

LightCycler®

LightCycler® 96 Real-Time PCR System
Super Capabilities Are Now Within Your Reach





*Discover the new LightCycler® 96 Real-Time PCR System—
A compact and smart device that's the perfect companion
for today's academic Superheroes.*

The LightCycler® 96 System embodies Roche expertise over the last decade in developing and providing high-performance qPCR systems that enable research breakthroughs.

Choose this 96-well qPCR solution to obtain everything top researchers expect from a LightCycler® Instrument: an ideal combination of accuracy, temperature homogeneity, and reproducibility now enhanced by an interface so intuitive that it is accessible to any user in the lab.

Now the quality and reliability of Roche real-time PCR systems are within every researcher's reach.

For life science research only. Not for use in diagnostic procedures.

Reach New Heights with an All-in-One Amplifier

The quality and features that make you the Hero

Have confidence in the data you generate and quickly get publication-ready results.

- Fast precision thermocycling and innovative glass fiber optics for unbiased 96-well data capture.
- Accurate results expected from a LightCycler® System—now including gradient functions.

Work economically, flexibly adapting your workflow to your assay format and throughput needs.

- Cost-effective value packs of optimized reagents and disposables.
- Choose between multiwell plates and clear or white tube strips provided with caps.

Speed time to results with advanced yet easy-to-use software designed for both novice and experienced users.

- Intuitive touchscreen interface and powerful data analysis.
- Choose your type of connectivity via network or USB stick and conveniently analyze data remotely via email.



LightCycler® 96 System Hardware

qPCR Superheroes prefer this innovative, calibration-free tool

Achieve the unbiased results your research requires with the innovative optics and thermal block of the LightCycler® 96 System.

Equally excite and simultaneously capture data from 96 wells.

With the LightCycler® 96 System's high-intensity LED and pairs of 96 robust fiber optic cables—half for excitation and half for emission (Figure 1), you will:

- Eliminate edge effects.
- Avoid variations in signal capture due to lags in acquisition time, common on other systems that use optical scanning.
- Avoid the need for a passive reference dye.

Reduce well-to-well variations through temperature homogeneity.

Maximize data consistency with the LightCycler® 96 System's full silver thermal block cycler, low mass electro-formed silver mount, and heated lid (Figure 2).

- Achieve high temperature homogeneity to reduce well-to-well variation.
- Prevent optical artifacts due to condensation.
- Perform assay optimization across a 20 °C gradient range.

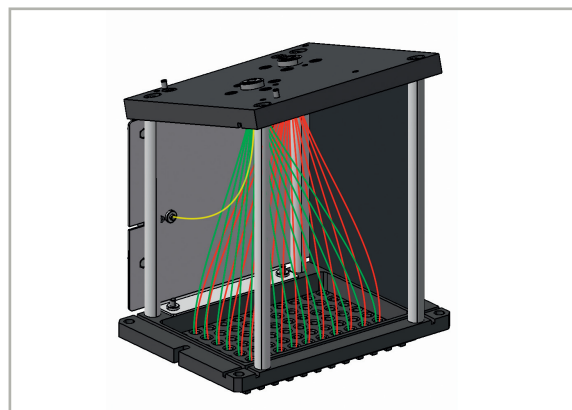


Figure 1: Innovative optics. The LightCycler® 96 patent-pending optics system is comprised of two robust sets of 96 fiber optics, one for providing the excitation light (green) and one for collecting the emitted light (red) to and from each well. The reference channel is shown in yellow.

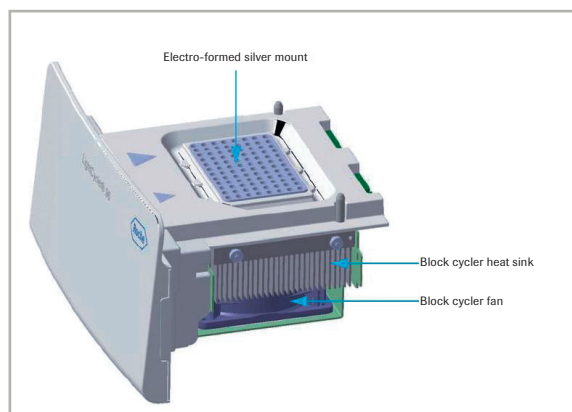


Figure 2: The block cycler unit. The main components of the block cycler unit consist of the silver thermal block cycler, the heated block cycler cover, the block cycler fan, and the electro-formed silver mount.

LightCycler® 96 System Software

As smart and intuitive as you want it to be

Whether you are a qPCR novice or a seasoned expert, the LightCycler® 96 Software can accommodate your needs—without wasting your time learning a new software package. First-time users can easily start data for all common applications in gene expression and genetic variation research. Advanced users exploit the system's powerful analytical capabilities and generate publication-ready results.

- Quickly program your run with predefined temperature protocols.
- Simplify routine and advanced tasks through a start-up wizard and shortcuts.
- Easily configure views for added flexibility.
- Meet MIQE requirements* and publish faster by readily generating RDML-formatted data.

| <i>Novice</i> | <i>Intermediate</i> | <i>Experienced</i> |
|---|--|--|
| Allows guided navigation and easy input. | Generates adaptable predesigned bar-chart diagrams. | Applies auto standard curves and efficiency corrections. |
| Facilitates analysis with one-view functions. | Offers more flexibility with one-click export options. | Gives access to raw data/statistics. |

Don't slow down your research mission

- **Choose your type of connectivity:** Control the system and monitor the run progress via the touchscreen, or alternatively, from any connected or network computer.
- **Conveniently analyze data remotely:** Use any network computer or a USB memory stick to download complete result files or have the instrument send them to you by email, as soon as the run is completed.



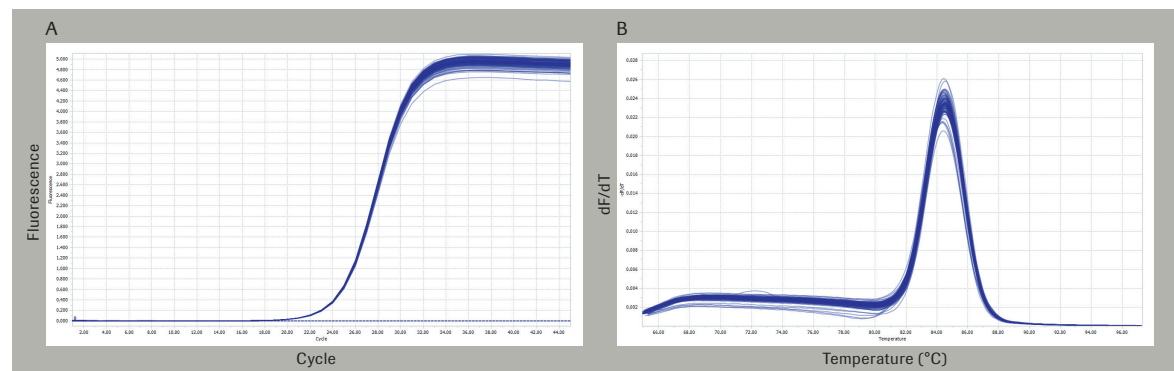
* The MIQE guidelines: minimum information for publication of quantitative real-time PCR experiments. Bustin S.A. et al. (2009). Clin Chem. 55(4):611–22.

LightCycler® 96 Performance

Generate the quality data that will leave your competitors in awe

Excellent reproducibility of amplification

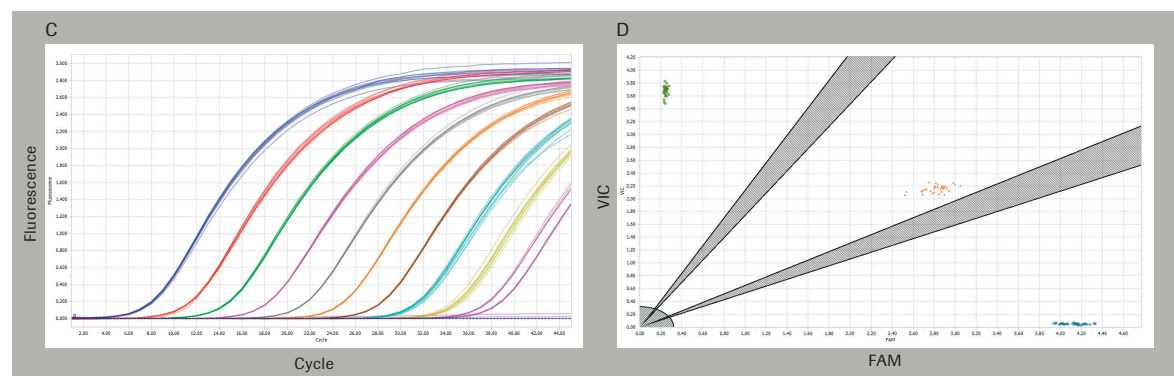
Homogeneity of reaction products



Real-time PCR was done using 30 ng of human DNA in each of the 96 block positions. **(A)** A 110 bp amplicon of the beta globin gene was amplified using SYBR Green I detection. **(B)** The reaction product was also subjected to melting curve analysis. Low variation C_q values (C_q range = 0.16 and SD = 0.033) and overlapping melt curves of the amplicon (T_M range of 0.28 °C and SD = 0.063) in each of the 96 positions demonstrate temperature homogeneity and equal treatment of all samples—independent of block position.

Dynamic range of gene quantification at low dilutions

Accurate SNP Genotyping



(C) A Parvo B19 gene fragment was amplified in 10 serial 1:10 dilutions ranging from 10^9 to 10^0 copies per well, and detected with Universal ProbeLibrary (UPL) Probe #137. Ten replicates were run for each dilution (only 9 for the 4 highest concentrations). The results show excellent reproducibility and resolution down to very low copy numbers.

(D) Endpoint genotyping analysis was performed on a 68 bp fragment of the ADD1 gene, using human genomic DNA as template. The Fast Start Essential DNA Probes Master was used for amplification and detection with hydrolysis probes labeled with FAM or VIC. Scatter plot analysis showed that wild type, heterozygote and mutant genotypes were differentiated in an unbiased way (green = wild type, blue = mutant, orange = heterozygote).

Technical Specifications

General

| | |
|-------------------------------|-----------------------------------|
| Weight | approx. 25 kg |
| Dimensions | W x D x H: 40 x 40 x 53 cm |
| Noise level during run | 43 dB(A) |
| Electrical approvals | CE, ICE, UL |
| Reaction volumes | 10–50 µl |
| Sample format | 96-well plates, 8-tube strips |
| Runtime | < 40 min for 3-step 40 cycles PCR |

Hardware

| | |
|---------------------------------------|--|
| Thermal cycling system | Peltier-based, 96-well block |
| Max ramp rate heating | 4.4 °C |
| Average ramp rate cooling | 2.2 °C |
| Programmable temperature range | 37–98 °C |
| Temperature accuracy | ±0.2 °C of target temperature |
| T_m uniformity | Range (max–min) 0.4 °C, SD<0.1 °C |
| Gradient operational range | 37–98 °C |
| Gradient programmable span | Max. 20 °C |
| Excitation | High-power broad spectrum LED |
| Measurement (integration time) | Simultaneous data acquisition for all positions in 10–1000 ms |
| Detection | CCD camera |
| Optical system | Fixed fiber optics with four excitation and four emission filters No moving scanning elements |
| C_q uniformity | Range (max–min) 0.8, SD < 0.2 (enabling resolution of 2-fold concentration differences) |

Analysis Software

| | |
|--------------------------|---|
| Operating systems | Win 7 + Win XP |
| Data analysis | Absolute and Relative Quantification T _m Calling Endpoint Genotyping HRM (included in free upgrade to software version 1.1) Qualitative Detection (included in free upgrade to software version 1.1) |
| Data export | Result table: export as .txt file |
| Data import | from Excel, .csv or .txt files |
| Failure flagging | Automated flagging for critical controls (e.g., positive control is negative) |

Run Mode

| | |
|--|---|
| Stand alone | Touchscreen support Flexible experiment programming and execution Online fluorescence display |
| PC connected | Programming, monitoring and analysis |
| LAN connected | Support of online monitoring using LAN connection Support of remote Roche Service |
| External devices | Support of external barcode scanner using USB connection |
| Instrument active communication | Email notification, with success or failure messaging and optional experiment file attachment |

Applications

| | |
|--|---|
| Dynamic range | 10 orders of magnitude |
| Range of excitation/emission wavelengths (nm) | 470/514 (SYBR, FAM, ResoLight dye) 533/572 (VIC, Hex, Yellow555) 577/620 (Red610, Texas Red), 645/697 (Cy5) |
| Detection formats | Intercalating dyes; Hydrolysis Probes |
| Multiplex analysis | Up to 4 channels, pre-calibrated color compensation (no user interaction necessary) |
| Passive reference dyes | Not necessary |

Order Information

| <i>Product</i> | <i>Cat. No.</i> | <i>Pack Size</i> |
|--|-----------------|---|
| LightCycler® 96 Instrument | 05 815 916 001 | 1 instrument |
| LightCycler® 8-Tube Strips (white) | 06 612 601 001 | 120 strips (white) and caps (clear); 10 unit packs with 12 tube and cap strips each |
| LightCycler® 96 DNA Green Value Pack S | 06 713 092 001 | 5 packs FastStart Essential DNA Green Master (25 ml); 1 pack LightCycler® 480 Multiwell Plates 96, white (50 plates) |
| LightCycler® 96 DNA Green Value Pack L | 06 713 106 001 | 20 packs FastStart Essential DNA Green Master (100 ml); 2 packs LightCycler® 480 Multiwell Plates 96, white (100 plates) |
| LightCycler® 96 DNA Probes Value Pack S | 06 713 076 001 | 5 packs of FastStart Essential DNA Probes Master (25 ml); 1 pack LightCycler® 480 Multiwell Plates 96, white (50 plates) |
| LightCycler® 96 DNA Probes Value Pack L | 06 713 122 001 | 20 packs of FastStart Essential DNA Probes Master (100 ml); 2 packs LightCycler® 480 Multiwell Plates 96, white (100 plates) |

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