

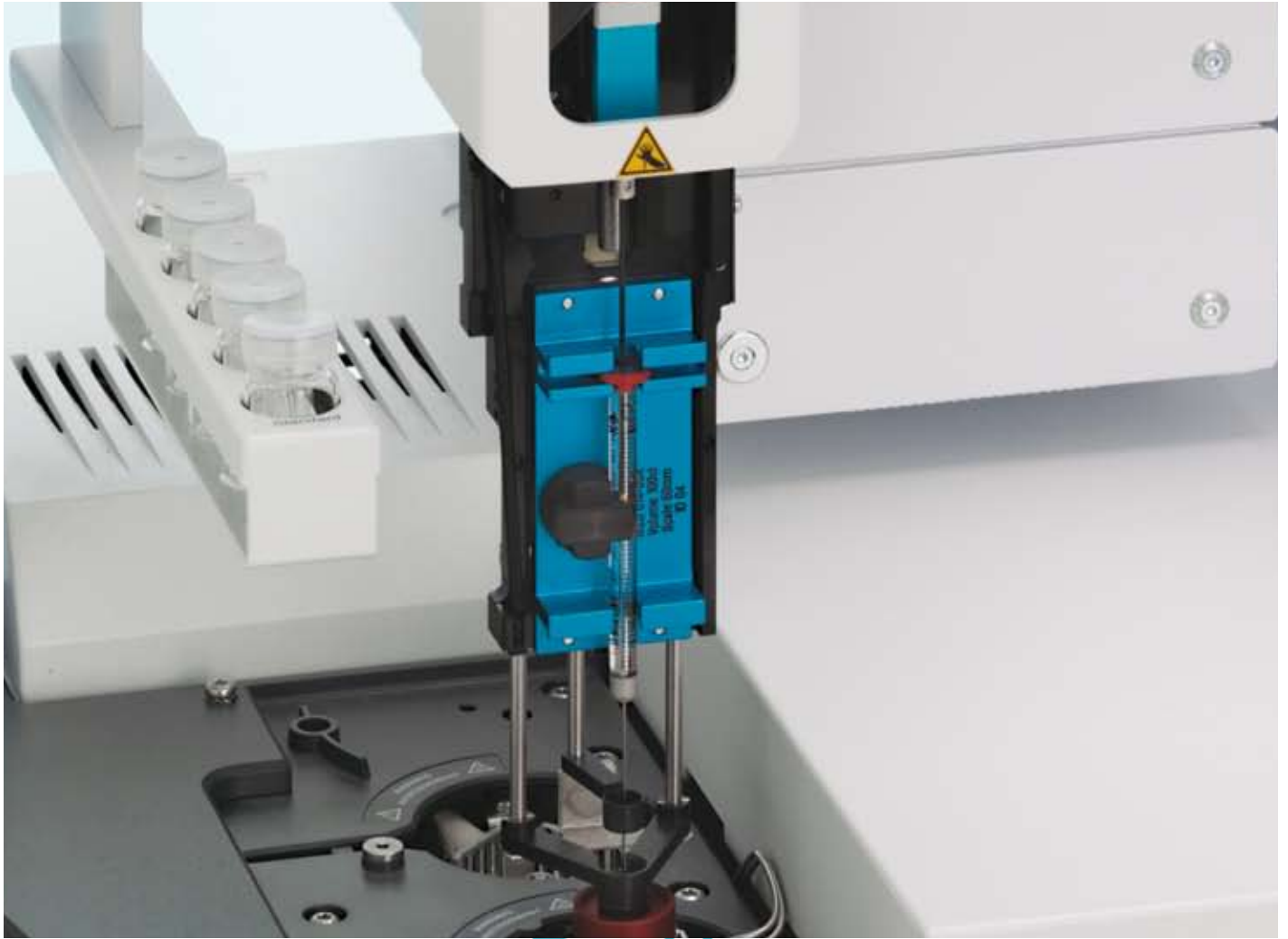
PAL GC-xt

Prep and Load Platform

The most flexible GC /GC-MS
liquid sample injector



Environmental
Foods/Beverages
Consumer Products
Forensics
Petrochemicals/Polymers
Pharmaceuticals



PAL GC-xt

Liquid mode

Prep and Load Platform

Every single injection step is individually controlled through the PAL-*xt* advanced software package

Liquid injection volume up to 500µl for LVI applications

Nanoliter injection mode

Fast injection cycle time

CTC Analytic's objective is to supply instruments to customers which make the operation of sample processing simple and transparent. In line with today's lab requirements for flexibility, capacity and precision, we have enhanced again the already proven reliability and productivity of our sample injection systems. PAL GC-*xt*, the new generation of CTC's GC Autosamplers offers all the features of our popular GC PAL unit and more, to meet today's requirements. The PAL GC-*xt* provides powerful working capabilities, an investment you can grow with.

Flexible sample handling

Every single injection step of the PAL GC-xt, e.g. fill/inject speed, pre- and post injection delay times, pre- and post syringe cleaning, variable needle penetration depths, or internal standard addition is individually controlled through the PAL GC-xt advanced software package. The LVI (Large Volume Injection) mode allows to inject samples up to 500µl in one stroke, without the usual degradation in chromatographic performance. Using the capability to inject larger volumes, you can eliminate the need to concentrate a sample through evaporation. This translates into substantial time and cost savings. For low volume samples the fast injection speed minimizes needle discrimination and reduces background interference which means better results with less rework. Fast injection cycle times of ~20 seconds together with the nanoliter injection capability fits perfectly into the field of fast GC applications.

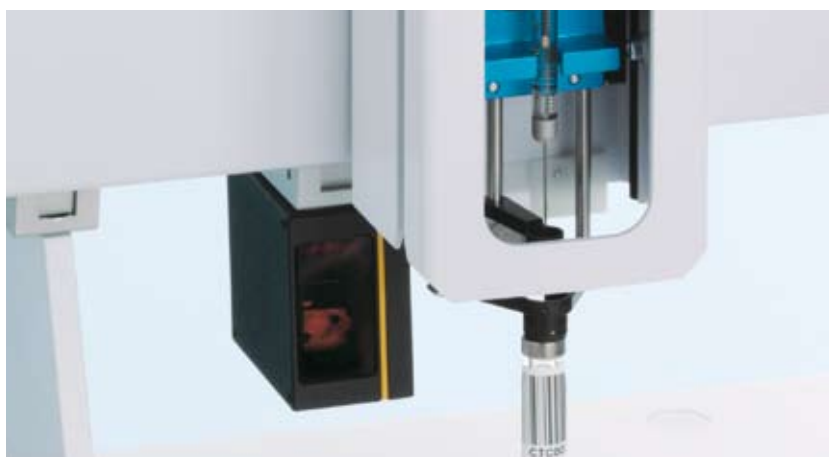


Flow-Through Cell for online analysis

Gradual expansion as needs change

Additional instrument capabilities can be added anytime by using one of the different PAL GC-xt options.

- Beside micro- or standard sample vials, the PAL GC-xt injects also directly from 96/384 well micro- or deepwell plates, the next generation of sample format.
- The barcode reader option transfers sample information to the PC control software, ensuring a positive sample identification in regulated environments.
- A unique Flow-Through Cell sampling station enables online analysis of drinking water or real time monitoring of chemical processes.
- Temperature controlled sample storage makes it easy to cool down samples to prevent degradation or heat samples for derivatisations or kinetic studies.



Barcode reading for positive sample identification

Productivity

The PAL GC-xt dual injection port mode allows injections from samples, placed in the same or different vials, in a single GC run. This assures high productivity for high sample throughput or dual column and/or detector confirmation.



Double stack microplate sample format

Maintenance

The modular PAL GC-xt design provides worry-free operation and low maintenance costs. An open architecture for easy access to the syringe, sample trays and GC injection ports, guarantees a quick exchange of the GC injector septa, sample tray formats or different syringe sizes. All PAL liquid handling systems are equipped with Flash EPROM technology, for easy update of every installed instrument with the newest enhancements and capabilities.



Temperature controlled sample storage from 4°C – 70°C

Flexible system control

Choose between 3 options to control your PAL GC-xt instrument. The local handheld controller provides easy-to-learn, easy-to-use operation. For individual application requirements the PC based Windows 2000/XP software Cycle Composer is available. For single keyboard operation of a whole GC/GC-MS System, various third party PAL GC-xt drivers are available.

Intelligent Automation

The software Cycle Composer provides smart remote control for the PAL GC-xt. The Cycle Composer software allows the operator to easily setup, edit and run GC methods for even very complex Prep and Load applications.

Third party data acquisition drivers

For "single keyboard" operation, various third party data acquisition instrument drivers are available, for a smooth and complete integration of the PAL GC-xt into one single GC processing system.

Perfect injection handling

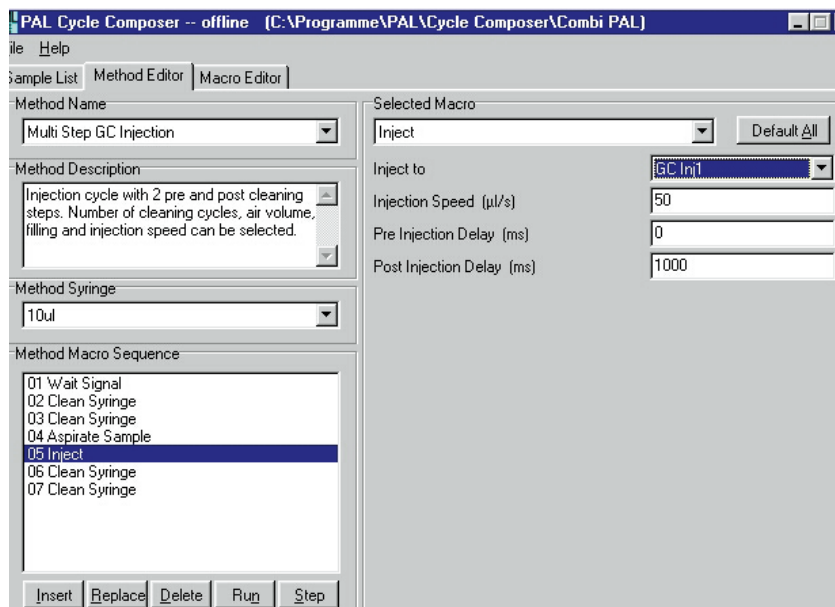
For maximized performance, the PAL GC-xt can handle up to 6 different syringe sizes, which cover an injection volume range of 0.1 µl -500 µl. Different injection modes include the traditional, the hot empty needle, the sandwich or the internal standard addition techniques. These choices provide solutions to various analytical problems and challenges. The sandwich mode prevents the effects of boiling point discrimination in low volume applications. The internal standard addition is used for quantitative calculations, retention index studies or matrix spiking.

Sampling flexibility

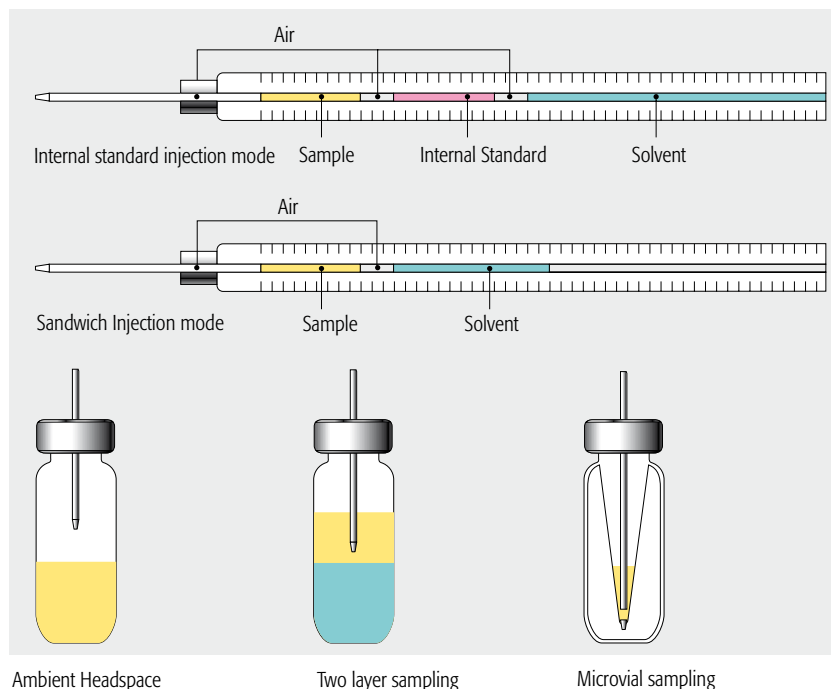
Beside liquid injections the PAL GC-xt can sample up to 500 µl of the headspace in a 2ml/10ml or 20ml vial. This straightforward and inexpensive procedure serves as a quick screening tool of unknown volatile samples. Variable syringe needle depths enable sample aspiration anywhere within a sample vial. Two layers or small volume samples are processed exactly with the PAL GC-xt's built in vial height monitoring system.

PAL GC-xt injection parameter control

- Pre injection syringe wash strokes for two different solvents
- Post injection syringe wash strokes for two different solvents
- Pre injection syringe wash strokes with sample
- Plunger speed used to aspirate / eject sample
- Air gap after sample aspiration
- Number of filling strokes to aspirate sample
- Delay time between sample pull-up and ejection
- Injector selection used for injection
- Plunger speed used during sample injection
- Delay time prior and after sample injection



PAL System remote control software



Solvent Reservoir for dilutions and derivatisations

- Superior accuracy and reproducibility combined with optimum injection flexibility
- Top mounted, saves valuable bench space
- Add on features – Barcode – Flow-Through Cell
- Interfaces with all major GC/ GC-MS Systems
- Temperature controlled sample storage from 4°C - 70°C
- High sample capacity up to 600 1ml vials
- Dual injection port mode
- Sampling flexibility with, vials, standard & deepwell microplates
- Sandwich injection mode



PAL SYSTEM

www.palsystem.com

PAL GC-*xt* General Specifications

System Type

XYZ robot with syringe only concept, no tubing in sample path

Local User Interface

Control panel with 4 function keys, graphical LCD display, unique scroll knob for teach functions

Remote Control

Cycle Composer control software Windows 2000 / XP
Third party instrument drivers for all major GC/GC-MS Systems

Maintenance

Accessibility to all maintenance parts from front
Preventative maintenance kits available

Electrical Control

1x RS232 / 1x LAN (with optional PAL-*xt* Electronics)
3x TTL Input
1x Opto Coupler Input
2x Relay Output

Power Requirements

100-240V, 120W, 50/60Hz

Environment

4°C - 40°C constant temperature, < 80% humidity
(non condensing)

Weight

~ 10kg (without accessories)

Dimension

Length 828mm Depth 385mm Height 575mm

Electrical Safety Standards

CAN/CSA C22.2 No. 61010-1 / ANSI/UL 61010-1 / EN 61010-1

Specifications are subject to change without notice
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GC Mounting Kits

Agilent Technologies 5890 / 6850 / 6890 | 7890
Thermo Scientific GC 8000Top / TRACE GC / Focus GC
Varian GC 3400 / 3600 / 3800 / 3900 / 430 / 450
Shimadzu GC 14 / 17A / 2010 / 2014
Perkin Elmer Autosystem XL / Clarus 400 / Clarus 500 / Clarus 600
GL Sciences GC 353 / 393 / 4000

Options :

Thermostated Trayholders (4°C – 70°C)
Barcode Reader for common industry standard barcode symbols
Flow-Through Cell
Stack for 96/384 well micro- or deepwell plates
Solvent/Reagent reservoir
Large Volume Wash Station

Syringe sizes:

1.2µl	(0.1µl-1.2µl)
5µl	(0.5µl-5.0µl)
10µl	(1µl - 10µl)
25µl	(2.5µl - 25µl)
100µl	(10µl - 100µl)
250µl	(25µl - 250µl)
500µl	(50µl - 500µl)

Injection speed:

Selectable from 0.01µl/sec. up to 250µl/sec.

Sample capacity:

up to	600	1ml micro vials
	294	2ml standard vials
	96	10ml or 20ml vials
	4	deepwell microplates
	6	standard microplates

Syringe cleaning:

Wash Station for 2 different solvents and 1 standard liquid

To learn more about the unique PAL-*xt* Series of GC/GC-MS sample injection systems or any of our LC/LC-MS sample handling systems contact your PAL System distributor.

The PAL GC-*xt* fits on any GC workstation

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