



# CFX384 Touch™ Real-Time PCR Detection System



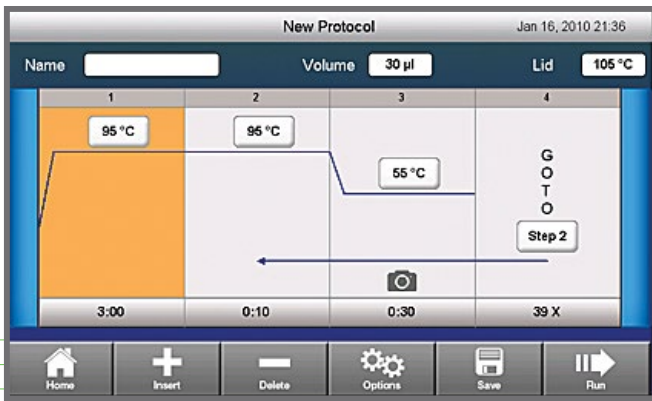
CFX384 TOUCH REAL-TIME PCR DETECTION SYSTEM

# ADVANCING qPCR TOGETHER

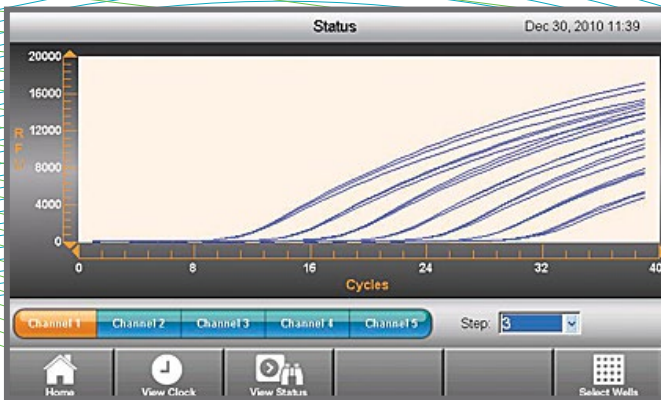


Easily start runs using the intuitive touch screen.

The CFX384 Touch Real-Time PCR Detection System is a powerful, flexible, and accurate high-throughput real-time PCR system. With stand-alone functionality, innovative optical design, and unsurpassed thermal cycler performance, the CFX384 Touch System shortens 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 CFX384 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. The CFX384 Touch System truly stands alone.

### With the CFX384 Touch System you can:

- **Generate excellent and robust results right away** — quick installation and factory-calibrated optics let you set up the system in seconds
- **Rely on performance** — long-lasting solid-state technology with LEDs and photodiodes provides precise quantification and target discrimination
- **Minimize sample and reagent usage** — 4-target multiplex experiments yield optimal results using sample volumes as low as 3 µl
- **Analyze results when and where you want** — receive email notification with an attached data file when a run is finished
- **Save research time** — well-grouping software feature provides the flexibility to analyze multiple experiments from a single plate
- **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

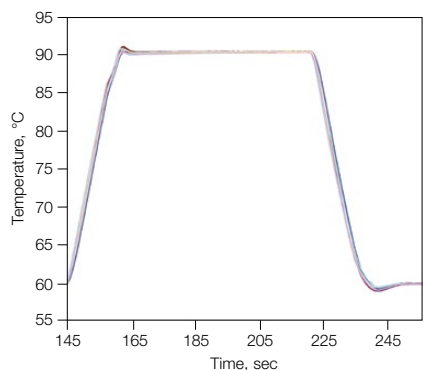
The CFX384 Touch Real-Time PCR Detection System, with up to four-target detection and powerful data analysis, brings flexibility and simplicity to researchers performing high-throughput real-time PCR in a 384-well format. With the precise thermal control of the C1000 Touch Thermal Cycler, the CFX384 Touch System delivers sensitive, reliable detection for real-time PCR applications.

### Superior Uniformity

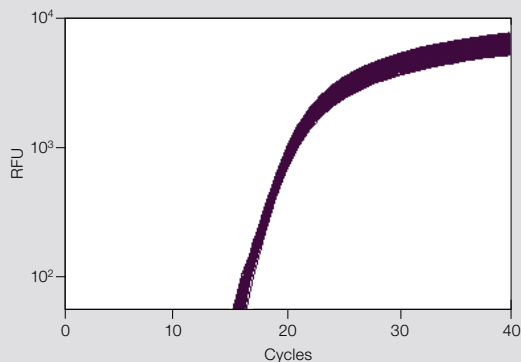
Precision of the temperature steps is critical for the rate and efficiency of PCR. To obtain reliable, consistent results, all sample wells must maintain proper temperature throughout each incubation step. The CFX384 Touch System maintains tight temperature uniformity at all points during a run — even while ramping. Its fast and accurate thermal control ensures all wells reach temperature uniformity within 10 sec of arrival to produce accurate quantitative results with shortened temperature steps.

### Thermal Gradient for Easy Optimization

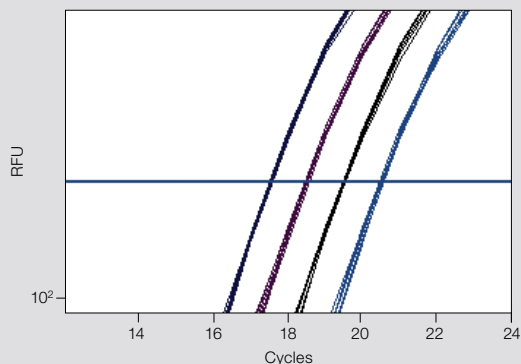
With the thermal gradient feature of the CFX384 Touch System, you can determine the optimal temperature for primer annealing in a single experiment, minimizing the use of precious samples and reagents and saving valuable research time. You can program a temperature gradient of up to 24°C across the reaction block, with exceptional temperature uniformity and reproducibility within each gradient zone.



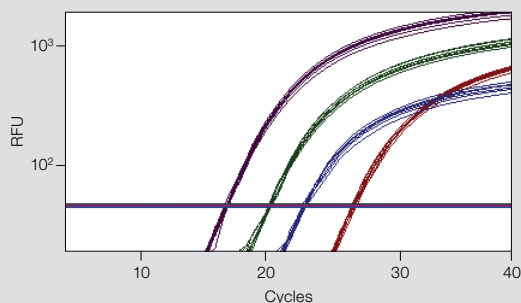
**Superior uniformity with rapid arrival at target temperature.** 1000-series thermal cyclers exhibit high average ramp rates, rapid settling time, and tight thermal uniformity throughout the ramp. This graph shows the temperature measured by probes in 12 wells across a sample block. The traces are nearly indistinguishable due to the tight uniformity.



**Excellent uniformity.** *IL-1β* plasmid template diluted to  $10^5$  copies/reaction amplified in the presence of a FAM-labeled detection probe with iQ™ Supermix. Graph shows 384 replicates of 5  $\mu$ l reactions. Average quantification cycle (Cq) =  $18.11 \pm 0.045$ . RFU, relative fluorescence units.



**Precise target discrimination.** One-cycle spacing between Cq values is precisely maintained in a series of twofold dilutions of human genomic DNA from 120 to 15 ng. *IL-1β* target was amplified using a FAM-labeled detection probe with iQ Supermix. Graph shows eight replicates for each dilution with the following average Cq values:  $17.47 \pm 0.02$ ,  $18.44 \pm 0.03$ ,  $19.43 \pm 0.02$ ,  $20.44 \pm 0.03$ . RFU, relative fluorescence units.



**Accurate multiplex gene expression at low volumes.** Human spleen RNA was transcribed into cDNA using the iScript™ cDNA Synthesis Kit. cDNA (50 ng) was amplified in four replicate 3  $\mu$ l reactions using four reporter dyes to monitor fluorescence data from four targets: ■, FAM/actin; ■, Cy5/tubulin; ■, HEX/GAPDH; ■, Texas Red/IL-2. RFU, relative fluorescence units.

# INNOVATIVE OPTICAL DESIGN

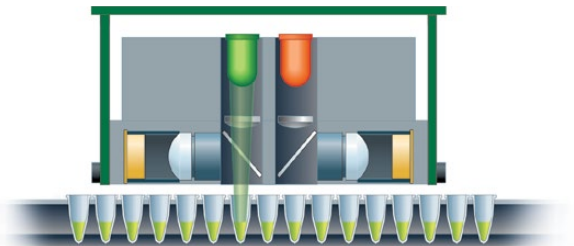
The solid-state optical technology of the CFX384 Touch System provides sensitive detection for precise quantification and target discrimination. Scanning just above the sample plate, the optics shuttle individually illuminates and detects fluorescence from each well with high sensitivity and no cross talk.

## Four-Target Multiplexing

The CFX384 Touch System can discriminate up to four 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.

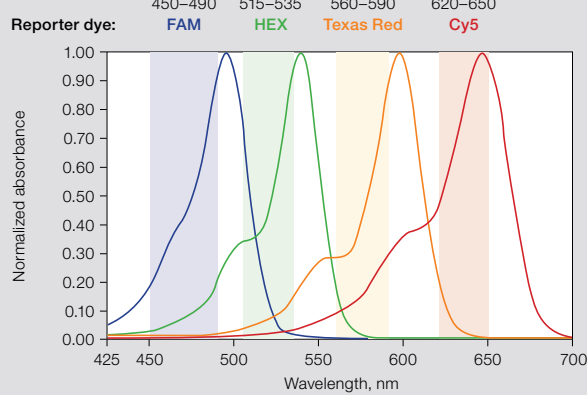
## Multiple Data Acquisition Modes

The CFX384 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 CFX384 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.

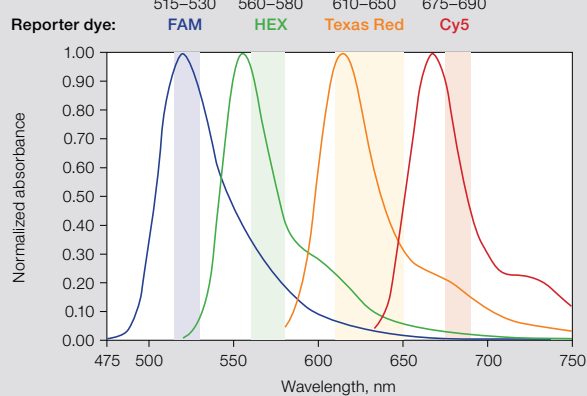


As the optics shuttle of the CFX384 Touch System travels across the plate, light is focused directly into the center of each sample well. Side view of the optics shuttle shows the green LED firing over a well.

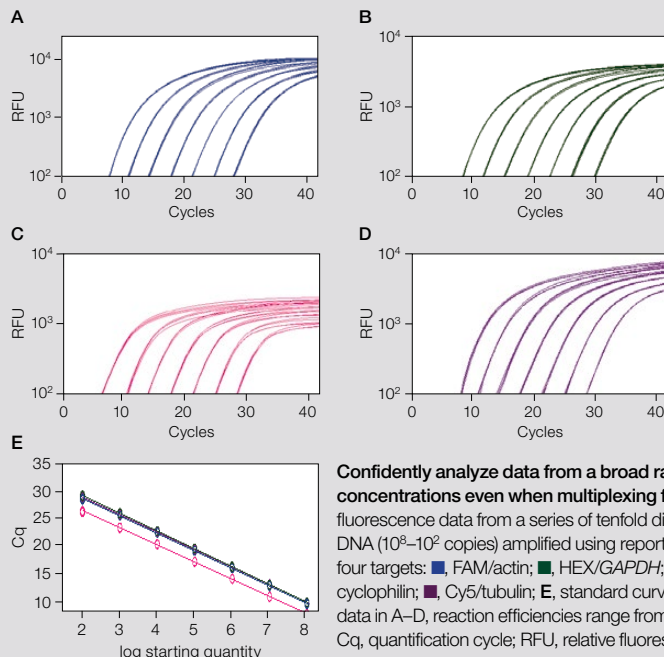
## Excitation



## Detection



Discrete excitation and detection wavelengths for the CFX384 Touch System enable thorough data discrimination.





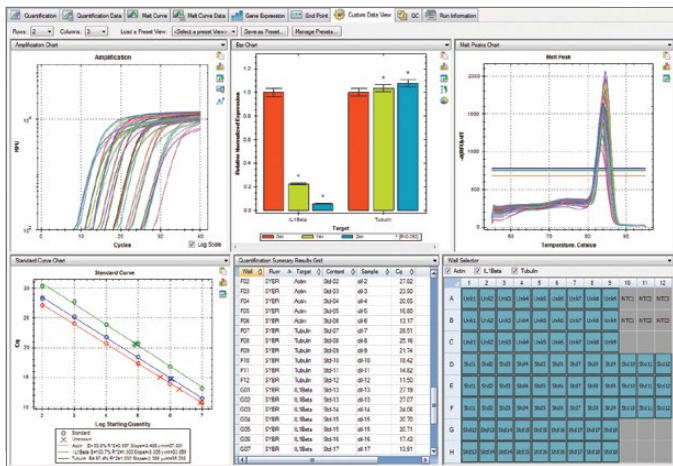
# POWERFUL SOFTWARE

## 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 predesigned 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.)



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

## The Security You Need

The Security Edition of CFX Maestro Software integrates the power of the CFX384 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
- **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

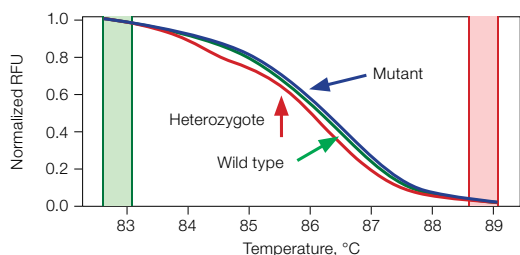
The screenshot shows the 'Electronic Signature' dialog box. It features a key icon and a text area for a signature. Below the text area, there is a 'User' field with the value 'GLOBAL/Aaron Burke'. There are input fields for 'Username:' and 'Password:'. A red text prompt says 'Please enter your reason for signing the file (Required Entry)'. At the bottom, there are 'OK' and 'Cancel' buttons.

Reliably track data files using electronic signatures.

# EXPANDED 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



### Quickly and accurately genotype samples using Precision Melt Analysis Software.

Discrimination of human hemochromatosis S65C SNP genotypes (A to T substitution). Data from homozygous wild type (■), mutant (■), and heterozygote (■) samples are shown on a normalized melt curve plot. RFU, relative fluorescence units.

single nucleotide polymorphisms (SNPs), identifying insertions/deletions or other unknown mutations, and determining the percentage of methylated DNA in unknown samples.

## qbase+ Software

qbase+ Software is a powerful tool that imports and analyzes data generated by the CFX96 Touch, CFX96 Touch Deep Well, CFX Connect, or CFX384 Touch System. This platform-independent software package is available for major computer operating systems such as Microsoft Windows, Macintosh, and Linux.

Key features of qbase+ Software:

- **Reliable validation** — based on proven solutions for quality control, normalization, and inter-run calibration
- **Efficient data analysis** — import and consolidate information from multiple runs and multiple instruments to quickly analyze your complete data set, and use a guided statistical wizard to determine significance
- **Streamlined publication submission** — export an RDML file containing annotations, such as sample and assay information, to conform to the minimum information for publication of quantitative real-time PCR experiments (MIQE) guidelines

## Expanding Your Throughput

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.



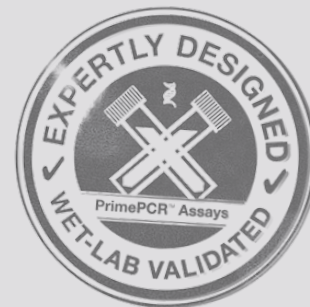
CFX Automation System II

## 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	2.5°C/sec
Average ramp rate	2°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	5 filtered LEDs
Detection	5 filtered photodiodes
Range of excitation/emission wavelengths	450–690 nm
Sensitivity	Detects 1 copy of target sequence in human genomic DNA
Dynamic range	10 orders of magnitude
Scan time	
All channels	<20 sec
Single channel fast scan	8 sec

### CFX Maestro Software

Operating systems	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 ( $\Delta Cq$ ) or normalized expression ( $\Delta\Delta Cq$ ) 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 <i>Cq</i> values for multi-plate studies Allelic discrimination End-point analysis
Image export	Image size: any Resolution: 72–600 dpi Image format: jpg, png, bmp
Data export	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
1841100	<b>C1000 Touch Thermal Cycler Chassis</b> , includes USB flash drive, power cord; does not include reaction module
1845385	<b>CFX384™ Optical Reaction Module</b> , for use with C1000 Touch Thermal Cycler Chassis, includes communication cable
1855484	<b>CFX384 Touch Real-Time PCR Detection System with Starter Package</b> , includes C1000 Touch Thermal Cycler Chassis, CFX384 Optical Reaction Module, CFX Maestro Software, license for qbase+ Software, communication cable, reagents, consumables
1855485	<b>CFX384 Touch Real-Time PCR Detection System</b> , includes C1000 Touch Thermal Cycler Chassis, CFX384 Optical Reaction Module, communication cable
12004110	<b>CFX Maestro Software</b>
12004128	<b>CFX Maestro Software for Mac</b>
12005258	<b>CFX Maestro Software, Security Edition</b>
1845025	<b>Precision Melt Analysis Software</b> , includes 2 user licenses, installation CD, 2 HASP HL keys, melt calibration kit
1845075	<b>CFX Automation System II</b> , includes plate handler and barcode scanner, mounting plate, automation software
1814000	<b>PX1™ PCR Plate Sealer</b> , includes heat sealing instrument
1814030	<b>Optically Clear Heat Seal</b> , for use with PX1 PCR Plate Sealer, 100
MSB1001	<b>Microseal® 'B' Adhesive Seals</b> , optically clear, 100
HSP3805	<b>Hard-Shell 384-Well Standard PCR Plates</b> , white well, clear shell, 50
HSP3905	<b>Hard-Shell 384-Well Standard PCR Plates</b> , white well, clear shell, barcoded, 50
1708840	<b>iScript Reverse Transcription Supremix for RT-qPCR</b> , 25 x 20 µl reactions, includes 100 µl 5x iScript RT Supremix, iScript RT Supremix No-RT Control
1725037	<b>iScript Advanced cDNA Synthesis Kit for RT-qPCR</b> , 25 x 20 µl reactions, includes 100 µl 5x iScript Advanced Reaction Mix, 25 µl iScript Advanced Reverse Transcriptase
1725270	<b>SsoAdvanced™ Universal SYBR® Green Supremix</b> , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions, 2x qPCR mix, contains Sso7d fusion polymerase, ROX Normalization Dyes
1725280	<b>SsoAdvanced Universal Probes Supremix</b> , 2 ml (2 x 1 ml vials), 200 x 20 µl reactions, 2x qPCR mix, contains Sso7d fusion polymerase, ROX Normalization Dyes
1725160	<b>SsoAdvanced PreAmp Supremix</b> , 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	<b>SingleShot™ SYBR® Green One-Step Kit</b> , 100 x 50 µl reactions, includes SingleShot Cell Lysis Reagents, iTaq™ Universal SYBR® Green One-Step Kit, SingleShot RNA Control

Visit [bio-rad.com/web/CFX384TouchMore](http://bio-rad.com/web/CFX384TouchMore) 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, iTaq, and SsoAdvanced Supremixes 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.

Purchase of iTaq Supremixes includes an immunity from suit under patents specified in the product insert to use only the amount purchased for the purchaser's own internal research. No other patent rights are conveyed expressly, by implication, or by estoppel. Further information on purchasing licenses may be obtained by contacting 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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