



CFX96 Touch™ Real-Time PCR Detection System



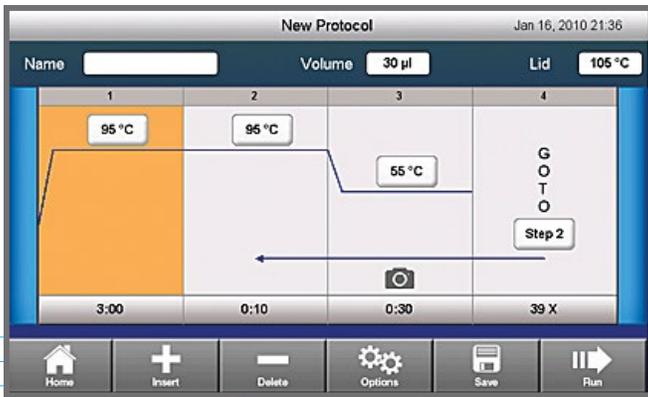
CFX96 TOUCH REAL-TIME PCR DETECTION SYSTEM

ADVANCING qPCR TOGETHER

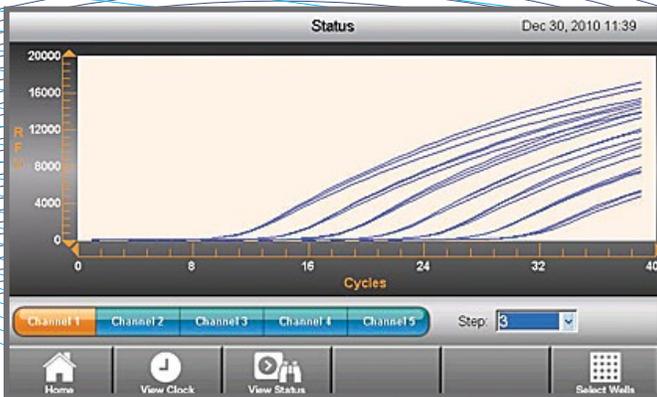


Easily start runs using the intuitive touch screen.

The CFX96 Touch Real-Time PCR Detection 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, yet 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.

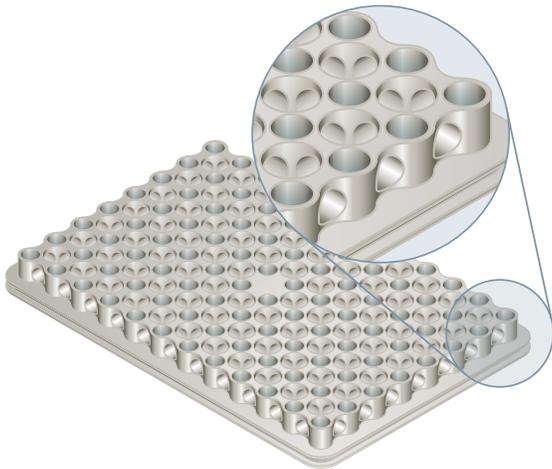
With the CFX96 Touch System you can:

- **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.

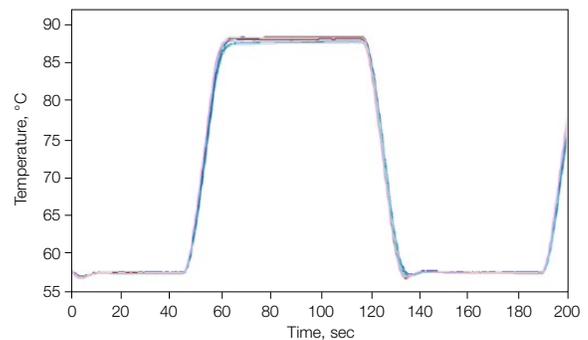


The patented* reduced-mass sample block heats and cools more quickly than standard blocks, so average ramp rates are increased and overall run times are reduced.

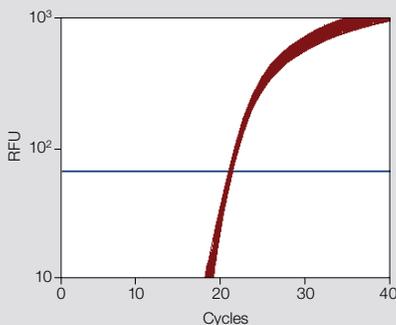
* U.S. patent 7,632,464.

Rapid Arrival at Target Temperature

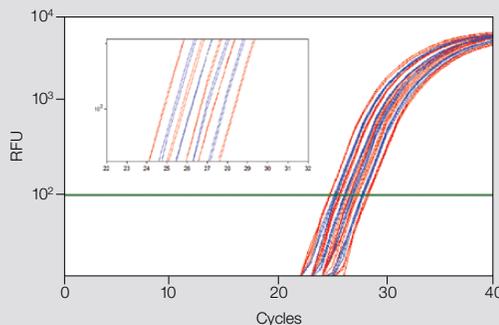
A key component of overall protocol run time is the time required to reach target temperature, which is determined by the average ramp rate and the time needed for the sample block to reach thermal uniformity. Maximum ramp rate is less important because it can fluctuate significantly during the ramp. 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 min — while still producing accurate quantitative results. Now you can tailor your runs around your schedule instead of tailoring your schedule around your runs.



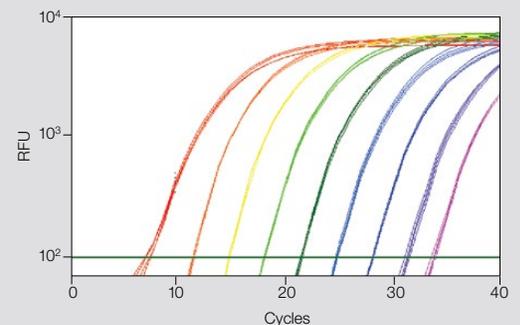
Superior uniformity with rapid arrival at target temperature. 1000-series thermal cyclers exhibit high average ramp rates, rapid settling time, and tight thermal uniformity throughout the ramp. This graph shows the temperature measured by probes in 15 wells across a sample block. The traces are nearly 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 min. 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

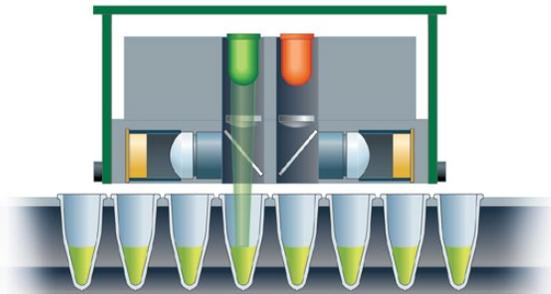
The solid-state optical technology of the CFX96 Touch System provides sensitive detection for precise quantification and target discrimination. Scanning just above the sample plate, the optics shuttle individually illuminates and detects fluorescence from each well with high sensitivity and no cross 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

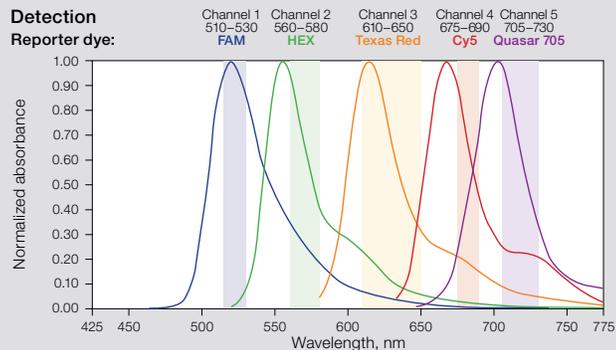
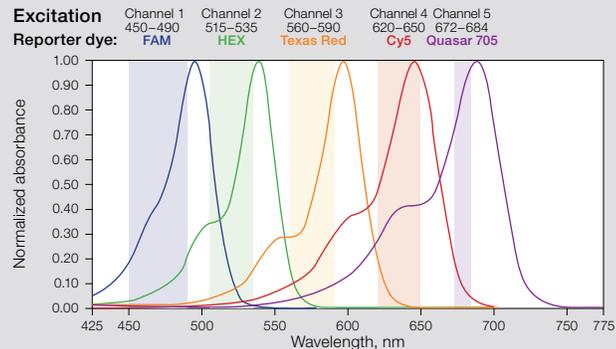
The CFX96 Touch System can discriminate up to five targets in a single reaction well. The optical filter sets are designed to maximize fluorescence detection for specific dyes in specific channels. At every position and with every scan, the optics shuttle is reproducibly centered above each well, so 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

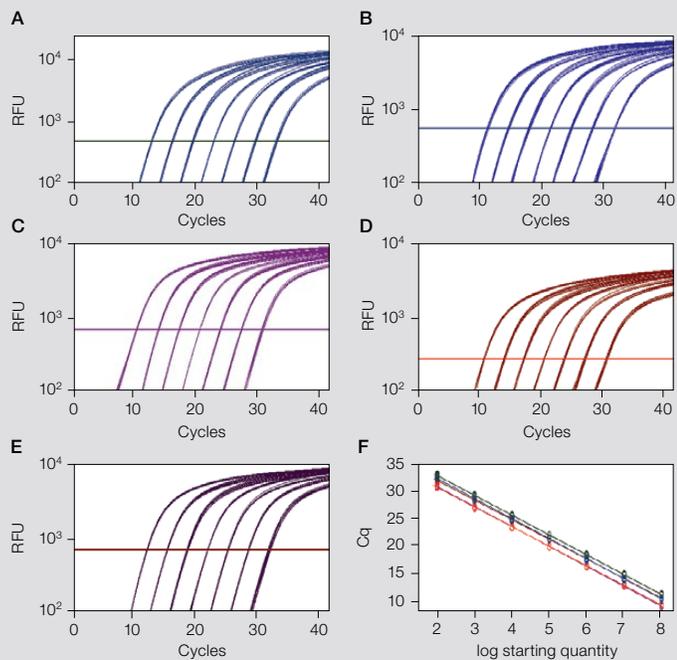
The CFX96 Touch System can acquire data using several modes. Choose to acquire data for SYBR® Green I, EvaGreen®, and single-color FAM protocols using the fast scan mode, or choose to acquire data from all channels when performing multiplex protocols. The CFX96 Touch System includes one channel with 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 Instruments 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 ANOVA
- **Extract more meaningful information from your run** — analyze data using 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 Detection 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.

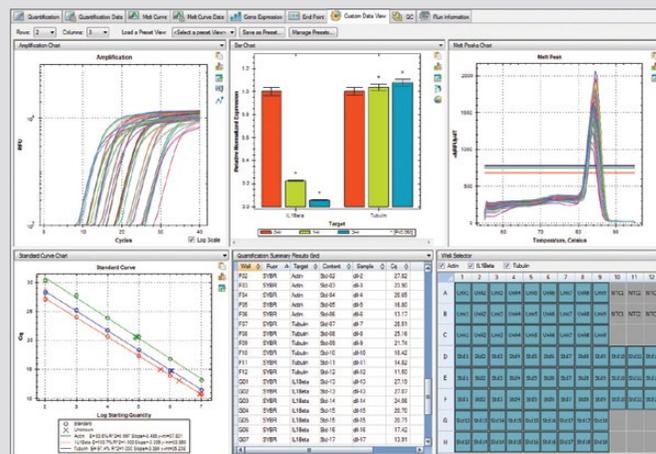
The Security You Need

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

Have confidence in the security of your data:

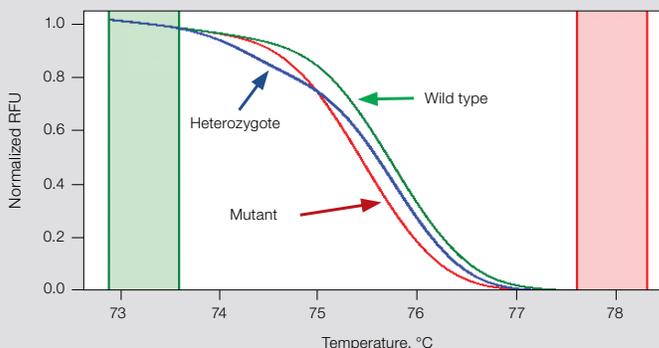
- **Mandatory password-protected log-in** — valid Windows 7, 8, or 10 user name and password are required
- **Hardware protection key (HASP HL key)** — key must be attached to a USB port on the computer to use the software

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

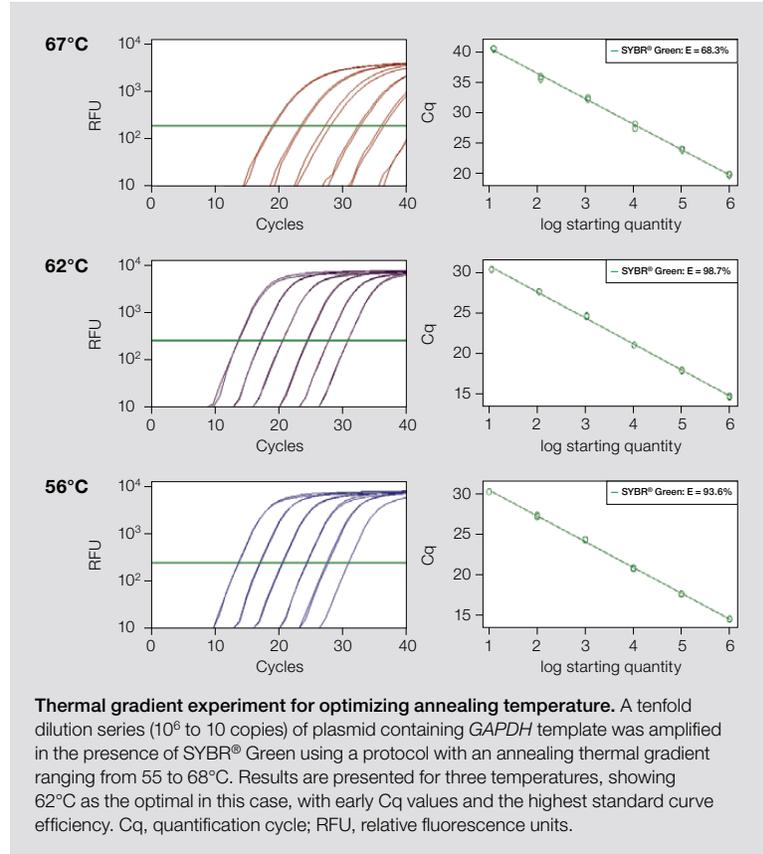
The flexibility of the 1000-series thermal cycling platform allows you to adjust your setup as your needs change. CFX Maestro Software can independently run up to four instruments. You can easily maximize your work efficiency by integrating one or two CFX Systems with the CFX Automation System II. This 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 Bio-Rad's 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, Windows 8, Windows 10, Mac OS X El Capitan, Mac OS Sierra
Memory	Minimum 1 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 multi-plate studies Allelic discrimination End-point analysis

Image export	Image size: any Resolution: 72–600 dpi
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Data export	Image format: jpg, png, bmp 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
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Ordering Information

Catalog #	Description
1841100	C1000 Touch Thermal Cycler Chassis , includes USB flash drive, power cord; does not include reaction module
1845097	CFX96™ Optical Reaction Module , for use with C1000 Touch Thermal Cycler Chassis, includes communication cable
1855196	CFX96 Touch Real-Time PCR Detection System with Starter Package , includes C1000 Touch Thermal Cycler Chassis, CFX96 Optical Reaction Module, CFX Maestro Software, license for qbase+ Software, communication cable, reagents, consumables
1855195	CFX96 Touch Real-Time PCR Detection System , includes C1000 Touch Thermal Cycler Chassis, CFX96 Optical Reaction Module, communication cable
12004110	CFX Maestro Software
12004128	CFX Maestro Software for Mac
12005258	CFX Maestro Software, Security Edition , includes 1 user license, installation CD, HASP HL key
1845025	Precision Melt Analysis Software , includes 2 user licenses, installation CD, 2 HASP HL keys, melt calibration kit
1845075	CFX Automation System II , includes plate handler and barcode scanner, mounting plate, automation software
1814000	PX1™ PCR Plate Sealer , includes heat sealing instrument
1814030	Optically Clear Heat Seal , for use with PX1 PCR Plate Sealer, 100
MSB1001	Microseal® 'B' Adhesive Seals , optically clear, 100
HSP9655	Hard-Shell Low-Profile 96-Well Skirted PCR Plates , white well, white shell, 50
HSP9955	Hard-Shell Low-Profile 96-Well Skirted PCR Plates , white well, white shell, barcoded, 50
1708840	iScript™ Reverse Transcription Supermix for RT-qPCR , 25 x 20 µl reactions, includes 100 µl 5x iScript RT Supermix, iScript RT Supermix No-RT Control
1725037	iScript Advanced cDNA Synthesis Kit for RT-qPCR , 25 x 20 µl reactions, includes 100 µl 5x iScript Advanced Reaction Mix, 25 µl iScript Advanced Reverse Transcriptase
1725848	iQ™ Multiplex Powermix , 50 x 50 µl reactions, 2x mix contains dNTPs, 11 mM MgCl ₂ , iTaq DNA Polymerase, stabilizers
1725270	SsoAdvanced™ Universal SYBR® Green Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions, 2x qPCR mix, contains Sso7d fusion polymerase, ROX Normalization Dyes
1725280	SsoAdvanced Universal Probes Supermix , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions, 2x qPCR mix, contains Sso7d fusion polymerase, ROX Normalization Dyes
1725160	SsoAdvanced PreAmp Supermix , 1.25 ml (1 x 1.25 ml vial), 50 x 50 µl reactions, 2x PreAmp Mix, contains dNTPs, Sso7d fusion polymerase, salts, enhancers, stabilizers, other proprietary components
1725095	SingleShot™ SYBR® Green One-Step Kit , 100 x 50 µl reactions

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

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Bio-Rad's real-time thermal cyclers are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 6,767,512 and 7,074,367.

The use of iQ, SsoAdvanced, and SsoFast Supermixes is covered by one or more of the following U.S. patents and corresponding patent claims outside the U.S.: 5,804,375; 5,538,848; 5,723,591; 5,876,930; 5,994,056; 6,030,787; 6,171,785; and 6,258,569. The purchase of these products includes a limited, non-transferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, are conveyed expressly, by implication, or by estoppel. These products are for research use only. Diagnostic uses under Roche patents require a separate license from Roche. Further information on purchasing licenses may be obtained from the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

Hard-Shell Plates are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 7,347,977; 6,340,589; and 6,528,302.

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Laboratories, Inc.**

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