The new standard for value and productivity

Agilent 1100 Series Modules and Systems for HPLC

Agilent Technologies
Innovating the HP Way

Complete control and networked data handling solutions for your laboratory

Agilent Technologies 1100 Series sets the industry standard for HPLC analysis. The combination of our long expertise in chemical analysis with leading computer technology expands networking technology into the laboratory. Since 1996, more than 120,000 LC units and more than 50,000 ChemStation data handling systems have been installed worldwide.

We protect your existing investment by offering data compatibility with older systems, even back to the beginning of the 1980's.

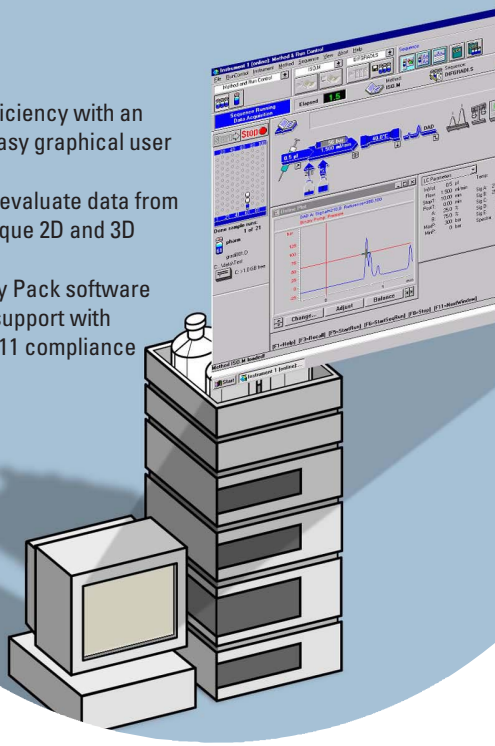
You have the flexibility of controlling your HPLC system with a handheld controller, your Agilent ChemStation or through a local area network (LAN) from your office computer for improved efficiency.

You can scale up from single systems to multiple instruments, including LC, LC/MS and GC, for maximum productivity.

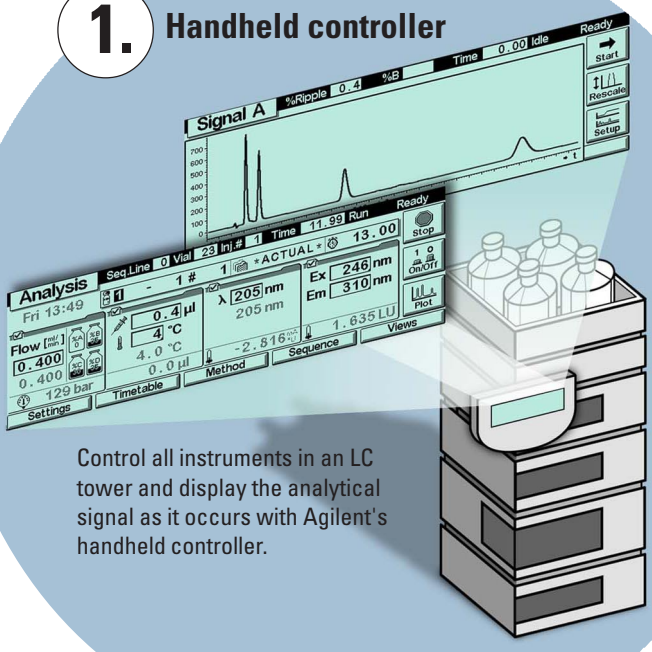
Agilent Technologies offers a fully-supported solution for all your equipment, computer hardware and network needs.

2. Standalone ChemStation

- Increase efficiency with an intuitively-easy graphical user interface.
- Control and evaluate data from multi-technique 2D and 3D instruments
- Add Security Pack software module for support with 21 CFR Part 11 compliance

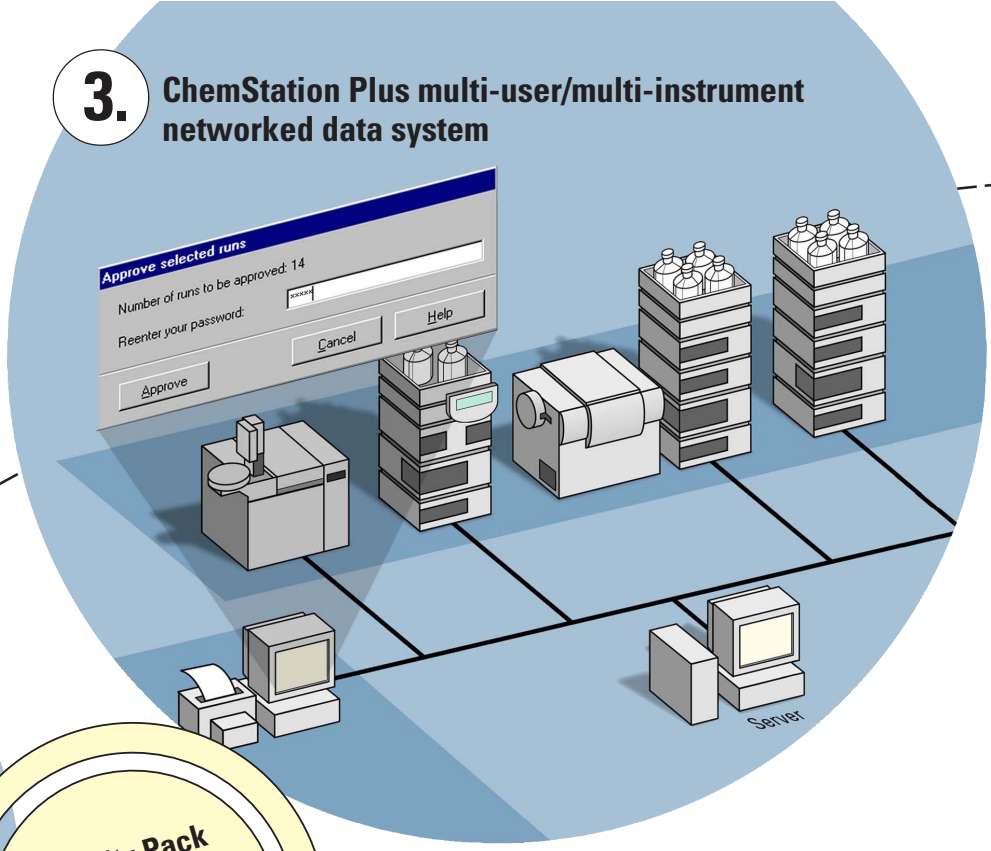


1. Handheld controller

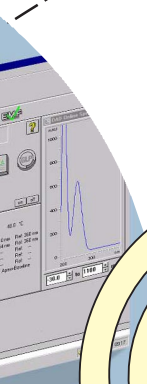


Control all instruments in an LC tower and display the analytical signal as it occurs with Agilent's handheld controller.

3. ChemStation Plus multi-user/multi-instrument networked data system



- Extend the standalone ChemStation to a client/server solution.
- Comply easily with regulatory guidelines through fully-traceable data and results, built-in audit-trails and integrated electronic results approval.
- Archive and retrieve data quickly and easily from any networked location.
- Monitor the status of your analyses remotely.
- Add package for method validation according to ICH guidelines.



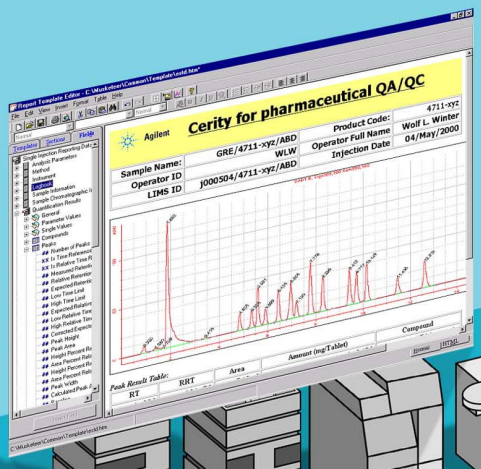
Security Pack for compliance with 21 CFR Part 11!

Cerity Networked Data System for pharmaceutical QA/QC

NEW

The Cerity networked data system is a targeted application that automates most routine tasks in pharmaceutical QA/QC.

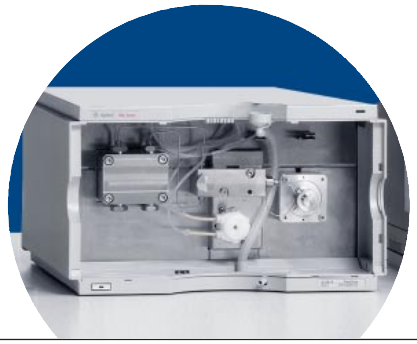
- Fully-scaleable client/server system providing for up to 150 signal channels and 30 concurrent users.
- A user interface that is optimized to model the QA/QC workflow.
- Generation and management of trustworthy and reliable records for support of 21 CFR Part 11.
- Control of additional systems such as Agilent 6890 GCs and 35900E interfaces, and Waters® Alliance® systems.



Superior HPLC modules for best chromatography results

Agilent Technologies is well known for superior technology. With our chemical analysis instruments, you get high qualitative accuracy, excellent quantitative precision, unmatched ruggedness and reliability for maximum uptime and fast results.

The Agilent 1100 Series keeps your productivity high and your operating costs low.



The preparative pump offers extremely low internal volumes in pump heads, valves and capillary connections.

Pumps

The isocratic pump is:
- a workhorse, designed for routine QA/QC applications
- upgradable to quaternary pump.

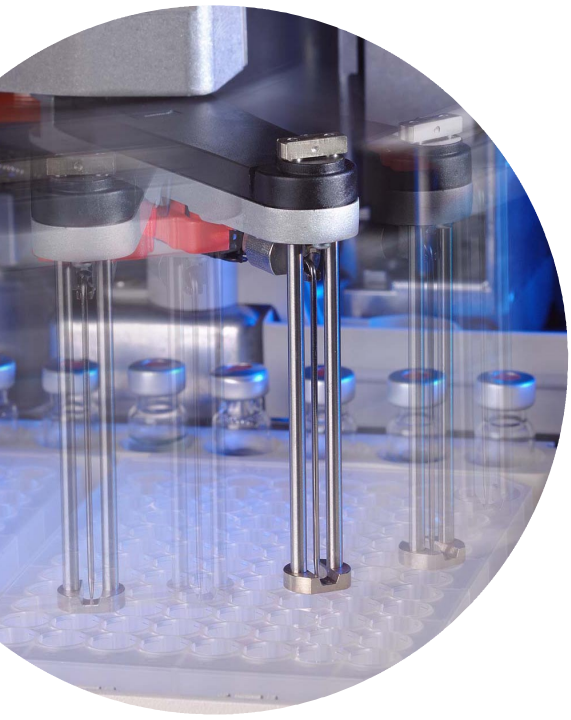
The binary gradient pump is:
- based on a high-pressure mixing principle
- the pump of choice for rapid, reproducible gradients and highest performance especially at low flow rates.

The quaternary pump provides:
- highest flexibility in solvent mixing for a wide range of research and routine applications
- A flow range, suitable for 0.2 ml/min up to 10 ml/min.

The 1100 Series also includes pumps, designed for specific applications:

The capillary pump:
- is ideally suited for capillary LC applications, where sample volumes are limited and higher sensitivity is essential
- offers optimized flow rates from 1 µl/min up to 100 µl/min in capillary mode and in normal mode up to 2.5 ml/min for highest flexibility in gradient work.

The preparative pump:
- is an isocratic high performance pump with two parallel pistons, perfect for scale-up work, for typical preparative HPLC and for purity checks
- assures flow rates up to 100 ml/min at 400 bar without the need to change pump heads
- is upgradable for gradient work.



Autosamplers

The standard autosampler is designed for reliability, safety, and ease of use needed in pharmaceutical routine tasks and quality control.

The well-plate autosampler adds maximum flexibility and fast injection cycles to your Agilent LC system by assuring increased sample injection speed for high sample throughput and overlapped injections for increased productivity.

Thermostatted micro autosampler and micro well-plate autosampler are designed to perform capillary LC, allowing injection of sample volumes from nl to µl ranges.

Thermostatted versions of the autosamplers allows you to run the sample tray above and below ambient temperatures, providing Peltier temperature control from 4 °C to 40 °C.

Thermostatted column compartment

This Peltier-based design offers:

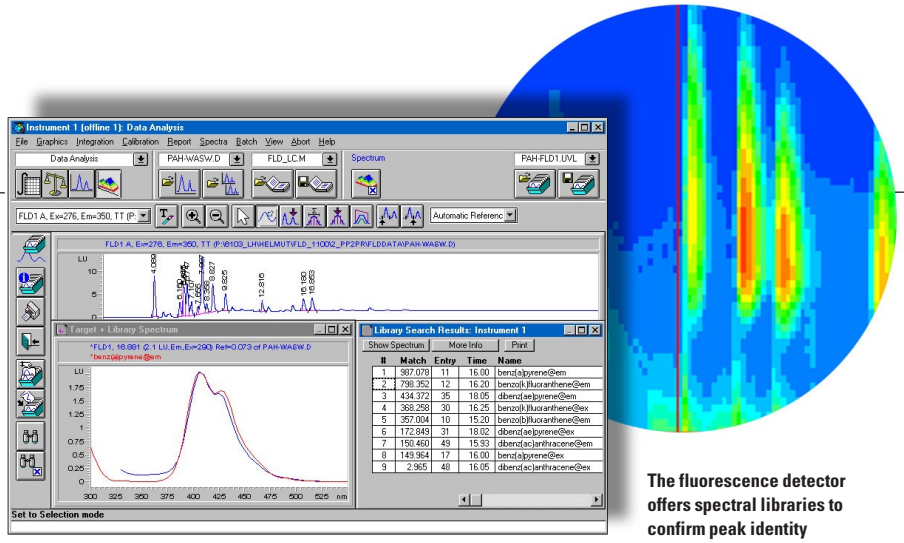
- Stable operation at ambient, subambient and above-ambient temperatures
- A column identification module that reads and records column parameters, providing automatic GLP/cGMP traceability and reducing operator error
- Compact size that fits conveniently in a single Agilent 1100 Series stack

Detectors

The 1100 Series includes variable, multiwavelength, diode-array and mass selective detectors in addition refractive index and fluorescence detectors.

The fluorescence detector, which has an innovative optical design, provides:

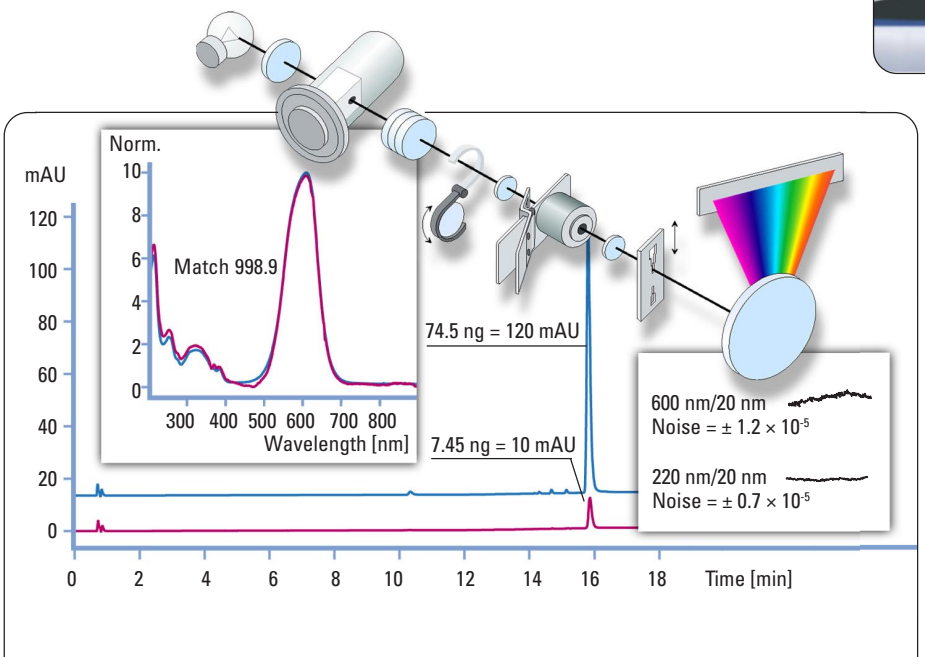
- Simultaneous quantitative and qualitative information from up to four signals in a single run, saving time
- Real-time spectra (similar to diode-array detection) for fast method optimization and peak identification



The fluorescence detector offers spectral libraries to confirm peak identity

The mass selective detectors offers:

- complete mass spectral information from the single-quadrupole LC/MSD and complete MS/MS data from the ion trap LC/MSD Trap
- excellent sensitivity, reproducibility and ruggedness thanks to a patented orthogonal-spray ion source and high-capacity drying gas system.



The diode-array detector gives outstanding sensitivity over the entire wavelength range—both UV and visible. Its features include:

- Deuterium and tungsten lamps that ensure the highest light output, from 190 to 950 nm
- 1024 diodes and a programmable slit to optimize wavelength resolution

Less time needed for laboratory tasks

For most laboratories, the number of samples keeps rising, while available space, instruments and personnel remain the same.

The Agilent 1100 Series HPLC provides an answer to this challenge. This system is designed for quick startup, automated validation, ease of use, fast chromatography and automated data transfer to save you time without demanding more space or resources.

Successful validation tools

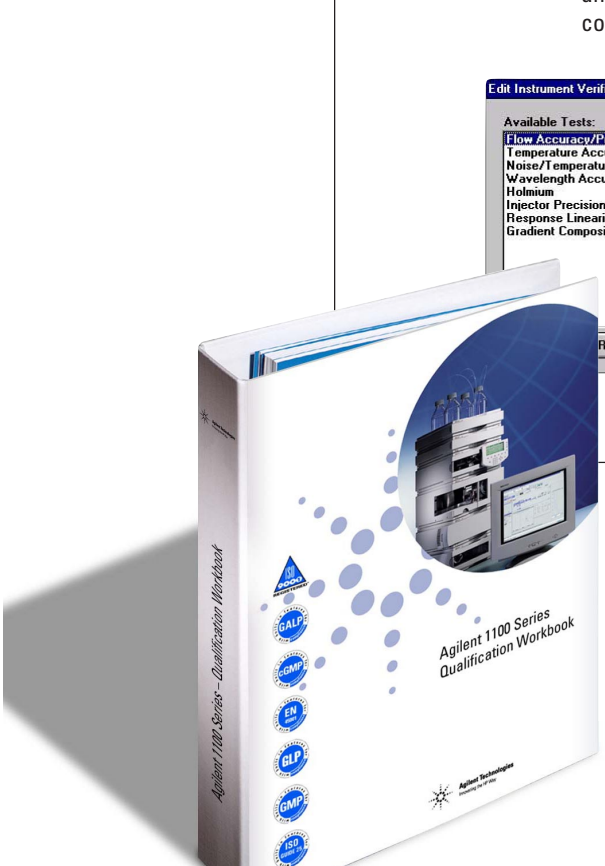
A Qualification Workbook and SOPs, shipped with each Agilent 1100 Series HPLC, keep validation time and costs low. This documentation includes all procedures and templates you need for fast installation qualification (IQ) and operational qualification (OQ).

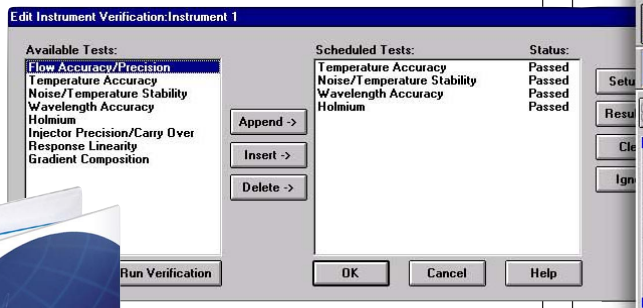
In less than four hours you can define OQ parameters and limits, perform tests automatically, verify performance limits and print inspection-ready results for a complete system.

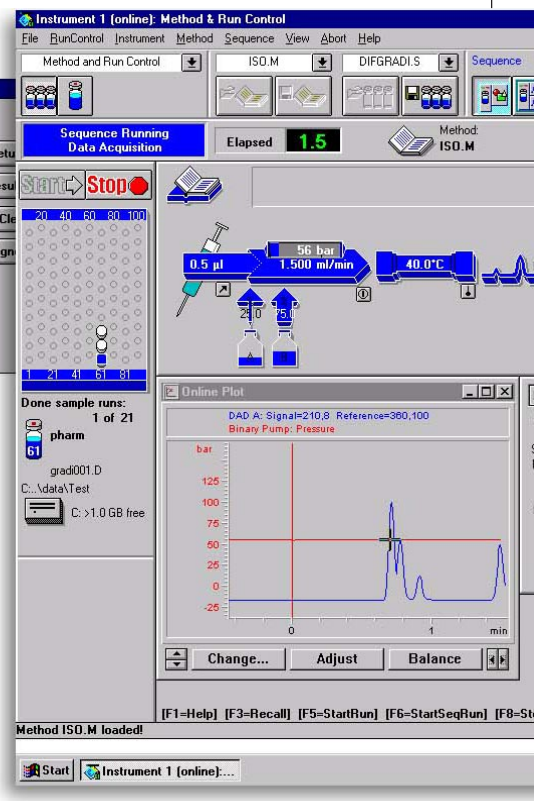
Easy method setup and operation

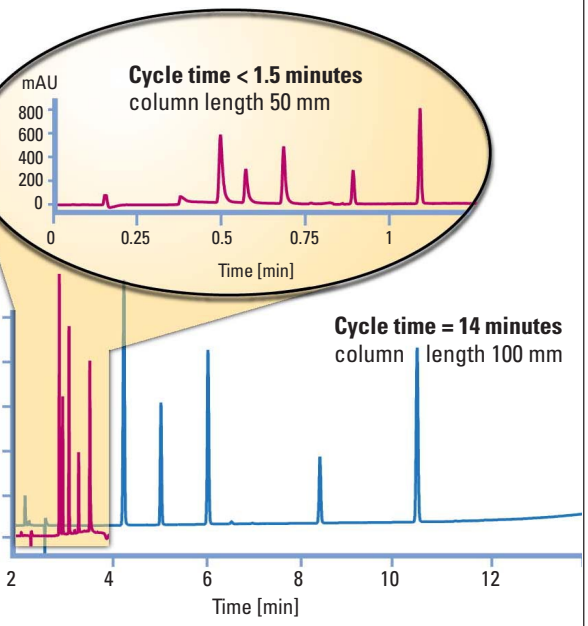
The simple-to-use graphical user interface and online tutorial minimize training costs. The interface enables system setup in minutes. Operation is intuitive with:

- Click-on, easy-to-identify icons
- A color-coded system display that shows the progress of an analysis



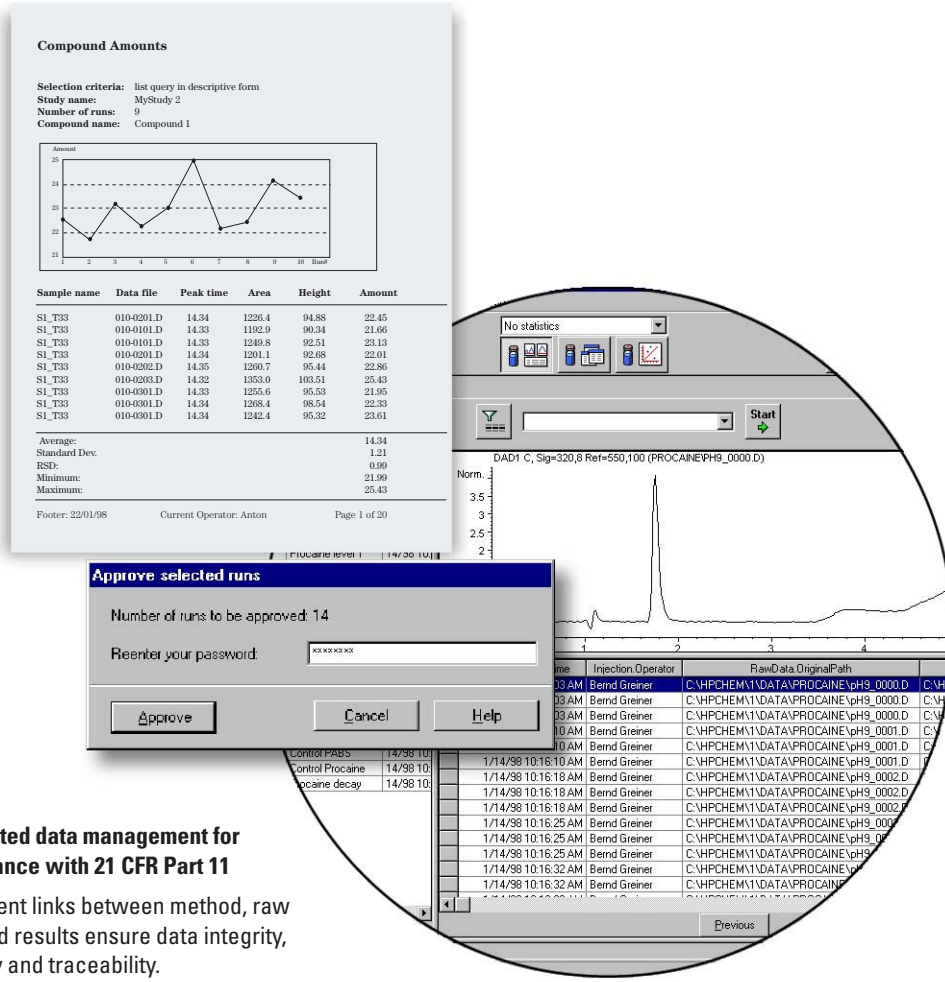






Fast and reliable analysis

The Agilent 1100 Series system with high pressure gradient pump speeds throughput by a factor of five or more. High precision and instrument-to-instrument reproducibility eliminate analysis rework and speed up method transfer.

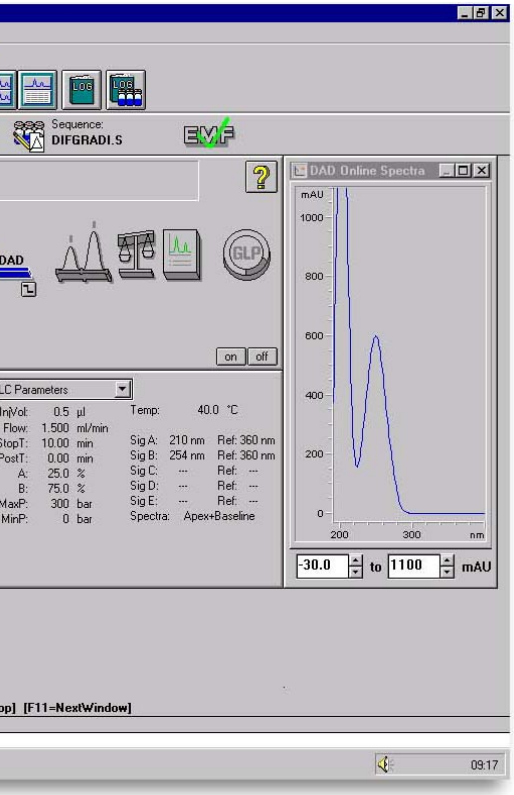


Automated data management for compliance with 21 CFR Part 11

Consistent links between method, raw data and results ensure data integrity, security and traceability.

This software lets you:

- Store raw and meta data automatically.
- Retrieve data of interest with an integrated query function.
- Create cross-sample reports and charts using standard or customized formats.
- Plot system performance or identify trends over time.



Time-saving maintenance tools

A unique early maintenance feedback tool alerts you when maintenance is due—in enough time to take action without losing uptime.

Other maintenance features include:

- A new multi-media CD-ROM that guides you through maintenance procedures
- Convenient front access for all maintenance

A comprehensive set of module choices

The Agilent web page for LC offers you access to our complete industry-specific solutions as well as detailed module and data handling information.

www.agilent.com/chem

Pumping systems

Include solvent bottles and cabinet.

Additional seal wash accessories, or an optional solvent selection valve for binary pumps.

Agilent 1100 Series preparative pump

Agilent 1100 Series isocratic pump

Agilent 1100 Series binary pump

Column compartment

Optional column selection valve available

Agilent 1100 Series thermostatted column compartment

Degassers

The online vacuum degasser comes standard with the quaternary pump.

Agilent 1100 Series vacuum degasser

Injection systems

Optional loop for large-volume injection

Agilent 1100 Series manual injector

Agilent 1100 Series standard autosampler and thermostatted version

Detectors

Agilent 1100 Series variable wavelength detector

Agilent 1100 Series multiwavelength detector

Agilent 1100 Series diode array detector

Agilent 1100 Series
capillary pump

Agilent 1100 Series
quaternary pump

Agilent 1100 Series
micro vacuum degasser

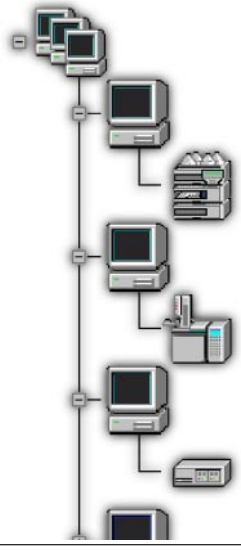
Controllers

Agilent 1100 Series
handheld control module

Agilent ChemStation

Agilent 35900 A/D converter
for non-Agilent equipment

LAN capabilities



Select among various hardware and software system control and data handling products:
- A handheld control module
- Agilent ChemStation for HPLC with optional software for spectral acquisition and evaluation
- Agilent ChemStore C/S data organization system
- Agilent Security Pack software module
- Agilent ChemStation Plus, which combines ChemStation, ChemStore and ChemAccess in a secure NT-server environment, enhanced with ChemStation Plus Security Pack
- Cerity networked data system for pharmaceutical QA/QC

Agilent 1100 Series
well plate autosampler and
thermostatted version

Agilent 1100 Series
thermostatted micro autosampler

Agilent 1100 Series
micro well plate autosampler
and thermostatted version

Agilent 220 micro plate sampler
with dedicated software

Agilent 1100 Series
fluorescence detector

Agilent 1100 Series
refractive index detector

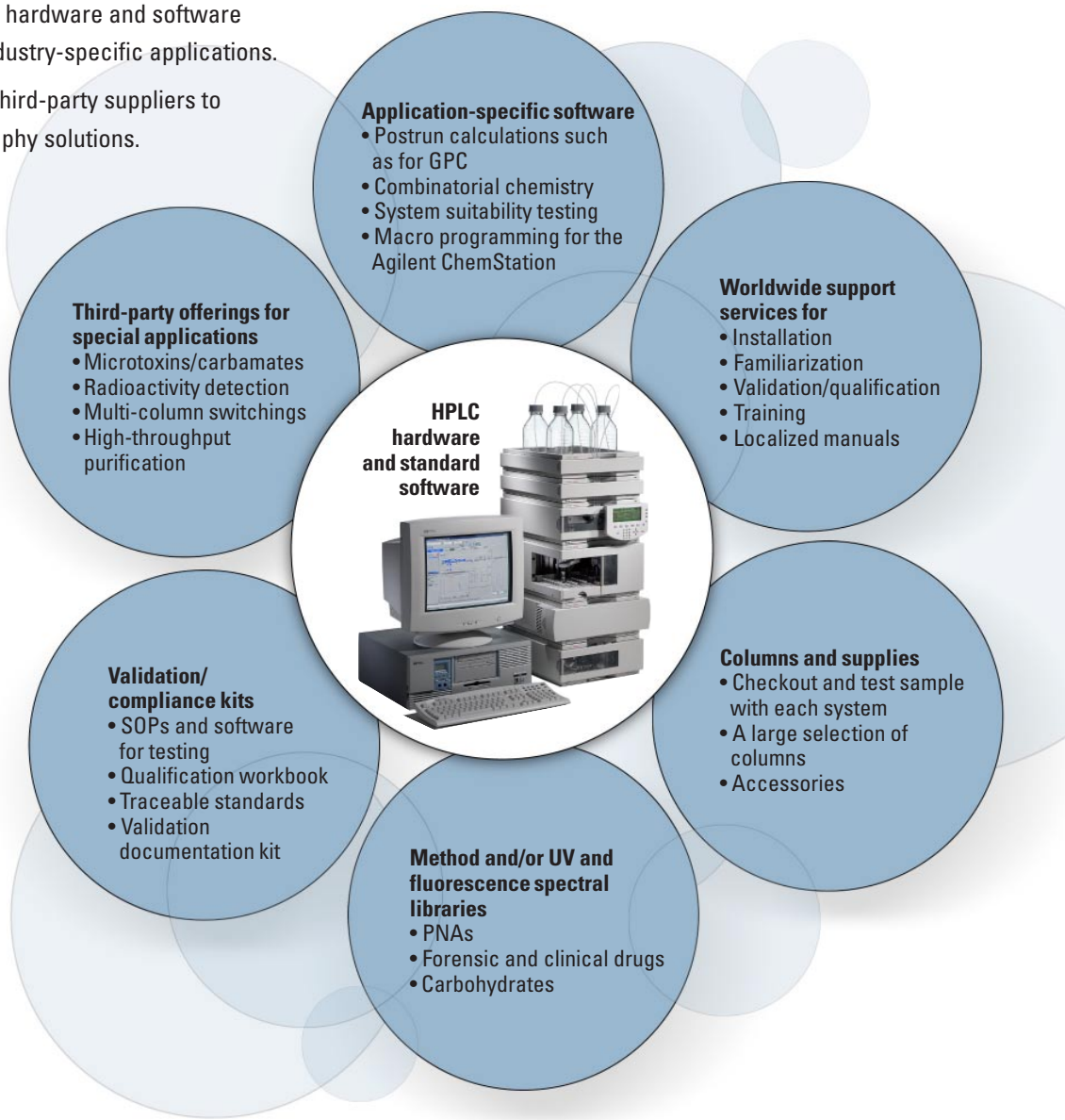
Agilent 1100 Series
LC/MSD VL or
LC/MSD SL

Agilent 1100 Series
LC/MSD Trap

Industry-specific total solutions that save time and money

To help new users run applications quickly and successfully, we offer everything needed for successful analysis results—from reliable hardware and software and long-lasting columns to industry-specific applications.

As appropriate, we work with third-party suppliers to provide complete chromatography solutions.



You can access these solution guides and many additional applications by visiting our world wide web site.

Our total solution ordering guides provide complete, preconfigured HPLC applications that illustrate the latest capabilities to improve performance, make your work easier and save time. Examples of key industry-specific applications show all chromatographic parameters and system configurations to ensure that you have just what you need to perform these analyses.

Each guide contains:
- Detailed chromatographic conditions
- Chromatograms of standards and real-life samples
- HPLC method performance
- Specific system configurations to perform the analyses
- Ordering information
- References to publications that describe the specific application

Agilent 1100 Series purification system

Do purification and purity checks in one completely automated and fast system. The system offers scaleable solutions for sample purification from µg to gram quantities and a unique combination allows to collect fractions based on time, peak and mass.

Agilent 1100 Series capillary LC system

This system is designed for increased sensitivity and for analyzing limited sample volumes, typically found in the biopharmaceutical research environment. It uses a unique pump technology that optimizes the system for capillary LC, offering a high level of sensitivity and reproducibility.

Agilent 1100 Series well-plate LC system

When well-plate sampling and high sample throughput are important, the well-plate LC system—optimized for fast sample analysis—is the answer. This system can increase the speed of sample analyses up to a factor of ten, with superior retention time and area precision.

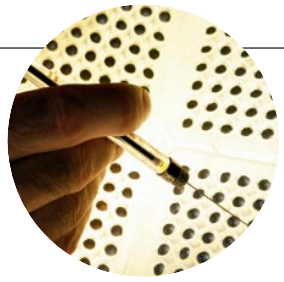
Agilent 1100 Series GPC analysis system

This solution offers cost-effective routine polymer characterization by GPC-SEC with refractive index and UV detectors. It is based on the reliable Agilent 1100 Series HPLC modules and the easy-to-use Agilent ChemStation with integrated GPC data analysis software.

Agilent 1100 Series LC value system

A complete, easy-to-use solution for laboratories expanding to HPLC. You can have a 1100 Series system known for ruggedness and reliability, easy and fast maintenance, minimal user training, and built-in productivity features. At a surprisingly low cost.

Pharmaceutical Applications with HPLC publication number 5968-2635E



Bioscience Solutions from Agilent Technologies publication number 5980-0793E

Environmental Solutions with HPLC publication number 5968-6726E

Food Solutions with HPLC publication number 5968-6663E

Polymer and Hydrocarbon Processing Solutions with HPLC publication number 5968-7020E

Specifications

Agilent 1100 Series Systems and Modules for HPLC

System specifications
(The system includes a binary pump, autosampler, column compartment and diode-array detector)

Performance specifications
Baseline noise: ±1 × 10^{-5} AU, at 254 nm
Ret. precision: < 0.3 % RSD
Inj. vol. precision: Typically < 0.5 % from 5–100 µl
Maintenance and system test
Accessibility to all maintenance parts from front
Maintenance instructions through multimedia CD-ROM
Time for full system test (OQ/PV) < 4 hours
Space and delay volume
System delay volume (typical): < 250 µl
Required benchspace: < 36 cm
System control
Through local computer software, LAN or local handheld control module
GLP features
Early maintenance feedback—EMF (lamp burn time, usage, number of injections with limits and feedback messages)

Agilent 1100 Series Pumping Systems

Flow precision:	0.3% RSD (typically < 0.15% RSD)
Settable flow range	
• Isocratic:	0.001–10 ml/min
• Binary:	0.001–5.0 ml/min
• Quaternary:	0.001–10 ml/min
• Capillary:	0.01 µl/min – 2.5 ml/min
• Preparative:	0.001 to 100 ml/min
Flow precision for capillary pump:	< 0.7 % RSD (typically < 0.4 % RSD)
Settable composition range: (binary/quaternary channels)	0–100%, in 0.1% increments, from two or four independent channels

Agilent 1100 Series Vacuum Degassers

Maximum flow rate:	10 ml per channel
Number of channels:	4
Internal volume:	Typically 12 ml per channel

Micro vacuum degasser

Maximum flow rate:	5 ml/min per channel
Number of channels:	4
Internal volume:	Typically 1 ml per channel

Agilent 1100 Series Column Compartment

Temperature range:	10 degrees below ambient to 80 °C
Temperature stability:	± 0.15 °C
Column capacity:	Three 30-cm columns

Agilent 1100 Series Autosamplers

Standard autosampler

Sample capacity:	Up to 100 vials
Injection volume:	0.1–100 µl standard range Optional extension: • Up to 1800 µl • Up to 5000 µl

Thermostatted micro autosampler

Sample capacity:	100 × 2-ml vials in standard tray; microvials (100 or 300 µl) with sleeves
Injection volume:	0.01–8 µl with small loop capillary; 0.01–40 µl with extended loop capillary

Well-plate autosampler

Sample capacity:	2 well plates (96 and 384), or up to 100 2-ml vials
Injection volume:	0.1–100 µl standard range Up to 1800 µl with multiple-draw (hardware modification required)

Micro well-plate autosampler

Sample capacity:	2 well plates (96 and 384) plus 10 additional 2-ml vials or up to 100 2-ml vials
Injection volume:	0.01–8 µl with small loop capillary; 0.01–40 µl with extended loop capillary

Precision for all autosamplers
Typically < 0.5% from 5-100 µl; typically < 1% from 1–5 µl
Thermostatted version of all autosamplers

Temperature range:	Settable from 4 °C–40 °C 1° increments

Agilent 1100 Series Variable Wavelength Detector

Short-term noise:	± 0.75 × 10^{-5} AU, 254 nm
Wavelength range:	190–600 nm

Agilent 1100 Series Multiwavelength Detector

Short-term noise:	± 1 × 10^{-5} AU, at 254 nm ± 1 × 10^{-5} AU, at 750 nm
Wavelength range:	190–950 nm
Signals:	Up to 5 wavelengths

Agilent 1100 Series Diode Array Detector

Short-term noise:	± 1 × 10^{-5} AU, at 254 nm ± 1 × 10^{-5} AU, at 750 nm
Wavelength range:	190–950 nm
Slit width:	Programmable: 1, 2, 4, 8, 16 nm
Diode width:	< 1 nm
Light source:	Deuterium / tungsten lamps

Agilent 1100 Series Fluorescence Detector

Performance:	10 fg anthracene LOD,
Excitation wl:	Range 200–700 nm,
Emission wl:	Range 280–900 nm,
Spectra storage:	All

Agilent 1100 Series Refractive Index Detector

Short-term noise:	± 2.5 × 10^{-9} RIU
Drift:	200 × 10^{-9} RIU/h
Valves:	Automatic purge and automatic solvent recycle

Agilent 1100 Series LC/MSD

Mass range:	VL – *m/z* 50 – 1500 SL – *m/z* 50 – 3000
Mass accuracy:	± 0.13 u
Mass axis stability:	± 0.13 u over 8 hours

SIM sensitivity:

	Quantity	Signal-to-noise ratio
VL	10 pg reserpine	50:1 RMS (10:1 peak-to-peak)
SL	1 pg reserpine	50:1 RMS (10:1 peak-to-peak)

Scan sensitivity:

	Quantity	Signal-to-noise ratio
SL	50 pg reserpine	50:1 RMS (10:1 peak-to-peak)

Agilent 1100 Series LC/MSD Trap

Mass range:	*m/z* 50 – 4000
Mass accuracy:	± 0.2 u
Mass axis stability:	± 0.2 u over 8 hours

Full scan MS/MS sensitivity:

Quantity	Signal-to-noise ratio
25 pg	50:1 peak-to-peak

www.agilent.com/chem

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