November 2021

QIAxpert®
User Manual

For use with QIAxpert and QIAxpert Software v 2.4

Sample to Insight

QIAGEN

Contents

Introduction 7
About this user manual 7
General information 8
Technical assistance 8
Policy statement 8
Intended use of the QIAxpert 8
Requirements for QIAxpert users 9
Safety Information 10
Proper use 10
Electrical safety 11
Biological safety 12
Samples 12
Chemical safety 13
Toxic fumes 13
Waste disposal 13
Mechanical hazards 14
Maintenance safety 14
Symbols on the QIAxpert 15
General Description 16
QIAxpert principle 16
Measurement features of the QIAxpert 16
Measurement modes 16
Measurement methods and applications 17
Processing of the absorption spectrum 17
Spectral content profiling 19
Determining bacterial growth 20
The QIAxpert slide 21
External features of the QIAxpert 23
Power supply 23

Installation Procedures....24
Unpacking the QIAxpert....24
Moving the QIAxpert....26
Installing the QIAxpert....26
Site requirements....26
Power requirements....27
Grounding requirements....27
Powering up the QIAxpert....27
Calibration and testing the QIAxpert....27
Steps before sample measurement....29
QIAxpert Software....30
Description of icons and buttons....30
Main menu....33
Creation of sample information import files....35
Importing sample information from a USB device....36
Importing sample information from the network....37
Measurement applications (apps)....37
Classic UV/VIS quantification apps....38
Spectral content profiling of biomolecule samples....40
Measurement results....42
Measurement results window....43
Slide overview....43
Details of spectral curves....45
Sample results for spectral content profiling....46
Classic UV/VIS results display....46
The Experiment list....48
Exporting data....49
Exporting data to USB....50
Exporting data to a network....50
Folders and file types....51
Exporting data by scanning the QR Code....54

Saving the blank 55
Settings and configuration 56
User settings 57
Application settings 58
Import/export settings 58
Network settings 60
Stored blanks 61
Regional settings 61
Tools 62
QIAGEN service settings 63
Operating Procedures 64
Sample measurement 64
Loading samples into the slide 64
Setting up the measurement 65
Applying a stored blank to an analysis 67
Loading the slide into the instrument 68
Entering sample information 68
Selecting the app 70
Measurement and analysis 70
Exporting results 71
Sample recommendations 71
Sample homogeneity 71
Buffer interference 72
Blank 72
Sample volume requirements 73
Manual loading of samples to the slide 73
General recommendations for sample handling 74
Maintenance Procedures 76
Cleaning the QIAxpert 76
Periodic maintenance 77
Calibration 77

Performance checks 79
Automatic system performance check 79
OD Check app 80
Troubleshooting 83
General troubleshooting 83
Example results showing problems 83
Error codes/messages 85
Applications 85
Database 86
Application/protocol 86
Device 87
Glossary 90
Appendix A – Informations de sécurité 91
Utilisation appropriée 91
Sécurité électrique 92
Sécurité biologique 94
Échantillons 94
Sécurité chimique 95
Vapeurs toxiques 95
Mise au rebut des déchets 95
Dangers mécaniques 95
Sécurité de maintenance 96
Symboles sur le QIAxpert 97
Appendix B – Sicherheitshinweise 98
Sachgemäße Handhabung 99
Schutz vor Stromschlag 100
Biologische Sicherheit 101
Proben 101
Chemikalien Sicherheit 102
Giftige Dämpfe 102
Entsorgen von Abfällen 102

Gefahren durch mechanische Teile 103
Sicherheitshinweise für Wartungsarbeiten 103
Symbole auf dem QIAxpert 104
Appendix C – Technical Data 105
Environmental conditions 105
Operating conditions 105
Transportation conditions 105
Storage conditions 105
Mechanical data and hardware features 106
QIAxpert system technical specifications 106
QIAxpert Slide-40 specifications 107
Declaration of conformity 108
Waste Electrical and Electronic Equipment (WEEE) 109
FCC declaration 109
Appendix D – QIAxpert Accessories 111
Ordering Information 111
Appendix E – Legal Information 112
Warranty statement 112
Liability clause 112
Index 114
Document Revision History 116

Introduction

Thank you for choosing the QIAxpert system. We are confident it will become an integral part of your laboratory.

Before using the QIAxpert, it is essential that you read this user manual carefully and pay particular attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation of the instrument and to maintain the instrument in a safe condition.

About this user manual

This user manual provides information about the QIAxpert in the following sections:

- Introduction
- Safety Information
- General Description
- Installation Procedures
- QIAxpert Software
- Operating Procedures
- Maintenance Procedures
- Troubleshooting Guide
- Glossary
- Appendices
- Index

The appendices include the following:

- French (FR) translation of Safety Information
- German (DE) translation of Safety Information
- Technical data and QIAxpert technical specifications
- Waste Electrical and Electronic Equipment
- FCC declaration
- Warranty terms
- Ordering information

General information

Technical assistance

At QIAGEN® we pride ourselves on the quality and availability of our technical support. Our Technical Services Departments are staffed by experienced scientists with extensive practical and theoretical expertise in sample and assay technologies and the use of QIAGEN products. If you have any questions or experience any difficulties regarding the QIAxpert or QIAGEN products in general, do not hesitate to contact us.

QIAGEN customers are a major source of information regarding advanced or specialized uses of our products. This information is helpful to other scientists as well as to the researchers at QIAGEN. We therefore encourage you to contact us if you have any suggestions about product performance or new applications and techniques.

For technical assistance and more information, please see our Technical Support Center at **www.qiagen.com/goto/TechSupportCenter** or call one of the QIAGEN Technical Service Departments or local distributors (see back cover or visit **www.qiagen.com**).

For up-to-date information about the QIAxpert, visit **https://www.qiagen.com/QIAxpert.**

Policy statement

It is the policy of QIAGEN to improve products as new techniques and components become available. QIAGEN reserves the right to change specifications at any time.

In an effort to produce useful and appropriate documentation, we appreciate your comments on this user manual. Please contact QIAGEN Technical Services.

Intended use of the QIAxpert

The QIAxpert is intended for molecular biology applications. This product is not intended for the diagnosis, prevention, or treatment of a disease.

The QIAxpert is designed for ultraviolet-visible (UV/VIS) quantification of small volume samples. The system is not intended to be used for other applications.

The QIAxpert instrument is intended for use by professional users trained in molecular biology techniques and the operation of the QIAxpert instrument.

Requirements for QIAxpert users

This table covers the general level of competence and training necessary for transportation, installation, use, maintenance, and servicing of the QIAxpert.

Task	Personnel	Training and experience
Delivery	No special requirements	No special requirements
Installation	Laboratory technicians or equivalent	Appropriately trained and experienced personnel
Routine use and maintenance	Laboratory technicians or equivalent	Appropriately trained and experienced personnel
Servicing	QIAGEN service personnel or service technicians of an authorized agent	Trained and authorized by QIAGEN

Safety Information

Before using the QIAxpert system, it is essential that you read this user manual carefully and pay particular attention to the safety information. The instructions and safety information in the user manual must be followed to ensure safe operation of the QIAxpert and to maintain the QIAxpert in a safe condition.

Note: Translations of the Safety Information in French and German are available in Appendix A and Appendix B.

The following types of safety information appear throughout this user manual.

WARNING	The term WARNING is used to inform you about situations that could result in **personal injury** to you or other persons. Details about these circumstances are given in a box like this one.

CAUTION	The term CAUTION is used to inform you about situations that could result in **damage to the instruments** or other equipment. Details about these circumstances are given in a box like this one.

The advice given in this manual is intended to supplement, not supersede, the normal safety requirements prevailing in the user's country.

Proper use

WARNING/ CAUTION	**Risk of personal injury and material damage** [W1] Improper use of the QIAxpert may cause personal injuries or damage to the instrument. The QIAxpert must only be operated by appropriately trained and experienced personnel. Servicing of the QIAxpert must only be performed by QIAGEN service personnel or service technicians of an authorized agent.

WARNING/ CAUTION	**Risk of personal injury and material damage** Do not attempt to move the QIAxpert during operation.	[W2]

WARNING/ CAUTION	**Explosive atmosphere** The QIAxpert is not designed for use in an explosive atmosphere.	[W3]

CAUTION	**Damage to the instrument** Direct sunlight may bleach parts of the instrument and cause damage to plastic parts. The QIAxpert must be located out of direct sunlight.	[C1]

CAUTION	**Damage to the instrument** Avoid spilling water or chemicals onto the QIAxpert. Damage caused by water or chemical spillage will void your warranty.	[C2]

In case of emergency, switch off the QIAxpert at the power switch and unplug the power supply from the power outlet.

Electrical safety

Note: Disconnect the line power outlet before servicing.

WARNING	**Electrical hazard** Any interruption of the protective conductor (earth/ground lead) inside or outside the instrument or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption is prohibited. **Lethal voltages inside the instrument** When the instrument is connected to line power, terminals may be live. Opening covers or removing parts is likely to expose live parts.	[W4]

CAUTION	**Damage to the instrument** [C5]
	Only IEC-60950 or IEC-61010 certified circuits are allowed to be connected to the QIAxpert device.

To ensure satisfactory and safe operation of the QIAxpert follow the guidelines below:

- The line power cord must be connected to a line power outlet that has a protective conductor (earth/ground).
- Do not adjust or replace internal parts of the instrument.
- Do not operate the instrument with any covers or parts removed.
- If liquid has spilled inside the instrument, switch off the instrument, disconnect it from power outlet, and contact QIAGEN Technical Services.
- When replacing the main fuse, replace only with the type and current rating specified on the rating label.
- Only use the provided power supply and main supply cord. For replacements contact QIAGEN Technical Service.
- Use of wrong power supply may cause fire due to overheating.
- If the instrument becomes electrically unsafe, prevent other personnel from operating it, and contact QIAGEN Technical Services. The instrument may be electrically unsafe when:
  - The line power cord appears to be damaged.
  - It has been stored for a prolonged period of time in conditions which are outside of the "Storage conditions", outlined in Appendix C.
  - It has been subjected to severe transport stresses.

Biological safety

Samples

Samples may contain infectious agents. You should be aware of the health hazard presented by such agents, and should use, store, and dispose of such samples according to the required safety regulations.

WARNING	**Samples containing infectious agents** [W5] QIAxpert is not intended for use with biological samples or infectious agents classified as WHO risk groups 3 and 4. Some samples, designated as WHO risk group 2, which are used with this instrument, may contain infectious agents. Handle such samples with the greatest of care and in accordance with the required safety regulations. Always wear safety glasses, 2 pairs of gloves, and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are not exposed to hazardous levels of infectious agents as defined in the applicable Safety Data Sheets (SDSs) or OSHA*, ACGIH†, or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state, and local health and safety regulations and laws.

Chemical safety

WARNING/ CAUTION	**Hazardous chemical substances** [W6] Some chemicals used with this instrument may be hazardous or may become hazardous after completion of the protocol run. Handle such samples with the greatest of care and in accordance with the required safety regulations. Always wear safety glasses, gloves and a lab coat. The responsible body (e.g., laboratory manager) must take the necessary precautions to ensure that the surrounding workplace is safe and that the instrument operators are not exposed to hazardous levels of toxic substances (chemical and biological) as defined in the applicable Safety Data Sheets (SDSs) or OSHA*, ACGIH† or COSHH‡ documents. Venting for fumes and disposal of wastes must be in accordance with all national, state and local health and safety regulations and laws.

* OSHA: Occupational Safety and Health Administration (United States of America).
† ACGIH: American Conference of Government Industrial Hygienists (United States of America).
‡ COSHH: Control of Substances Hazardous to Health (United Kingdom).

Toxic fumes

If working with volatile solvents or toxic substances, you must provide an efficient laboratory ventilation system to remove vapors that may be produced.

Waste disposal

Used plasticware may contain hazardous chemicals, or contagious/biohazardous materials. Such wastes must be collected and disposed of properly according to local safety regulations.

For disposal of waste electrical and electronic equipment (WEEE), see page 109.

Mechanical hazards

To ensure satisfactory and safe operation of the QIAxpert, follow these guidelines:

- Use only recommended consumables/slides.

Maintenance safety

Perform the maintenance as described in “Maintenance Procedures”. QIAGEN charges for repairs that are required due to incorrect maintenance.

WARNING/ CAUTION	**Risk of personal injury and material damage** Only perform maintenance that is specifically described in this user manual.	[W7]

WARNING/ CAUTION	**Risk of electric shock** Do not open any panels on the QIAxpert.	[W8]

CAUTION	**Damage to the instrument** Do not use solvents, or reagents containing acids, alkalis, or abrasives to clean the QIAxpert.	[C3]

CAUTION	**Damage to the touchscreen and computer** Do not pour or spray liquids, e.g., cleaning agents, on to the QIAxpert. Use a tissue moistened with water only for cleaning.	[C4]

Symbols on the QIAxpert

Symbol	Location	Description
CE	Type plate on the back of the instrument	CE mark for European Conformity
C US	Type plate on the back of the instrument	CSA listing mark for Canada and the USA
	Type plate on the back of the instrument	Legal manufacturer
	Type plate on the back of the instrument	Waste Electrical and Electronic Equipment (WEEE) mark for Europe
FC	Type plate on the back of the instrument	FCC mark of the United States Federal Communications Commission
	Type plate on the back of the instrument	RCM mark for Australia (supplier identification N17965)
25	Type plate on the back of the instrument	RoHS mark for China (the restriction of the use of certain hazardous substances in electrical and electronic equipment)

General Description

The QIAxpert is a stand-alone reader designed for measuring the UV/VIS absorption spectrum of microliter-sized liquid samples in a manual workflow. The quantity and quality of biomolecules such as DNA, RNA, and proteins are calculated from the measured absorption spectrum.

QIAxpert principle

The QIAxpert contains all hardware and software to measure DNA, RNA, or protein samples and to save and export experiment data. A single-channel spectrometer reads the UV/VIS absorption spectra. A pump and manifold unit transfer the sample in the microfluidic QIAxpert Slide from storage to the microcuvettes, and a mechanical X-Y-Z stage moves the slide inside the instrument. Up to 16 samples can be loaded into a QIAxpert slide at a time to be processed in one run. The minimal read time for a full Slide-40 is approximately 2 minutes. Unused wells can be used at a later time.

The integrated 7 inch (17.8 cm) color touchscreen gives the user access to the QIAxpert software. The software is designed to define and start an experiment in an easy way by protocol selection. After the read, the sample analysis results are displayed on the screen.

QIAxpert Slides are microfluidic plastic disposables, allowing fast and reliable quantification of 2 µl liquid samples. On-board capillary channels preserve the samples after pipetting for up to 2 hours and allow sample preparation away from the QIAxpert. See Appendix D for ordering information.

Measurement features of the QIAxpert

Measurement modes

The concentration of substances is calculated from the absorption using the Beer-Lambert Law:

$$OD = \varepsilon * C * L$$

"OD" is the optical density (or absorbance) and is defined as log (P_O/P) where P_O is the power of a beam of monochromatic radiation and P is the value of the beam decreased as a result of absorption. The symbol "ε" represents the extinction coefficient (material dependent). "C" is the concentration of the substance, and "L" is the path length of the beam passing through the sample.

The on-board software includes two methods for sample quantification.

Classic absorbance-based quantification

This method uses the value of A_{260} for quantification of nucleic acids or the A_{280} peak for protein quantification. Absorbance ratios (A_{260}/A_{280} and A_{260}/A_{230}) are shown for purity analysis.

Determining protein concentration

To determine the protein concentration of your sample, measure the absorbance at the wavelength of 280 nm (e.g., with the app A280 Protein). Using the Beer-Lambert law and the specific extinction coefficient (ε) of your protein of interest, the concentration (C) is calculated in mol/L as:

$C = OD / (\varepsilon * L)$; with L = 0.5 mm.

Spectral content profiling

For a robust purity assessment and reliable quantification, the on-board software has a superior UV/VIS-based quantification using advanced analytics to differentiate the DNA, RNA, or impurities fractions by analyzing the full spectral curve.

Measurement methods and applications

Processing of the absorption spectrum

QIAxpert measures the power spectrum of the light beam. This is the spectral content of the light passing through the disposable cuvette. This spectrum is given by:

$$Psample = Plamp * Tcuvette$$

"*Plamp*" is the power spectrum of the lamp, and "*Tcuvette*" is the transmission of the measurement reservoir of the cuvette. This transmission includes the absorption of the sample in the measurement reservoir (if reservoir is not empty).

The QIAxpert software calculates the transmission spectrum of the samples in the cuvette from the power spectra of the filled and empty measurement reservoirs.

In the first step, a stray-light correction is applied to the power spectrum. This allows the measurement range to be extended to higher maximal concentrations. From this corrected power spectrum, the transmission spectrum of the sample is calculated.

$$\mathrm{Tsample} = \frac{Psample, filled}{Psample, empty}$$

This allows compensation for the transmission properties of the empty cuvette.

The next step is calculating the intrinsic absorption of the substance by dividing the transmission spectrum by the transmission of the blank sample. Dividing by the blank allows compensating the intrinsic absorption of the buffer. In the same step the OD is calculated:

$$\mathrm{OD} = \log \frac{Tsample}{Tblank}$$

In most cases, the blank (or buffer) has little or no absorption. However, there are exceptions. For example, TE-type buffers have a non-negligible absorption in the UV range.

For classic UV/VIS measurements we recommend running a blank with the samples to be analyzed. For the UV/VIS application, the elution/storage buffer should be used as a blank.

Do not use sample storage buffer as the blank for spectral content profiling analyses. Required corrections for spectral content profiling are performed via an automatic blanking by the system. You may alternatively use pure water (ddH_2O) as the blank. Refer to "Blank", page 72, for more details.

Note: If no blank is used, or if the blank cannot be analyzed, the system performs an automatic blanking. This is a software-based correction that compensates for effects or noise (e.g., from plastic absorbance or scatter from imperfections or dust on the slide).

In the final step, the OD is converted to OD10mm via this formula:

$$\mathrm{OD10mm} = OD \frac{\mathrm{10mm}}{\mathrm{pathlength}}$$

The concentration and other quality factors are calculated from the OD_{10mm} spectrum. This requires a reference wavelength and a concentration factor.

For example, for dsDNA the reference wavelength is 260 nm and the concentration factor is 50 ng/µl per $OD_{10\ mm}$

$$\mathrm{C} = \mathrm{OD10mm} * \mathrm{concentration_factor}$$

The concentration factor is derived from the Beer-Lambert Law (see above):

$$\mathrm{OD} = \varepsilon * \mathrm{C} * \mathrm{L}$$

OD is the absorbance at a particular wavelength, ε is the extinction coefficient, C is the concentration, and L is the path length of the measurement cuvette.

Spectral content profiling

The aim of the spectral content profiling applications on the QIAxpert is to enable accurate, dye-free quantification of a complex sample containing multiple UV/VIS-absorbing chemicals that may interfere with the A_{260} or A_{280} absorbance methods.

Specific spectral profiling applications ("apps") have been designed specifically for nucleic acids that have been purified using QIAGEN chemistries. Apps are available for:

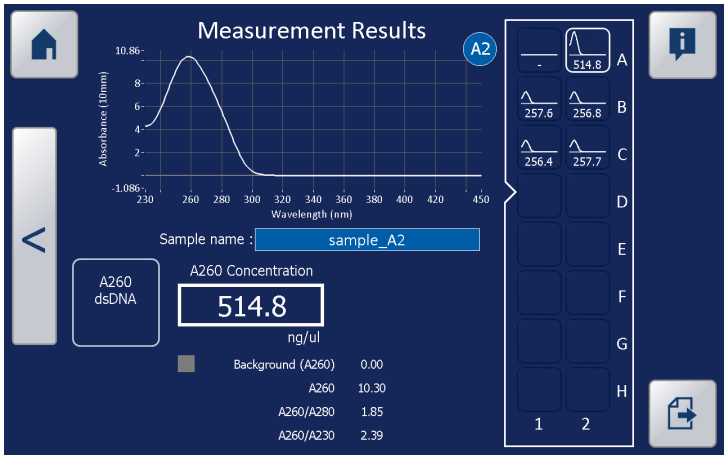
- Mammalian genomic DNA (gDNA) purified with QIAamp® or QIAsymphony® technology (DNA QIAamp or DNA QIAsymphony app)
- PCR amplicons purified with QIAquick® technology (PCR QIAquick app)
- Total RNA purified with RNeasy® technology (RNA RNeasy app)
- Human whole blood RNA purified with PAXgene® Blood RNA technology (PAXgene RNA app)

Additionally, general spectral profiling applications are available that have been designed for non-QIAGEN purification chemistry or for samples where no specific app is available:

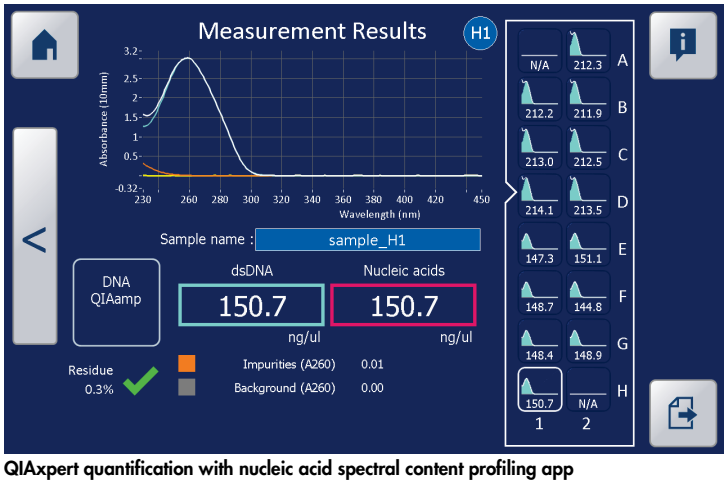
- Mammalian gDNA purified with other than the above mentioned purification chemistry (DNA Mamm. app)
- Plant DNA purified from plant specimens (DNA Plant app)
- PCR amplicons purified with other than the above mentioned purification chemistry (Purified PCR app)
- Total RNA purified with other than the above mentioned purification chemistry (RNA app)
- RNA purified from FFPE specimens (RNA FFPE app)

These apps use state-of-the-art software algorithms to extract the contribution of specific components in a mixture from the measured UV/VIS spectrum. The principle is based on Beer's law for mixtures. This states that the absorption spectrum of a mixture is a linear combination of the spectra of the constituents.

Using reference spectra, the inverse solution of decomposing a measured spectrum in a linear combination of spectra originating from its constituents is used to determine concentrations of a mixture's components. The contribution of the profile of the molecule of interest (e.g., DNA or RNA), together with the residual profile of impurities and sample turbidity, can be accurately determined within the recorded spectrum.



QIAxpert results of traditional A_{260} nucleic acid quantification



QIAxpert quantification with nucleic acid spectral content profiling app

Determining bacterial growth

It is possible to determine the bacterial growth with the QIAxpert using the QIAxpert slide.

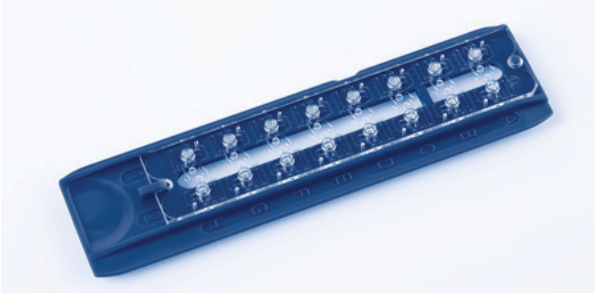
For this, measure the absorbance at the wavelength of 600 nm at given time points, for example, using the app UV/VIS. Plot the absorbance values against time to identify the different phases of bacterial growth (lag phase, exponential phase, stationary phase, and death phase).

The QIAxpert slide

The QIAxpert disposable slide is made of advanced technical plastics allowing high optical transmission over the UV/VIS spectrum from 230 to 750 nm with high accuracy.

The basic parts of the disposable slide are:

- Conical-shaped input wells
  The wells are positioned with a 9 mm pitch suitable for multi-channel pipettors.
- Storage channel
  Once a sample droplet is dispensed into the input well, the fluid is immediately taken up by the storage channel through capillary forces. Evaporation of the sample is strongly suppressed and the risk of cross contamination is reduced. This allows sample preparation away from the QIAxpert while conserving samples in the disposable slide for up to 2 hours prior to read out.
- Optical readout microcuvette
  The capillary storage channel is connected further downstream with a microcuvette for optical readout. The cuvettes have a fixed path length.
- Vent hole
  The microfluidic channel continues via a small channel towards the vent hole, to which the QIAxpert instrument connects its vacuum pressure system.



QIAxpert Slide-40

Note: It is not recommended to use the slide disposables after the expiry date as the proper functioning of the QIAxpert slide is no longer guaranteed. Please use the disposable before the end of the month indicated on the expiry date label on the box containing the QIAxpert slides.

Specifications of the QIAxpert Slide-40 are given in the following table and in Appendix C.

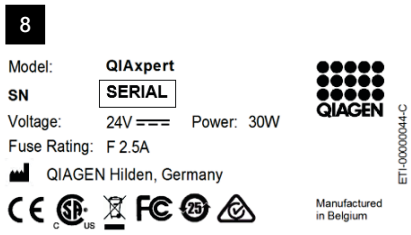
Specification	Value
Path length of measurement cuvette	0.5 mm path
Sample input volume	2 µl*
Sample residence time	2 h
Measurement range ($OD_{10\ mm}$)†	0.03 to 40 $OD_{10\ mm}$†
DNA concentration range	1.5 ng/µl up to 2000 ng/µl dsDNA (A_{260})

* Check the accuracy of the pipet and pipet tips to avoid loading incorrect sample volumes, which could result in faulty analyses or inaccurate results.
† The OD is the optical absorption measured by the instrument. The $OD_{10\ mm}$ is the OD calculated from the measured OD as if the path length is 10 mm (= the path length of a standard cuvette).

External features of the QIAxpert

QIAxpert front view

QIAxpert rear view



Label on rear

1 Touchscreen

2 Slide entrance gate

3 USB port, front (for data export)

4 USB port, rear

5 Power switch ("0" marks the OFF position of the power switch; "I" marks the ON position of the power switch)

6 TCP/IP interface

7 24V DC power plug (for power supply cord)

8 Label with model-name, serial number of the instrument, rated voltage and power, fuse rating, manufacturing and regulatory markings

"⎓": Symbol for direct current

Power supply

The QIAxpert instrument uses an external AC/DC power supply that is included in the shipment. The power supply input has a wide voltage range from 100–240V AC. The 24V power supply that plugs in to the QIAxpert enables connection of the instrument to a power outlet.

Installation Procedures

Unpacking the QIAxpert

1. Before unpacking the QIAxpert, check whether the package is damaged.

   In case of damage, contact the delivery service of the package.

2. Open the cardboard box containing the instrument.

   First remove the accessory box, then the top foam.

3. Lift the QIAxpert instrument together with the lower foam shapes out of the transportation box and place on a stable surface.

4. Remove the foam shapes and take off the protective plastic cover.

5. Retain the package in case you need to transport the QIAxpert in the future. Using the original packaging minimizes damage during transportation.

   After unpacking the QIAxpert, check that the following items are supplied:

   - QIAxpert instrument
   - Accessory box containing:
     - USB device
     - Power supply and power cord set
     - CD with **.pdf** of *QIAxpert User Manual*
     - *QIAxpert Calibration Instructions* for installation, calibration and testing
     - *QIAxpert Quick Start Guide* for sample measurement
     - Positioning and wavelength accuracy calibration tools

   If anything is missing, contact QIAGEN Technical Services.

   Note: QIAxpert slides are not included in the package and must be ordered separately. See Appendix D for details.

6. Check that the QIAxpert is not damaged.

   If anything is damaged, contact QIAGEN Technical Services.

   Note: Make sure that the QIAxpert has equilibrated to ambient temperature before operating it.

Moving the QIAxpert

Always carry the QIAxpert with both hands below the base of the instrument.

Note: The QIAxpert requires recalibration after transportation. Follow the procedure described in the *QIAxpert Calibration Instructions*.

Installing the QIAxpert

Site requirements

Place the QIAxpert on a flat, stable surface, and ensure that there is sufficient space around and under the instrument for ventilation. Leave some space at the rear of the instrument for the power switch, power supply and USB connection.

The QIAxpert is for indoor use only under the following conditions (see also Appendix C):

- Room temperature within the range of 15 to 35°C (59 to 95°F)

- Up to 2000 m (6500 ft) above mean sea level (MSL)
- Relative humidity max. 75% (noncondensing)
- Pollution level 2

Power requirements

The power line to the QIAxpert should be voltage-regulated and surge-protected.

The power supply of the QIAxpert is compatible with voltages of 100–240 V AC.

Make sure that the voltage rating of the QIAxpert power supply is compatible with the AC voltage available at the installation site.

Grounding requirements

To protect operating personnel, the National Electrical Manufacturers' Association (NEMA) recommends that the QIAxpert be correctly grounded (earthed). The power supply should be plugged into an AC power outlet that has a ground (earth) connection.

Powering up the QIAxpert

Plug in the QIAxpert power supply.

Power up the QIAxpert by moving the power switch to the "On" position. The power switch is located at the rear of the instrument.

The QIAxpert will start up, a system check will be performed, and the home screen will open with the main menu (see "Main menu", page 33).

Calibration and testing the QIAxpert

Before its first use, the QIAxpert requires calibration of the touchscreen sensitivity (only valid for instruments with serial number <201123), pump system, motor positioning, and wavelength accuracy. We recommend recalibrating the instrument annually or after transport.

Touchscreen sensitivity calibration: With the new QIAxpert instrument (with serial number >201122), the calibration of the touchscreen sensitivity during the first installation of the instrument is not required anymore. Therefore, touchscreen calibration functionality is disabled for System 2.00 instruments. In older system versions of the instrument, this functionality is still enabled.

The following tools are required for performing these calibrations.

	Name of tool	Description
	QIAxpert Slide-40	A clean, standard sample measurement slide for the pump calibration.
	Positioning Calibration Slide	Dedicated plastic material slide with metallic plate containing precision holes for positioning calibration.
	Wavelength Calibration Slide	Dedicated metallic slide with two optical filters for wavelength accuracy calibration **Important**: handle slide carefully to avoid touching the optical filters. Use isopropanol and lint-free optical paper (as used for microscope lenses) for cleaning and store in the original box for protection.

1. When starting the QIAxpert instrument for the first time, a calibration wizard initiates automatically and guides you through the calibration procedure.
2. Carefully follow instructions for a total of 4 calibrations:
   - Touchscreen sensitivity calibration (only valid for instruments with serial number <201123)
   - Pump system calibration
   - Motor positioning calibration
   - Wavelength accuracy calibration
3. Upon successful completion of the calibration, the QIAxpert is ready for sample measurement.

   Note: If the QIAxpert fails calibration, retry using the Tools function in Settings (see "Tools", page 62). If the QIAxpert fails again, please contact QIAGEN Technical Services.

   Optional: The photometric accuracy and precision of the QIAxpert in combination with QIAxpert Slide consumables can be tested with the OD Check app (see "OD Check app", page 80).

Steps before sample measurement

To avoid workflow interruptions, QIAGEN recommends configuring certain QIAxpert settings at startup before running samples on the QIAxpert for the first time. These recommended settings are:

- Set up of users (see "User settings", page 57)
- Setting up network connection (see "Network settings", page 60)
- Auto-export of data (see "Import/export settings", page 58)
- Date and time settings (see "Regional settings", page 61)

QIAxpert Software

Description of icons and buttons

The QIAxpert software is integrated in the on-board computer and is easy to operate through the touchscreen. Each icon or button has a dedicated meaning designed to guide the user through the various processes: for example, setting up a measurement, exporting data, (re)viewing experiment results.

The following table gives a brief description of each icon and button. Detailed functionality is described in later sections of this user manual.

Note: Most icons/buttons have 2 status options:

- Active: recognized by a brightened symbol
- Not active: recognized by a faded symbol

Icon/button	Description
	The main menu opens when the QIAxpert is powered up. The icon is present in the left upper corner of all screens. Tap to return to the QIAxpert main menu.
	If this button is bright when it is tapped, a pop-up window will appear with more screen subject information. To make a screenshot of the current view that is automatically exported to an inserted USB device, keep the icon tapped until it flashes up; then release. The picture file is automatically stored on the USB device.
	Tap this button to start a measurement (see “Selecting the app”, page 70).
	Tap this button to view the list of the last 100 measurements.
	Tap to enter settings.

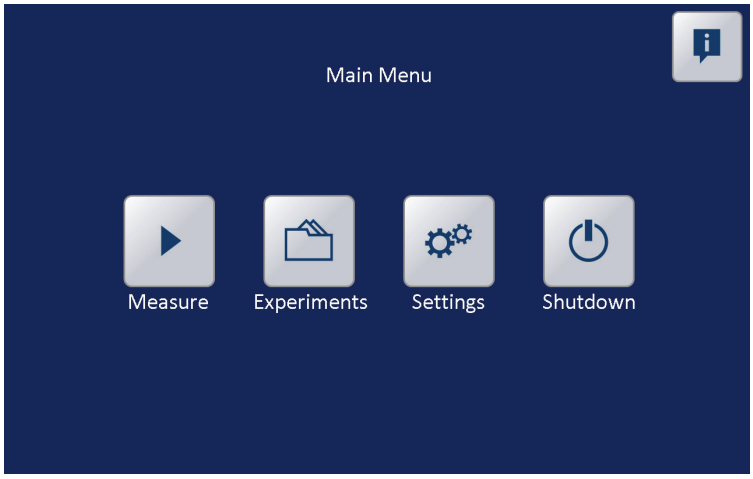
	Description
	Tap this button to shut down the QIAxpert software. Activate the software again by swiping/wiping on/over the touchscreen.
	Slide display. Slide-40 layout shown here loaded with 1 blank (B) and 7 samples (S).
	Tap to activate (blue highlighted), and then assign wells filled with blank solution on the slide display.
	Tap to activate (blue highlighted), and then assign wells filled with sample solution on the slide display.
	Tap to activate (blue highlighted), and then use this button to clear the assignment of a well as a blank or sample.
	Tap the **Next** or **Back** bars to proceed to the next screen (right side) or to go back to the previous screen (left side). When active, the button appears bright.
	Tap this button to activate the user manager.
	This button appears on the Results screen and is used to select the appropriate export method (USB device, network, or by QR Code®; see “Exporting data”, page 49).

	Description
	This button is used to import sample information from the network (see "Importing sample information from the network", page 37).
	Tap this button to save.
	1. Go to **Settings** > **Network Settings**. Use the **Network Settings** button to define if the IP address is obtained automatically or to set up the network connection manually. 2. Import sample information from a dedicated network location (see "Creation of sample information import files", page 35). 3. Export measurement data to a dedicated network location (see "Exporting data to a network", page 50).
	Import sample information from a USB device (see "Creation of sample information import files", page 35). Export measurement data to a USB device (see "Exporting data to USB", page 50).
	Export a summary of the measurement data to your smart phone or tablet by scanning the QR Code (see "Exporting data by scanning the QR Code", page 54).
	Save blanks for applying to further experiments (see "Saving the blank", page 55).
	Tap to add new applications to the selection list.
	Tap to open the list of stored blanks.

Icon/button	Description
	Tap to set regional settings including local date and time, csv export preferences, and language for the provided information in different languages when selecting the info button on any given screen.
	Tap to open a menu for tools and service purposes. Detailed functionality of each button is explained in "Tools", page 62.

Main menu

The QIAxpert main menu is shown on the touchscreen when the power is switched on.



Tap the **Info** button to open an extra window with a brief explanation of all the selectable buttons. Tap the Info screen to close the Info window.

Start a new experiment by selecting the **Measure** button. See "Setting up the measurement", page 65, for more details on setting up a measurement.

Tap the **Experiments** button to open a list of recently performed measurements. This list of experiments is stored on the hard drive of the on-board computer and is limited to 100 experiments. Once this allotted number is reached, the oldest experiments are deleted automatically.

Note: We recommend exporting each experiment immediately to an external USB device or network server (see "Exporting data", page 49).

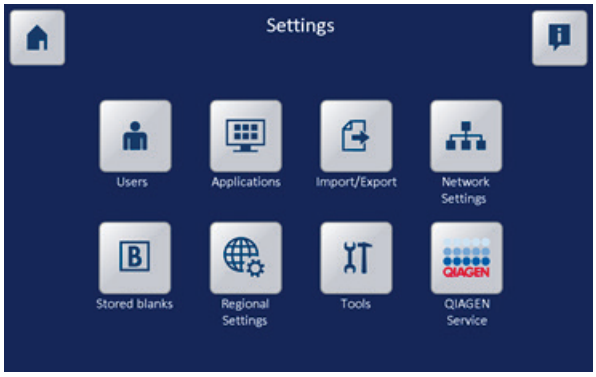
Note: We recommend using the auto-export function to routinely capture all QIAxpert data. For more information, see "Import/export settings", page 58.

Note: Using the shutdown button on the touchscreen will inactivate the QIAxpert by software sleep. The QIAxpert remains powered in sleep mode. Swiping on the blank touchscreen will reactivate the QIAxpert. Sleep mode is automatically entered after 3 hours of inactivation/idle time. See the table below for reactivation scheme for instruments with serial number >201122:

Situation	QIAxpert status	Reactivating by swiping on screen
Shutdown via touchscreen by user	Sleep mode	Within 2 h after entering sleep mode: Rebooting, boot screen visible after approx. 10 s After 2 h: Rebooting, boot screen visible after approx. 1 min
QIAxpert unused for approx. 3 h	Sleep mode	Within 2 h after enter sleep mode: Rebooting, boot screen visible after approx. 20 s After 2 h: Rebooting, boot screen visible after approx. 1 min
shutdown by user followed by toggle button OFF	Power off	-/- (reactivation only possible in sleep mode)

For full shut down, switch off the power with the power switch at the back of the instrument.

The **Settings** button opens a window containing several options.

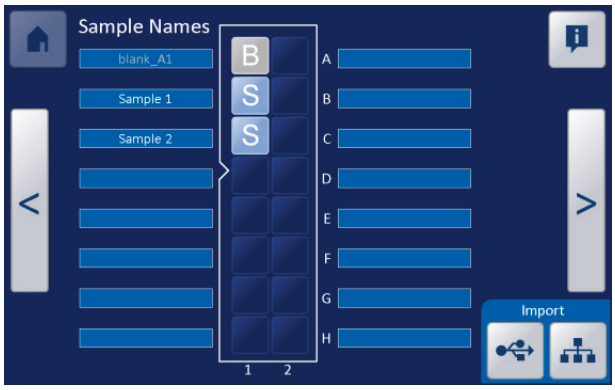


These options are used to configure the QIAxpert.

Note: We recommend that certain QIAxpert settings be configured at start up to avoid workflow interruptions. See "Steps before sample measurement", page 29.

Creation of sample information import files

At the start of an experiment, default names are given to samples, for example, **Sample A1**, **Sample B1**. Custom sample names can be entered by tapping the text bar next to each sample to open a keyboard.



Alternatively, a **.txt** file containing predefined sample names (e.g., barcodes) can be imported from a USB device or the network. This **.txt** file contains specific columns for sample names and app specific sample information (e.g., extinction coefficients, sequences). It must be created when using the import function.

QIAGEN provides a Microsoft® Excel® template with the correct column order to create the appropriate **.txt** file automatically. The first column contains the well positions; the second column contains the sample names. The third column contains specific information from the A_{280} Protein app, as described below.

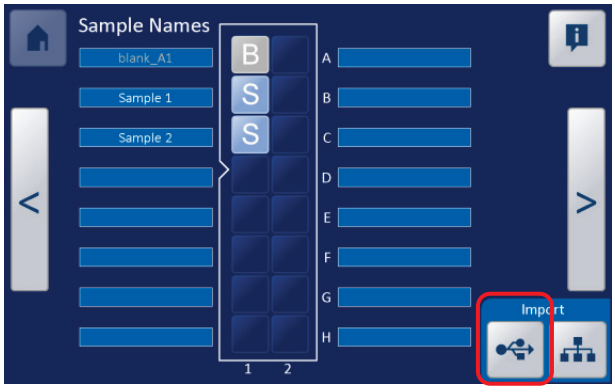
When measuring protein with the A_{280} Protein app, the extinction coefficient can be loaded into the software by entering it into column **Protein extinction coefficient (E1%)** (see "Classic UV/VIS quantification apps", page 38).

	A	B	C
1	QIAxpert - Create import file		
2	Use this sheet to create an import file for your sample information (check if Macros are enabled) Enter the specific information in the columns and click "Create QIAxpert import file" Select the location and filename (.txt) and click "Save" QIAxpert will look for the file on your USB drive in the folder "QIAxpert Import"		Create QIAxpert import file
3			
4	Position	Sample name	Protein extinction coefficient (E1%)
5	A1		
6	B1		
7	C1		
8	D1		
9	E1		
10	F1		
11	G1		
12	H1		
13	A2		
14	B2		
15	C2		
16	D2		
17	E2		
18	F2		
19	G2		
20	H2		

Importing sample information from a USB device

The sample information **.txt** file is located in a specific folder called **QIAxpert Import** on the USB device.

1. Insert the USB device into the port at the front of the instrument and tap the **USB** button on the sample names screen (right bottom).

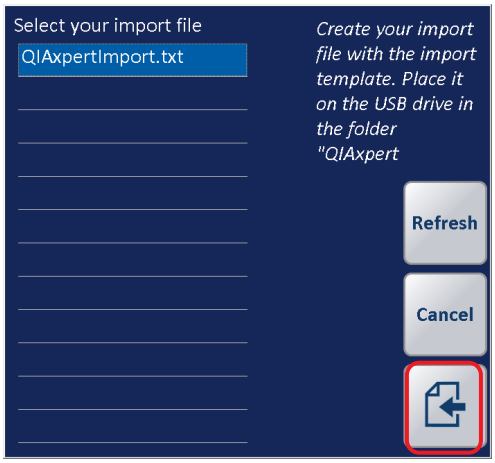


2. Select the file and tap the **Import** button for automatic import of the sample name file.

Importing sample information from the network

First, establish the network connection via the TCP/IP interface (see "External features of the QIAxpert", page 23; "Network settings", page 60; and "Import/export settings", page 58). To import sample name information from the network, a specific folder called **QIAxpert Import** must be present at the same network location as the **QIAxpert Experiments** folder. See "Folders and file types", page 51, for information on selecting a network folder.

3. Save the **.txt** file within the **QIAxpert Import** folder.
4. Tap the **Network** button on the sample names screen (right bottom) to list the available **.txt** files in the folder.
5. Select the file of choice and tap the **Import** button for automatic sample name import.



6. To continue the measurement process, tap the **Next** bar on the right side of the screen.

Measurement applications (apps)

Each newly installed QIAxpert includes a selection of protocols called "apps" for immediate use:

- A set of pre-installed apps for quantification based on classic UV/VIS
- A set of pre-installed apps for spectral content profiling of samples
- Pre-installed app for instrument testing (see "Performance checks", page 79):
  - OD Check

More apps can be downloaded and added to your QIAxpert. Go to the QIAxpert product page at **https://www.qiagen.com/QIAxpert**.

See "Application settings", page 58, for more information on uploading apps to the QIAxpert.

Classic UV/VIS quantification apps

The set of pre-installed apps for quantification based on classic UV/VIS includes:

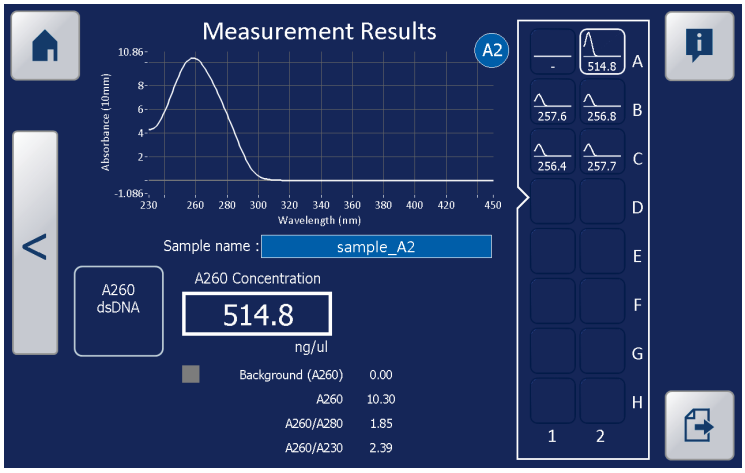
- A_{260} dsDNA
- A_{260} RNA
- A_{260} ssDNA
- A_{280} Protein
- UV/VIS

dsDNA, RNA, and ssDNA apps

Nucleic acids have an absorption maximum at 260 nm (A_{260}). The QIAxpert instrument reads this absorption with high accuracy and repeatability. The nucleic acid concentration is calculated from the OD at 260 nm using the Beer-Lambert Law, which relates absorption and concentration. The proportionality factor depends on the type of molecule. For example, an A_{260} reading of 1.0 at 10 mm path length is equivalent to approximately 50 ng/µl dsDNA, 33 ng/µl for ssDNA, or 40 ng/µl RNA.

DNA or RNA purity analysis is done by calculating the A_{260}/A_{230} and A_{260}/A_{280} ratios. As a general rule, an A_{260}/A_{280} ratio of approximately 1.8 and an A_{260}/A_{230} ratio of 2.0 or greater predict "clean" DNA. Good quality RNA will have an A_{260}/A_{280} ratio in the range 1.8–2.0 and an A_{260}/A_{230} of 2.0 or greater.

Note: The solution properties pH and ionic strength can affect the A_{260}/A_{230} and A_{260}/A_{280} ratios. Therefore, we recommend using a buffered solution like TE buffer (pH 8.0) as both the nucleic acid solution and the blanking solution used to normalize during the measurement. Pure water often has an acidic pH and can lower the A_{260}/A_{280} ratio, while TE buffer has an intrinsic UV absorption below 240 nm.



Classic UV/VIS absorption spectrum for dsDNA

Protein app

Quantification of protein, like nucleic acids, can be calculated from a UV absorption spectrum, in this case at 280 nm, using the extinction coefficient of the proteins and the Beer-Lambert equation. This method is suitable to quantify purified proteins. Due to the presence of interfering chemicals, it is not suitable for crude protein samples.

Note: The extinction coefficient of the measured protein can be entered manually or uploaded via the sample information import sheet (see "Creation of sample information import files", page 35) by entering it into column **Protein extinction coefficient (E1%).**

Since the UV absorption of nucleic acids at 280 nm can be as much as 10 times that of a protein, a small percentage of nucleic acids in a sample can greatly distort the protein quantification. Therefore, the protein sample purity must be determined using the A_{260}/A_{280} ratio. A value <1 indicates a "pure" protein and a higher value indicates nucleic acid contamination.

UV/VIS (general) app

The UV/VIS app is a basic app for measuring and displaying the full UV/VIS spectrum. The software will show the OD value of three wavelengths of choice.

Spectral content profiling of biomolecule samples

The set of pre-installed apps* for spectral content profiling of biomolecule samples includes:

- DNA QIAamp
- DNA QIAsymphony
- PCR QIAquick
- RNA RNeasy
- PAXgene RNA
- DNA Mamm.
- DNA Plant
- Purified PCR
- RNA
- RNA FFPE

The aim of the spectral content profiling applications on the QIAxpert is to enable accurate, dye-free quantification of biological samples containing multiple UV/VIS absorbing chemicals that may interfere with the A_{260} or A_{280} classic absorbance methods.

The basis for this approach is measurement of the UV/VIS spectrum from 230 to 750 nm. Additional state-of-the-art software further analyzes the shape of the spectrum. Content information of the molecule selected for quantification is subtracted from the recorded spectrum leaving the residual profile of impurities and sample turbidity.

Note: The spectral content profiling apps analyze and show discrimination between DNA and RNA where the concentration of total nucleic acids is ≥25 ng/µl. For measurement of concentrations below this threshold, a result curve (pink) for total nucleic acids will be shown but not for individual types.

No discrimination information is given if more than 2.5% of the measurement is represented by residues of impurities. This is also indicated by the appearance of a red cross instead of a green tick mark. Please refer to the description of the yellow curve in "Details of spectral curves", page 45, for more details.

* QIAGEN may not update the *QIAxpert User Manual* every time a new app is released and added to the set of pre-installed apps. Please visit **www.qiagen.com** or contact QIAGEN Technical Services to receive information on new apps.

Note: A list of compatible QIAamp, QIAquick, and RNeasy Kits can be requested from QIAGEN Technical Services.

DNA QIAamp app

This spectral content profiling app is specifically designed to quantify dsDNA purified with QIAamp silica-membrane technology.

Note: Do not use the DNA QIAamp spectral content profiling app to measure concentration of plasmids. The app is intended for mammalian gDNA with 40–45% GC content.

DNA QIAsymphony app

This spectral content profiling app is specifically designed to quantify dsDNA purified with QIAsymphony technology.

Note: The DNA QIAsymphony spectral profiling app is intended for molecular biology applications only and not for the diagnosis, prevention, or treatment of a disease. The app is intended for mammalian gDNA with 40–45% GC content.

PCR QIAquick app

This spectral content profiling app is specifically designed to quantify PCR amplicons purified with QIAquick silica-membrane technology.

RNA RNeasy app

This spectral content profiling app is specifically designed to quantify RNA purified with RNeasy technology.

PAXgene RNA app

This spectral content profiling app is specifically designed to quantify RNA purified with PAXgene Blood RNA technology.

DNA Mamm. app

This spectral content profiling app is specifically designed to quantify gDNA purified using technology other than the QIAamp silica-membrane or the QIAsymphony technology.

Note: Do not use the DNA Mamm. spectral content profiling app to measure concentration of plasmids. The app is intended for mammalian gDNA with 40–45% GC content.

DNA Plant app

This spectral content profiling app is specifically designed to quantify DNA purified from plant specimens.

Note: Do not use the DNA Plant spectral content profiling app to measure concentration of plasmids. The app is intended for plant DNA with 30–50% GC content.

Purified PCR app

This spectral content profiling app is specifically designed to quantify PCR amplicons purified using technology other than the QIAquick silica-membrane technology.

RNA app

This spectral content profiling app is specifically designed to quantify RNA purified using technology other than the RNeasy technology.

RNA FFPE app

This spectral content profiling app is specifically designed to quantify RNA from FFPE specimens.

Measurement results

The Results window is automatically opened when a measurement is made or when a measurement is selected from the experiment list. The data can be viewed in the Results window.

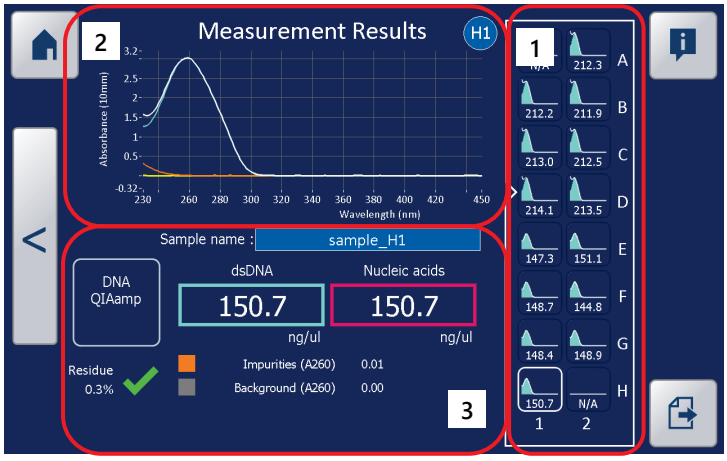
This section describes general data analysis and general data representation of measurement results.

Note: Some features and information about results are app specific. Please refer to “Sample results for spectral content profiling”, page 46, and “Classic UV/VIS results display”, page 46, for more information about app specific results.

Measurement results window

The measurement results window can be divided into 3 major fields:

- Slide overview (1)
- Details of spectral curves (2)
- Sample results for the activated well (3)



Slide overview

An overview of the slide appears on the right of the Measurement results window. Each sample result is represented by a thumbnail view including a number below the graph representing concentration of the main molecule. Select an individual sample (activated selection highlighted) and the results are shown on the left side of the measurement results window.

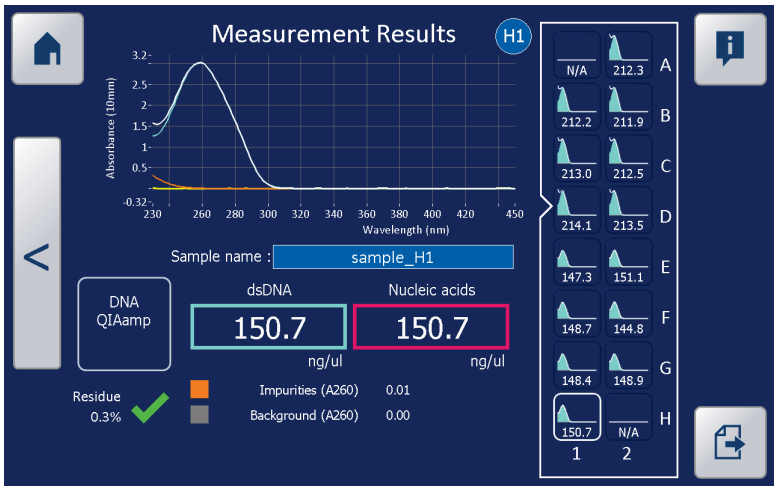
Features of the slide overview are as follows:

Feature	Description
White curve	Measured UV/VIS spectrum of the sample, proportional in size.
Blue filled curve	Actual spectral profile of the main molecule used for the concentration determination. **Note**: This is only shown when a spectral content profiling app is selected and not for traditional UV quantification methods.
Pink filled curve	Alternative to the blue filled curve in DNA or RNA spectral profiling apps. **Note**: When the quality of spectral profiling is not within specification (see "Spectral content profiling of biomolecule samples", page 40), all nucleic acids (DNA, RNA, nucleotides) are grouped in one "nucleic acid" profile used for concentration determination (see example below). See also "General troubleshooting", page 83, for troubleshooting.
Red background (Error flag)	No filled microcuvette could be detected and therefore no spectrum and concentrations can be shown.
Blue background	Normal measurement conditions.
Red bar	For samples which have a higher values than OD40, the area > OD 40 is shown in red. When multiple samples are measured, all samples are shown with the same scale than the samples with the highest values. Therefore, all samples have a red bar, which only shows the unreliable part of the measurement.

Details of spectral curves

For spectral content profiling applications, the following curves are shown with identical colors as the data displays located underneath.

Curve	Description
White	Measured UV/VIS sample spectrum. This is the only spectral curve shown when selecting a traditional UV/VIS quantification app (A_{260} or A_{280}).
Blue	Profile of the main molecule isolated by the spectral profiling algorithms. This blue curve will appear pink when grouping of all nucleic acid types is required. **Note**: When the quality of spectral profiling is not within specification (see "Spectral content profiling of biomolecule samples", page 40), all nucleic acids (DNA, RNA, nucleotides) are grouped in one "nucleic acid" profile used for concentration determination (see example below). See also "General troubleshooting", page 83.
Orange	Profile of all impurities found.
Gray	Sample background spectrum mostly caused by sample turbidity and impurities with absorbances in the VIS range of the spectrum e.g., hemoglobin, chlorophyll.
Yellow	Residual spectrum, i.e., part of the measured spectrum that cannot be attributed to the reference profiles used in the algorithm. The surface under curve of this residual spectrum relative to the surface-under-curve of the measured "white" spectrum gives the residue value in percentage as indication of the quality of the spectral content profiling (see below).



Sample results for spectral content profiling

For spectral content profiling applications, the data are shown with color indications matching the colored profiles in the graph.

- Sample name as given during the measurement
- Application selected
- Blue box: main molecule concentration
  Note: When the quality of spectral profiling is not within specification (see "Spectral content profiling of biomolecule samples", page 40), an "N/A" is shown instead of the main molecule concentration. In this case, all nucleic acids (DNA, RNA, nucleotides) are grouped in one "nucleic acid" profile used for concentration determination and displayed in a pink box.
- Pink box: total nucleic acid concentration
- Orange-tagged box: sum of contaminants calculated as A_{260} value
- Gray-tagged box: background (turbidity) calculated as A_{260} value
- Residue: Determined as the surface under-curve of the residual spectrum relative to the surface under-curve of the measured "white" spectrum
  This indicates the quality of the spectral content profiling. When the quality is sufficiently high for complete spectral content profiling, a green tick mark is shown. Alternatively, a red cross indicates lower quality of profiling. Grouping of all nucleic acids is required for reliable results and box and graph will be colored pink.

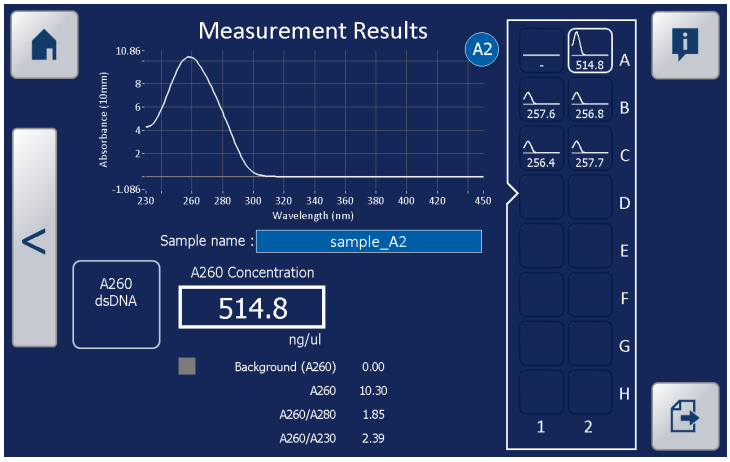
In addition to specific spectral content profiling results shown in the measurement results window, other information such as classic A_{260} or A_{280} quantification and wavelength ratios are included in the exported measurement result files (see "Folders and file types", page 51).

Classic UV/VIS results display

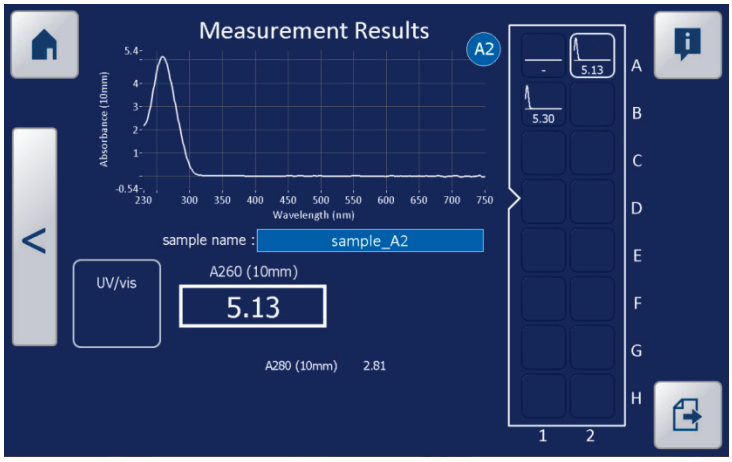
The measurement results window shows specific information depending on the selected application. For apps that use a classic UV/VIS approach rather than spectral content profiling, all absorbance data are shown in the measurement results screen and in the exported result files.

For classic quantification apps based on A_{260} and A_{280}, a slightly different result screen is shown with the measured UV/VIS (230–450 nm) spectrum in white. A turbidity correction is used as the background correction and is shown as a gray curve.

The data overview shown below reports the concentration based on A_{260} and shows the relevant wavelength ratios.



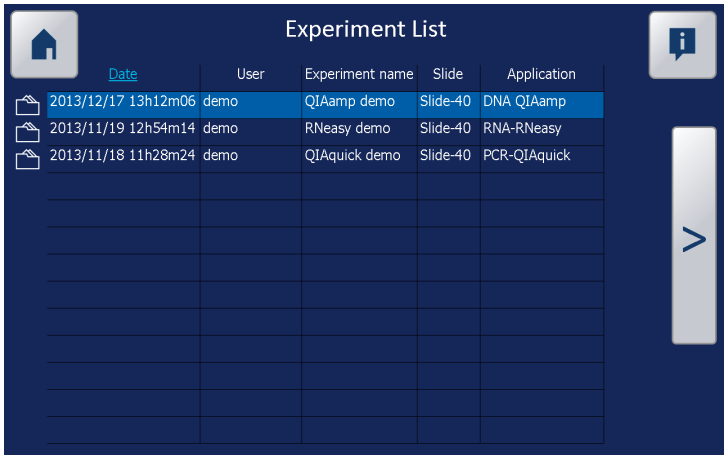
For the basic UV/VIS spectral app, the full UV/VIS spectral graph (230–750 nm) is displayed in white. For background correction, the most transparent wavelength position is sought and its absorbance is subtracted from all wavelengths.



The data located below the graph show the OD values of up to three wavelength positions selected during measurement.

The Experiment list

The **Experiment list** can be opened by tapping the **Experiments** button on the main menu.



The 100 most recent experiments are listed within this overview. When the number of experiments exceeds 100, the oldest experiment is removed automatically.

Note: We recommend exporting each experiment to a USB device or network immediately after measurement is completed to avoid losing results. This can be done automatically (see "Exporting data", page 49).

A scroll bar on the right side of the experiment list makes it possible to scroll through the list to locate and select the desired measurement result. Each experiment is identified with a time stamp (date + time), the user ID, experiment name, the slide type used, and the protocol.

By default, experiments are listed according to the time stamp. To change the order of the list, tap a column header, for example, **User**, and experiments are grouped by User. This feature allows easy searching within the experiment list.

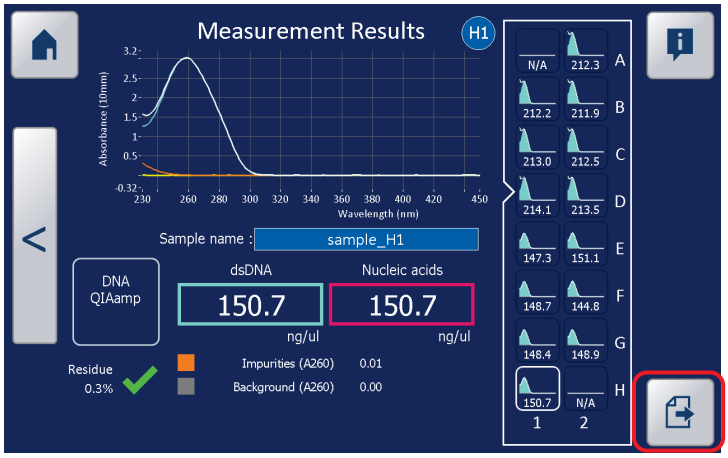
To open the chosen experiment, select the row with the experiment of interest in the overview. It will appear highlighted. Tap on the **Next** bar on the right side of the screen. The results open automatically for review.

Important: The experiment list on QIAxpert is not a data archive. Once the maximum number of experiments is reached (100), the oldest experiments will be deleted automatically and without warning!

Note: To safeguard your experimental data please use the Export or Auto-Export functions described in "Import/export settings", page 58.

Exporting data

After measurement is complete, the **Export** function in the results screen allows the user to retrieve the data from the QIAxpert. In addition, previous experiments can be opened and exported through the experiment folder located in the main menu screen.



When the **Export** button is selected, an export window opens showing the export options.

Options for export are:

- To USB device
- To network drive
- Export by scanning the QR Code
- Save blank

Exporting data to USB

To export experiment data to a USB device, plug in the USB device in the front USB port of the QIAxpert and wait a few seconds for software recognition.

Tap the **To USB** button to export the results.

A folder **QIAxpert Experiments** will be created on the USB device to store QIAxpert results in a folder for each experiment. If the folder **QIAxpert Experiments** already exists on the USB device, then a folder for the exported experiment will be added to it.

Exporting data to a network

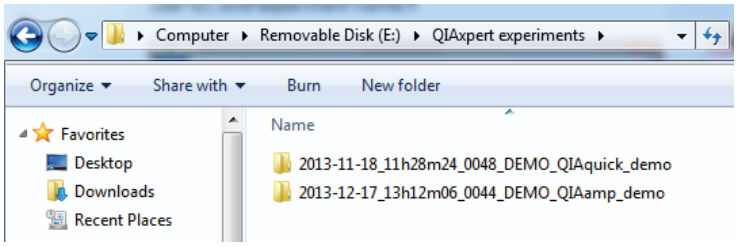
First, establish the network connection via the TCP/IP interface and define the network settings and folder location (see "External features of the QIAxpert", page 23; "Network settings", page 60; and "Import/export settings", page 58).

To export experiment data to a network drive, tap the **To network** button to export the results to a dedicated location. This location is assigned in the Settings window of the QIAxpert (see "Import/export settings", page 58). A folder for the experiment is stored at that location.

The same network folder can include a folder **QIAxpert Import** containing the **.txt** files for importing sample names and other experiment input. For more information on selecting the appropriate location in the network server, see "Importing sample information from the network", page 37.

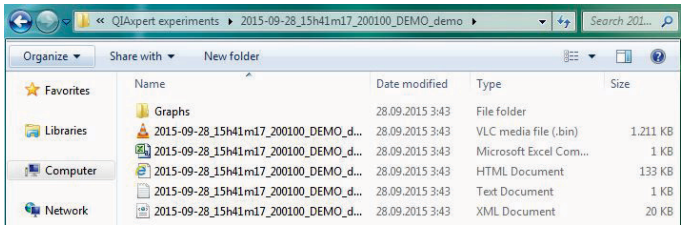
Folders and file types

A dedicated folder with the experiment results is created during export of experiment result data to the **QIAxpert Experiments** folder on a USB device or a network. The name of the experiment folder is a combination of the time stamp, user ID, and experiment name.



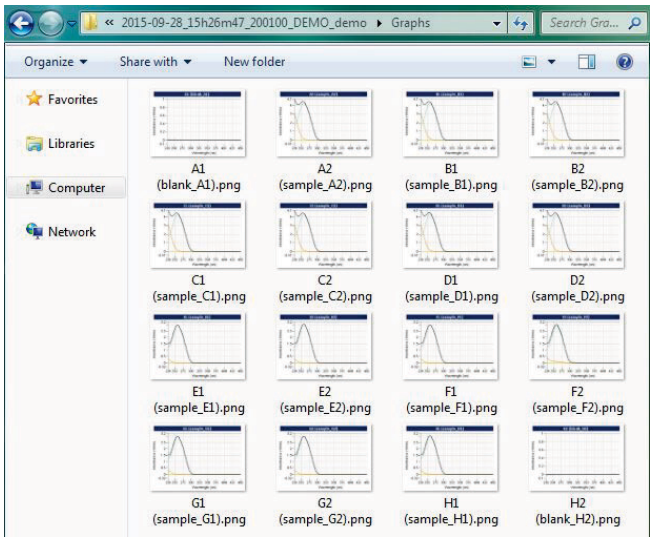
A folder with single spectra for each sample in **.png** format and various export file formats of the same result file are available within the folders:

- Graphs folder
- **.csv** file
- **.html** file
- **.txt** file
- **.bin** file



Graphs folder

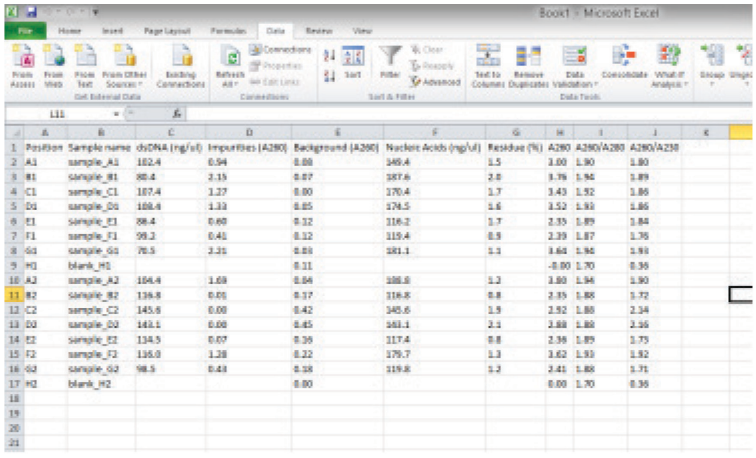
This folder contains single spectra for each sample well in **.png** format. These can be opened with a graphics viewing software (e.g., Windows Photo Viewer) or with any browser.



.csv file

This format opens automatically in Excel. The file contains all results in a table form.

Note: In certain cases, a better view with columns will appear by opening Excel first then opening this file from within Excel.

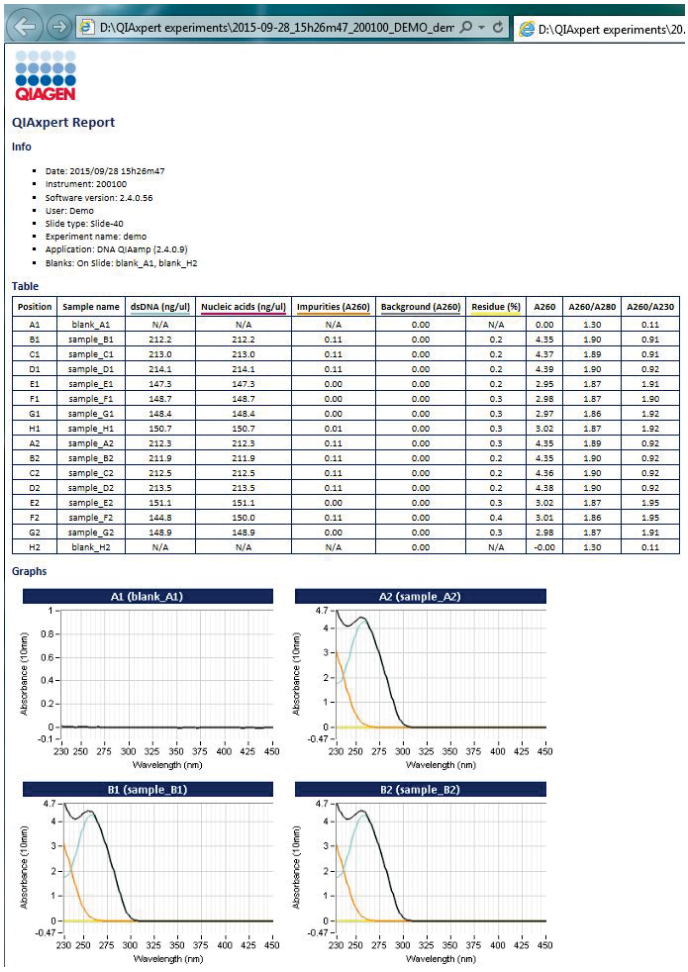


Position	Sample name	dsDNA (ng/ul)	Impurities (A280)	Background (A260)	Nucleic Acids (ng/ul)	Residue (%)	A260	A260/A280	A260/A230
A1	sample_A1	182.4	0.94	0.00	149.4	1.5	1.00	1.90	1.80
B1	sample_B1	80.4	2.15	0.07	187.6	2.0	1.76	1.94	1.89
C1	sample_C1	187.4	1.27	0.00	170.4	1.7	3.43	1.92	1.86
D1	sample_D1	188.4	1.33	0.05	174.5	1.6	3.52	1.93	1.86
E1	sample_E1	88.4	0.60	0.12	116.2	1.7	2.35	1.89	1.84
F1	sample_F1	98.2	0.41	0.12	119.4	0.9	2.39	1.87	1.76
G1	sample_G1	78.5	2.21	0.00	181.1	1.1	3.64	1.94	1.93
H1	blank_H1			0.11			-0.00	1.70	0.36
A2	sample_A2	184.4	1.69	0.04	188.0	1.3	3.80	1.94	1.90
B2	sample_B2	138.8	0.01	0.17	116.8	0.8	2.35	1.88	1.72
C2	sample_C2	145.6	0.00	0.42	145.6	1.9	2.92	1.88	2.14
D2	sample_D2	143.1	0.00	0.45	161.1	2.1	3.88	1.88	2.16
E2	sample_E2	134.5	0.07	0.36	117.4	0.8	2.36	1.89	1.75
F2	sample_F2	136.0	1.28	0.22	179.7	1.3	3.62	1.93	1.92
G2	sample_G2	98.5	0.43	0.38	119.8	1.2	2.41	1.88	1.71
H2	blank_H2			0.00			0.00	1.70	0.36

.html file

This format can be opened with any browser. The file contains all results in a table form and includes all spectra as shown in the results window. The single spectra can be exported to Microsoft Word, Excel, PowerPoint®, or other applications via drag-and-drop or by right-clicking a spectrum, selecting **Copy** and then pasting it into the destination application.

Note: To enable this functionality, the Graphs folder and the **.html** report must be located in the same folder.



Position	Sample name	dsDNA (ng/ul)	Nucleic acids (ng/ul)	Impurities (A260)	Background (A260)	Residue (%)	A260	A260/A280	A260/A230
A1	blank_A1	N/A	N/A	N/A	0.00	N/A	0.00	1.30	0.11
B1	sample_B1	212.2	212.2	0.11	0.00	0.2	4.35	1.90	0.91
C1	sample_C1	213.0	213.0	0.11	0.00	0.2	4.37	1.89	0.91
D1	sample_D1	214.1	214.1	0.11	0.00	0.2	4.39	1.90	0.92
E1	sample_E1	147.3	147.3	0.00	0.00	0.2	2.95	1.87	1.91
F1	sample_F1	148.7	148.7	0.00	0.00	0.3	2.98	1.87	1.90
G1	sample_G1	148.4	148.4	0.00	0.00	0.3	2.97	1.86	1.92
H1	sample_H1	150.7	150.7	0.01	0.00	0.3	3.02	1.87	1.92
A2	sample_A2	212.3	212.3	0.11	0.00	0.3	4.35	1.89	0.92
B2	sample_B2	211.9	211.9	0.11	0.00	0.2	4.35	1.90	0.92
C2	sample_C2	212.5	212.5	0.11	0.00	0.2	4.36	1.90	0.92
D2	sample_D2	213.5	213.5	0.11	0.00	0.2	4.38	1.90	0.92
E2	sample_E2	151.1	151.1	0.00	0.00	0.3	3.02	1.87	1.95
F2	sample_F2	144.8	150.0	0.11	0.00	0.4	3.01	1.86	1.95
G2	sample_G2	148.9	148.9	0.00	0.00	0.3	2.98	1.87	1.91
H2	blank_H2	N/A	N/A	N/A	0.00	N/A	-0.00	1.30	0.11

.txt file

This basic export format can be opened in Excel or Notepad. The file contains a table with all results.

2013-04-18_13h57m31_0013_DEMO_RNA_from_cell_I - Not

File Edit Format View Help

Position	Sample name	RNA (ng/ul)			Impurities (A260)			Background (A260)		
A1	sample_A1	1349.8	0.27	0.31	1359.4	0.4	33.96	2.07	2.20	
B1	sample_B1	137.6	0.28	0.00	137.6	0.3	3.72	2.05	1.43	
C1	sample_C1		0.03	0.00	0.0	1.3	0.03	-6.06	0.00	
D1	sample_D1	132.1	0.21	0.00	132.1	0.3	3.50	2.05	2.18	
E1	sample_E1	106.6	0.15	0.00	106.6	0.4	2.81	2.04	1.05	
F1	sample_F1	132.4	0.19	0.00	132.4	0.3	3.50	2.06	2.15	
G1	sample_G1	137.1	0.30	0.00	137.1	0.3	3.72	2.04	1.46	
H1	blank_H1			0.00			0.00	3.13	0.94	
A2	sample_A2	136.0	0.32	0.00	136.0	0.3	3.71	2.03	1.51	
B2	sample_B2	130.2	0.20	0.00	130.2	0.3	3.45	2.04	2.13	
C2	sample_C2	102.1	0.17	0.00	102.1	0.4	2.72	2.04	1.05	
D2	sample_D2	131.2	0.20	0.00	131.2	0.3	3.47	2.05	2.16	
E2	sample_E2	136.3	0.31	0.00	136.3	0.4	3.71	2.03	1.44	
F2	sample_F2	47.6	0.13	0.00	47.6	0.6	1.32	2.02	2.17	
G2	sample_G2	103.1	0.17	0.00	103.1	0.4	2.74	2.06	1.04	
H2	blank_H2			0.00			-0.00	3.13	0.94	

.bin file

This is the raw data of the measurement. This format is a cryptic file that cannot be opened with common PC software.

Exporting data by scanning the QR Code

To export experiment data by scanning the QR Code, tap the **Show QR code** button.

Export a summary of the measurement data by scanning the QR Code using a QR Code reader program or app on your smart phone or tablet.

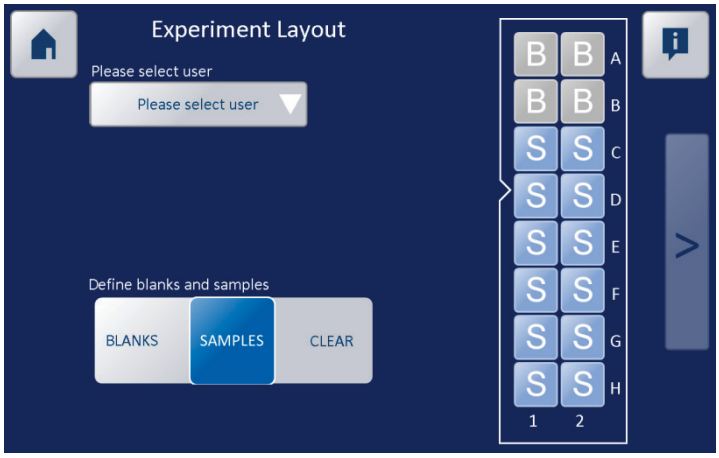
To scan a QR Code, activate the device's camera and point it at the code. There is no need to take a photo or press a button. QR Code reader apps automatically recognize any QR Code and have auto-detect scanning.

- QR Reader for iPhone®
- QR Reader for iPad®
- QR Code Reader (Android®)

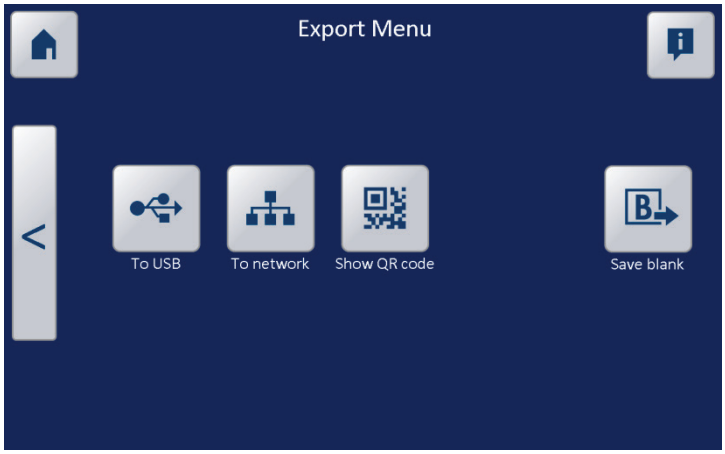
A result table is displayed on your smart device.

Saving the blank

To save a blank such that it can be applied to subsequent runs, you must analyze at least 3 valid replicates of the blank within the same measurement.



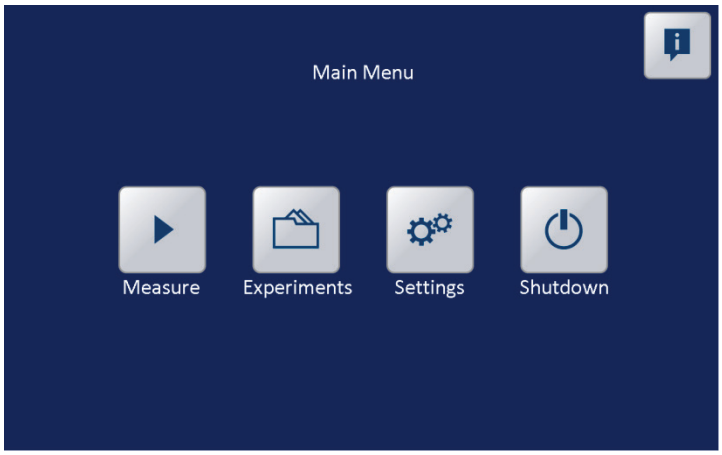
After measurement of the slide is complete, open the **Export menu** and select **Save blank** to store the blank.



Note: Stored blanks will be automatically deleted after 30 days or upon recalibration of the instrument.

Settings and configuration

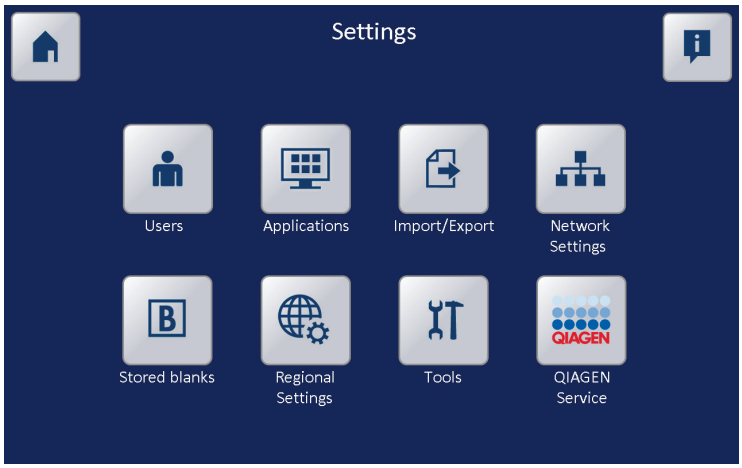
Note: To avoid interruptions in the measurement process workflow, we recommend configuring some actions and settings during the first installation. To start the process, tap the **Settings** button on the main menu.



There are 8 options in the Settings window.

- Users
- Applications
- Import/Export
- Network Settings
- Stored blanks

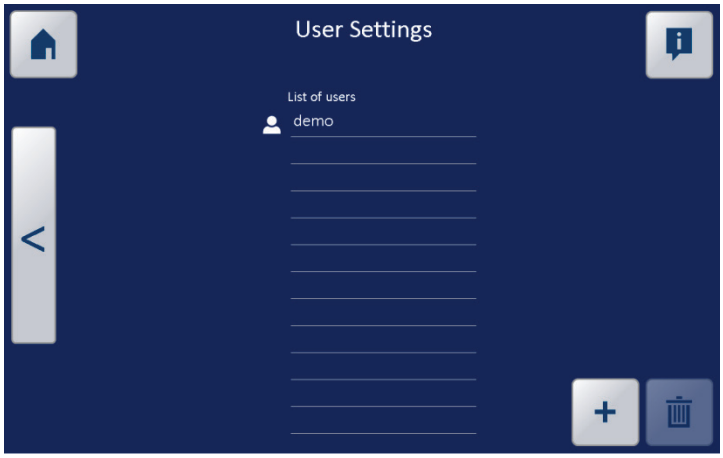
- Regional settings
- Tools
- QIAGEN Service



User settings

Tap **Users** in the **Settings** screen to open the users menu.

All current QIAxpert users are listed in this menu. It is mandatory to select a user during experiment setup. New users can be added either in this window or during the experiment setup. To avoid interruption of the measurement process we recommend defining and creating a list of users as part of the installation procedure.



1. Tap the **+** button to create a new user.
2. Enter the name using the keyboard window that opens.
3. Tap **Accept** to confirm.

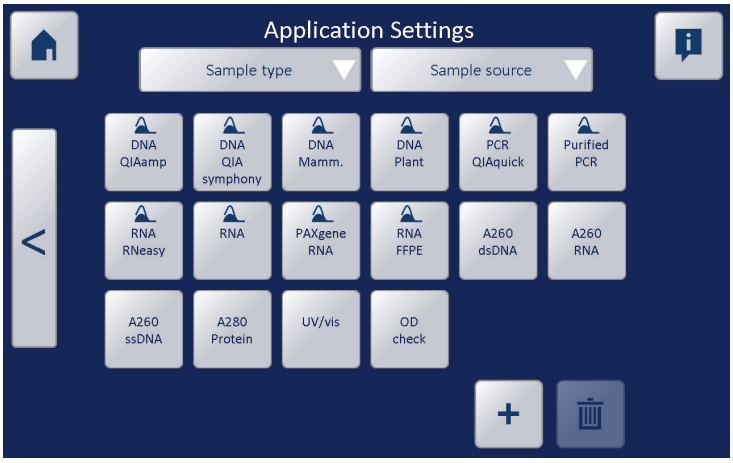
To remove a user, select the name from the list. Tap the **recycle bin** button to delete the selected name.

Application settings

QIAGEN continues to develop new apps. These apps included within Instruments Software are available on the resource tab of the QIAxpert product page **https://www.qiagen.com/QIAxpert**.

Tap **Applications** in the Settings screen to open the Application settings window.

The Application settings window can be used to view installed or to delete unused apps.



To upgrade newly available apps onto the QIAxpert including the newest Instruments Software version, please see "Upgrading the QIAxpert software" on page 62.

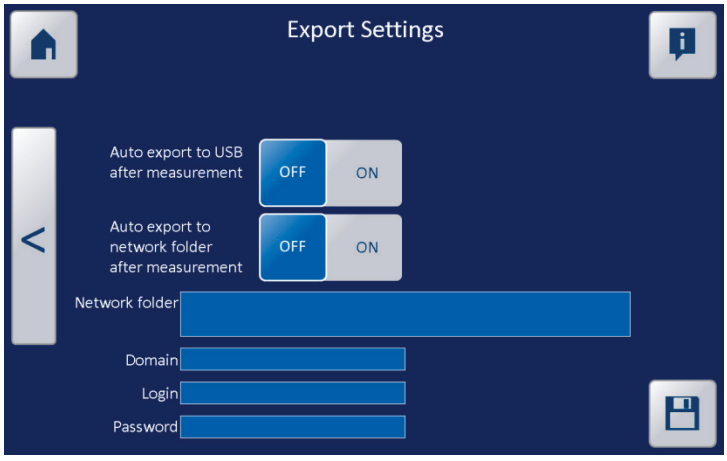
To remove an application from the QIAxpert application list, select the application name and tap the **recycle bin** button.

Import/export settings

Tap **Import/Export** in the **Settings** screen to open the Export settings window.

For more information on import of samples information see "Creation of sample information import files", page 35.

The **Export settings** allow the user to define the default export method for experiment results. Auto-export to a USB device or a network is set in the **Off** position by default.



The export setting can be selected by tapping the **On** button. If no preference is set, the experiments have to be exported manually.

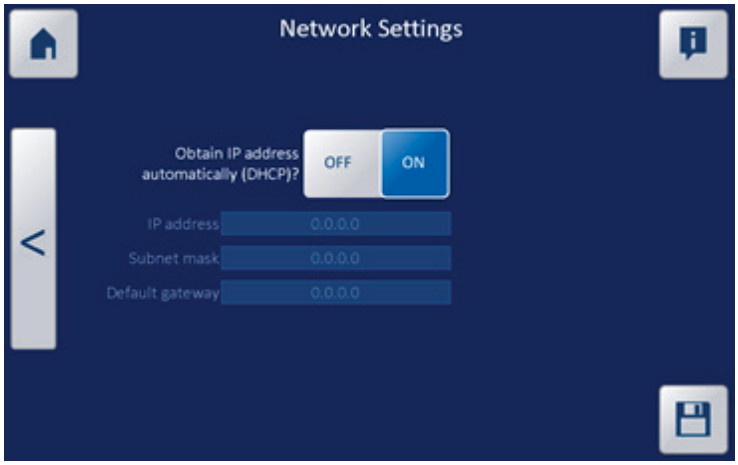
If the network is selected for export, additional information is required:

- The network folder of choice
  Note: Please use the full network path including server IP or server name and all subfolders.
- The domain name
  Note: The domain name can be found in the system control of your computer. You can also search for Domain on your computer.
- The login and password for access to this domain

After any change to the settings, tap the **save** button to store the new preferences.

Network settings

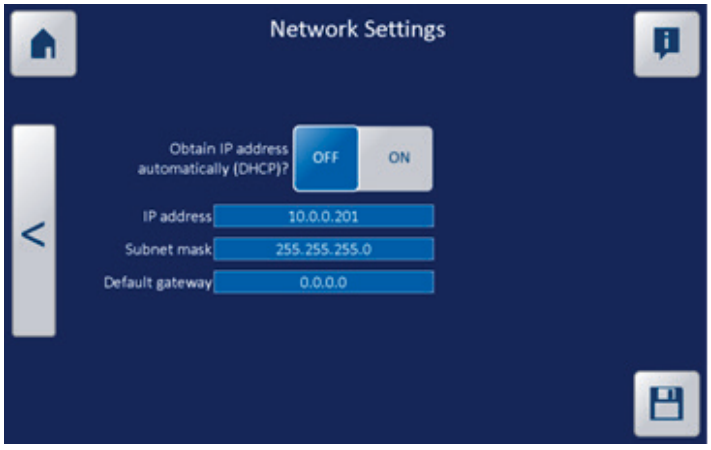
To set up your network connection, press **Network Settings** in the **Settings** screen.



This screen allows the user to select DHCP (ON) or static IP (OFF). In case you turn DHCP Off, additional information is required:

- IP address
- Subnet mask
- Default gateway

These information will be provided by your IT department.



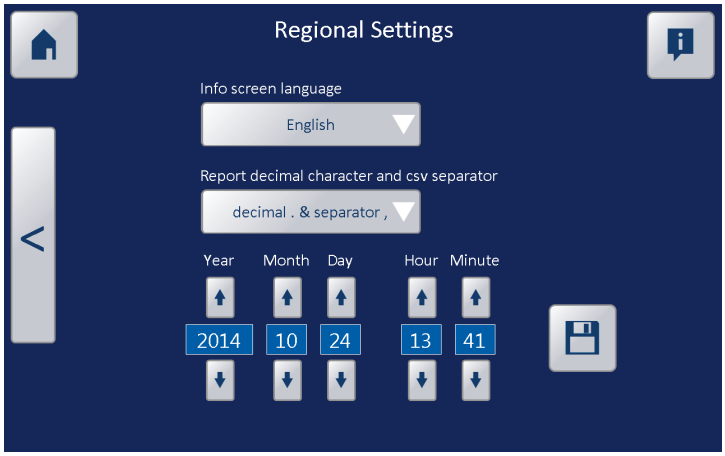
Stored blanks

Tap **Stored blanks** in the Settings screen to open the list of stored blanks.

Note: Stored blanks will be automatically deleted after 30 days or upon recalibration of the instrument.

Regional settings

Tap **Regional settings** in the Settings screen to open the Regional settings window.



Set the info screen language to your language preference.

Note: This does not change the language of the actual software, but provides information in different languages when selecting the info button on any given screen.

Set the decimal character and csv separator according to the Region and Language settings in your Microsoft Windows® or other operating system.

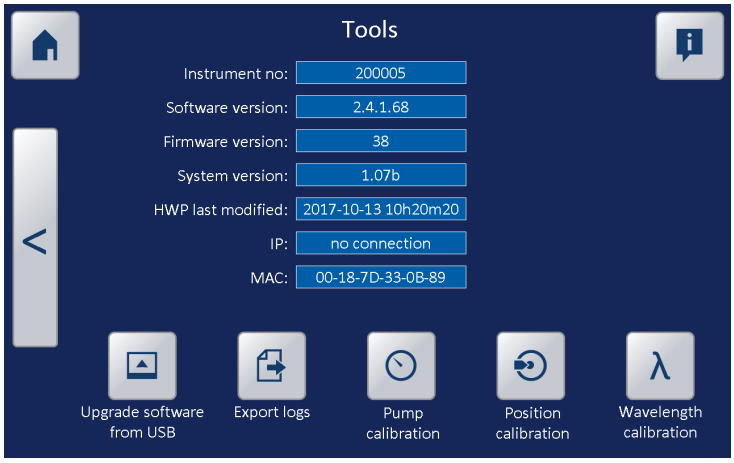
Set the date and time according to your time zone.

Tap the **save** button to store the settings.

Tools

Tap **Tools** on the Settings screen to open the Tools window.

General QIAxpert information is listed in this window. It includes buttons to upgrade software, to export log files, and for calibration. For instructions for calibration, refer to the *QIAxpert Calibration Instructions*.



Upgrading the QIAxpert software

Prepare a USB device containing the new QIAxpert software version. This is a file with the **.QIAxpert** extension.

1. To upgrade the software version on the QIAxpert, plug in the USB device.
2. In the Service settings window, tap **Upgrade software from USB**.

   A new screen opens with an overview of all **.QIAxpert** files on the USB device.

3. Select the correct file and installation will start.

   The QIAxpert shuts down and restarts automatically. Settings and data remain unchanged.

Exporting instrument information and log files

To assist QIAGEN to support users of the QIAxpert, an overview of instrument details together with error log files can be exported.

Insert a USB device, then tap the **Export error logs** button to export the error logs and instrument information. A folder **QIAxpert Logging** is created automatically in the destination USB device.

QIAGEN service settings

The QIAGEN service settings window is specific for QIAGEN service personnel.

Operating Procedures

This section describes operation of the QIAxpert system. Before proceeding, you should familiarize yourself with the features of the QIAxpert described in "General Description", page 16, and the QIAxpert software described in "QIAxpert Software", page 30.

Sample measurement

Running samples on the QIAxpert requires only a few steps:

- Starting the QIAxpert
- Loading samples into the slide
- Setting up the measurement
- Loading the slide into the instrument
- Entering sample information
- Selecting the app
- Measurement and analysis
- Exporting data

Loading samples into the slide

1. Prepare and vortex each sample to ensure it is homogeneous. See "Sample recommendations", page 71, for information on handling and preparation of samples.
2. Spin briefly at high speed to remove particles.

   Note: Only a single sample type can be used in one measurement process (e.g., all RNA, or all protein).
3. Pipette 2 µl samples into the slide wells using an appropriate pipette.

   Follow the pipetting guidelines in "Manual loading of samples to the slide", page 73.

   Note: We recommend pipetting the blank first. If air bubbles have been loaded with the blank, a new slide can be taken without wasting the samples.

   Note: Use no blank (see "Blank", page 72) or water (ddH_2O) as the blank for spectral content profiling apps. Use sample buffer for the classic A_{260} and A_{280} apps.

   Once the sample is dispensed in the well, it will automatically move into the channel reservoir by capillary force. The sample is now protected, and stability is guaranteed for up to 2 h.

   Note: Avoid spilling sample on the slide surface. Spills may lead to changes in pump characteristics, requiring service intervention.

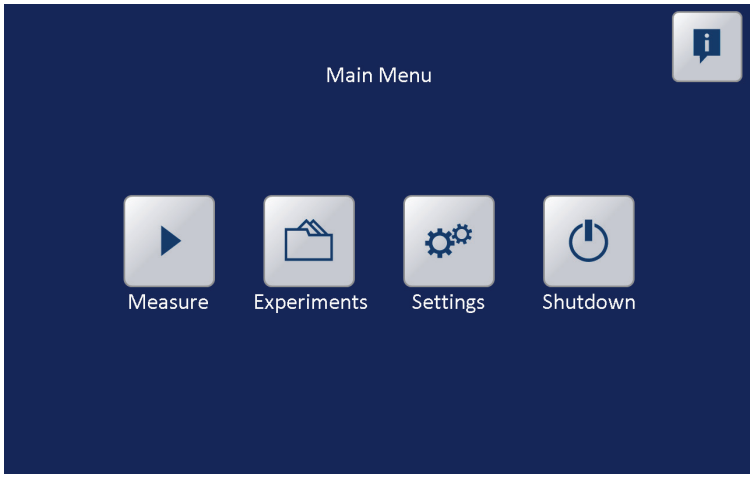
Note: Start the measurement within a maximum time span of 2 h. The slide is an ideal sample carrier.

Setting up the measurement

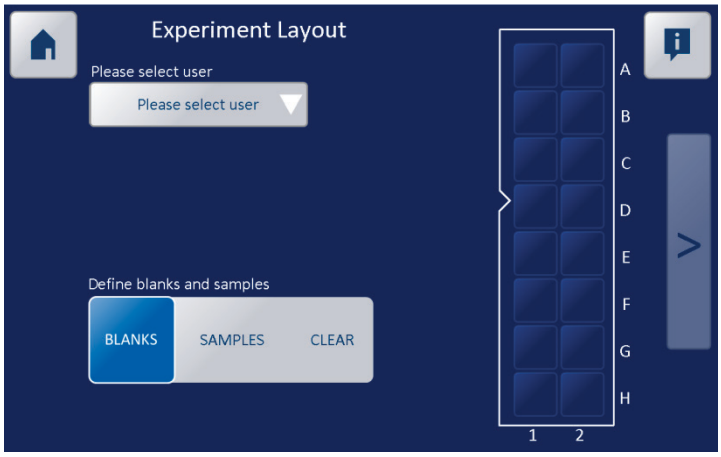
4. Switch the QIAxpert power switch to "On".

   The software will start automatically. If the QIAxpert is in sleep mode, simply swipe your finger over the touchscreen to reactivate the system. (See the table on page 34 for reactivation times and scheme).

5. Go to the main menu.



6. Start a new experiment by tapping the **Measure** button.



User selection

7. Tap **Please select user**.

8. Select the appropriate user from the list in the window that opens.

If the user is not yet defined, create one by selecting **+** in **User Settings** (see "User settings", page 57).

Define the wells

9. Define the wells as filled with blank or sample solutions.
10. Tap the **Blanks** icon (default blue) and choose the position on the slide layout.

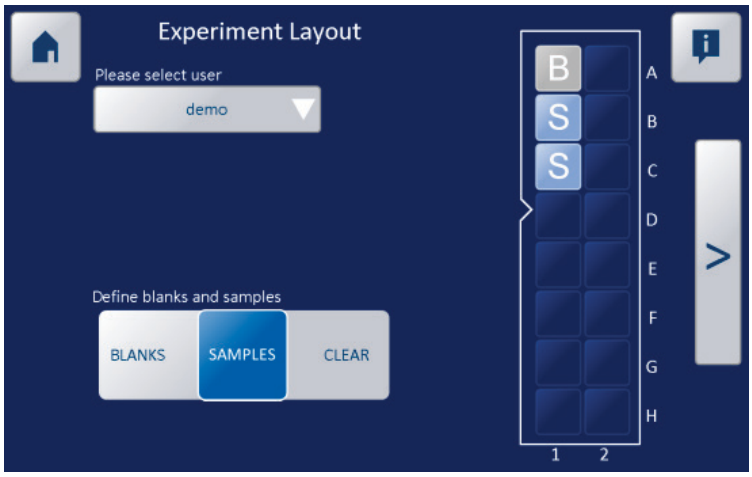
    A marking **B** is shown in the selected well.
11. Repeat the previous step to define the well(s) filled with sample by tapping **Sample** then choosing the position on the slide layout.

    A marking **S** is shown in the selected well(s).

If a well position is marked by mistake, use the **Clear** button to tap the position and remove the **B** or **S** mark from the layout. Glide a fingertip over multiple well locations to define multiple wells.

Once the minimum slide layout is filled in, the **Next** bar on the right side of the screen is activated and changes from faded to bright.

Note: If more than one blank is loaded, then the average of these is calculated and used. (This is good practice as blanking will be more accurate.) The number of samples may be from 1 to 15. If no blank is used, the system performs an automatic blanking.



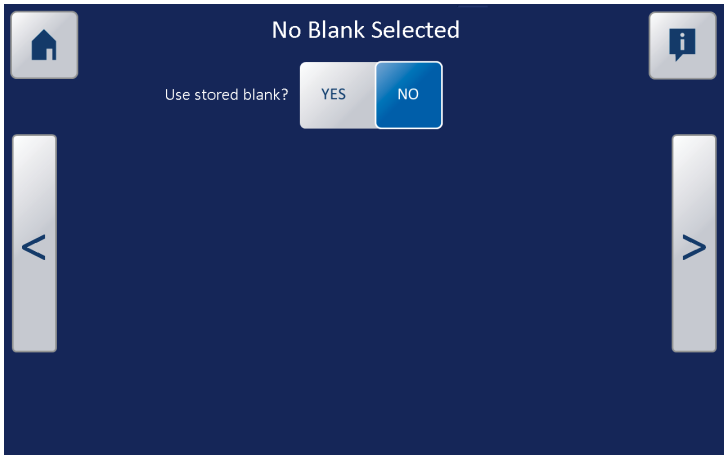
12. Tap the Next bar to continue.

    Note: To save a blank such that it can be applied to subsequent runs, you must analyze at least 3 valid replicates of the blank within the same measurement.

Applying a stored blank to an analysis

Optionally, a stored blank can be applied to an analysis, instead of running a blank sample on the slide.

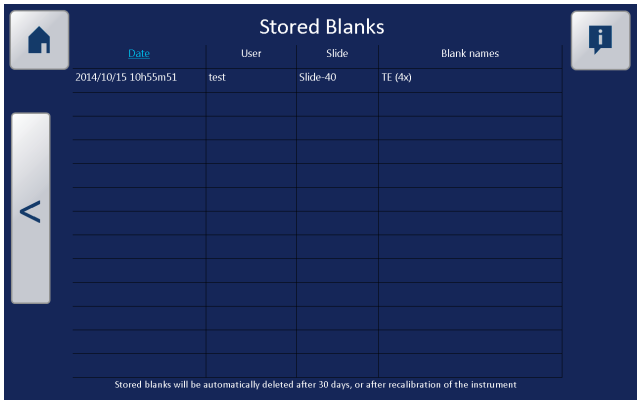
If no Blank position is defined or selected on the Experiment layout screen, an additional screen will appear:



Select **No** if you do not want to apply a stored blank; in this case the system will apply autoblanking to the analysis.

Select **Yes** if you would like to use a stored blank.

Subsequently, a list of stored blanks is shown. Select an appropriate blank and tap the **Next** bar to continue after your selection.

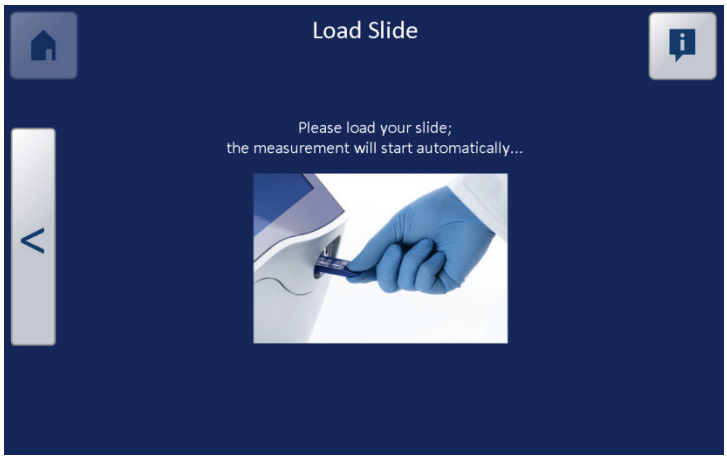


Important: When selecting a stored blank from the list, make sure it matches the elution buffer used to elute the samples to be analyzed.

Refer to “Blank”, page 72, for blanking recommendations.

Loading the slide into the instrument

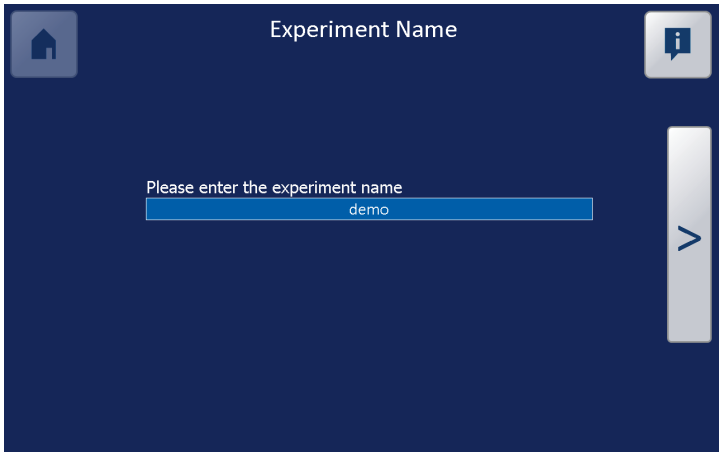
13. Insert the slide when prompted on the screen.
14. Gently push the slide into the gate until the loader retracts the slide automatically into the QIAxpert.



The QIAxpert will start reading the slide immediately. Meanwhile, additional experiment information can be added.

Entering sample information

An experiment name can be defined in the text bar. Tap the text bar to open the keyboard then enter the experiment name.

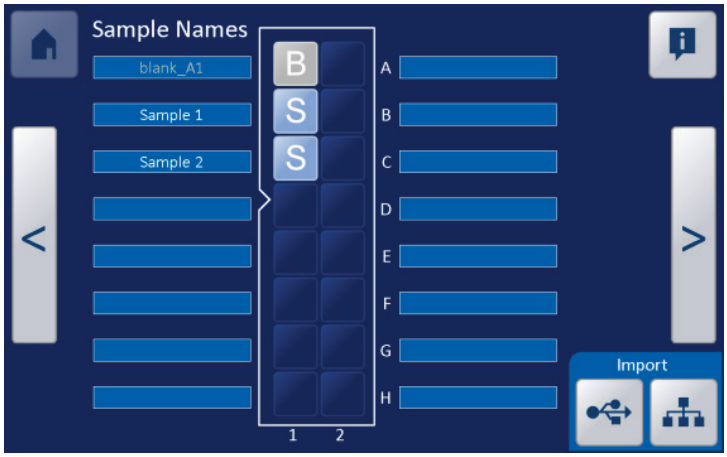


To continue without entering an experiment name, tap the **Next** bar on the right side of the screen.

Entering sample names

Default names are given to samples, for example, **blank_A1**, **sample_B1**. These can be replaced by custom sample names.

Tap the text bar next to each sample to open the keyboard and enter the new sample name with the keyboard.

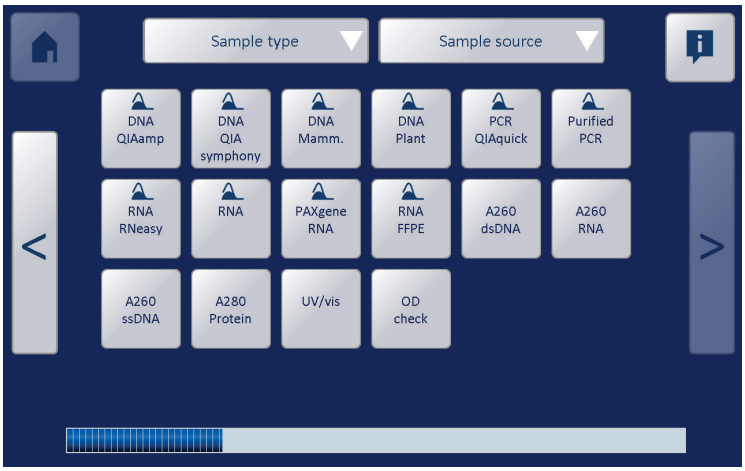


Alternatively, it is possible to import a **.txt** file containing predefined sample names (e.g., barcodes) from a USB device or the network using the appropriate import buttons. For more information on importing sample names, see "Creation of sample information import files", page 35.

To continue without entering sample names, tap the **Next** bar on the right side of the screen.

Selecting the app

15. Select the application.

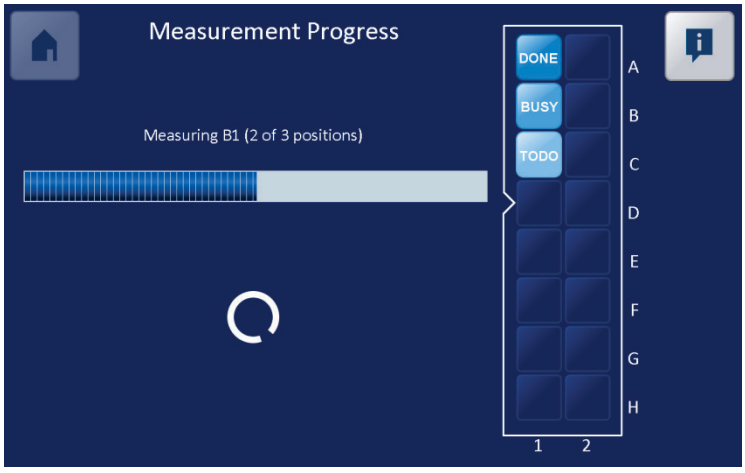


A short explanation of the highlighted app will appear at the bottom of the screen. For a description of available apps, see "Measurement applications (apps)", page 37.

16. After application selection, continue by tapping the **Next** bar on the right side of the screen.

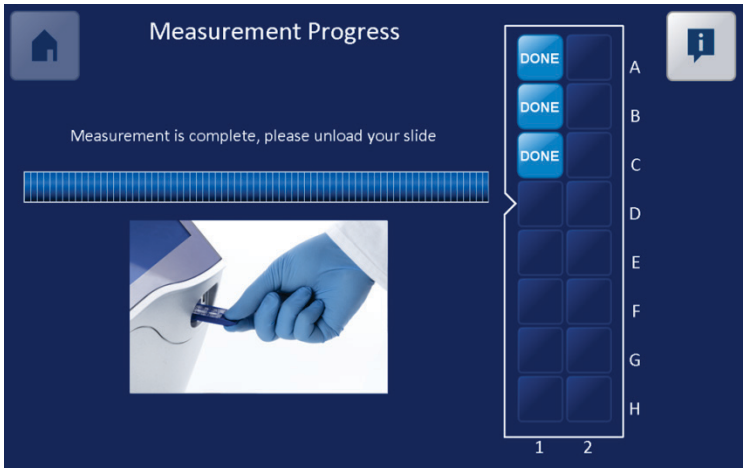
Measurement and analysis

The measurement progress screen opens.



Progress is indicated by a growing blue bar, and by text and color indications (**TO DO**, **BUSY**, and **DONE**) on the samples in the slide view.

When the measurement is finished, the slide gate opens and the thumb grip of the slide emerges from the gate.



Remove the slide from the QIAxpert instrument.

Note: No results are shown until the slide has been removed.

After the slide is removed, the results are calculated and shown on the screen.

The result screen and interpretation of results shown on the screen are explained in "Measurement results", page 42.

Exporting results

Results can be exported by tapping the **Export** button on the Measurement results screen.

Options for export are:

- To USB device
- To network drive
- Export by scanning the QR Code
- Save blank

For more information about exporting results, see "Exporting data", page 49.

Sample recommendations

Sample homogeneity

No extra sample preparations are required, but it is important that samples are homogeneous to ensure accurate and reliable measurement data.

Sampling from non-homogeneous solutions can cause significant deviations in the data generated using small volume spectrophotometers. Highly concentrated nucleic acid samples and other viscous solutions are common examples of non-homogeneous solutions.

Note: Genomic DNA, lambda DNA, and viscous solutions of highly concentrated nucleic acids are common examples that require careful attention to ensure homogeneity before sampling.

Note: Proteins can be subject to denaturation, precipitation, and aggregation, and therefore may require special handling to ensure sample homogeneity.

Buffer interference

Detergents in the sample may interfere with proper functioning of the slides.

Maximum detergent concentrations:

- Tween80: 5.00%
- Tween20: 0.25%
- SDS: 2.00%
- NP-40: 0.015%
- Triton X-100: 0.015%
- Brij97: 0.125%
- Brij35: 10%
- CHAPS: 20%
- CTAB: 0.06%

Blank

Classic UV/VIS

For classic UV/VIS measurements, we recommend running a blank with the samples to be analyzed. For the UV/VIS application, the elution/storage buffer should be used as a blank.

Blanks can be stored and applied to subsequent measurements (see "Saving the blank", page 55).

Note: The most accurate measurement will be obtained by using a blank on the slide the samples are analyzed on. If stored blanks are to be used, we recommend validating this with your particular application.

Note: If no blank is used, or if the blank cannot be analyzed, the system performs an automatic blanking. This is a software-based correction that compensates for effects or noise (e.g., from plastic absorbance or scatter from imperfections or dust on the slide).

Spectral content profiling

Important: Do not use sample storage buffer as the blank for spectral content profiling analyses.

Required corrections for spectral content profiling are performed via an automatic blanking by the system. You may alternatively use pure water (ddH_2O) as the blank.

Sample volume requirements

For precise measurements, it is essential that the measurement chamber is correctly filled with the recommended amount of sample. A sample volume of 2 µl is sufficient to ensure reproducibility. We recommend using a regularly calibrated 0.5–5 µl pipet with corresponding precision tips to ensure that the recommended sample quantity is accurately dispensed.

Note: It is not necessary to fill all 16 input wells to perform a measurement. A single sample measurement can be done, and the unused positions on the slide can be filled in another measurement experiment until all input reservoirs have been used.

Note: The slides are single-use disposables. Do not reuse positions that have been used in a previous experiment. The self-filling behavior of the channel is lost.

Manual loading of samples to the slide

Manual pipetting can be done with a single channel or a multichannel pipet.

1. Before pipetting a sample into slide, make sure the sample is homogenous.
   If required, vortex the sample and then spin briefly at high speed.
2. Set the volume of the pipet to 2 µl.
3. Depress the plunger of the pipette smoothly to the first stop position.
4. Immerse the pipet tip in the sample and allow the plunger to move up smoothly to the rest position.
   Avoid air bubbles in the pipet tips.
5. Hold the pipette at a slight angle (approx. 45 degrees) and bring the head of the tip(s) into the input wells of the slide.

The tip(s) may make contact with the conical inner wall of the input well.

Note: Do not depress the plunger when the pipet tip is placed vertically in the receiving well.

6. Dispense the sample in the well by gently pressing the plunger to the first stop.
7. Keep the plunger at the first stop while gently lifting the tip from the well.

   Note: Do not depress the plunger as far as the "blow out" stop.

   Note: The depth of immersion of the tip into the sample in the sample tube has a significant effect on the result. If the tip is immersed too deeply in the sample, droplets will form on the outside of the tip and will be deposited along with the sample. If the tip is not immersed deeply enough, a vortex will be formed and the pipet will not aspirate the selected volume.
8. The sample will be drawn automatically into the channel reservoir by capillary action.
9. Remove the tip(s) and repeat this pipetting cycle until all samples have been loaded.

An alternative pipetting method is to use reverse pipetting by using the second stop to aspirate the sample and only release the sample until the first stop is reached.

General recommendations for sample handling

- Use a 0.5–5 µl or 1–10 µl pipet that is regularly serviced and calibrated.
- Use short, rigid tips (especially with a multichannel pipet) and ensure that tips fit the input well.
- The sample must be homogeneous.

  Sampling from non-homogeneous solutions can cause significant deviations in the data. Highly concentrated nucleic acid samples and other viscous solutions are common examples known to the molecular biologist.
- Dispense the sample in one smooth action.

  Multistep dispensing can lead to air gaps in the sample.
- Do not push the sample into the reservoir with the pipet.

  The dispensed sample will automatically move into the channel reservoir by capillary action.
- Do not blow out the air after dispensing!

Blow-out generates an air bubble in the input well. These bubbles can block the entrance of the channel at the bottom of the input well or may move into the channels, making measurements unreliable.

Note: Take extra care when using electronic pipets. They may be automatically set to blow out the sample during dispensing.

- Do not spill sample around the input well, especially near the vent hole.

  If sample is deposited by accident close to the vent hole, do not use this slide for measurement. The presence of sample material near the vent hole may result in a persistent change in pump characteristics, requiring service intervention.

- Use the recommended sample volume. Larger sample volumes will not lead to better results.

  If too much sample is dispensed:

  - There is a risk that the measurement reservoir will be filled during pipetting, resulting in inaccurate measurements. The probability of direct filling is quite small, but there is a possibility of error.

Maintenance Procedures

The following maintenance procedures and performance checks must be carried out to ensure reliable operation of the QIAxpert.

Cleaning the QIAxpert

Important: Switch the instrument off and disconnect the line power cord from the power outlet before cleaning.

WARNING	**Risk of electric shock**	[W8]
	Do not open any panels on the QIAxpert before cleaning the QIAxpert.	

CAUTION	**Damage to the instrument**	[C3]
	Do not use solvents, or reagents containing acids, alkalis, or abrasives to clean the QIAxpert.	

CAUTION	**Damage to the touchscreen and computer**	[C4]
	Do not pour or spray liquids, e.g., cleaning agents, on to the QIAxpert. Use a tissue moistened with water only for cleaning.	

Important: We recommend wiping the QIAxpert with a damp cloth only.

The following disinfectants and detergents are recommended for cleaning the QIAxpert.

Note: If cleaning agents different from those recommended are used, ensure that their compositions are similar to those described below.

General cleaning of the QIAxpert:

- Mild detergents
- 70% ethanol

General instructions

Do not use spray bottles to spray cleaning or disinfectant liquids onto surfaces of the QIAxpert.

If solvents or saline, acidic, or alkaline solutions are spilt on the QIAxpert, wipe the liquid away immediately.

Follow manufacturer's safety instructions for handling cleaning agents.

Follow manufacturer's instructions for soaking time and concentration of the cleaning agents: exposure for longer that the recommended soaking time can damage the instrument.

Periodic maintenance

QIAGEN does not recommend any specific annual maintenance of the QIAxpert.

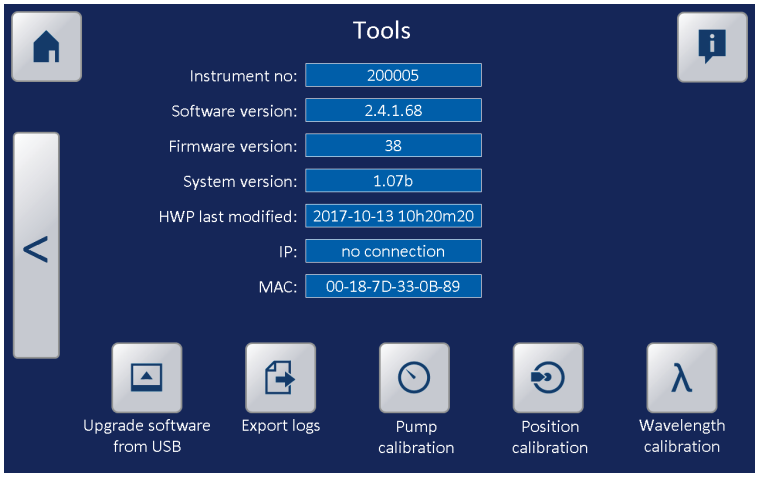
Calibration

QIAGEN recommends system calibration before first use, and after transportation. QIAGEN also recommends annual recalibration of the QIAxpert.

The following tools are required for performing the calibrations:

	Name of tool	Description
	QIAxpert Slide-40	A clean, standard sample measurement slide for the pump calibration.
	Positioning Calibration Slide	Dedicated plastic material slide with metallic plate containing precision holes for positioning calibration.
	Wavelength Calibration Slide	Dedicated metallic slide with two optical filters for wavelength accuracy calibration **Important**: Handle slide carefully to avoid touching the optical filters. Use isopropanol and lint-free optical paper (as used for microscope lenses) for cleaning and store in the original box for protection.

1. Start the QIAxpert instrument and wait for the Main Menu screen to appear.
2. Open the Settings screen and tap **Tools** to open the Tools window.



3. Calibrations for the pump system, the motor positioning, and the wavelength accuracy can be initiated by clicking the respective icon.
4. Perform each calibration. Carefully follow the instructions given on the screen for each.

Upon successful completion of all three calibrations, the QIAxpert is ready for sample measurement.

Note: If any calibration fails, reinitiate the calibration or contact QIAGEN Technical Services.

Export of calibration reports

To export calibration reports, plug a USB device into the front port and click Export logs on the Tools screen.

Touchscreen sensitivity recalibration

Touchscreen sensitivity recalibration is not required for new QIAxpert instruments (serial number >201123). Therefore, touchscreen calibration functionality is disabled for System 2.00 instruments. In older system versions of the instrument, this functionality is still enabled.

The touchscreen sensitivity calibration is performed only when starting the instrument for the first time, and recalibration is normally not required. However, a recalibration is possible. During instrument startup, the QIAGEN logo appears on the screen. A Touchscreen icon is visible for a few seconds in the bottom right corner. The touchscreen sensitivity calibration can be initiated by turning off the QIAxpert instrument during these few seconds and then restarting.

Performance checks

Automatic system performance check

The QIAxpert system performs a self-test on start up.

Motors

This test checks the functionality of the motors and switches.

Pump

This test checks the functionality of the pump system at different mbar levels and tests function of the pressure sensing of the instrument.

Pressure variation with a regular slide inserted is checked using internal sensors at 15, 20, and 25 mbar.

Optics

This test checks the functionality of the optic parts in terms of illumination, lamp variation, and wavelength calibration.

Last calibrations

This checks if the last calibrations were successful.

Self-test failure:

In case of self-test failure, the **Measure** button remains inactive and no sample analysis can be performed.

Try recalibration of the instrument as described in "Periodic maintenance", page 77, or contact QIAGEN Technical Services.

OD Check app

The QIAxpert software includes the OD Check app to test the photometric accuracy and precision of the QIAxpert in combination with QIAxpert slide consumables.

This check is based on the readout of a gravimetrically prepared solution of potassium dichromate (K2Cr2O7), a NIST Traceable Reference Material (NIST: National Institute of Standards and Technology) with a verified absorbance at 350 nm. When the test report shows results out of specification, recalibration is required.

Note: Recommended pipetting techniques must be followed to ensure that the test is performed correctly (for more information, see "General recommendations for sample handling", page 74).

Procedure

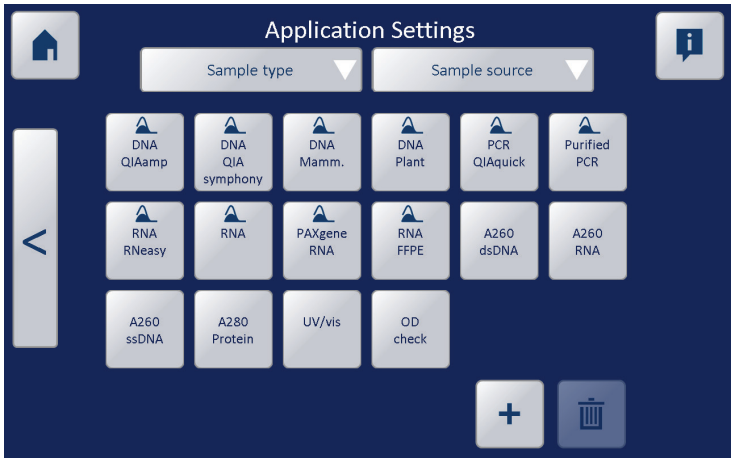
To perform the OD Check test with potassium dichromate, follow the same steps used to set up a new experiment.

1. On the main screen, press **Measure**.
2. Prepare the slide.
3. For the blank, pipet 2 µl of ddH_20 into well A1 of an empty/new QIAxpert slide.

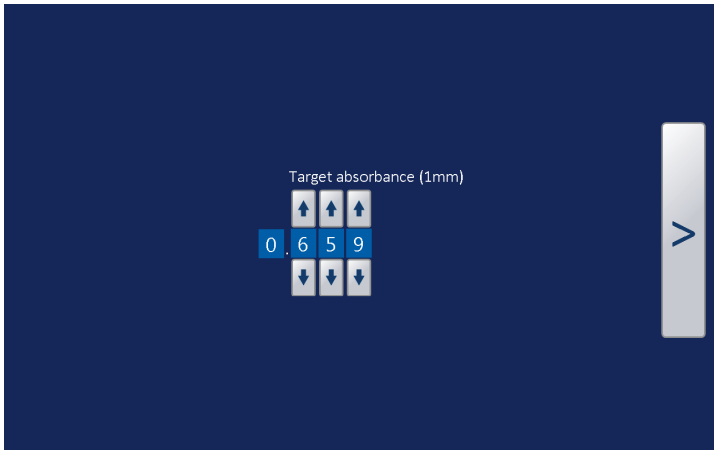
4. Add 2 µl of QIAxpert Potassium Dichromate solution (cat. no. 990701) to the rest of the wells in the slide. See Appendix D for ordering information.

   Note: Use a freshly opened vial. Once opened, the vial must be used within 1 h.

5. In the slide setup, select the first position as blank (B) and the other positions as sample (S).
6. Enter any sample or experiment name (not relevant).
7. Tap the Next bar.
8. Select the OD Check app.

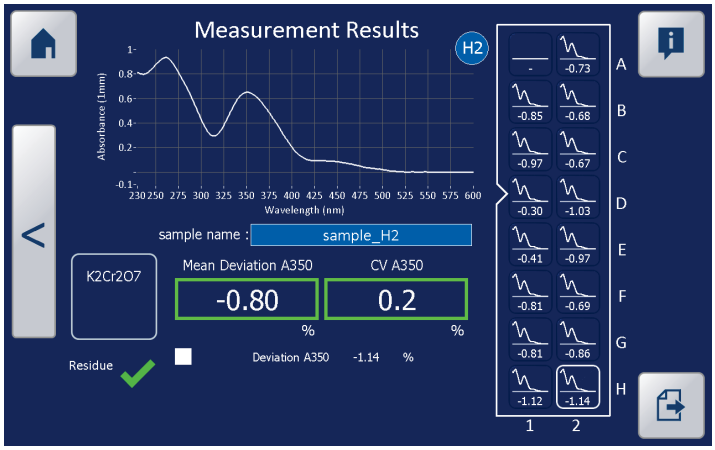


9. Enter the target absorbance number found on the QIAxpert Potassium Dichromate vial.



The result of the performance check will appear in the Measurement results window to indicate if the QIAxpert is working within the optical specifications required for accurate and precise readings.

- A green rectangle will be displayed if the QIAxpert passes the potassium dichromate test.
- A red rectangle will be displayed if the QIAxpert fails the potassium dichromate test.
- The maximum allowed mean deviation A_{350} and CV A_{350} are 4% and 3%, respectively.



Troubleshooting the OD check results

Inaccurate measurements can be caused by:

- The reference vial being open longer than 1 hour, leading to abnormally high OD values
- Time between dispensing and measuring is longer than 2 hours, leading to evaporation effects
- Insufficient dispensed volume leading to incorrectly filled microcuvettes
- Inappropriate blank
- An obstruction in the optical path (e.g., large particles, fingerprint, small air bubbles) has influenced the measurement
- The pumps are performing out of specifications (see color indications on the thumbnail view)
- The optical performance of the QIAxpert is out of specifications

When red values are shown, repeat the validation test with the opened vial of potassium dichromate (if repeat measurements can be done within 1 hour), or with a fresh vial.

If the second result is consistent with the first failed test, please contact QIAGEN Technical Services.

Troubleshooting

General troubleshooting

If results are questionable, recalibrate the instrument. If the problem persists after recalibration, contact QIAGEN Technical Services.

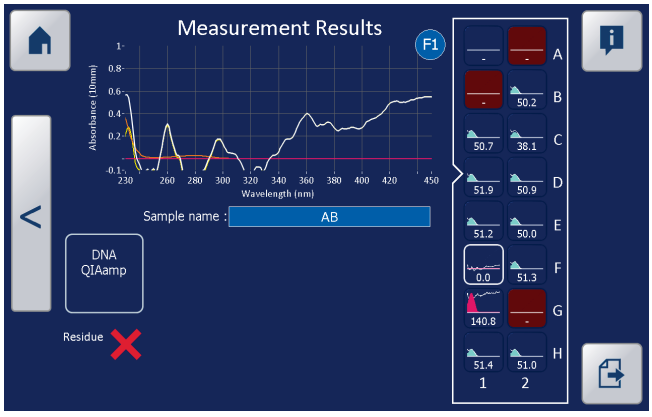
When contacting QIAGEN Technical Services, please export log files via the Tools screen (see "Tools", page 62) and have the experiment files (***.html, *.csv, and *.bin**) ready. We also recommend processing a slide with only ddH_2O in the sample wells.

Proper pipetting is crucial. Forcing of liquid into the microfluidic channels, or allowing air bubbles to form, can affect the results. Please refer to "Manual loading of samples to the slide", page 73, for pipetting instructions.

Example results showing problems

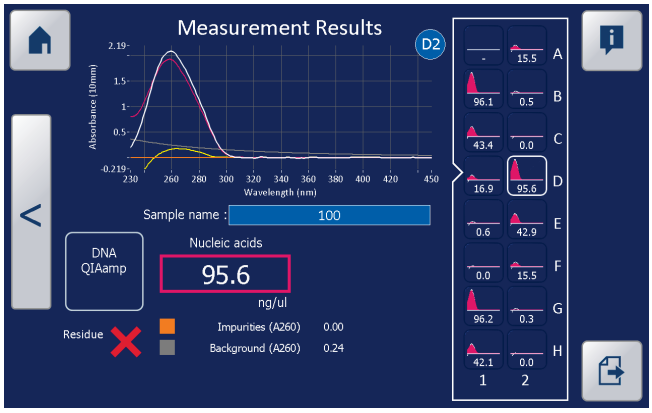
Air bubbles

Reload the slide with your samples following the instructions in "General recommendations for sample handling", page 74.



Overblanking

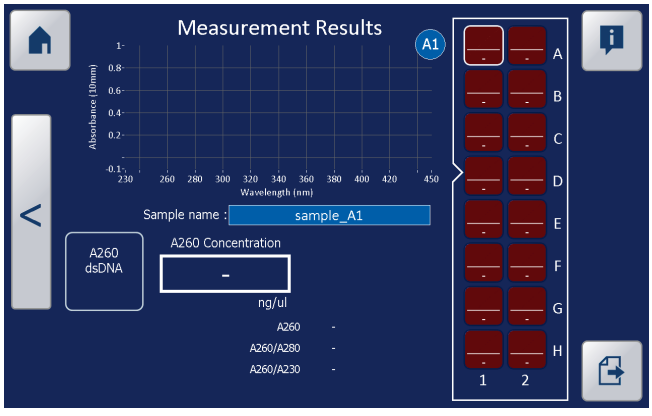
For spectral content profiling, do not use sample buffer as the blank. See "Blank", page 72, for blanking recommendations.



Red flags

Red flags may be caused by:

- Volume problems
- Air bubbles
- Pump problems
- Sample too viscous
- Slide has been used before
- Detergents (see “Buffer interference”, page 72, for maximum concentrations)
- Hydrophobic substances



Error codes/messages

Applications

Code	Code description	Problem solving action
APP900	No USB drive found	Wait for a few seconds and try again. If still not responding, unplug and re-enter the USB stick to retry.
APP901	Multiple USB drives found	Remove the USB drives. Only one allowed at any given time.
APP902	Error checking for USB	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP903	Folder does not exist	Make sure folder on USB drive is in the correct location (top level) and named correctly.
APP904	Copy from USB to QIAxpert applications folder failed	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP905	This experiment is already on the drive	No further action required.
APP906	Not enough space on the drive	Create some space on the drive by deleting files, or use another drive (USB) or location (network).
APP907	Experiment path does not exist	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP908	Copy experiment error	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP909	No network folder set	Define network folder, domain, login, and password in the Export Settings section.
APP910	Network folder not found	Check network cable and folder name and location on server. Or try to save again. If necessary change the folder in the Export settings menu.
APP911	Error checking for network folder	Check network cable and retry. Check if all network settings are correct. If not solved, contact QIAGEN Technical Services for more information.
APP912	Error deleting oldest experiment	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP913	Logging path does not exist	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP914	Error during renaming	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP925	Network folder does not have the right syntax	Always start the network folder with “\\”.
APP926	Host not found.	Please check if the cable at the back is connected and that you set the network folder correctly. If this error message appears in the export settings screen, try to save again.

Code	Code description	Problem solving action
APP928	Error creating zip file	Error when trying to export the log files. Retry. If not solved, contact QIAGEN Technical Services for more information.
APP940	Could not create HTML report	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP941	Could not create csv/txt report	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP942	Could not create QR code	Retry. If not solved, contact QIAGEN Technical Services for more information.
APP970	QIAxpert updater not found	Please contact QIAGEN Technical Services. Your system can be corrupt or is missing a crucial part.
APP999	Network folder error	Retry. If not solved, contact QIAGEN Technical Services for more information.

Database

Code	Code description	Problem solving action
DBA001	Could not open database file	Restart and retry. If not solved, contact QIAGEN Technical Services for more information.
DBA002	Writing to database file error	Restart and retry. If not solved, contact QIAGEN Technical Services for more information.
DBA010	Could not read experiment	Restart and retry. If not solved, contact QIAGEN Technical Services for more information.
DBA020	Database load, could not open/create database file	Restart and retry. If not solved, contact QIAGEN Technical Services for more information.
DBA041	Database store, could not write to database file	Restart and retry. If not solved, contact QIAGEN Technical Services for more information.
DBA061	Database remove, could not write to database file	Restart and retry. If not solved, contact QIAGEN Technical Services for more information.

Application/protocol

Code	Code description	Problem solving action
PRT001	Could not load application	Application is not compatible with the QIAxpert software version. Please download the latest version of the application from the QIAGEN website.
PRT002	License check failed	Possible corrupt Application. Contact QIAGEN Technical Services for more information.
PRT003	Get parameters failed	Possible corrupt Application. Contact QIAGEN Technical Services for more information.

Code	Code description	Problem solving action
PRT004	Execute failed	Possible corrupt Application. Contact QIAGEN Technical Services for more information.
PRT005	Unknown license error	Unknown cause, send error logs to QIAGEN to get more information.
PRT006	License GUID check failed	License is corrupt. Contact QIAGEN.
PRT007	Protection dll not found	Retry. If not solved, contact QIAGEN Technical Services for more information.

Device

Code	Code description	Problem solving action
DEV000	Unknown error	Switch off QIAxpert and restart.
DEV001	Could not connect to the QIAxpert instrument	Please check if restarting fixes this issue. If not solved, contact QIAGEN Technical Services for more information.
DEV002	Incorrect message received	Restart. If not solved, contact QIAGEN Technical Services for more information.
DEV003	Connection error	Restart.
DEV004	Timeout	Restart.
DEV005	No HW parameters found	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV006	Firmware connection test failed	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV020	Logging error	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV100	Requested position not reached	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV101	Positioning contains zeros	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV102	Cannot move XX on Z	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV103	XY not allowed when gate active	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV104	Homing error, slot switch pressed, fork switch not	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.

Code	Code description	Problem solving action
DEV105	V MAX not in range (20..2040)	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV106	A MAX not in range (20..2040)	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV107	CHOPCONF values not in range	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV108	INT Handler ERROR	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV110	Homing error	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV111	Axis reference error	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV140	Position calibration failed	Restart and try again. If problem persists, contact QIAGEN Technical Services for more information.
DEV200	Pump out of range	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV201	Pressure sensor not connected	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV202	No pressure	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV300	Temperature out of range	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV340	Pump calibration failed	Restart and try again. If problem persists, contact QIAGEN Technical Services for more information.
DEV401	AD board not connected	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV402	CMOS not connected	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV403	Photo diode board not connected	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV404	CMOS dark out of range	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.

Code	Code description	Problem solving action
DEV405	Photo diode dark out of range	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV410	Photo diode no light	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV411	CMOS no light	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV412	No lamp output	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV420	High lamp variation	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV430	Large peak shift	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV431	Not enough light	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV440	Wavelength calibration failed	Restart and try again. If problem persists, contact QIAGEN Technical Services for more information.
DEV540	Last calibration unsuccessful	Perform the previously failed calibration (see "Calibration", page 77). If not solved and if problem persists, contact QIAGEN Technical Services for more information.
DEV900	Action cannot be performed	Restart. If not solved and if problem persists, contact QIAGEN Technical Services for more information.

Glossary

Term	Description
Absorbance	A logarithmic ratio of the radiation falling upon a material to the radiation transmitted through a material.
App(s)	Apps are application files to directly facilitate specific spectrophotometric applications.
Blank	A blank solution in spectroscopy is one that is used as a reference. It is set to a zero reading and is used to calibrate the spectrophotometer.
Curve	A plot of absorbance versus wavelength (see spectrum).
Microfluidics	Microfluidics deals with the behavior, precise control, and manipulation of fluids that are geometrically constrained to a small, typically submillimeter, scale.
Optical density (OD)	Same as absorbance.
Power switch	A button located at the back of the QIAxpert. It allows the user to switch the QIAxpert on and off.
Sample	A representative piece of material selected from a larger quantity.
Slide	A unique microfluidic carrier with on-board capillary channels to protect samples.
Spectral content profiling	Analysis that extracts the contribution of specific components in a mixture from the measured UV/VIS spectrum.
Spectrum	A plot of absorbance versus wavelength for a compound, characterized by the wavelength (A_{max}) at which the absorbance of the material is the greatest.

Appendix A – Informations de sécurité

Avant d'utiliser le system QIAxpert, il est impératif de lire attentivement ce manuel et de porter une attention particulière aux informations de sécurité. Afin de garantir un fonctionnement du QIAxpert en toute sécurité et de maintenir le QIAxpert en bon état de marche, il est impératif de suivre les instructions et les informations de sécurité fournies dans le présent manuel d'utilisation.

Remarque: Les traductions des Informations de sécurité en français et en allemand sont disponibles dans l'annexe A et dans l'annexe B.

Les types d'informations de sécurité suivants sont fournis tout au long du manuel d'utilisation.

AVERTISSEMENT	Le terme AVERTISSEMENT signale des situations risquant d'entraîner des **accidents corporels** dont l'utilisateur, ou d'autres personnes, pourraient être victime. Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.

ATTENTION	Le terme ATTENTION signale des situations risquant d'entraîner des **détériorations de l'appareil** ou de tout autre matériel. Les détails concernant ces circonstances sont donnés dans un encadré identique à celui-ci.

Les conseils donnés dans ce manuel ont pour but de venir compléter les exigences de sécurité habituelles en vigueur dans le pays de l'utilisateur, et non de s'y substituer.

Utilisation appropriée

AVERTISSEMENT/ ATTENTION	**Risque d'accident corporel et de détérioration du matériel** L'utilisation inappropriée du QIAxpert peut entraîner des accidents corporels ou une détérioration de l'appareil. Le QIAxpert ne doit être manipulé que par du personnel convenablement formé et expérimenté. L'entretien du QIAxpert ne doit être effectué que par le personnel d'entretien QIAGEN ou les techniciens d'entretien d'un agent autorisé.	[W1]

AVERTISSEMENT/ ATTENTION	**Risque d'accident corporel et de détérioration du matériel** Ne pas essayer de déplacer le QIAxpert pendant qu'il est en marche.	[W2]

AVERTISSEMENT/ ATTENTION	**Atmosphère explosive** Le QIAxpert n'est pas conçu pour être utilisé dans une atmosphère explosive.	[W3]

ATTENTION	**Détérioration de l'appareil** La lumière directe du soleil peut décolorer les pièces de l'appareil et abîmer les éléments en plastique. Tenir le QIAxpert à l'abri de la lumière directe du soleil.	[C1]

ATTENTION	**Détérioration de l'appareil** Éviter de renverser de l'eau ou des produits chimiques sur le QIAxpert. La détérioration de l'appareil dû au déversement de liquides annule la garantie.	[C2]

En cas d'urgence, éteignez le QIAxpert à l'aide de l'interrupteur d'alimentation et débranchez le câble d'alimentation de la prise de courant.

Sécurité électrique

Remarque: Avant l'entretien, débrancher le câble d'alimentation de la prise de courant.

	Danger électrique Toute interruption du conducteur de protection (conducteur de terre/de masse) à l'intérieur ou à l'extérieur de l'appareil ou toute déconnexion de la borne du conducteur de protection est susceptible de rendre l'appareil dangereux. Toute interruption intentionnelle est interdite. **Tensions mortelles à l'intérieur de l'appareil.**	[W4]

	Lorsque l'appareil est relié à l'alimentation, les bornes peuvent être sous tension et l'ouverture de capots de l'appareil ou le retrait de pièces risque d'exposer des éléments sous tension.

AVERTISSEMENT	**Détérioration de l'instrument**	[C5]
	Il est uniquement autorisé de connecter les circuits certifiés CEI-60950 ou CEI-61010 au dispositif QIAxpert.	

Afin que le QIAxpert fonctionne de manière satisfaisante et en toute sécurité, conformez-vous aux conseils suivants :

- Le câble d'alimentation doit être relié à une prise d'alimentation disposant d'un conducteur de protection (terre/masse).
- Ne pas régler ni remplacer les pièces internes à l'instrument.
- Ne pas faire fonctionner l'appareil si des capots ou des pièces ont été retirés.
- En cas de déversement de liquides á l'intérieur de l'appareil, débrancher celui-ci de la prise d'alimentation et contracter les Services techniques de QIAGEN.
- Si vous remplacez les fusibles, ne les remplacer qu'avec des fusibles du même type et équivalent en voltage, comme indiqué sur le fusible.
- Seuls l'alimentation et le cordon d'alimentation au secteur fournis doivent être utilisés. Pour tout remplacement, contactez le service technique de QIAGEN.
- L'utilisation d'une alimentation inadaptée est susceptible de provoquer un incendie en raison d'une surchauffe.
- Si l'appareil devient dangereux sur le plan électrique, empêchez d'autres membres du personnel de l'utiliser et contacter le support technique de QIAGEN. L'appareil peut être dangereux électriquement si:
    - le câble d'alimentation semble endommagé.
    - il a été stocké pendant une période de temps prolongée dans des conditions en dehors des spécifications des « Storage Conditions » (Conditions de stockage), mentionnées dans l'annexe C.
    - il a subi des chocs sévères durant le transport.

Sécurité biologique

Échantillons

Les échantillons peuvent contenir des agents infectieux. Vous devez connaître le risque que de tels agents représentent pour la santé et devez utiliser, stocker et mettre au rebut ces échantillons conformément aux règles de sécurité nécessaires.

AVERTISSEMENT	**Échantillons contenant des agents infectieux** [W5] Le QIAxpert n'est pas prévu pour mesurer des échantillons biologiques ou des agents infectieux dans le WHO classé groupe risque 3 et 4. Certains échantillons, dans le WHO classé groupe risque 2, utilisés avec cet appareil peuvent contenir des agents infectieux. Manipuler ces échantillons avec la plus grande précaution et conformément aux réglementations de sécurité en vigueur. Toujours porter des lunettes de protection, deux paires de gants et une blouse de laboratoire. La personne responsable (par exemple, le directeur du laboratoire) doit prendre les précautions nécessaires afin de garantir que le lieu de travail environnant est sûr et que les opérateurs de l'appareil ne sont pas exposés à des niveaux dangereux d'agents infectieux comme cela est défini dans les fiches de données de sécurité (FDS) ou dans les documents de l'OSHA *, de l'ACGIH,† ou du COSHH‡ applicables. L'évacuation des vapeurs et la mise au rebut des déchets doivent s'effectuer conformément à toutes les réglementations et lois nationales, régionales et locales relatives à la santé et à la sécurité.

Sécurité chimique

AVERTISSEMENT/ ATTENTION	**Substances chimiques dangereuses** **[W6]** Certains produits chimiques utilisés avec cet appareil peuvent être dangereux ou le devenir après l'exécution du cycle du protocole. Manipuler ces échantillons avec la plus grande précaution et conformément aux règles de sécurité nécessaires. Toujours porter des lunettes de protection, des gants et une blouse de laboratoire. La personne responsable (par exemple, le directeur du laboratoire) doit prendre les précautions nécessaires afin de garantir que le lieu de travail environnant est sûr et que les opérateurs de l'appareil ne sont pas exposés à des niveaux dangereux de substances (chimiques ou biologiques) toxiques comme cela est défini dans les fiches de données de sécurité (FDS) ou dans les documents de l'OSHA*, de l'ACGIH† ou du COSHH‡ applicables. L'évacuation des vapeurs et la mise au rebut des déchets doivent s'effectuer conformément à toutes les réglementations et lois nationales, régionales et locales relatives à la santé et à la sécurité.

* OSHA : Occupational Safety and Health Administration (Administration pour la santé et la sécurité du travail) (États-Unis d'Amérique).
† ACGIH: American Conference of Government Industrial Hygienists (Conférence américaine des hygiénistes industriels gouvernementaux) (États-Unis d'Amérique).
‡ COSHH: Control of Substances Hazardous to Health (Contrôle des substances dangereuses pour la santé) (Royaume-Uni).

Vapeurs toxiques

Si vous travaillez avec des solvants volatils ou des substances toxiques, vous devez disposer d'un système de ventilation de laboratoire efficace afin d'évacuer les vapeurs qui peuvent être générées.

Mise au rebut des déchets

Le matériel en plastique usagé peut contenir des produits chimiques dangereux ou des matières contagieuses/infectieuses. Ces déchets doivent être convenablement collectés et mis au rebut conformément aux règles de sécurité locales.

Pour la mise au rebut des déchets d'équipements électriques et électroniques (DEEE), voir page 109.

Dangers mécaniques

Afin que le QIAxpert fonctionne de manière satisfaisante et en toute sécurité, conformez-vous aux conseils suivants :

- Utiliser exclusivement les consommables/lames recommandé(e)s.

Sécurité de maintenance

Procéder à la maintenance comme décrit dans le chapitre “Maintenance”. QIAGEN facture les réparations rendues nécessaires suite à une maintenance inappropriée.

AVERTISSEMENT/ ATTENTION	**Risque d’accident corporel et de détérioration du matériel** N’effectuez que la maintenance spécifiquement décrite dans ce manuel d’utilisation.	[W7]

AVERTISSEMENT	**Risque de décharge électrique** Ne pas ouvrir les panneaux du QIAxpert.	[W8]

ATTENTION	**Détérioration de l’appareil** Ne pas utiliser de solvants ni de réactifs contenant des acides, des bases ou des composés abrasifs pour nettoyer le QIAxpert.	[C3]

ATTENTION	**Détérioration de l’écran tactile et de l’ordinateur** Ne pas verser ou pulvériser de liquides, par exemple des produits nettoyants, sur le QIAxpert. Utiliser exclusivement un tissu imprégné d’eau pour le nettoyage.	[C4]

Symboles sur le QIAxpert

Symbole	Emplacement	Description
CE	Plaque signalétique à l'arrière de l'appareil	Symbole CE pour la conformité européenne
C US	Plaque signalétique à l'arrière de l'appareil	Conforme aux normes de sécurité des États Unis et du Canada
	Plaque signalétique à l'arrière de l'appareil	Fabricant légal
	Plaque signalétique à l'arrière de l'appareil	Déchets d'équipements électriques et électroniques (DEEE) pour l'Europe
FC	Plaque signalétique à l'arrière de l'appareil	Marque FCC de la Fédéral Communications Commission des États-Unis
	Plaque signalétique à l'arrière de l'appareil	Marque RCM pour l'Australie (identifiant du fournisseur N17965)
25	Plaque signalétique à l'arrière de l'appareil	Label RoHS pour la Chine (restriction de l'utilisation de certaines substances dangereuses dans l'équipement électrique et électronique)

Appendix B – Sicherheitshinweise

Vor der Inbetriebnahme des QIAxpert sollten Sie dieses Handbuch sorgfältig durchlesen – beachten Sie insbesondere die Sicherheitshinweise. Die Anweisungen und Sicherheitsinformationen in diesem Handbuch müssen vom Anwender befolgt werden, um einen sicheren Betrieb des QIAxpert zu gewährleisten und das Gerät in einem sicheren Zustand zu erhalten.

Hinweis: Übersetzungen der Sicherheitshinweise in Französisch und Deutsch stehen in Appendix A bzw. Appendix B zur Verfügung.

In diesem Handbuch werden die folgenden beiden Kategorien von Sicherheitshinweisen verwendet:

WARNUNG	Der Begriff „WARNUNG“ (“WARNING”) weist Sie auf Situationen hin, in denen eine **Verletzungsgefahr** für Sie selbst oder andere Personen besteht. Nähere Einzelheiten über diese Situationen werden in einem Textfeld wie diesem beschrieben.

ACHTUNG	Der Begriff „ACHTUNG“ (“CAUTION”) weist Sie auf Situationen hin, in denen **das Gerät** oder andere Geräte **beschädigt** werden könnten. Nähere Einzelheiten über diese Situationen werden in einem Textfeld wie diesem beschrieben.

Die in diesem Handbuch enthaltenen Hinweise stellen eine Ergänzung und keinen Ersatz der üblichen Sicherheitsanforderungen dar, die im jeweiligen Land gelten.

Sachgemäße Handhabung

WARNUNG/ ACHTUNG	**Verletzungsgefahr und Beschädigung des Geräts** [W1] Die unsachgemäße Bedienung des QIAxpert kann zu einer Verletzung des Benutzers oder zur Beschädigung des Geräts führen. Das QIAxpert darf nur von entsprechend geschultem und qualifiziertem Personal betrieben werden. Die Instandhaltung des QIAxpert darf nur durch Servicespezialisten des QIAGEN Außendiensts oder Servicetechniker eines autorisierten Auftragnehmers durchgeführt werden.

WARNUNG/ ACHTUNG	**Verletzungsgefahr und Beschädigung des Geräts** [W2] Bewegen Sie das QIAxpert System auf keinen Fall während des Betriebs.

WARNUNG/ ACHTUNG	**Explosionsfähige Atmosphären** [W3] Der QIAxpert ist nicht für den Gebrauch in explosionsfähigen Atmosphären vorgesehen.

ACHTUNG	**Geräteschäden** [C1] Direktes Sonnenlicht könnte zum Ausbleichen von Geräteteilen führen und Schäden an Kunststoff teilen verursachen. Das QIAxpert darf daher nicht in einem Bereich mit direkter Sonneneinstrahlung aufgestellt werden.

ACHTUNG	**Geräteschäden** [C2] Vermeiden Sie es, Wasser oder Chemikalien auf der Oberfläche des QIAxpert zu verschütten. Durch verschüttete Chemikalien oder verschüttetes Wasserverursachte Geräteschäden sind nicht durch die Garantieabgedeckt.

Schalten Sie im Notfall das QIAxpert System aus, und ziehen Sie den Netzstecker aus der Steckdose.

Schutz vor Stromschlag

Hinweis: Ziehen Sie das Netzanschlusskabel aus der Steckdose, bevor Sie Wartungsarbeiten am Gerät vornehmen.

WARNUNG	**Gefahr durch Stromschlag**	[W4]
	Jede Unterbrechung des Schutzleiters (Erdungs- bzw. Masseleiter) im Gerät oder außerhalb des Geräts und jede Abtrennung des Schutzleiters am Anschluss der Netzleitung erhöht die Gefahr eines Stromschlags. Eine absichtliche Unterbrechung der Schutzleiterverbindung ist verboten. **Gefährliche Spannung im Gerät** Wenn das Gerät an die Stromversorgung angeschlossen ist, sind die Anschlussstellen spannungsführend. Öffnen der Abdeckungen oder das Entfernen von Gehäuseteilen können spannungsführende Komponentenfreigelegt werden.	

WARNUNG	**Beschädigung des Geräts**	[C5]
	Das QIAxpert System darf nur mit Stromkreisen verbunden werden, die nach IEC-60950 oder IEC-61010 zertifiziert sind.	

Um einen zufriedenstellenden und sicheren Betrieb des QIAxpert zu gewährleisten, befolgen Sie bitte die nachstehenden Hinweise:

- Das Netzkabel muss an eine Wechselstrom-Steckdose mit Schutzleiter (Erdungs-/Masseleiter) angeschlossen werden.
- Nehmen Sie im Geräteinneren keine Einstellungen an Teilen vor und wechseln Sie keine Teile aus.
- Nehmen Sie das Gerät nicht in Betrieb, wenn Abdeckungen oder Teile entfernt worden sind.
- Falls Flüssigkeit auf dem Gerät verschüttet wird und in das Gerät läuft, dann schalten Sie es sofort aus, trennen Sie es von der Netzspannung (Stecker ziehen!) und setzen Sie sich mit dem Technischen Service von QIAGEN in Verbindung.
- Beim Austausch der Netzsicherung ersetzen Sie diese nur durch eine desselben Typs und der Stromstärke, die auf dem Etikett/ Typenschild angegeben ist.
- Benutzen Sie ausschließlich das Netzteil und das Netzstromkabel, die im Lieferumfang enthalten sind. Ersatzteile erhalten Sie vom Technischen Service von QIAGEN.
- Bei Verwendung eines falschen Netzteils besteht Brandgefahr durch Überhitzung.
- Falls die elektrische Sicherheit bei der Bedienung des Geräts nicht mehr gewährleistet werden kann, muss das Gerät gegen unbefugte oder unabsichtliche Benutzung gesichert werden.

Kontaktieren Sie anschließend den Technischen Service von QIAGEN. Die elektrische Sicherheit des Geräts ist nicht mehr gegeben, wenn:

- das Gerät oder das Netzkabel beschädigt erscheint;
- das Gerät für längere Zeit unter Bedingungen gelagert wurde, die von den im Abschnitt „Lagerungsbedingungen“ in Appendix C genannten Spezifikationen abweichen;
- das Gerät unsachgemäß transportiert worden ist.

Biologische Sicherheit

Proben

Proben können infektiöse Erreger enthalten. Sie sollten sich der Gesundheitsgefahr bewusst sein, die von diesen Erregern ausgeht, und derartige Proben gemäß den erforderlichen Sicherheitsbestimmungen handhaben, lagern und entsorgen.

WARNUNG **Proben, die infektiöse Erreger enthalten** [W5]

Der QIAxpert ist nicht für die Nutzung mit biologische Proben oder infektiöse Substanzen der WHO-Risikogruppen 3 und 4 vorgesehen.

Einige Proben, der WHO Risikogruppe 2, die mithilfe dieses Geräts verarbeitet werden, können infektiöse Erreger enthalten. Gehen Sie beim Umgang mit biologischen Materialien mit der größtmöglichen Vorsicht und gemäß den erforderlichen Sicherheitsbestimmungen vor. Tragen Sie immer eine Schutzbrille, zwei Paar Laborhandschuhe und einen Laborkittel.

Die verantwortlichen Personen (z. B. Laborleiter) müssen alle erforderlichen Vorsichtsmaßnahmen treffen, um sicherzustellen, dass der Arbeitsplatz sicher ist und die Bediener der Geräte nicht gefährlichen Konzentrationen infektiöser Erreger ausgesetzt werden. Das bedeutet, dass die Grenzwerte in Bezug auf infektiöse Erreger, die in den entsprechenden Sicherheitsdatenblättern (SDBs) oder den Vorschriften der OSHA*, ACGIH† oder COSHH‡ festgelegt sind, nicht überschritten werden dürfen.

Beim Betrieb eines Abzugs und bei der Entsorgung von Abfallstoffen müssen alle Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz auf übernationaler, nationaler und regionaler Ebene eingehalten werden.

Chemikalien Sicherheit

WARNUNG	**Gefährliche Chemikalien**	[W6]
	Einige der in Verbindung mit diesem Gerät verwendeten Chemikalien sind gesundheitsgefährdend oder können nach Beendigung eines Protokoll-Laufs gesundheitsgefährdend werden. Gehen Sie beim Umgang mit biologischen Materialien mit der größtmöglichen Vorsicht und gemäß den erforderlichen Sicherheitsbestimmungen vor. Tragen Sie immer eine Schutzbrille, zwei Paar Laborhandschuhe und einen Laborkittel. Die verantwortlichen Personen (z. B. Laborleiter) müssen alle erforderlichen Vorsichtsmaßnahmen treffen, um sicherzustellen, dass der Arbeitsplatz sicher ist und die Bediener der Geräte nicht gefährlichen Konzentrationen infektiöser Erreger ausgesetzt werden. Das bedeutet, dass die Grenzwerte in Bezug auf infektiöse Erreger, die in den entsprechenden Sicherheitsdatenblättern (SDBs) oder den Vorschriften der OSHA*, ACGIH† oder COSHH‡ festgelegt sind, nicht überschritten werden dürfen. Beim Betrieb eines Abzugs und bei der Entsorgung von Abfallstoffen müssen alle Bestimmungen und Gesetze zu Gesundheitsschutz und Sicherheit am Arbeitsplatz auf übernationaler, nationaler und regionaler Ebene eingehalten werden.	

* OSHA: Occupational Safety and Health Administration (Vereinigte Staaten von Amerika)
† ACGIH: American Conference of Government Industrial Hygienists (Vereinigte Staaten von Amerika)
‡ COSHH: Control of Substances Hazardous to Health (Vereinigtes Königreich)

Giftige Dämpfe

Alle Arbeiten mit flüchtigen Lösungsmitteln oder toxischen Substanzen müssen unter einem funktionierenden Laborabzugssystem durchgeführt werden, damit die möglicherweise entstehenden Dämpfe abziehen können.

Entsorgen von Abfällen

Benutzte Verbrauchs- und Kunststoffartikel könnten gefährliche Chemikalien oder infektiöse Erreger enthalten. Derartige Abfälle müssen gesammelt und gemäß den geltenden kommunalen Sicherheitsbestimmungen entsorgt werden.

Beachten Sie bei der Entsorgung von Elektro- und Elektronik-Altgeräten (WEEE) die anzuwendenden gesetzlichen Bestimmungen, siehe Seite 109.

Gefahren durch mechanische Teile

Um einen zufriedenstellenden und sicheren Betrieb des QIAxpert zu gewährleisten, befolgen Sie bitte die nachstehenden Hinweise:

- Verwenden Sie nur die empfohlenen Verbrauchsartikel/Objektträger.

Sicherheitshinweise für Wartungsarbeiten

Führen Sie alle Wartungsarbeiten gemäß den Anweisungen im Abschnitt „Wartungsarbeiten" durch. QIAGEN stellt alle Reparaturen in Rechnung, die nachweislich auf eine inkorrekte Wartung zurückzuführen sind.

WARNUNG/ ACHTUNG	**Verletzungsgefahr und Beschädigung des Geräts** Führen Sie nur Wartungsarbeiten durch, die ausdrücklich in diesem Handbuch beschrieben werden.	[W7]

WARNUNG/ ACHTUNG	**Gefahr durch Stromschlag** Öffnen Sie keines der Gehäusebleche des QIAxpert System.	[W8]

ACHTUNG	**Geräteschäden** Verwenden Sie weder Lösungsmittel noch Reagenzien, die Säuren, Laugen oder Abrasivstoffe enthalten, um das QIAxpert System zu reinigen.	[C3]

ACHTUNG	**Gefahr der Beschädigung von Touchscreen und Computer** Schütten oder sprühen Sie keine Flüssigkeiten, z. B. Reinigungsmittel, auf die Oberflächen des QIAxpert. Verwenden Sie zum Reinigen nur ein mit Wasser angefeuchtetes Laborwischtuch.	[C4]

Symbole auf dem QIAxpert

Symbol	Ort	Beschreibung
CE	Typenschild auf der Geräterückseite	CE-Markierung der EU-Konformität
C US	Typenschild auf der Geräterückseite	Entspricht US-amerikanischen und kanadischen Sicherheitsstandards
	Typenschild auf der Geräterückseite	Hersteller i. S. d. Gesetzes
	Typenschild auf der Geräterückseite	WEEE-Markierung (Zertifizierung gemäß europäischer Richtlinien bzw. Elektro- und Elektronik-Altgeräte-Verordnung) für Europa
FC	Typenschild auf der Geräterückseite	FCC-Markierung der Federal Communications Commission der Vereinigten Staaten
	Typenschild auf der Geräterückseite	RCM-Zeichen für Australien (Herstellerkennung: N17965)
25	Typenschild auf der Geräterückseite	Markierung gemäß RoHS-Richtlinie für China (Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten)

Appendix C – Technical Data

QIAGEN reserves the right to change specifications at any time.

Environmental conditions

Operating conditions

Power	100–240 V AC, 50/60 Hz Mains supply voltage fluctuations are not to exceed 10% of the nominal supply voltages External 24 V power supply designed for wide range of input voltages; maximum power consumption approximately 50 W
Fuse	F2.5A
Overvoltage category	OVC II
Air temperature	15°C to 35°C (59°F to 95°F)
Relative humidity	Max. 75% (noncondensing)
Altitude	Up to 2000 m (6500 ft.) above mean sea level (MSL)
Place of operation	For indoor use only
Pollution level	2
Environmental class	During operation 3K2 and 3M2

Transportation conditions

Air temperature	–25°C to 60°C (–13°F to 140°F) in manufacturer's package
Relative humidity	Max. 75% (noncondensing)

Storage conditions

Air temperature	5°C to 40°C (41°F to 104°F) in manufacturer's package
Relative humidity	Max. 85% (noncondensing)

Mechanical data and hardware features

Dimensions	Width: 23 cm (9.1 in.) Depth: 28 cm (11 in.) Height: 30 cm (11.8 in.)
Mass	9 kg (19.8 lb.) standard configuration
Capacity	Up to 16 samples per run, including blanks
Software	QIAxpert is supplied with on-board QIAxpert System Software. Measurement apps are available for use with the QIAxpert and can be downloaded from **https://www.qiagen.com/QIAxpert**.

QIAxpert system technical specifications

Description	Specification
Type	UV/VIS polychromatic system + reference channel
Optical principle	Ultrasensitive photodiode array spectrophotometer for UV-VIS range
Light source	Xenon flash lamp
Wavelength range	230-750 nm
Wavelength resolution	<3 nm
Wavelength accuracy	≤0.2 nm
Wavelength reproducibility	0.1 nm
Photometric range	0.0005-2.0 OD
Absorbance precision	0.001 OD
Absorbance accuracy	4% (0.66 OD at 350 nm)
Full spectrum acquisition	20 per second
Data output	USB, TCP/IP or QR Code
AD conversion	16 bit

QIAxpert Slide-40 specifications

Description	Specification
Dimensions	Width: 2.6 cm (1 in.) Length: 9.8 cm (3.9 in.) Height: 0.6 cm (0.24 in.)
Path length	0.5 mm
Recommended sample quantity	2 µl
Maximum sample residence time	2 hours
Measurement range (10 mm equivalent)	0.03-40 OD
Measurement time for fully loaded slide	Approximately 2 minutes
Concentration range	1.5 ng/µl up to 2000 ng/µl dsDNA (A_{260})

Declaration of conformity

Name and address of the legal manufacturer:

QIAGEN GmbH
QIAGEN Strasse 1
40724 Hilden
Germany

An up-to-date Declaration of Conformity can be requested from QIAGEN Technical Services.

Waste Electrical and Electronic Equipment (WEEE)

This section provides information about disposal of waste electrical and electronic equipment by users.

The crossed-out wheeled bin symbol (see below) indicates that this product must not be disposed of with other waste; it must be taken to an approved treatment facility or to a designated collection point for recycling, according to local laws and regulations.

The separate collection and recycling of waste electronic equipment at the time of disposal helps to conserve natural resources and ensures that the product is recycled in a manner that protects human health and the environment.

Recycling can be provided by QIAGEN upon request at additional cost. In the European Union, in accordance with the specific WEEE recycling requirements and where a replacement product is being supplied by QIAGEN, free recycling of its WEEE-marked electronic equipment is provided.

To recycle electronic equipment, contact your local QIAGEN sales office for the required return form. Once the form is submitted, you will be contacted by QIAGEN either to request follow-up information for scheduling collection of the electronic waste or to provide you with an individual quote.

FCC declaration

The ''United States Federal Communications Commission'' (USFCC) (in 47 CRF 15. 105) declared that the users of this product must be informed of the following facts and circumstances.

This device complies with part 15 of the FCC. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus complies with Canadian ICES-003.

The following statement applies to the products covered in this manual, unless otherwise specified herein. The statement for other products will appear in the accompanying documentation.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

QIAGEN GmbH, Germany is not responsible for any radio television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connection cables and equipment other than those specified by QIAGEN GmbH, Germany. The correction of interference caused by such unauthorized modification, substitution or attachment will be the responsibility of the user.

Appendix D – QIAxpert Accessories

Ordering Information

Product	Contents	Cat. no.
QIAxpert Slide-40	25 disposable QIAxpert microfluidic slides for up to 16 analyses.	990700
QIAxpert Potassium Dichromate Solution (3)	Solution for testing the photometric accuracy of the QIAxpert instrument; 3 x 1 ml vials	990701

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.

Appendix E – Legal Information

Warranty statement

Thank you for your purchase of QIAGEN instrumentation. Your instrument has been carefully tested to ensure optimum operating efficiency and reproducibility of results. QIAGEN warrants that all new instrumentation manufactured by QIAGEN will correspond to the product specifications and be free from defects in workmanship and materials for a period of twelve (12) months from the original date of shipment. Repair or replacement of defective parts will be provided to the purchaser during this time period provided the QIAGEN instrumentation is operated under conditions of normal and proper use, but not for damage caused by the customer. If any part or subassembly proves to be defective, it will be repaired or replaced at QIAGEN's sole option, subsequent to inspection at the factory, or in the field by an authorized factory representative, provided that such defect manifested under normal and proper use.

Limitation of warranties and remedies

THE FOREGOING WARRANTY IS QIAGEN'S SOLE AND EXCLUSIVE WARRANTY, AND REPAIR OR REPLACEMENT OF DEFECTIVE PARTS IS THE SOLE AND EXCLUSIVE REMEDY. THERE ARE NO OTHER WARRANTIES OR GUARANTEES, EXPRESS OR IMPLIED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED, TO THE FULLEST EXTENT PERMITTED BY LAW. (NOTE: SOME STATES DO NOT PERMIT DISCLAIMERS OF IMPLIED WARRANTIES SO THIS LIMITATION MAY NOT APPLY TO YOU). WITH THE EXCEPTION OF THE ABOVE-REFERENCED REPAIR OR REPLACEMENT REMEDY, QIAGEN SHALL HAVE NO OBLIGATION OR LIABILITY OF ANY NATURE WHATSOEVER WITH RESPECT TO THE QIAGEN INSTRUMENTATION, WHETHER ARISING IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE, INCLUDING BUT NOT LIMITED TO, LIABILITY FOR INDIRECT, CONSEQUENTIAL, INCIDENTAL AND/OR SPECIAL, PUNITIVE, MULTIPLE AND/OR EXEMPLARY DAMAGES AND/OR OTHER LOSSES (INCLUDING LOSS OF USE, LOST REVENUES, LOST PROFITS AND DAMAGE TO REPUTATION), EVEN IF SUCH DAMAGES WERE FORESEEN OR FORSEEABLE, OR WERE BROUGHT TO QIAGEN'S ATTENTION. IN NO EVENT SHALL QIAGEN'S LIABILITY TO YOU EXCEED THE PURCHASE PRICE OF THE PRODUCT.

Liability clause

QIAGEN shall be released from all obligations under its warranty in the event repairs or modifications are made by persons other than its own personnel, except in cases where the Company has given its written consent to perform such repairs or modifications. All materials

replaced under this warranty will be warranted only for the duration of the original warranty period, and in no case beyond the original expiration date of original warranty unless authorized in writing by an officer of the Company. Read-out devices, interfacing devices and associated software will be warranted only for the period offered by the original manufacturer of these products. Representations and warranties made by any person, including representatives of QIAGEN, which are inconsistent or in conflict with the conditions in this warranty shall not be binding upon the Company unless produced in writing and approved by an officer of QIAGEN.

Index

Accessories, 111
Application settings, 58
Apps, 37
  DNA QIAamp, 41
  nucleic acids, 38
  OD Check, 80
  PCR QIAquick, 41, 42
  protein, 39
  RNA RNeasy, 41, 42
  selection, 70
  spectral content profiling, 40
  upload, 58
  UV/VIS, 38
  UV/VIS general, 39
Attention, 91
Auto-export, 59
Avertissement, 91
Beer-Lambert Law, 16
Blank, 18, 72
Buttons, 30
Calibration, 27
Cautions, 10
Cleaning, 76
Data export, 49
Date and time, 61
Detergents, 72
DNA QIAamp, 41
Error codes
  applications, 85
  database, 86
  device, 87
  protocol, 86
Error logs, 63
Experiment
  define wells, 66
  layout, 66
  name, 68
  new, 65
Experiment list, 48
Export
  by QR Code, 54
  data, 71
  file types, 51
  folders, 51
  menu, 49
  settings, 58
  to network, 50
  to USB, 50
Export settings, 58
File types, 51
Folders, 51
Fumes, 13
Glossary, 90
Icons, 30
Import
  sample information, 36
Installation
  power, 27
  site, 26
  unpacking, 24
Intended use, 8
List of experiments, 33
Main menu, 33
Maintenance, 76
  cleaning, 76
  periodic, 77
Measurement
  applications, 37
  methods, 17
  modes, 16
  progress, 70
  results, 42
  starting, 70
Measurement results window, 43
New experiment, 65
Operating conditions, 105
PCR QIAquick, 41, 42
Performance checks, 79
Pipetting, 73
Power supply, 23
Powering up, 27
QIAxpert
  hardware features, 106
  mechanical data, 106
  principle, 16
  slide specifications, 107
  technical specifications, 106
QR code, 54

Results, 42
classic UV/VIS, 46
spectral content profiling, 45
RNA RNeasy, 41, 42
Safety
biological, 12
electrical, 11
infectious agents, 12
information, 10
maintenance, 14
mechanical hazards, 14
proper use, 10
Sample
handling, 74
homogeneity, 71
information, 35
loading, 64, 73
names, 35, 69
volume, 73
Sécurité
dangers mécaniques, 95
électrique, 92
utilisation appropriée, 91
Settings
application, 58
at startup, 29
date and time, 61
export, 58
QIAGEN service, 63
stored blanks, 61
tools, 62
user, 57
Settings window, 34, 56
Shutdown, 34
Sicherheit
Chemikalien, 102
elektrische, 100
Gefahr durch mechanische Teile, 103
sachgemäße Handhabung, 99
Slide
description, 21
load, 68
overview, 43
sample loading, 64, 73
specifications, 22, 107
unload, 70
Software
apps, 37
buttons, 30
icons, 30
upgrade, 62
Spectral content profiling, 19, 40, 45
Spectral curves, 45
Storage conditions, 105
Stored blanks, 61
Symbols, 15
Technical assistance, 8
Testing, 80
Tools, 62
Transportation conditions, 105
Troubleshooting, 83
User
add, 57
requirements, 9
selection, 65
settings, 57
Version, 8
Warnhinweise, 98
Warnings, 10
Waste disposal, 13, 109

Document Revision History

Date	Changes
R5 12/2015	Updated spectral profiling applications list and description of new apps (DNA QIAsymphony and PAXgene RNA), updated symbols/marks and description on the QIAxpert, added new Declaration of Conformity and made minor text and picture updates
R6 02/2018	Updated safety norm (61010 ed. 3) including Biological Safety W5, residue threshold value corrected from 3% to 2.5% (p. 42) regarding discrimination between DNA and RNA of spectral content profiling apps, description added for new apps (DNA mammalian, DNA plant, Purified PCR, RNA and RNA FFPE), updated unpackaging chapter, updated QIAxpert system technical specifications and made minor text and picture updates
R7 12/2019	Added a section on Determining protein concentration (p. 17). Added a section on Determining bacterial growth (p. 20). Updated some buttons/icons descriptions. Updated some screenshots. Added new information on Feature of the slide overview (p. 44). Added a section on Network Settings (p. 60).
R8 11/2021	Added the last serial number of the instruments that requires calibration of the touchscreen sensitivity. Added a paragraph regarding touchscreen sensitivity calibration. Changed “new biosample apps” to “new apps” under Application settings section. Inserted a table with reactivation scheme for instruments with serial number >201122. Added statement regarding about the reaction time of the screen after being on sleep mode. Added a paragraph saying that touchscreen sensitivity re-calibration is not required for new QIAxpert instruments.

Notes

Notes

Trademarks: QIAGEN®, Sample to Insight®, QIAamp®, QIAquick®, QIAsymphony®, QIAxpert®, RNeasy® (QIAGEN Group); Android® (Google, Inc.); Excel®, Microsoft®, PowerPoint®, Windows® (Microsoft Corporation); iPad®, iPhone® (Apple Computer, Inc.); PAXgene® (PreAnalytiX GmbH); QR Code® (Denso Wave, Inc.). Registered names, trademarks, etc. used in this document, even when not specifically marked as such, are not to be considered unprotected by law.

HB-1761-008 © 2021 QIAGEN, all rights reserved.

11/2021 HB-1761-008