

QIAxcel[®] — Pure Excellence

QIAxcel Advanced System

Designed to speed up
your gel electrophoresis



The QIAxcel Advanced System — for effortless DNA fragment and RNA analysis

Accelerate your research with the new QIAxcel Advanced System and perform DNA fragment analysis of 12 samples in as little as 3 minutes — without the need for tedious agarose gel preparation. The revolutionary QIAxcel Advanced System replaces traditional, labor-intensive gel analysis of DNA and RNA — streamlining your workflow and reducing time to result (Figures 5–6). The QIAxcel Advanced System fully automates sensitive, high-resolution capillary electrophoresis of up to 96 samples per run. Ready-to-run gel cartridges allow 96 samples to be analyzed with a minimum of hands-on interaction, reducing manual handling errors and eliminating the need for tedious gel preparation. User-friendly QIAxcel ScreenGel Software ensures convenient analysis and documentation of data.



Figure 1. The QIAxcel Advanced System.

The QIAxcel Advanced System provides:

- Rapid analysis of up to 96 samples without manual intervention
- Safety and convenience with ready-to-use gel cartridges
- Robust results for nucleic acid concentrations as low as 0.1 ng/ μ l
- Standardized and accurate analysis with a resolution down to 3–5 bp
- User-friendly analysis software that supports 21 CFR part 11 compliance

A ready-to-go solution for electrophoresis

Perform fully automated DNA fragment and RNA analysis with ready-to-run gel cartridges, allowing maximum cost efficiency and time savings.



Figure 2. QIAxcel Advanced instrument and QIAxcel ScreenGel Software.

The QIAxcel Advanced System includes:

- QIAxcel Advanced instrument
- QIAxcel ScreenGel Software
- Laptop
- Accessories



Figure 3. QIAxcel Kit.

QIAxcel Kits contain:

- Gel cartridge with 12 separation micro-channels with a built-in gel matrix
- Prepared buffers
- Handbook

Go to www.qiagen.com/online-demo to see the virtual demo!

Taking ease of use to a new level

Just a few, simple steps are required to operate the QIAxcel Advanced System: load the gel cartridge of your choice, fill and load the buffer tray, load your samples in 96-well plates or in PCR tubes or strips, select the process profile to be used — and go! Tedious gel preparation and extensive user training is eliminated, streamlining the workflow in your lab and facilitating integration of the system in your daily routine. Within minutes of starting a run, you can see the first results appearing in real time on the computer screen.

Innovative technology and gel chemistry for a wide range of applications

The QIAxcel Advanced instrument includes an array of light-emitting diodes and micro-optical collectors that latch to capillaries within QIAxcel gel cartridges. Fragments that are migrating through a gel matrix within the capillary pass excitation and detection spots and the signal is transmitted through a photomultiplier tube to the QIAxcel ScreenGel Software for data interpretation (Figure 4).

The high detection sensitivity provided by the QIAxcel Advanced instrument enables robust results even with low concentrations of nucleic acid. With a resolution of 3–5 bp for fragments smaller than 0.5 kb, the QIAxcel Advanced System ensures greater accuracy than slab-gel methods, as well as greater confidence in data interpretation. Sample consumption is less than 0.1 µl per analysis, saving your precious sample for further downstream analysis.

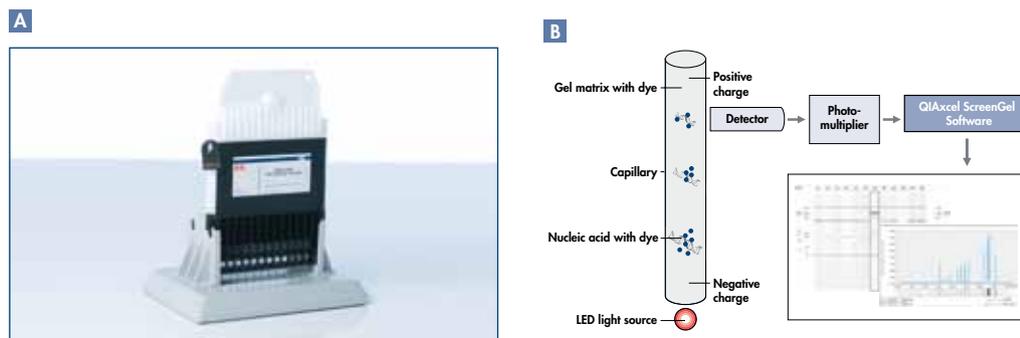


Figure 4. **A** QIAxcel gel cartridge. **B** Capillary gel electrophoresis using the QIAxcel Advanced. Nucleic acid molecules are size separated by applying a current to a gel-filled capillary, and detected as they migrate toward the positively charged terminus. The signal data pass through a photomultiplier and are converted to an electropherogram and gel image by the QIAxcel ScreenGel Software.

A range of QIAxcel Kits is available for various applications, meeting different resolution and speed requirements (Table 1).

Table 1. QIAxcel Kit specifications

QIAxcel Kit	Analyte	Size range	Best resolution				Run time/ 12 samples†
			100 bp – 500 bp	500 bp – 1 kb	1 kb – 5 kb	5 kb – 10 kb	
QX DNA High Resolution Kit	DNA	15 bp – 10 kb	3 – 5 bp	50 bp	200 – 500 bp	1 – 1.5 bp	7 – 20 min
QX DNA Screening Kit	DNA	15 bp – 5 kb	20 – 50 bp	50 – 100 bp	500 bp	–	5 min
QX DNA Fast Analysis Kit	DNA	15 bp – 3 kb	50 – 100 bp	100 – 250 bp	250 bp – 1 kb*	–	3 – 5 min
QX RNA QC Kit v2.0	RNA	15 bp – 6 kb	–	–	–	–	10 min

* Best resolution between 1–3 kb. † Run time depends on method used.

Unmatched speed of analysis

In addition to superior resolution, the QIAxcel DNA High Resolution Kit ensures significant time savings compared to high-resolution agarose gels (Figure 5). The QIAxcel DNA Fast Analysis Kit is highly suitable for routine evaluation of fragments for qualitative single or multiplex PCR applications. The use of the gel cartridge for PCR screening streamlines the workflow in your lab by minimizing analysis time for fragments of 15 bp to 3 kb in size — 96 samples are processed in approximately 25 minutes. For routine evaluation of fragments for restriction endonuclease digestion, qualitative single or multiplex PCR, and other DNA applications, we offer the QIAxcel DNA Screening Kit. The use of gel cartridges for DNA screening streamlines the workflow by minimizing analysis time for fragments of 15 bp to 5 kb in size — 12 samples can be processed within 5 minutes.

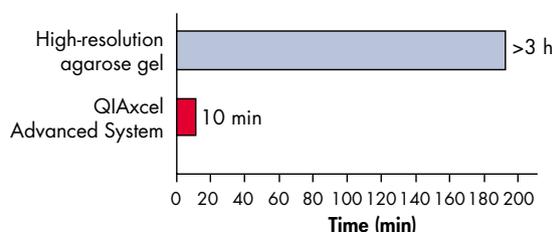


Figure 5. Reduced run times. Nucleic acid separation on the QIAxcel Advanced System, using the QX DNA High Resolution Kit takes less than 10% of the time of conventional high-resolution agarose.



Exceptional safety and convenience

Overcome the bottlenecks of slab-gel electrophoresis and enjoy greater process safety and convenience with the QIAxcel Advanced System. Hands-free sample loading and self-contained components minimize exposure to hazardous chemicals such as ethidium bromide.

Experience additional benefits such as:

- Reduced need for waste handling
- Software that supports 21 CFR part 11 compliance
- Minimal risk of error due to fewer manual steps
- Superior performance due to proven QIAGEN Quality®
- Reliability and higher sensitivity

Streamline your workflow

The QIAxcel Advanced System not only speeds up your DNA and RNA analysis by eliminating slab-gel analysis, but also contributes to streamlining your entire sample purification and analysis workflow (Figure 6). Used in combination with proven QIAGEN end-point PCR kits, the QIAxcel Advanced provides an all-in-one, pretested solution for reliable analysis of PCR fragments, ensuring reproducibility and significant time and cost savings.

For an overview of QIAGEN's comprehensive solutions for PCR and RT-PCR, visit www.qiagen.com/maximize-success.

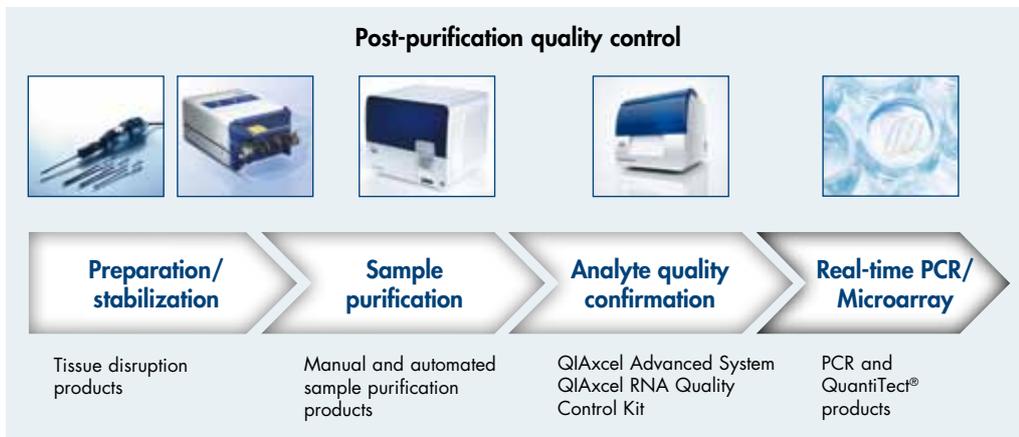
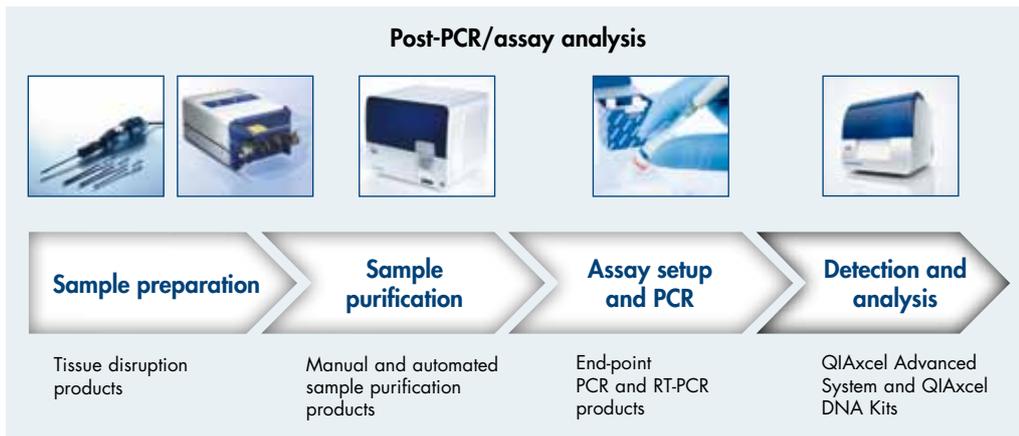


Figure 6. Streamline your workflow.

Bringing you peace of mind

QIAGEN offers unrivaled instrument support and assures continued success with your QIAxcel Advanced System. You benefit from comprehensive instrument service that fully covers costs for labor, travel, and repair parts during the warranty period. We also offer Warranty PLUS extended warranties, giving you complete cost control and enhanced coverage through priority response time.



One instrument, many applications

The QIAxcel Advanced System is a versatile solution for electrophoresis and offers a broad range of applications. Preprogrammed methods, in combination with the corresponding gel cartridges, allow separation and analysis of a variety of nucleic acids, including single or multiple PCR fragments, DNA digested with restriction endonucleases, total RNA, and cRNA. The throughput capacity of the QIAxcel Advanced System makes it highly suited for laboratories employing 96-well RNA purification technologies that need a fast solution for quality control. Unlike other commercially available devices that provide processing of only up to 12 samples at time, the QIAxcel Advanced System allows processing of all 96 samples without manual intervention.

Advantages of the QIAxcel Advanced System for bacterial genotyping

The QIAxcel Advanced System can be successfully used together with the QIAxcel DNA Screening Kit for high-throughput genotyping of bacteria. The QIAxcel Advanced System enables greater sizing accuracy and more sensitive detection than conventional agarose gel electrophoresis (Figure 7).

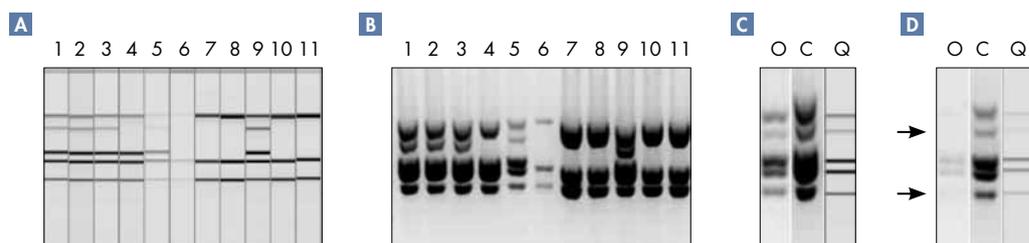
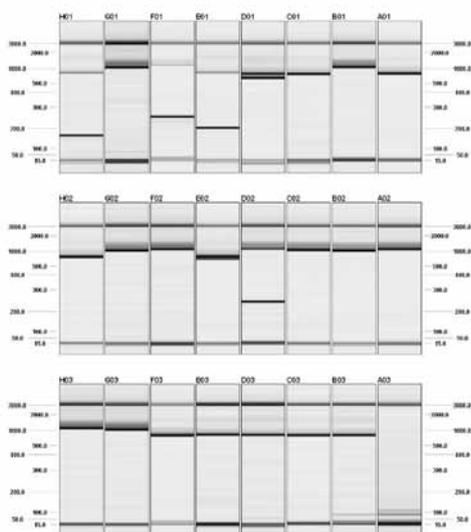


Figure 7. False negative error calls due to weak amplicons when analyzing samples by agarose gel electrophoresis. Samples were analyzed on either **A** the QIAxcel Advanced System at the original concentration or **B** by agarose gel electrophoresis with five-fold concentration. Samples 3 **C** and 5 **D** were analyzed by agarose gel electrophoresis at the original concentration (**O**), with five-fold concentration (**C**), and at the original concentration on the QIAxcel Advanced (**Q**). The arrows represent bands originally scored as negative. *Data kindly provided by Mutschall and coworkers, Laboratory for Foodborne Zoonoses, Public Health Agency of Canada, Lethbridge, Alberta, Canada.*



Fast PCR fragment analysis for typing purposes

The QIAxcel DNA Fast Analysis Kit is highly suited for routine evaluation of DNA fragments in qualitative single or multiplex PCR applications (Figure 8). The use of the QIAxcel DNA Fast Analysis cartridge for PCR screening streamlines the workflow in your lab by minimizing analysis time for fragments of 15 bp to 3 kb in size — 96 samples are processed in approximately 25 minutes.

Figure 8. Screenshot showing data from PCR fragment analysis. PCR products from a standard PCR were directly analyzed using the QIAxcel DNA Fast Analysis Kit without prior purification.

Pre-sequencing testing: Deletion/insertion analysis

The QIAxcel Advanced System has been shown to be highly suitable for pre-screening of amplicons prior to Pyrosequencing®, using the EGFR gene as a model system. All deletion mutants were detected and the corresponding deletion size was correctly scored, allowing wild-type samples to be excluded from the downstream sequencing step (Figure 9). The presented results indicate that this technology is highly applicable in insertion/deletion studies and will allow researchers to save time and costs.

Quality control of total RNA and cRNA for microarray analysis

Monitoring the integrity of the initial total RNA sample, as well as products generated throughout the entire procedure is crucial, since RNA degradation strongly influences the predictive power obtained from the microarray data. The QIAxcel Advanced System is highly suitable for analyzing the integrity of total RNA (Figure 10) and size distribution of fragmented or intact cRNA. The data shown illustrate the benefits of using the QIAxcel Advanced System and the QIAxcel RNA QC Kit v2.0 for RNA quality control before microarray analysis.

Sensitive detection of genetic mutations using a combination of multiplex PCR and capillary gel electrophoresis

Mutation analysis is performed in several areas of research, including detection and analysis of genetic differences such as identifying mutations for diagnostics, typing of disease loci, and investigating relationship and paternity patterns. Reliable multiplex PCR assays are essential for such experiments. This includes specific and sensitive co-amplification, even of low-abundance targets or targets with high GC content and secondary structures. However, establishment of sensitive multiplex PCR assays can be challenging, often requiring lengthy optimization of experimental parameters and yielding results that are not reproducible. Analysis of the multiplex PCR fragments is typically performed on an agarose gel or a capillary electrophoresis-based DNA sequencer, which is time consuming. With agarose gels, handling is difficult and not standardized for routine applications. The Type-it® Mutation Detect PCR Kit and the QIAxcel Advanced System provide a rapid and straightforward standardized procedure for multiplex analysis of mutations (Figure 11).

Figure 11. Sensitive detection of a mutated cancer-related gene. The indicated amounts of DNA extracted from a lymphoma related cell line (Ramos) were spiked into human leukocyte DNA and the mutated Ramos target was detected together with 2 internal controls. Using the Type-it Mutation Detect PCR Kit, the mutated gene was detected even when only 25 pg of DNA was present. **A** Electrophoresis was performed on a 1.3% agarose gel. **B** Electrophoresis was performed on the QIAxcel Advanced System using the QIAxcel High Resolution Kit. **M**: 100 bp ladder.

A1 A2 A3 A4 A5 A6 A7 B4

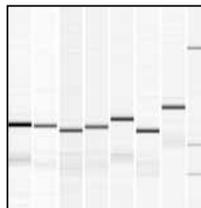


Figure 9. Analysis of PCR fragments after amplification of the indicated EGFR region using samples with known deletions versus a wild-type sample.

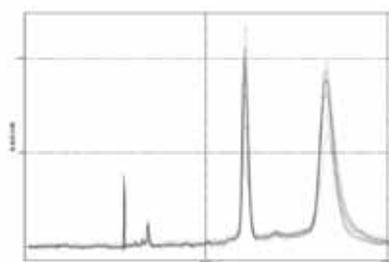
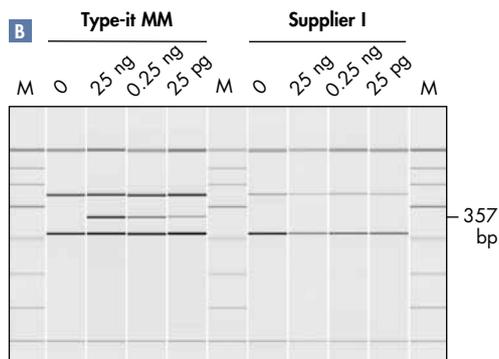
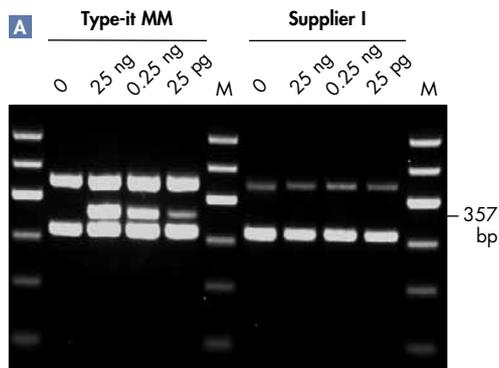


Figure 10. Analysis of purified RNA on the QIAxcel Advanced System. Electropherogram views of purified total RNA. Data kindly provided by D. van Leenen, Microarray Facility, University Medical Center Utrecht, The Netherlands.



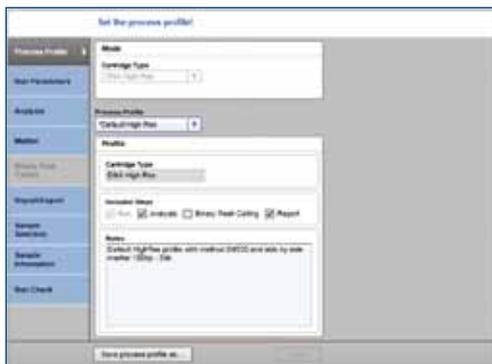


Figure 12. Process profiles simplify and standardize data collection and analysis.

New QIAxcel ScreenGel Software — a new level of convenience

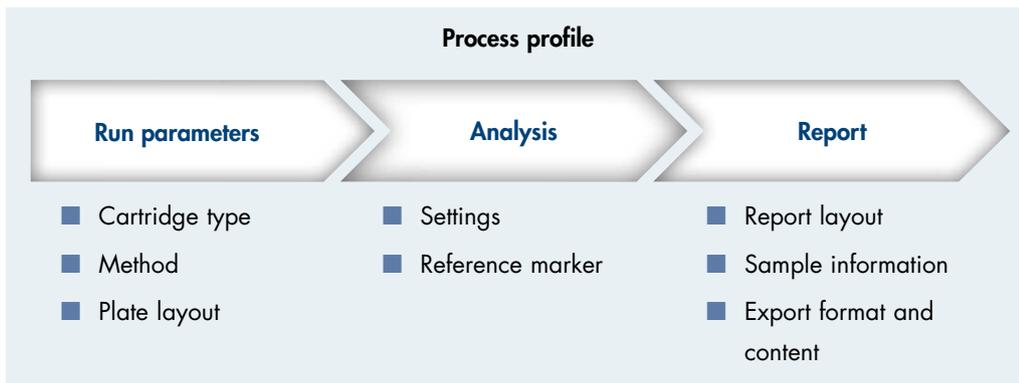
QIAxcel ScreenGel Software, specifically developed for use with the QIAxcel Advanced System, is a powerful and user-friendly tool for data collection and analysis. Interactive tools simplify analysis, facilitate rapid data interpretation, and provide flexibility with data and results displayed in both electropherogram and gel image formats. Results can be viewed individually or displayed as overlay views for sample and data comparison. All-in-one analysis for multiple data sets simplifies evaluation. A unique algorithm calculates and generates a tabular display of a variety of peak properties, including number of peaks as well as the size, height, width, and area of each peak. Comprehensive data reports can be easily generated and saved or exported to meet individual documentation needs. Complete process profiles for standardized sample processing — from running samples to data analysis, generating reports and exporting data — minimize the need for additional training for users (Figure 12).

Benefits of the QIAxcel ScreenGel Software:

- User management options prevent unauthorized access
- Guided run setup and convenient analysis
- Intuitive use with drag-and-drop navigation
- Effortless, customized documentation of results saves time
- Electronic data documentation supporting 21 CFR part 11 compliance

Process profiles allow you to:

- Predefine the entire workflow
- Reduce software interaction to a minimum
- Standardize your routine applications
- Reduce handling errors to a minimum



Easy setup and start

Starting your experiment is easy using the Process Wizard (Figure 13). This convenient feature enables guided setup and allows you to define run parameters and preselect DNA size markers. Reagent lot number information can be included and samples can be selected with a single click of the mouse. Run checks can also be easily performed.

Your experiment at a glance

Experiment Explorer allows users to display and analyze samples according to individual preferences. Samples can be easily selected with just a click of the mouse. Simple drag-and-drop features can be used to visualize samples. A high degree of flexibility enables multiple data sets to be combined. Versatile analysis features allow convenient processing of data. As an additional safety feature for setting up of a reference marker table and subsequent sample size determination, optical comparison of expected fragment pattern versus detected fragment pattern is possible and automatic alerts are generated if fragments are missing.

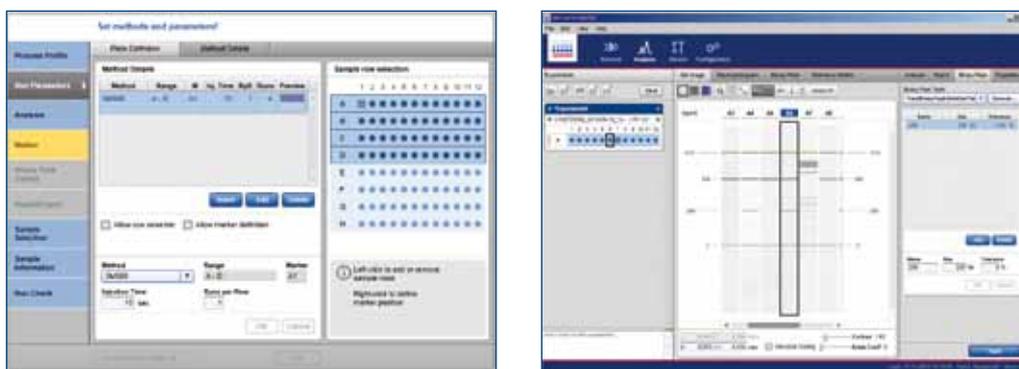


Figure 13. Easy-to-use software features.



Figure 14. Convenient documentation.

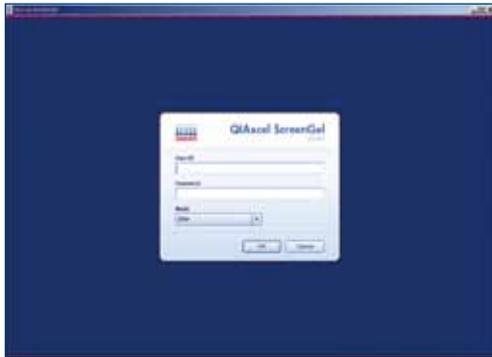


Figure 15. Password-protected login.

Effortless, customized documentation of results and convenient data import and export

The software enables configurable reports to be generated (Figure 14). Cartridge ID and calibration status can be included and data can be electronically documented. Data are available in **.csv** and **.xml** formats, enabling easy transfer to other databases and systems such as LIMS.

Support of 21 CFR part 11 compliance

QIAxcel ScreenGel Software includes specific features that support the technical requirements of 21 CFR Part 11 regulations. Security features such as the following are available:

- Password-protected login to prevent unauthorized access and data manipulation
- Audit trail documentation for configuration files and system events
- Automatic saving and archiving of write-protected raw data

Secure user management

Different user profiles are available (Routine, Basic, Advanced, Admin) and are password protected (user login is required) for increased security. A simplified interface minimizes the need for user training and makes the software especially attractive to inexperienced users.

Discover the QIAxcel world at www.qiagen.com/online-demo

Ordering Information

Product	Contents	Cat. no.
QIAxcel Advanced System	Capillary electrophoresis device, including computer and QIAxcel ScreenGel Software, 1-year warranty on parts and labor	9001941
Warranty PLUS 2 Basic, QIAxcel Advanced	3-year warranty, 5-working day response time, all labor, travel, and repair parts	9241202
QIAxcel DNA High Resolution Kit (1200)*	QIAxcel DNA High Resolution Gel Cartridge, Buffers, Mineral Oil, QX Intensity Calibration Marker, 12-Tube Strips	929002
QIAxcel DNA Screening Kit (2400)*	QIAxcel DNA Screening Gel Cartridge, Buffers, Mineral Oil, QX Intensity Calibration Marker, 12-Tube Strips	929004
QIAxcel DNA Fast Analysis Kit (3000)	QIAxcel DNA Fast Analysis Cartridge, Buffers, Mineral Oil, QX Intensity Calibration Marker, QX DNA Size Marker 50 bp – 1.5 kb, QX Alignment Marker 15 bp/3 kb, 12-Tube Strips	929008
QIAxcel RNA Quality Control Kit v2.0 (1200)	QIAxcel RNA Quality Control Cartridge, Buffers, Mineral Oil, QX Intensity Calibration Marker, QX RNA Alignment Marker, QX RNA Size Marker 200–6000 nt, QX RNA Denaturation Buffer, 12-Tube Strips	929104
QIAxcel ScreenGel Software	Separate license for use of QIAxcel ScreenGel software on an additional computer	9021163
QIAxcel ScreenGel Software (10)	Ten licenses for use of QIAxcel ScreenGel software on additional computers	9021165

* QX DNA Size Markers and QX Alignment Marker are not provided with the QIAxcel DNA High Resolution Kit or the QIAxcel DNA Screening Kit and need to be ordered separately.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Visit www.qiagen.com/instrument-benefits and discover how the QIAxcel Advanced System can benefit your electrophoresis applications!

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Brazil = Orders 0800-557779 = Fax 55-11-5079-4001 = Technical 0800-557779

Canada = Orders 800-572-9613 = Fax 800-713-5951 = Technical 800-DNA-PREP (800-362-7737)

China = Telephone 86-21-3865-3865 = Fax 86-21-3865-3965 = Technical 800-988-0325 or 400-880-0325

Denmark = Orders 80-885945 = Fax 80-885944 = Technical 80-885942

Finland = Orders 0800-914416 = Fax 0800-914415 = Technical 0800-914413

France = Orders 01-60-920-920 or 0800-912965 = Fax 01-60-920-925 = Technical 01-60-920-930 or 0800-912961

Germany = Orders 02103-29-12000 = Fax 02103-29-22000 = Technical 02103-29-12400

Hong Kong = Orders 800 933 965 = Fax 800 930 439 = Technical 800 930 425

India = Orders 91-11-43184444 = Fax 91-11-43184445

Ireland = Orders 1800-555-049 = Fax 1800-555-048 = Technical 1800-555-061

Italy = Orders 800-789 544 = Fax 02-334304-826 = Technical 800-787980

Japan = Telephone 03-6890-7300 = Fax 03-5547-0818 = Technical 03-6890-7300

Korea (South) = Orders 080-000-7146 = Fax 02-2626-5703 = Technical 080-000-7145

Luxembourg = Orders 8002-2076 = Fax 8002-2073 = Technical 8002-2067

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Spain = Orders 091-630-7050 = Fax 091-630-5145 = Technical 091-630-7050

Sweden = Orders 020-790282 = Fax 020-790582 = Technical 020-798328

Switzerland = Orders 055-254-22-11 or 0800-897470 = Fax 055-254-22-13 = Technical 055-254-22-12 or 0800-837160

UK = Orders 01293-422-911 or 0808-2343665 = Fax 01293-422-922 = Technical 01293-422-999 or 0808-2343974

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