



## CFX384 Touch Real-Time PCR System



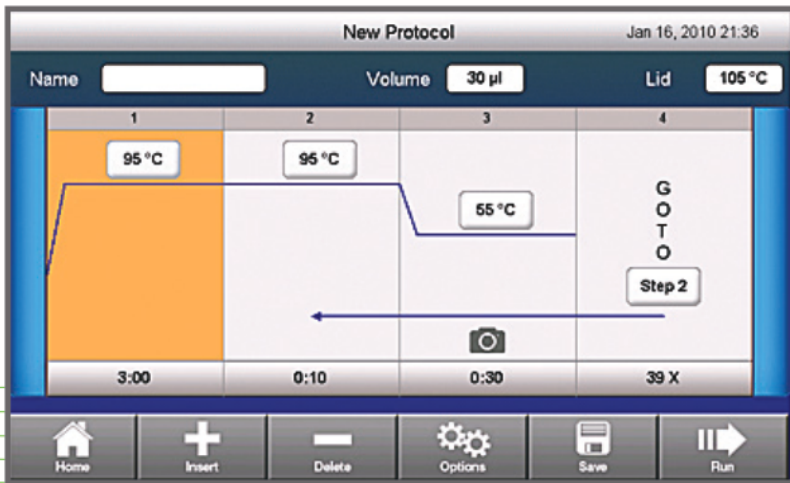
CFX384 TOUCH REAL-TIME PCR SYSTEM

# ADVANCING qPCR TOGETHER



Easily start runs using the intuitive touch screen.

The CFX384 Touch Real-Time PCR 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

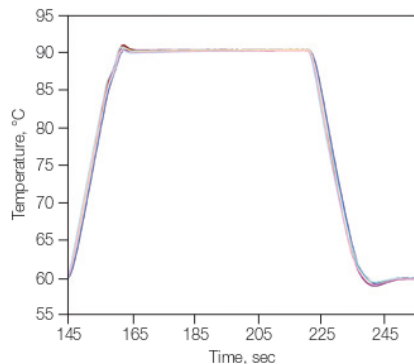
The CFX384 Touch Real-Time PCR System, with up to four-target detection and powerful data analysis, brings flexibility and simplicity to researchers performing high-throughput real-time PCR in a 384-well format. With the precise thermal control of the C1000 Touch Thermal Cycler, the CFX384 Touch System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

## Superior Uniformity

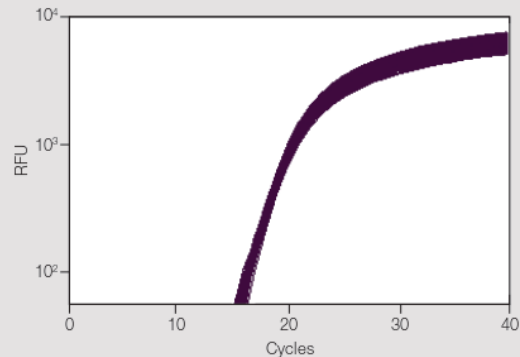
Precision of the temperature steps is critical for the rate and efficiency of PCR. To obtain reliable, consistent results, all sample wells must maintain proper temperature throughout each incubation step. The CFX384 Touch System maintains tight temperature uniformity at all points during a run — even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

## Thermal Gradient for Easy Optimization

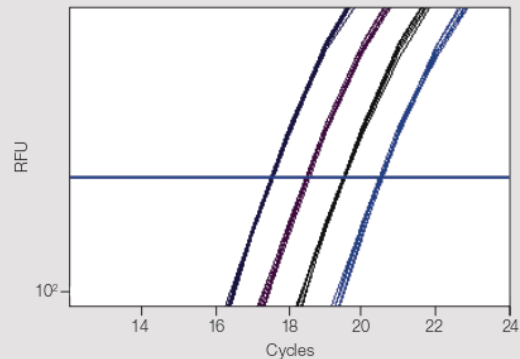
With the thermal gradient feature of the CFX384 Touch System, you can determine the optimal temperature for primer annealing in a single experiment, minimizing the use of precious samples and reagents and saving valuable research time. You can program a temperature gradient of up to 24°C across the reaction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



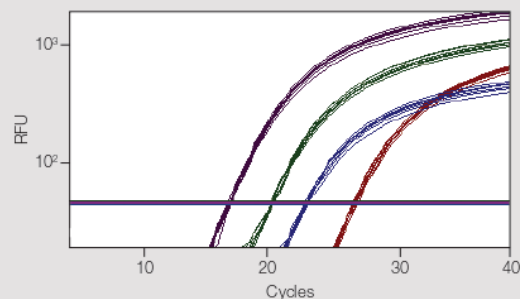
**Superior uniformity with rapid arrival at target temperature.** Bio-Rad 1000-series thermal cyclers exhibit high average ramp rates, rapid settling time, and tight thermal uniformity throughout the ramp. This graph shows the temperature measured by probes in 12 wells across a sample block. The traces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

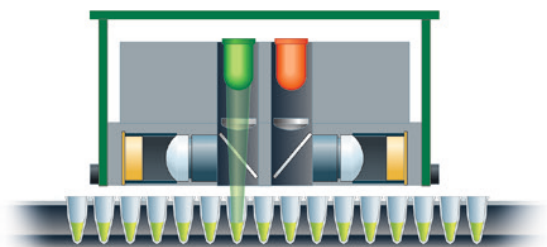
The solid-state optical technology of the CFX384 Touch System provides sensitive detection for precise quantification and target discrimination. Scanning just above the sample plate, the optics shuttle individually illuminates and detects fluorescence from each well with high sensitivity and no cross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

## Four-Target Multiplexing

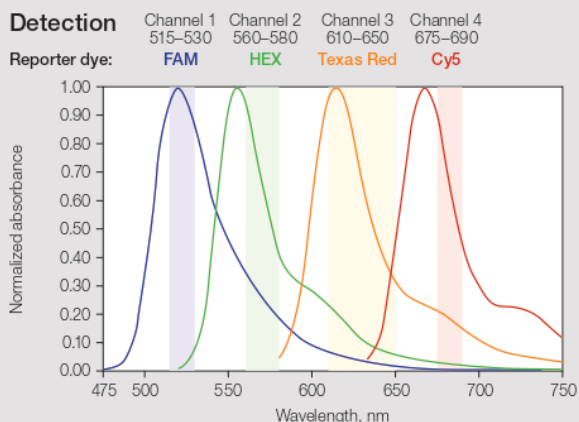
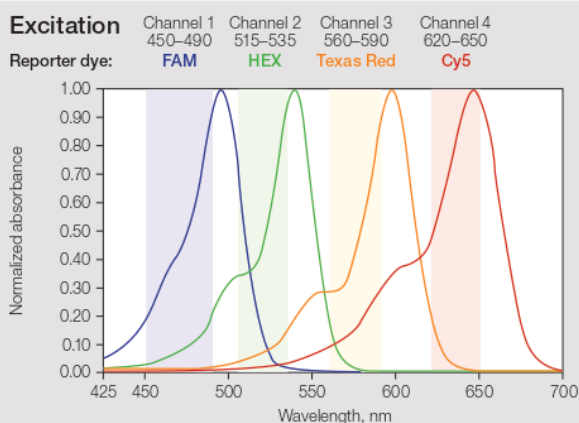
The CFX384 Touch System can discriminate up to four targets in a single reaction well. The optical filter sets are designed to maximize fluorescence detection for specific dyes in specific channels. At every position and with every scan, the optics shuttle is reproducibly centered above each well, so 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

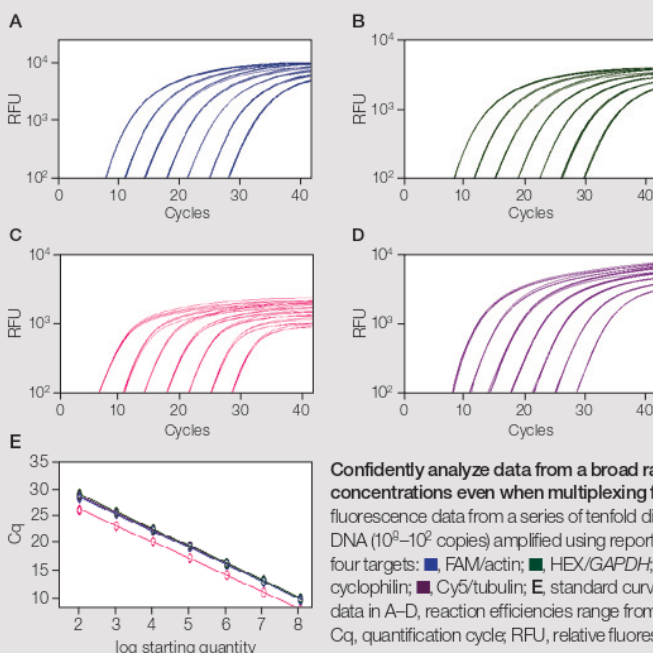
The CFX384 Touch System can acquire data using several modes. Choose to acquire data for SYBR® Green I, EvaGreen®, and single-color FAM protocols using the fast scan mode, or choose to acquire data from all channels when performing multiplex protocols. The CFX384 Touch System includes one channel with 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.



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



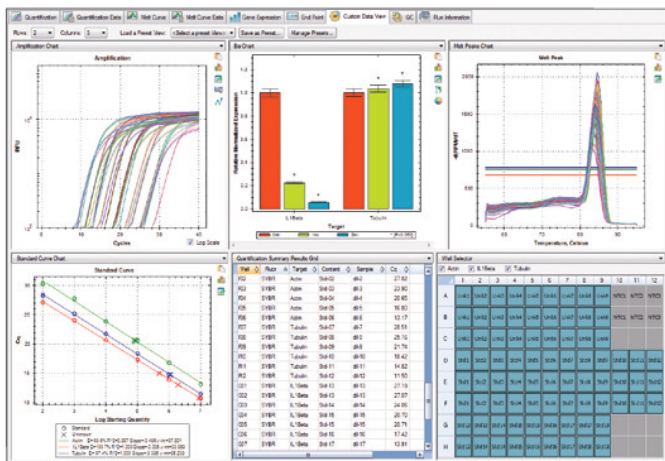
# POWERFUL SOFTWARE

## CFX Maestro Software

CFX Maestro Software for CFX Real-Time PCR 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 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 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
- **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 with the following content:

I acknowledge and agree that by selecting the 'OK' button below I will be affixing my electronic signature, which is the equivalent of a written signature, to this document.

User: GLOBAL/Aaron Burke

Username:

Password:

Please enter your reason for signing the file (Required Entry)

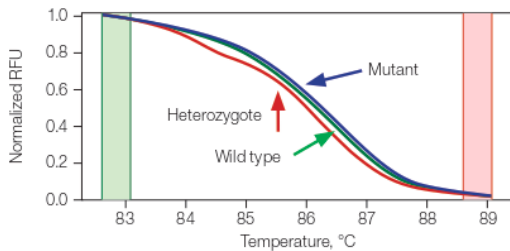
OK Cancel

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 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



### 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.

(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, macOS, 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 dataset 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.



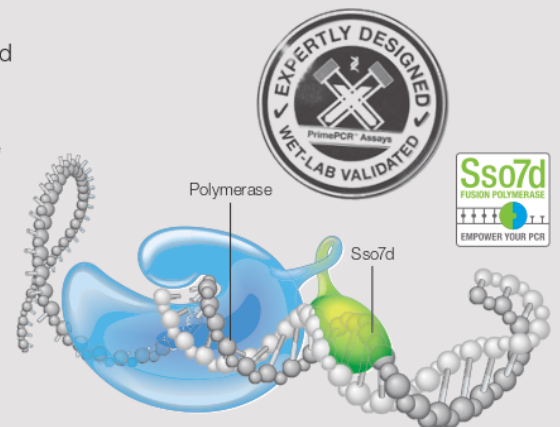
CFX Automation System II

## 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 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	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	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 ( $\Delta C_q$ ) 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

1855484	<b>CFX384 Touch Real-Time PCR System with Starter Package</b> , includes C1000 Touch Thermal Cycler Chassis, CFX384 Optical Reaction Module, CFX Maestro Software, qbase+ Software license, cables, reagents, consumables
1845384	<b>CFX384 Optical Reaction Module for Real-Time PCR Systems with Starter Package</b> , 384-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	<b>PX1 PCR Plate Sealer</b> , heat sealing instrument
1845075	<b>CFX Automation System II</b> , includes plate handler and barcode scanner, mounting plate, automation software

### Software

All software for Windows unless otherwise noted.

12013758	<b>CFX Maestro Software 2.0</b>
12004128	<b>CFX Maestro Software for Mac</b>
12012832	<b>CFX Maestro Software 2.0, Security Edition</b> , 1 license
12013028	<b>CFX Maestro Software 2.0, Security Edition</b> , 5 licenses
12012834	<b>CFX Maestro Software 2.0, Chinese Edition</b>
12012833	<b>CFX Maestro Software 2.0, Russian Edition</b>
1845025	<b>Precision Melt Analysis Software</b> , includes 2 user licenses, data analysis software for all CFX Real-Time PCR Systems, 2 HASP HL keys, calibration kit

### Reagents

1708841	<b>iScript Reverse Transcription Supermix</b> , 400 $\mu$ l (4 x 100 $\mu$ l vials), 100 x 20 $\mu$ l reactions
1725035	<b>iScript gDNA Clear cDNA Synthesis Kit</b> , 100 x 20 $\mu$ l reactions
1725038	<b>iScript Advanced cDNA Synthesis Kit</b> , 100 x 20 $\mu$ l reactions
1708891	<b>iScript cDNA Synthesis Kit</b> , 100 x 20 $\mu$ l reactions
1725271	<b>SsoAdvanced Universal SYBR<sup>®</sup> Green Supermix</b> , 5 ml (5 x 1 ml vials), 500 x 20 $\mu$ l reactions
1725281	<b>SsoAdvanced Universal Probes Supermix</b> , 5 ml (5 x 1 ml vials), 500 x 20 $\mu$ l reactions
1725160	<b>SsoAdvanced PreAmp Supermix</b> , 1.25 ml (1 x 1.25 ml vial), 50 x 50 $\mu$ l reactions
12010220	<b>Reliance One-Step Multiplex RT-qPCR Supermix</b> , 5 ml (5 x 1 ml vials), 1,000 x 20 $\mu$ l reactions
12010221	<b>Reliance One-Step Multiplex RT-qPCR Supermix</b> , 10 ml (2 x 5 ml vials), 2,000 x 20 $\mu$ l reactions
1725120	<b>iTaq Universal SYBR<sup>®</sup> Green Supermix</b> , 2 ml (2 x 1 ml vials), 200 x 20 $\mu$ l reactions
1725151	<b>iTaq Universal SYBR<sup>®</sup> Green One-Step Kit</b> , 500 x 20 $\mu$ l reactions
1725130	<b>iTaq Universal Probes Supermix</b> , 2 ml (2 x 1 ml vials), 200 x 20 $\mu$ l reactions
1725141	<b>iTaq Universal Probes One-Step Kit</b> , 500 x 20 $\mu$ l reactions

### Consumables

HSP3805	<b>Hard-Shell 384-Well Skirted PCR Plates</b> , clear shell/white well for higher fluorescent signals, 50
MSB1001	<b>Microseal 'B' Adhesive Seals</b> , optically clear, 100
MSF1001	<b>Microseal 'F' PCR Plate Seals</b> , foil, pierceable, 100

Visit [bio-rad.com/CFX384TouchMore](http://bio-rad.com/CFX384TouchMore) 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**

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Life Science  
Group

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