

Applied Biosystems StepOne™ and StepOnePlus™ Real-Time PCR Systems

Remarkably Simple Systems. Simply Remarkable Results.

Common System Features:

- Perform standard PCR in less than 2 hours and fast PCR reactions in less than 40 minutes
- Intuitive, flexible software and wizards guide new users through their real-time PCR experiments in three easy to follow steps
- Ultra-compact footprint fits any laboratory setting
- Multiple installation configurations to match laboratory requirements
- LCD touchscreen and USB drive for easy setup and analysis
- Remote monitoring and email notification for convenience and time-savings



StepOne™ and StepOnePlus™ Systems

StepOne System

48 wells for lower throughput

3 colors for basic applications research

Easily upgradeable to the StepOnePlus System

StepOnePlus System

96 wells for higher throughput

4 colors for more flexibility

VeriFlex™ Block technology for thermal cycling flexibility

The Applied Biosystems StepOne™ and StepOnePlus™ Real-Time PCR Systems are remarkably powerful real-time PCR instruments designed with a user-friendly interface. Flexible and simple to use, these systems can be set up and operated with total confidence, even by researchers who have little or no previous real-time PCR experience. Highly affordable, these new low- to medium-throughput

systems are suitable for every level of experience.

The easy to use software with its optional wizards guides researchers through all aspects of sample processing, including sample and reaction setup, thermal cycling, and fluorescent detection. The StepOne and StepOnePlus Systems even assist users in selecting and ordering real-time PCR reagents online.

Real-Time PCR Applications

Both systems support many real-time quantitative PCR applications, including gene expression analysis, using relative standard curve and comparative C_T ($\Delta\Delta C_T$) for relative quantitation, and standard curve for absolute quantitation. In addition, the systems enable qualitative, post-PCR detection of nucleic acids for allelic discrimination (SNP genotyping) assays and presence/absence (plus/minus) assays that use internal positive controls. New applications include melt curve analysis as an independent application and real-time PCR amplification using the allelic discrimination (SNP genotyping) application.

Applications

The StepOne Systems support any real-time PCR application. Predesigned or custom assays are available for the following applications:

- Gene Expression Profiling
- SNP Genotyping
- MicroRNA Expression
- Translocation Analysis
- Viral Load Analysis
- Gene Detection

For information about existing Gene Expression, MicroRNA and Translocation Analysis Assays, please visit www.allgenes.com

SNP Genotyping Assay information can be found at www.allsnps.com

Fluorescence Detection

Fluorophore detection chemistries include FAM™, VIC®/JOE™ and ROX™ dye-labeled TaqMan® MGB probe-based assays. With the StepOnePlus System, TAMRA™ dye can also be utilized. The fluorophore detection chemistries offer outstanding specificity and sensitivity for real-time quantitation, gene expression assays, genotyping assays, and multiplex reactions. The systems also accommodate SYBR® Green I

dye assay chemistry, an economical alternative for target identification, initial screening assays, or for studies that require only a few reactions.

All sample wells in these systems are illuminated with a single high powered blue LED that will last for up to ten years of continuous use, virtually eliminating the need to replace the light source. Fluorescence emission is detected through filters on a photodiode. The emission filters are optimized for use with FAM/SYBR Green I, VIC/JOE, and ROX fluorescent dyes.

Software

Instrument software for the Applied Biosystems StepOne and StepOnePlus Real-Time PCR Systems runs on the Windows XP® operating system and provides instrument control, data collection, and data analysis. This user-friendly and intuitive software package includes the following features:

- Experimental Design Wizards to help you design and set up experiments
- Pipetting protocols and recipes for quick experimental setup
- Advanced setup for expert users who require flexibility for more complex applications, such as multiplexing
- QuickStart setup so that you can begin a run immediately and enter plate information later
- Real-time monitoring of amplification growth curves for viewing a run in progress

- Remote real-time monitoring for observing the run from a remote PC
- Email notifications to alert you when a run has started or ended
- Auto-baseline and auto-threshold for simplified data analysis
- Automated SNP genotype calling with intuitive graphical output and quality-value assignment
- Tools for easy identification of sample wells when viewing amplification curves or SNP genotyping plots
- Troubleshooting flags to help diagnose and solve problematic experiments
- Multiple Plots view for simultaneous data assessment from four perspectives
- Easy cut-and-paste functionality
- Exports data to PowerPoint®, Excel®, or .jpeg files

Primer Express® Software v3.0 is also included with the systems. This software offers simple primer and probe design for real-time PCR applications.

Installation Specifications

Prior to shipping, each system is professionally calibrated for optical and thermal accuracy. During the installation setup, which requires <4 hours, the RNaseP Instrument Verification Test Plate confirms performance specifications to ensure data fidelity.

VeriFlex™ Blocks

The 96-well StepOnePlus System features VeriFlex™ technology, which

TABLE 1. Features At A Glance

	StepOne System	StepOnePlus System
Throughput/Wells	48	96
FAM/SYBR Green dyes	✓	✓
VIC/JOE dyes	✓	✓
ROX dyes	✓	✓
NED/TAMRA dyes		✓
VeriFlex Block		✓

TABLE 2. Demonstrated Performance Specifications

Dynamic Range	9 logs of linear dynamic range
Sensitivity	A single-reporter TaqMan® Assay can detect 10 copies of RNaseP in a 30-µL reaction volume
Precision	Using the TaqMan® RNaseP Instrument Verification Plate, the system can distinguish between 5,000 and 10,000 template copies of RNaseP with 99.7% confidence
Run Time	Fast: <40 min/40-cycle PCR reactions, using the TaqMan® RNaseP Verification Test Plate Standard: <2 hours/40-cycle PCR reactions

brings six independently controllable peltier blocks together for precise temperature control and enhanced PCR functionality. VeriFlex blocks deliver flexibility for those who have probes and primers that are optimized at different annealing temperatures.

PC Free and Networkable Operation

The StepOne and StepOnePlus Systems can be installed in five distinct configurations:

1. PC controlled
2. PC free
3. Networked
4. PC controlled connected to LAN
5. PC controlled with network instrument

Connection to an Ethernet network enables remote monitoring, downloading and uploading of experimental files and data.

Computer Specifications

StepOne and StepOnePlus Systems may ship with a laptop or tower computer and USB memory stick, although the instrument can be operated even without a PC—a QuickStart feature initiates experimental runs from the instrument touchscreen. Systems without computers are also available.

A customer-provided PC must meet the following minimum requirements to support the system:

- Windows XP® O.S., Service Pack 2

- Intel processor 1 GHz or higher
- Minimum 512 MB RAM
- Minimum 20 GB hard drive
- CD ROM
- Ethernet network interface adaptor (10BASE-T)
- Minimum 1024 × 1280 monitor resolution

Convenient Online Ordering

For convenient ordering of real-time PCR master mixes and consumable plasticware, an experimental material list is accessible through the Design Wizard in the system software. It links directly to the Applied Biosystems Store (optional).

Service and Warranty

Purchase of the StepOne or StepOnePlus Real-Time PCR System includes a limited warranty* on parts and labor. Applied Biosystems provides worldwide technical support and service. Depot repair and update services are available for both systems through Applied Biosystems.

StepOne Upgrade

For those customers whose lab needs are changing Applied Biosystems offers the StepOnePlus System upgrade. Just send in your existing system and you'll receive a StepOnePlus loaner instrument until your upgraded system arrives in your lab.**

Instrument Registration

Register your Applied Biosystems StepOne or StepOnePlus System on-line and receive a free t-shirt and the latest product updates and exciting promotional offers. Register your system at info.appliedbiosystems.com/steponeereg

Ambion and Applied Biosystems RNA Isolation Kits

Ambion and Applied Biosystems offer a range of RNA isolation kits that are suitable for a wide variety of sample types including animal and plant tissue, cultured cells, blood, bacteria, and yeast. Blood, bacteria, and formalin-fixed material require RNA isolation kits designed specifically for that sample type, whereas most eukaryotic samples can be processed with excellent results using Ambion's standard RNA isolation kits.

TaqMan® Gene Expression and Genotyping Master Mixes

Tailored for quantitative real-time PCR experiments, the TaqMan® Gene Expression and Genotyping Master Mixes are specially formulated for exceptional sensitivity and reproducibility for both routine and challenging quantitative applications. Each mix has been extensively validated for use on the StepOne and StepOnePlus Systems, as well as all other Applied Biosystems real-time PCR platforms.

TaqMan® Gene Expression, SNP Genotyping, and MicroRNA Assays

Applied Biosystems provides pre-formulated, ready-to-use, quality-tested 5' nuclease TaqMan® Assays for use with the StepOne and StepOnePlus Real-Time PCR systems, as well as for all other real-time PCR platforms in the Applied Biosystems product portfolio (Table 4).

To learn more about reagents, consumables and assays, please visit info.appliedbiosystems.com/steponeplus

*Warranty length varies by region

**StepOne upgrade coming soon

TABLE 3. Instrument Specifications

	StepOne System	StepOnePlus System
Thermal cycling system	Peltier-based system	Peltier-based system
Block format	48-well block	96-well block
Supported volumes	10–30 μ L	10–30 μ L
Supported consumables	<ul style="list-style-type: none"> • 48-well (0.1 mL) plates with optical adhesive covers • 48-well (0.1 mL) plates with optical flat caps • 8-tube (0.1 mL) strips with optical flat caps • Individual (0.1 mL) tubes with optical flat caps 	<ul style="list-style-type: none"> • 96-well (0.1 mL) plates with optical adhesive covers • 96-well (0.1 mL) plates with optical flat caps • 8-tube (0.1 mL) strips with optical flat caps • Individual (0.1 mL) tubes with optical flat caps
Sample ramp rate	Fast mode: +/- 2.2°C/sec Standard mode: +/- 1.6°C/sec	Fast mode: +/- 2.2°C/sec Standard mode: +/- 1.6°C/sec
Peak block ramp rate	4.6°C/sec	4.6°C/sec
VeriFlex™ Block	N/A	25°C (5°C zone-to-zone)
Temperature range	4°C–100°C	4°C–100°C
Temperature accuracy	\pm 0.25°C (35°C to 95°C) of setpoint/display temperature, measured 3 minutes after clock start	\pm 0.25°C (35°C to 95°C) of setpoint/display temperature, measured 3 minutes after clock start
Temperature uniformity	\pm 0.50°C, measured 30 seconds after clock start over the temperature range of 35°C to 95°C	\pm 0.50°C, measured 30 seconds after clock start over the temperature range of 35°C to 95°C
Melt curve resolution	As small as 0.1°C	As small as 0.1°C
Optical system	Single excitation LED, emission filters, photodiode	Single excitation LED, emission filters, photodiode
Calibrated dyes at installation	FAM™, SYBR® Green I, VIC®, JOE™, ROX™ dyes	FAM™, SYBR® Green I, VIC®, JOE™, NED, TAMRA, ROX™ dyes
Passive reference dyes	ROX™ dye	ROX™ dye
Data collection	Data collected in all filters for all wells regardless of plate setup Plate setup may be modified after run completes	Data collected in all filters for all wells regardless of plate setup Plate setup may be modified after run completes
Quantitative PCR Run Time	Fast: <40 minutes Standard: <2 hours	Fast: <40 minutes Standard: <2 hours
Touchscreen	LCD/6.5 in. VGA (640x480)/32K colors	LCD/6.5 in. VGA (640x480)/32K colors
Instrument dimensions	Width: 24.6 cm (9.7 in.) Depth: 51.2 cm (20.2 in.) Height: 42.7 cm (16.8 in.) Weight: 23.6 kg (52 lbs.)	Width: 24.6 cm (9.7 in.) Depth: 51.2 cm (20.2 in.) Height: 42.7 cm (16.8 in.) Weight: 24 kg (53 lbs.)

TaqMan® Assays

Applied Biosystems offers the most comprehensive set of inventoried TaqMan® Gene Expression and SNP Genotyping Assays available. More than 700,000 Gene Expression Assays and over 4.5 million pre-designed human, and 10,000 pre-designed mouse SNP Genotyping Assays are available at your fingertips (Table 4). Alternatively, you can submit your target DNA sequence from any organism, and we'll custom-build an assay for you. Applied Biosystems also offers TaqMan® MicroRNA Assays to quantify miRNA with the sensitivity and specificity of TaqMan® assay chemistry. For more information on Gene Expression Assays, visit www.allgenes.com; for information on SNP Genotyping Assays, visit www.allsnps.com

Reagents and Disposables

A complete line of reagents, including TaqMan® Fast Universal PCR Master Mix, TaqMan® Universal PCR Master Mix, Power SYBR® Green PCR Master Mix, and disposables, including 96-well plates, is available for use with the StepOne™ and StepOnePlus™ Real-Time PCR Systems (Table 5). These products can easily be added to a shopping list for future reference or for ordering through the “Materials List” link in the experimental Design Wizard.

TABLE 4. TaqMan® Gene Expression, SNP Genotyping, and MicroRNA Assays

TaqMan® Assays Selection Guide	Application		
	Gene Expression*	SNP Genotyping†	MicroRNA††
TaqMan® Pre-designed Assays (Inventoried and Made-to-Order)	Yes	Yes	Yes
Custom TaqMan® Assays	Yes	Yes	No
Species	Number of Inventoried and Made-to-Order Assays		
Human	> 2,024,000	> 4,000,000	> 300
Mouse	> 179,000	> 10,000	> 240
Rat	> 128,000	§	> 180
<i>Drosophila melanogaster</i>	> 38,000	§	> 50
<i>Arabidopsis thaliana</i>	> 95,000	§	> 40
<i>Caenorhabditis elegans</i>	> 90,000	§	> 60
Canine	> 6,000	§	N/A
Rhesus macaque	> 70	§	N/A

* Includes mRNA, gene copy number, and mitochondrial assays

† Includes HapMap and drug metabolism genotyping assays

†† Gene expression only

§ Custom TaqMan Assays are available for any SNP, transcript, and genome

TABLE 5. Select Reagents, Consumables, and Service Contract Offerings

Category/Product Description	Quantity	P/N
Seals and Covers		
MicroAmp™ 48-Well Optical Adhesive Film	25 films	4375928
MicroAmp™ 48-Well Optical Adhesive Film	100 films	4375323
MicroAmp™ 96-Well Optical Adhesive Film	25 films	4360954
MicroAmp™ 96-Well Optical Adhesive Film	100 films	4311971
Reaction Plates		
MicroAmp™ Fast Optical 48-Well Reaction Plate	20 plates	4375816
MicroAmp™ Fast Optical 96-Well Reaction Plate with Barcode (0.1 mL)	20 plates	4346906
MicroAmp™ Fast Optical 96-Well Reaction Plate with Barcode (0.1 mL)	200 plates	4366932
8-Well Strips		
MicroAmp™ Fast 8-Tube Strip, 0.1 mL	125 strips	4358293
MicroAmp™ Optical 8-Cap Strip	300 strips	N8010535
Accessories		
MicroAmp™ Fast 48-Well Tray	10 trays	4375282
MicroAmp™ 96-Well Tray/Retainer Set for VeriFlex™ Block Systems	10 trays	4381850
MicroAmp™ 48-Well Base Adaptor	5 adaptors	4375284
Reagents		
Power SYBR® Green PCR Master Mix	5 mL	4367659
TaqMan® Gene Expression Master Mix	5 mL	4369016
TaqMan® Genotyping Master Mix	10 mL	4371355
TaqMan® Fast Universal PCR Master Mix	2 x 1.25 mL	4352042
TaqMan® One-Step RT-PCR Master Mix Reagents Kit	5 mL	4309169
High Capacity cDNA Reverse Transcription Kit	200 reactions	4368814
Service Plan		
For more information contact your local sales representative		SCSTEPONE

ORDERING INFORMATION

Description	Part Number
StepOne™ Real-Time PCR System	4376357
StepOne™ Real-Time PCR System with Laptop Computer	4376373
StepOne™ Real-Time PCR System with Tower Computer	4376374
StepOnePlus™ Real-Time PCR System	4376600
StepOnePlus™ Real-Time PCR System with Laptop Computer	4376598
StepOnePlus™ Real-Time PCR System with Tower Computer	4376599
StepOnePlus™ Real-Time PCR System Upgrade Kit*	4379216

*For users of the StepOne™ Real-Time PCR System. Coming soon.

For Research Use Only. Not for use in diagnostic procedures.

NOTICE TO PURCHASER:

The StepOne™ and StepOnePlus™ Real-Time PCR Systems are covered by one or more of US Patents Nos. 5,038,852, 5,333,675, 5,656,493, 5,475,610, 5,602,756, 6,703,236, 6,814,934, and corresponding claims in their non-US counterparts, owned by Applied Biosystems. No right is conveyed expressly, by implication, or by estoppel under any other patent claim, such as claims to apparatus, reagents, kits, or methods such as 5' nuclease methods. 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.

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Headquarters
 850 Lincoln Centre Drive | Foster City, CA 94404 USA
 Phone 650.638.5800 | Toll Free 800.345.5224
www.appliedbiosystems.com

International Sales
 For our office locations please call the division headquarters or refer to our Web site at
www.appliedbiosystems.com/about/offices.cfm