CFX96 Touch™ Real-Time PCR
Detection System

BIO-RAD

Advancing qPCR Together

The CFX96 Touch real-time PCR detection system builds on the power and flexibility of the C1000 Touch™ thermal cycler to create an exceptional real-time PCR system. Its unsurpassed thermal cycler performance plus 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.

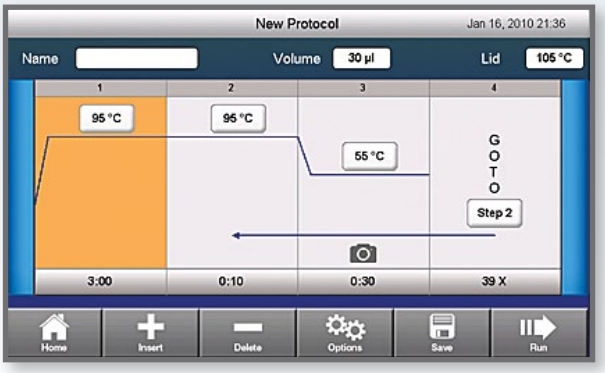
With the CFX96 Touch system you can:

- **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 for higher throughput

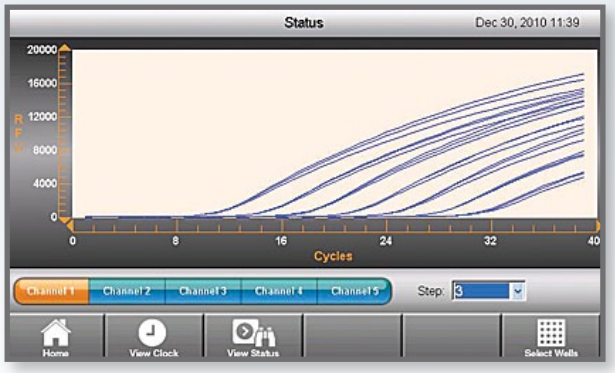
qPCR That Stands Alone

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.

Easily start runs using the intuitive touch screen.



Quickly customize run parameters.

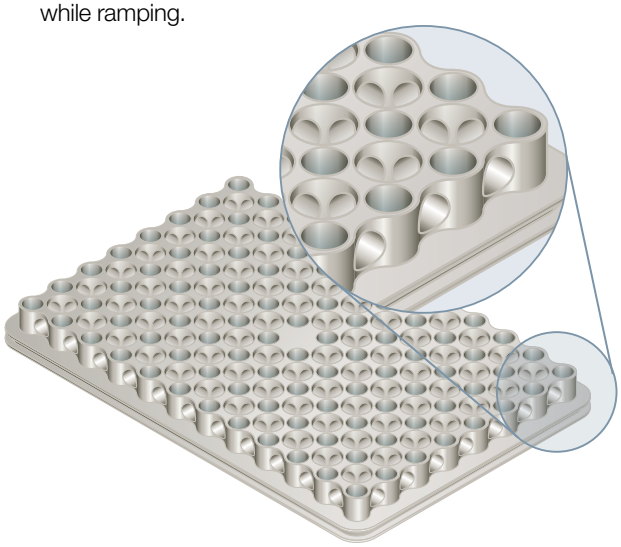


Monitor run progress in real time by viewing the amplification traces on the LCD display.

Fast 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 (TEs), the heating and cooling elements of the thermal cycler, to maintain tight temperature uniformity at all points during a run — even while ramping.

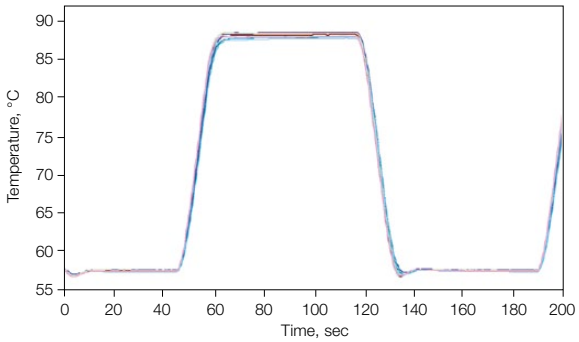


The patented* reduced-mass sample block heats and cools more quickly than standard blocks, so average ramp rates are increased and overall run times are reduced.

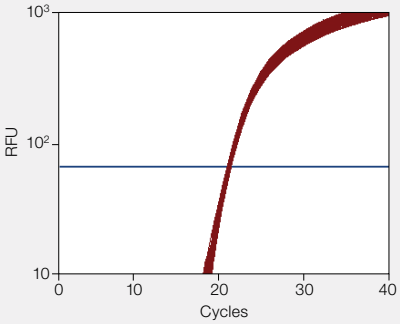
* U.S. patent 7,632,464.

Rapid Arrival at Target Temperature

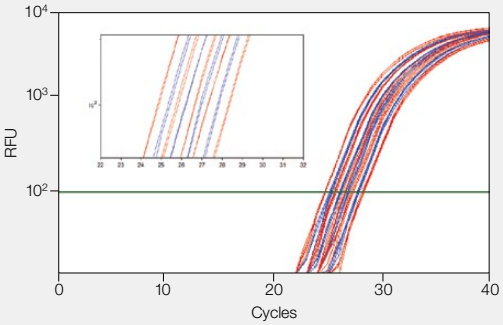
A key component of overall protocol run time is the time required to reach target temperature, which is determined by the average ramp rate and the time needed for the sample block to reach thermal uniformity. Maximum ramp rate is less important because it can fluctuate significantly during the ramp. 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.



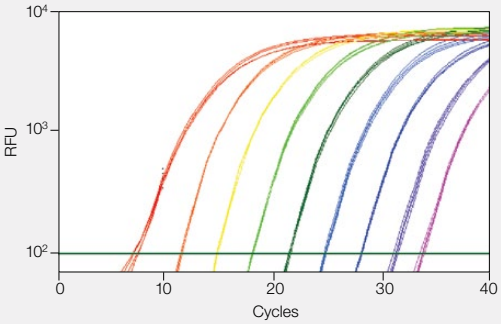
Superior uniformity with rapid arrival at target temperature. 1000-series thermal cyclers exhibit high average ramp rates, rapid settling time, and tight thermal uniformity throughout the ramp. This graph shows the temperature measured by probes in 15 wells across a sample block. The traces are nearly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



Excellent uniformity. IL-1β 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 µl 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 qPCR results in less than 30 min. Tenfold serial dilutions of 10 ng to 100 ag of cDNA from human spleen were used in each 20 µl 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

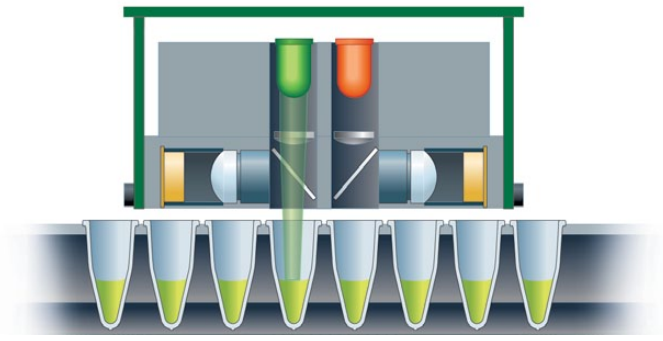
The CFX96 Touch system's solid-state optical technology provides sensitive detection for precise quantification and target discrimination. Scanning just above the sample plate, the optics shuttle individually illuminates and detects fluorescence from each well with high sensitivity and no cross talk.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

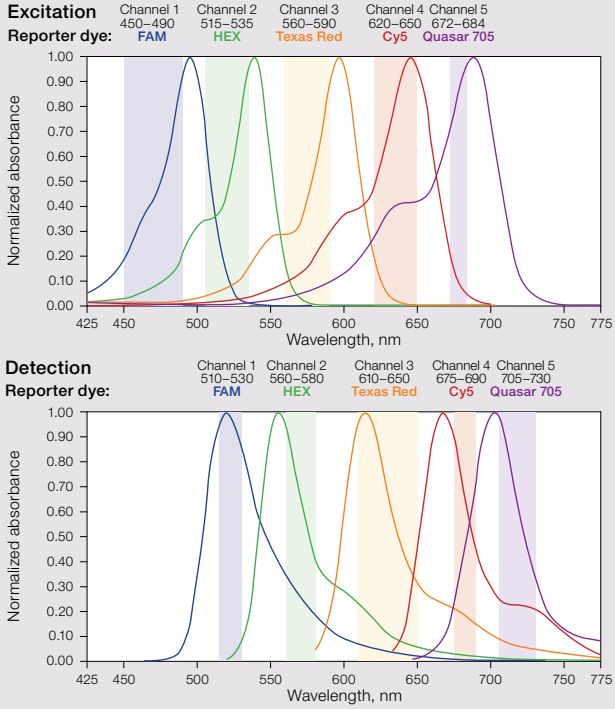
The CFX96 Touch system can discriminate up to five targets in a single reaction well. The optical filter sets are designed to maximize fluorescence detection for specific dyes in specific channels. At every position and with every scan, the optics shuttle is reproducibly centered above each well, so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

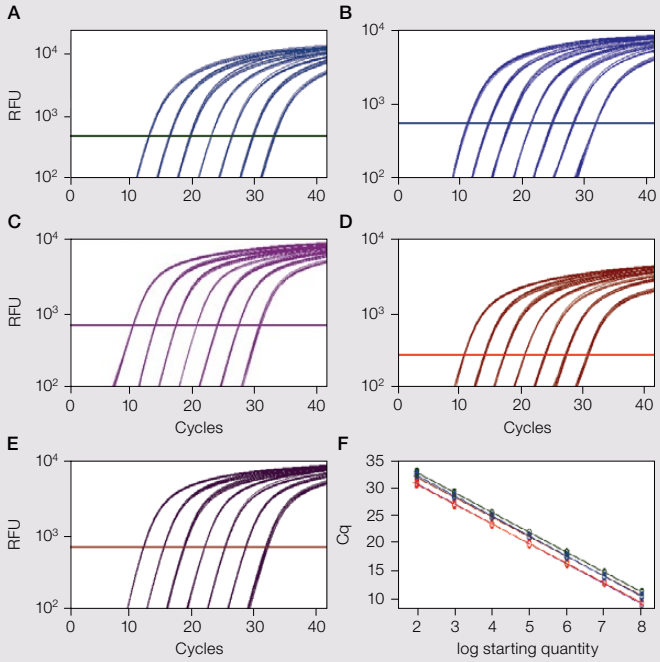
The CFX96 Touch system can acquire data using several modes. Choose to acquire data for SYBR® Green I, EvaGreen, and single-color FAM protocols using the fast scan mode, or choose to acquire data from all channels when performing multiplex protocols. The CFX96 Touch system's optics shuttle includes one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



As the CFX96 Touch optics shuttle 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 thorough 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-1β; **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 Manager™ Software

CFX Manager software accommodates individual user needs and different types of experiments with intuitive navigation and customizable settings.

With CFX Manager software you can:

- **Get started quickly** — intuitive navigation and startup wizard
- **Stay organized** — reserve instruments using the Scheduler and rapidly prepare reactions with the Master Mix Calculator
- **Analyze results when and where you want** — email notification with an attached data file when a run is finished
- **Make decisions about data faster** — easily visualize all your important run data in a single window using Custom Data View
- **Perform normalized gene expression** — advanced analysis tools using multiple reference genes and individual reaction efficiencies
- **Export only the data you want** — Custom Data Export lets you specify what to export and in what format
- **Run on multiple operating systems** — compatible with Windows XP, Windows Vista, and Windows 7

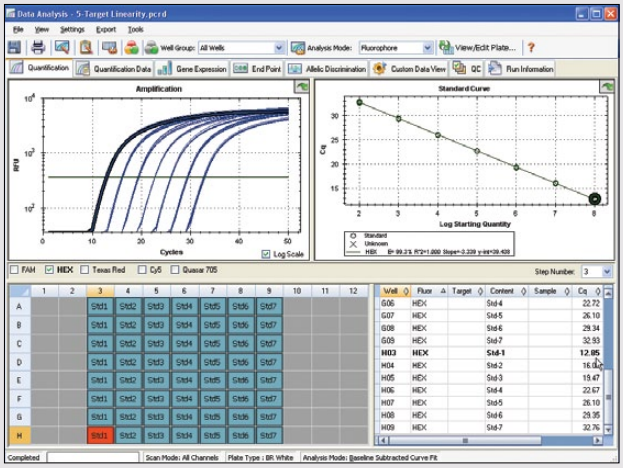
Precision Melt Analysis™ Software

Precision Melt Analysis software imports and analyzes data files generated by the CFX96 Touch 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 SNPs, identifying insertions/deletions or other unknown mutations, and determining the percentage of methylated DNA in unknown samples.

qbase^{PLUS} Software

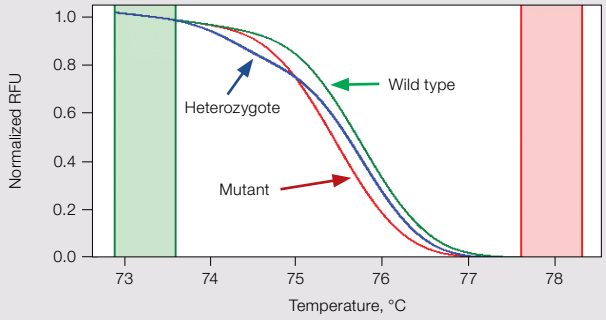
qbase^{PLUS} software is a powerful tool that imports and analyzes data generated by the CFX96 Touch or CFX384 Touch real-time PCR detection system. This platform-independent software package is available for major computer operating systems such as Microsoft Windows, Macintosh, and Linux.

CFX Manager Software



Easily identify specific samples using the multipane data highlighting feature.

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.

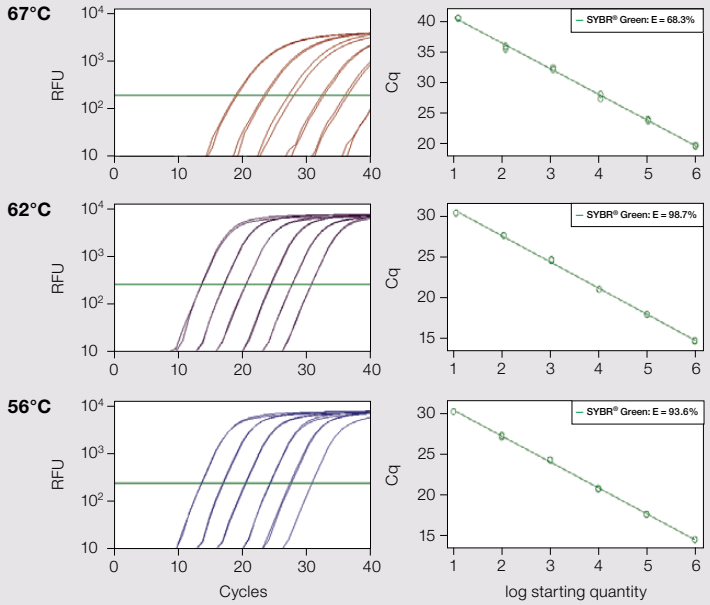
Key features of qbase^{PLUS} software:

- **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 MIQE guidelines

Efficient Optimization

Thermal Gradient

Determining the optimal temperature for primer annealing is crucial for efficient and specific amplification of product. With the CFX96 Touch system's thermal gradient feature, 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.



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® Green dye using a protocol with an annealing thermal gradient ranging from 55 to 68°C. Results are presented for three temperatures, showing 62°C as the optimal in this case, with early Cq values and the highest standard curve efficiency. Cq, quantification cycle; RFU, relative fluorescence units.

CFX Automation System

Expanding Your Throughput

The flexibility of the 1000-series thermal cycling platform allows you to adjust your setup as your needs change. CFX Manager software can independently run up to four instruments. Maximize laboratory throughput by integrating one CFX96 Touch system with a CFX automation system for hands-free loading and unloading of up to fifteen 96-well plates.

Bio-Rad's PCR instruments, reagents, plastics, and software are powerful building blocks for your genomic research, providing the flexibility and reliability you need to accelerate discovery.

Reagents That Provide Optimal Performance

Bio-Rad reagents demonstrate best-of-class performance over a wide dynamic range of input RNA, cDNA, and genomic DNA. The broad mix of reverse transcription kits and supermixes for qPCR delivers maximum sensitivity and consistent results every time.

Don't Worry About Your Consumables

Bio-Rad's plastic consumables have been validated to deliver reliable, reproducible results, leaving you less to worry about.

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 Manager Software	
Operating systems	Windows XP, Windows Vista, Windows 7
Memory	Minimum 1 GB
Multiplex analysis	Up to 5 targets per well
Data analysis modes	PCR quantification with standard curve
	Melt curve analysis
	Gene expression analysis by relative quantity (ΔCq) or normalized expression (ΔΔCq) with multiple reference genes and individual reaction efficiencies
	Multiple file gene expression analysis for comparison of an unlimited number of Cq values
	Allelic discrimination
	End-point analysis
Data export	Save, copy, and print all graphs and spreadsheets from right-click menu
	Export specified data in multiple formats
	Copy and paste into Microsoft Excel, Word, or PowerPoint file
	Customizable reports containing run settings, data graphs, and spreadsheets can be directly printed or saved as PDFs
System	
Licensed for real-time PCR	Yes
Sample capacity	96 wells
Sample size	1–50 µl (10–25 µl recommended)
Communications	USB 2.0
Electrical approvals	IEC, CE
Dimensions (W x D x H)	33 x 46 x 36 cm (13 x 18 x 14")
Weight	21 kg (47 lb)

Ordering Information

Catalog #	Description
184-1100	**C1000 Touch Thermal Cycler Chassis**, includes USB flash drive, power cord; does not include reaction module
184-5096	**CFX96™ Optical Reaction Module**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase^{PLUS} software, communication cable, reagents, consumables
184-5097	**CFX96 Optical Reaction Module**, for use with C1000 Touch thermal cycler chassis, includes CFX Manager software, license for qbase^{PLUS} software, communication cable
185-5196	**CFX96 Touch Real-Time PCR Detection System**, includes C1000 Touch thermal cycler chassis, CFX96 optical reaction module, CFX Manager software, license for qbase^{PLUS} software, communication cable, reagents, consumables
185-5195	**CFX96 Touch Real-Time PCR Detection System**, includes C1000 Touch thermal cycler chassis, CFX96 optical reaction module, CFX Manager software, license for qbase^{PLUS} software, communication cable
184-5001	**CFX Manager Software, Security Edition**, includes 1 user license, installation CD, HASP HL key
184-5025	**Precision Melt Analysis Software**, includes 2 user licenses, installation CD, 2 HASP HL keys, melt calibration kit
184-5072	**CFX Automation System**, includes robotic plate handler, base tray, bar code scanner, CFX automation control software CD
172-5200	**SsoFast EvaGreen Supermix**, 200 x 20 µl reactions, 2x mix contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, EvaGreen dye, stabilizers
172-5230	**SsoFast Probes Supermix**, 200 x 20 µl reactions, 2x mix contains dNTPs, Sso7d fusion polymerase, $MgCl_2$, stabilizers
170-8890	**iScript™ cDNA Synthesis Kit**, 25 x 20 µl reactions, includes 5x iScript reaction mix, iScript reverse transcriptase, nuclease-free water
172-5848	**iQ Multiplex Powermix**, 50 x 50 µl reactions, 2x mix contains dNTPs, 11 mM $MgCl_2$, iTaq™ DNA polymerase, stabilizers

BIO-RAD

Bio-Rad Laboratories, Inc.

Life Science Group

Web site *www.bio-rad.com* ***USA*** *800 424 6723* ***Australia*** *61 2 9914 2800* ***Austria*** *01 877 89 01* ***Belgium*** *09 385 55 11* ***Brazil*** *55 11 5044 5699* ***Canada*** *905 364 3435* ***China*** *86 21 6169 8500* ***Czech Republic*** *420 241 430 532* ***Denmark*** *44 52 10 00* ***Finland*** *09 804 22 00* ***France*** *01 47 95 69 65* ***Germany*** *089 31 884 0* ***Greece*** *30 210 9532 220* ***Hong Kong*** *852 2789 3300* ***Hungary*** *36 1 459 6100* ***India*** *91 124 4029300* ***Israel*** *03 963 6050* ***Italy*** *39 02 216091* ***Japan*** *03 6361 7000* ***Korea*** *82 2 3473 4460* ***Mexico*** *52 555 488 7670* ***The Netherlands*** *0318 540666* ***New Zealand*** *64 9 415 2280* ***Norway*** *23 38 41 30* ***Poland*** *48 22 331 99 99* ***Portugal*** *351 21 472 7700* ***Russia*** *7 495 721 14 04* ***Singapore*** *65 6415 3188* ***South Africa*** *27 861 246 723* ***Spain*** *34 91 590 5200* ***Sweden*** *08 555 12700* ***Switzerland*** *061 717 95 55* ***Taiwan*** *886 2 2578 7189* ***Thailand*** *800 88 22 88* ***United Kingdom*** *020 8328 2000*