tested to ensure consistent product performance you can trust.



**Bio-Rad
Laboratories, Inc.**

Life Science
Group

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