

# Applied Biosystems 7500 Real-Time PCR System

## A *Real* Affordable and Versatile Approach to Real-Time PCR

- **Five color detection provides the flexibility to perform a variety of applications including gene expression analysis, pathogen quantitation, 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®; variable excitation capability allows greater sensitivity for longer wavelength (red) dyes**
- **Powerful, flexible software includes new plate set-up wizards to guide you through experimental set-up, while automated analysis tools make data processing and data viewing simple and straightforward**
- **Latest generation, Peltier-based thermal cycling system supports standard 96-well format plates and 0.2 mL tubes**
- **Future upgrade path to high-speed thermal cycling enabling you to significantly reduce your real-time PCR run time**
- **Small instrument footprint permits easy placement in any laboratory, even those with limited space**



### Introduction

The Applied Biosystems 7500 Real-Time PCR System is an integrated and versatile platform 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 homogeneous 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. Real-time PCR runs are completed in under two hours, using 96-well plates and tubes (individual or 8-strip), with a supported volume range of 25 – 100  $\mu$ L. Compared with manual PCR quantitation techniques such as Northern blotting or RNase protection assays, real-time PCR offers enormous time savings, greater sensitivity, superior precision, and a larger dynamic range.

### Real-Time PCR Applications

The 7500 system supports many real-time PCR applications, including gene expression analysis using relative quantitation (RQ) assays and pathogen quantitation using standard curves. In addition, the system allows for qualitative, post-PCR detection of nucleic acids for allelic discrimination (SNP genotyping) assays and plus/minus assays that use 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 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 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.

### Sequence Detection Software

Sequence Detection Software for the 7500 system 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
- Real-time monitoring of amplification growth curves enabling you to view run 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
- Relative quantitation (RQ) study 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 with intuitive graphical output and quality-value assignment
- Simple dissociation curve data collection and viewing

- Tool tips for easy identification of sample wells when viewing amplification curves or SNP genotyping plots
- Lamp-life monitoring and instrument diagnostics provide confidence in your instrument performance

### Future Upgrade to High-Speed Thermal Cycling

An optional service-engineer-installed upgrade to a high-speed thermal cycling block will be available. Using this complete system which includes our new master mix formulations you will be able to significantly decrease your real-time PCR run time.

### Instrument Specifications

Thermal cycling system	Peltier-based, 96-well block, upgradable to a 96-well format, high-speed thermal cycling block
Optical system	Five-excitation, five-emission filters, and CCD camera
<b>Run Variables</b>	<b>Standard</b>
Quantitative PCR run time	< 2 hours
Block format	96-well plates and 0.2 mL tubes
Supported volumes	25 – 100 µL

### Instrument and Computer Dimensions

Dimension	7500 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)	32 kg (70 lb)

### Computer Specifications

Applied Biosystems supplies a Dell™ Business Line computer (notebook or tower) for use with the 7500 system. For the latest computer specifications, please visit the Applied Biosystems Web site at: [www.appliedbiosystems.com](http://www.appliedbiosystems.com)

### Installation Specifications

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

### Demonstrated Performance

The 7500 system has been demonstrated to achieve the following performance targets:

- 9 logs of linear dynamic range
- Detection of 10 starting copies of template in a 50 µL reaction for a single reporter TaqMan® assay with a confidence level of 99.7%

### Reagents and Disposables

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

### TaqMan® Assays-on-Demand™ and TaqMan® Assays-by-Design™ Products

Applied Biosystems provides preformulated, ready-to-use, quality-tested, 5' nuclease TaqMan® probe-based assays for use with the 7500 system (see table below).

### Service and Warranty

Purchase of the instrument includes a one-year limited warranty on parts and labor, plus an installation package that includes set-up and calibration of the instrument by our highly trained Service Support team.

### Support

Applied Biosystems technical specialists and scientists provide worldwide applications support and service.

### TaqMan® Assay Products

Assay Details	Application	
	Gene Expression	SNP Genotyping
TaqMan® Assays-on-Demand™ Products (off-the-shelf assays)	Yes	Yes
TaqMan® Assays-by-Design™ Products (custom assays)	Yes	Yes
Genome Availability	Number of Assays	
Human	> 21,500	> 156,500
Mouse	> 13,000	N/A
Rat	> 3,500	N/A
URL (assays can be ordered online only)	<a href="http://www.allgenes.com">www.allgenes.com</a>	<a href="http://www.allsnps.com">www.allsnps.com</a>

## Ordering Information

### Description

### P/N

7500 Real-Time PCR System with Notebook Computer

4351104

7500 Real-Time PCR System with Tower Computer

4351105



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