

Applied Biosystems 7500 Real-Time PCR System and Applied Biosystems 7500 Fast Real-Time PCR System

A *Real* Fast and *Real* Versatile Approach to Real-Time PCR

- The 7500 Fast Real-Time PCR System enables standard 96-well format high speed thermal cycling, significantly reducing your run time for quantitative real-time PCR applications, delivering results in about 35 minutes
- The 7500 Real-Time PCR System is a versatile, leading-edge platform providing enhanced performance capabilities and an upgrade path to high-speed thermal cycling
- Five-color detection system provides the flexibility to perform a variety of applications including gene expression analysis, SNP genotyping and plus/minus assays that utilize internal positive controls
- Advanced optical configuration supports a broader range of fluorophores, including FAM™/SYBR® Green I, VIC®/JOE™, NED™/TAMRA™/Cy3™, ROX™/Texas Red®, and Cy5™ dyes; variable excitation capability allows greater sensitivity for longer wavelength (red) dyes
- Powerful, flexible software includes new plate setup wizards to guide you through experimental setup, while automated analysis tools such as RQ Study (Relative Quantitation) gene expression analysis software allow the simultaneous analysis and visualization of up to ten 96-well plates of data



Applied Biosystems 7500 Real-Time PCR System

Applied Biosystems 7500 Fast Real-Time PCR System

- Small instrument footprint permits easy placement in any laboratory, even those with limited space

Introduction

The Applied Biosystems 7500 and 7500 Fast Real-Time PCR Systems are integrated, versatile platforms for the detection and quantification of nucleic acid sequences. Real-time PCR combines thermal cycling, fluorescence detection, and application-specific software to measure the cycle-by-cycle accumulation of PCR products in a single-tube homogenous reaction.

Quantitative results are available immediately upon completion of PCR, with no need to run gels, purify PCR products, or perform any post-PCR manipulation. Compared with manual PCR quantitation techniques, such as Northern blotting or RNase protection assays, real-time PCR offers an enormous time savings, greater sensitivity, superior precision, and a larger dynamic range.

Fast Thermal Cycling

The 7500 System is available in two configurations; the 7500 Fast System configuration with a high-speed, 96-well format thermal cycling block capable of quantitative real-time PCR runs in about 35 minutes, and the standard configuration with a 96-well format thermal cycling block with run times of under 2 hours. A service engineer installed Fast Upgrade Kit is available for the 7500 System to upgrade it to the Fast configuration.

The Applied Biosystems 7500 Fast Real-Time PCR System delivers high-speed cycling capabilities with a new fast ramping Peltier-based thermal cycling block. This hardware, together with new Optical Fast 96-well reaction plates and a new hot-start DNA polymerase containing master mix, comprise the complete Fast system. Using this system quantitative real-time PCR runs can be completed in about 35 minutes with comparable performance to standard run times for supported applications.

The 7500 Fast System supports three thermal cycling modes; Fast, Standard and 9600 emulation. Standard and 9600 emulation thermal cycling modes on the 7500 Fast System have ramp rates comparable to the standard 7500 System. Data collection processes for Fast 7500 Systems remain the same as for standard 7500 Systems.

Real-Time PCR Applications

The 7500 and 7500 Fast Systems support many real-time PCR applications, including gene expression analysis using relative quantitation (RQ) assays and pathogen detection using standard curves. In addition, the systems allow for qualitative post-PCR detection of nucleic acids for allelic discrimination (SNP genotyping assays) and plus/minus assays that utilize internal positive controls.

Fluorescence Detection

All sample wells are illuminated with a tungsten halogen lamp. Light from this lamp passes through five excitation filters before reaching sample wells. The inclusion of excitation filters improves the ability of the instrument to excite dyes at longer (red) wavelengths, resulting in greater sensitivity and precision for these dyes. Fluorescence emission is then detected through five emission filters (even in Fast thermal cycling mode) to a charge-coupled device (CCD) camera. Emission filters are optimized for use with FAM™/SYBR® Green I, VIC®/JOE™, NED™/TAMRA™/Cy3™, ROX™/Texas Red®, and Cy5™ fluorescent dyes.

Demonstrated Performance Specifications

Instrument	7500 System	7500 Fast System
Dynamic Range	9 logs of linear dynamic range	9 logs of linear dynamic range
Sensitivity	Detection of 10 copies of template in a 50 µL reaction for a single reporter TaqMan® assay, with 99.7% confidence	Detection of 10 copies of template in a 20 µL reaction for a single reporter TaqMan® assay, with 99.7% confidence
Run Time	1 hour and 50 minute run time for a 40 cycle PCR reaction using the TaqMan® RNase P Instrument Verification Plate	37 minute run time for a 40 cycle PCR reaction using the TaqMan® RNase P Fast Instrument Verification Plate

Sequence Detection Software

Sequence Detection Software for the 7500 and 7500 Fast systems runs on the Windows XP® operating system and is used for instrument control, data collection, and data analysis. Powerful and user-friendly, the software includes:

- Plate set-up wizards for easy experimental design, even with complex multicolor assays
- The added ability for the 7500 Fast System to choose between Fast, Standard, and 9600 emulation thermal cycling modes
- Real-time monitoring of amplification growth curves enabling viewing of runs in progress
- The flexibility to add extra PCR cycles while runs are in progress
- Auto-baseline and auto-threshold for simplified data analysis
- Absolute quantitation of nucleic acid targets with the ability to simultaneously analyze multiple standard curves on a single plate, improving your workflow and easing the burden of downstream analysis
- RQ (Relative Quantitation) gene expression analysis software with powerful data viewing capabilities allowing the simultaneous analysis of up to ten 96-well plates of data

- Automated SNP genotype calling capability, including 2-cluster calling, with intuitive graphical output and quality-value assignment, makes SNP analysis simple and straightforward
- Simple dissociation curve data collection and viewing, enabling the addition of dissociation stages while runs are in progress
- Tool tips for easy identification of sample wells when viewing amplification curve or SNP genotyping plots
- Lamp-life monitoring and instrument diagnostics to provide confidence in your instrument performance

Installation Specifications

The TaqMan® Fast RNase P Instrument Verification Plate enables the 7500 Fast System to distinguish between samples containing 5,000 and 10,000 template DNA copies, with a statistical confidence level of 99.7% and a run time of about 35 minutes.

The TaqMan® RNase P Instrument Verification Plate enables the 7500 System to distinguish between samples containing 5,000 and 10,000 template DNA copies, with a statistical confidence level of 99.7%.

Computer Specifications

Applied Biosystems supplies a Dell™ business line computer (note book or tower) for use with the 7500 and 7500 Fast Systems. For the latest computer specifications please visit the Applied Biosystems website at www.appliedbiosystems.com

Reagents and Disposables

A complete line of reagents including TaqMan® Fast Universal PCR Master Mix, TaqMan® Universal Master Mixes, SYBR® Green I Master Mixes, and disposables including 96-well plates, is available for use with the Applied Biosystems 7500 and 7500 Fast Real-Time PCR Systems.

Service and Warranty

Purchase of the 7500 System or 7500 Fast System includes a one-year limited warranty on parts and labor. Purchase of the 7500 Fast System Upgrade Kit includes a 90-day limited warranty on parts and labor. The 7500 System, 7500 Fast System and 7500 Fast Upgrade Kit include set-up and calibration of the instrument by our highly trained Service Support team.

Support

Technical specialists and scientists provide worldwide applications support and service.

Instrument Specifications

Instrument	7500 System and 7500 Fast System	
Thermal cycling system	Peltier-based, 96-well block	
Optical system	Five-excitation, Five-emission filters and CCD camera	
Instrument	7500 System	7500 Fast System
Quantitative PCR run time	< 2 hours	< 40 minutes
Supported Volumes	20-100 µL	10–30 µL
Supported Consumables	<ul style="list-style-type: none"> • Standard Optical 96-well plates • 8-strip 0.2mL tubes • 0.2mL tubes • Optical Adhesive Covers • Optical Flat Caps 	<ul style="list-style-type: none"> • Optical Fast 96-well plates • Optical Adhesive Covers

Supported Applications

Instrument	7500 System		7500 Fast System	
	Standard/9600 Emulation	Fast	Standard/9600 Emulation*	
Absolute Quantitation	Yes	Yes	Yes	
Relative Quantitation	Yes	Yes	Yes	
Allelic Discrimination	Yes	No	Yes	
Plus/Minus Assays using IPC	Yes	No	Yes	

*Ramp rates for Standard/9600 emulation mode are matched to the 7500 System Standard/9600 emulation modes. However, overall run times are shorter on the 7500 Fast System for these modes.

TaqMan® Genomic Assay Products

Applied Biosystems provides preformulated, ready-to-use, quality-tested, 5' nuclease TaqMan® assays for use with the 7500 and 7500 Fast systems.

Assay Details	Application	
	Gene Expression	SNP Genotyping
TaqMan® Genomic Assays	Yes	Yes
Custom TaqMan® Genomic Assays	Yes	Yes
Genome Availability	Number of Assays	
Human	> 204,000	> 1,990,000
Mouse	> 179,000	N/A
Rat	> 128,000	N/A
URL (assays can be ordered online only)	www.allgenes.com	www.allsnps.com

Instrument and Computer Dimensions

Dimension	7500/7500 Fast System	Notebook	Tower
Width	34 cm (13.39 in.)	32 cm (12.4 in.)	18 cm (7.1 in.)
Depth	45 cm (17.72 in.)	26 cm (10.1 in.)	45 cm (17.6 in.)
Height	49 cm (19.29 in.)	3 cm (1.2 in. closed)	42 cm (16.7 in.)
Weight	34 kg (75 lb)	2.1 kg (4.7 lb)	20.4 kg (45 lb)

Ordering Information

Description	P/N
7500 Real-Time PCR System with Notebook Computer and SDS Software	4351104
7500 Real-Time PCR System with Tower Computer and SDS Software	4351105
7500 Fast System Upgrade Kit	4362143
7500 Fast Real-Time PCR System with Notebook Computer and SDS Software	4351106
7500 Fast Real-Time PCR System with Tower Computer and SDS Software	4351107
Notebook Computer for 7500/7500 Fast System	4359286
Tower Computer for 7500/7500 Fast System/7500 Fast Upgrade Kit	4359284
17" Flat Panel Monitor	4346944



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Authorized Thermal Cycler

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