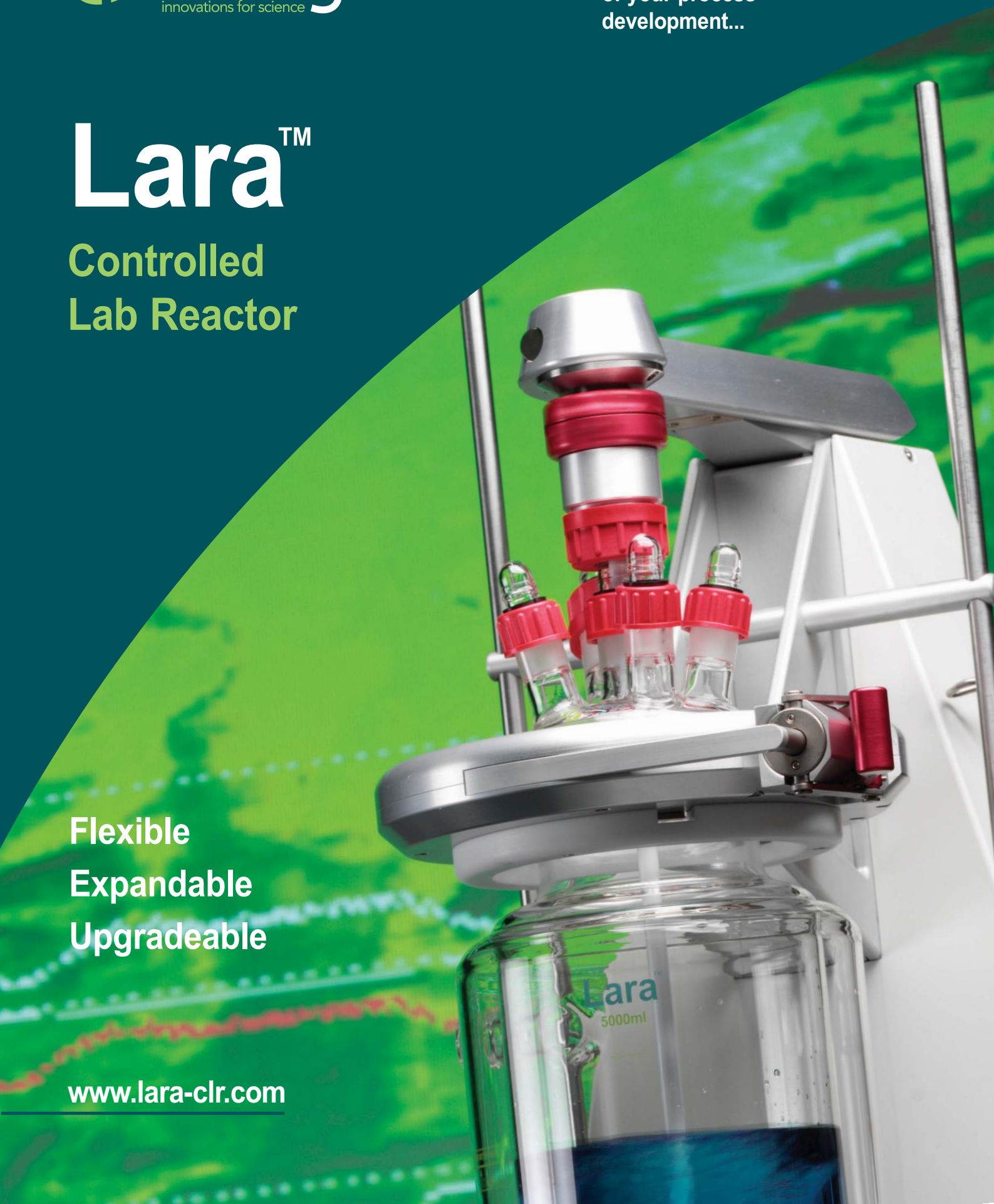
radleys
innovations for science

Improving the efficiency of your process development...

Lara™

Controlled Lab Reactor



Flexible
Expandable
Upgradeable

www.lara-clr.com

The Concept

The concept behind Lara was to develop a flexible, affordable, easy-to-use CLR system. Lara incorporates many unique features that simplify the user's interaction saving time and money and making process automation of this type much more accessible.

Mechanical features include; a vessel clamping mechanism which automatically centralises the reaction vessel; fixed overhead stirring that ensures perfect stirrer alignment; a semi-automated oil drain down for fast exchange of reaction vessels; and the ability to connect a whole variety of different sensors and devices.

The easy-to-learn Lara control software has been written to allow users to integrate their existing laboratory hardware and to write, import and save experimental recipes, create new control loops and perform chemistry unattended.

Setting new standards in flexibility and simplicity in process automation...

The Benefits

- Enhanced productivity
- Process reproducibility
- Extremely easy to operate
- Time-saving user features
- Fits into a standard fume cupboard
- Affordable

Applications

- Process scale-up
- Process optimisation
- Method development
- Large scale synthesis
- Synthesis of building blocks
- Crystallisation studies
- Calorimetry studies
- Reaction process monitoring

Expansion Hub is flexible, expandable, upgradeable

To expand the capabilities of your Lara system simply integrate your existing third party equipment or add a dedicated Lara Expansion Module as and when you need it...

The Lara Expansion Hub offers unlimited system expansion and development opportunities through the control of existing or future third party laboratory equipment such as pumps, balances, thermoregulators, temperature probes etc. The Expansion Hub simply connects to the Lara core system providing a complete integrated, yet expandable solution.

The Expansion Hub offers the following connectivity:

- RS232 devices (e.g. thermoregulators, balances and pumps).
- Analogue devices (e.g. temperature probes, pH probes, turbidity meters).
- Digital inputs (e.g. switches).
- Digital outputs (e.g. relays).

Coflux™ Reaction Monitoring Module

Realtime Calorimetry - Coflux represents an exciting new form of reaction process monitoring offering high levels of performance and flexibility at an affordable price. The system provides quick, efficient and calibration free real-time information and is suitable for hazard assessment, process monitoring, scale up, process optimisation and more.

Features of the Coflux Reaction Monitoring Module include:

- Instant safety data.
- No baseline calibrations required.
- Detection of reaction end point.
- Optimised reagent additions.
- Rapid return on investment.
- Realtime information on power and enthalpy.
- Precise temperature control and stability.
- Safer control of exotherms and endotherms.
- Early indication of reaction issues.
- Detection and tracking of crystallisations.

GSK invest in Lara...

Lara has enabled GlaxoSmithKline to create an open access facility in which optimised synthetic routes for early candidates are developed to supply material for testing and scale-up.

The Scale-Up Lab (SUL) at GSK Stevenage is part of the Chemical Development group and is involved in the production of material for phase 1 clinical trials and early toxicity testing in support and approval of these trials, in addition to process qualification prior to further scale up. Traditionally the SUL had employed a range of jacketed glass reaction systems developed with parts sourced from several suppliers. However these systems were somewhat inflexible, especially in terms of exchanging vessels, which were particularly labour-intensive and time consuming. To cope with different reaction volume requirements it was necessary to employ a permanent 3-vessel platform that occupied a large area of valuable laboratory space. Data logging required the use of external portable equipment that was cumbersome and did not fully integrate all parameters.

Lara was selected as it delivered a completely integrated solution offering hardware and software components specifically designed to provide the ease-of-use, time-savings, comprehensive data logging and reliability sought by the SUL.

Offering a choice of easily interchangeable jacketed glass reaction vessels Lara has enabled the SUL to considerably reduce downtime between user modifications.Lara's compact footprint has released fume cupboard space for other equipment. A host of novel hardware features and intuitive PC control software has allowed the system to be productively used by all staff. Comprehensive data logging built into the system has enabled the SUL to use Lara to control and monitor a range of third party devices.

Looking to the future GSK are now investigating how Lara can further assist them in accelerating applications in chemical and process development and have subsequently invested in several other Lara systems for sites in Europe and the USA.

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Self aligning integral stirrer drive

- The integral hinged design permits full access to the reactor lid and ports, ensuring the quick and easy removal of the lid and stirrer guide.
- Correct stirrer alignment is assured every time, with no requirement to align the stirrer motor between procedures, saving valuable time in setting up new experiments.
- Low profile drive mechanism reduces the overall height of the unit to ensure that Lara will easily fit into a standard fume cupboard.
- Maintains constant speed regardless of load.

Quick-release vessel clamp

- All Lara reaction vessels are securely held by a single point clamp and self adjusting sealing mechanism. No tools are required to exchange vessels.
- Vessel remains supported even when clamp is unlocked.
- Reaction vessels or lids can be exchanged in minutes to allow a fast turn around between experiments.
- The automatic centralisation of the glassware ensures perfect alignment of the stirrer drive every time.
- The detachable clamping mechanism can be autoclaved or cleaned.

Self gripping stirrer guide

- Unique design allows stirrer shafts to be gripped or released in seconds without the need for tools.
- The leak-free seal mechanism allows the system to be readily operated under vacuum or inert atmospheres.
- Enclosed design prevents any contamination of stirrer drive mechanism.
- All wetted parts and bearings are chemically resistant and user replaceable.
- Compatible with both PTFE and glass stirrer designs.
- Custom stirrer designs available.

Versatile scaffolding

- Designed with a compact footprint to save valuable fume cupboard space.
- In-built scaffolding provides a convenient platform to allow the attachment of glassware and third party devices.
- Removable base allows frame to be mounted efficiently on to existing fume cupboard scaffolding.
- Ergonomic cable clips ensure a safe and tidy working environment.

Easily interchangeable glass vessels

- A wide range of easily interchangeable jacketed glass reaction vessels from 100ml to 5 litre available - with split jacket, vacuum jacket, conical or dished design.
- Unique vessel clamping mechanism and quick-release sidearms and allows you to swap vessels in minutes.
- Easy to remove V4 zero dead space drain valve ensures that all the vessel contents are stirred and temperature controlled at all times.
- Custom vessel and lid designs available.
- Full range of ancillary glassware available including: condensers, distillation heads, dropping funnels, vacuum taps, gas bubblers etc.

100ml | 250ml | 500ml | 1 litre | 5 litre | Custom 1 litre split jacketed vessel

Quick connect sidearm couplings

- Unique quick release coupling allows rapid exchange of vessels without the use of tools.
- Operate over the entire dynamic temperature range of the Lara system (-80 to +200˚C).
- Unrestricted internal design maximises flow and efficiency of thermofluid at the reaction vessel.
- Optional manifold adapters allow compatibility with split-jacketed vessels.
- All wetted parts are chemically resistant and user replaceable.

Semi-automated thermofluid drain down

- The pressure free thermofluid drain down, provides a quick and safe method of removing the thermofluid from the vessel jacket when changing vessels.
- Removes the time consuming requirement to drain thermoregulator on vessel exchange.
- Engineered to minimise the hazards and inconvenience associated with spilt thermofluid.
- Does not require an additional pump or vacuum line to drain the jacket.

Accepts a wide range of sensors

- Integral electronics allow the direct connection and configuration of up to three sensors and one output (effector).
- System configurations are readily interchangeable or upgradeable as user requirements evolve.
- Additional sensor and output (effector) ports are available via the Lara Expansion Hub allowing unlimited device connectivity.

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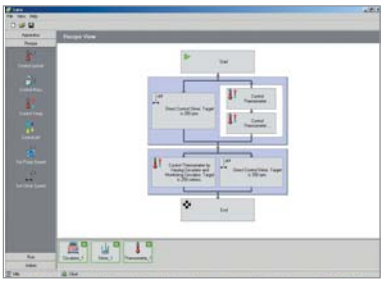
User friendly software with easy recipe design and full data logging...

Software interaction

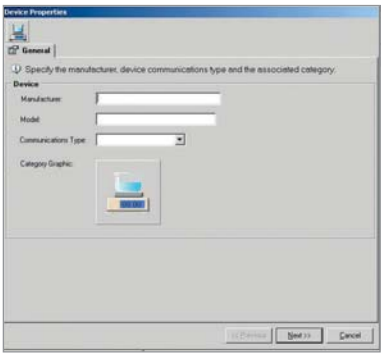
- Intuitive drag and drop interface allows the easy configuration of new hardware and recipes.
- Automatic pre-run verification ensures correct communication with required devices.
- User defined graphs allow real time data to be presented in a variety of formats.



Flexible recipe design

The Windows based Lara software allows the fast creation of new recipes via a logical flowchart interface.

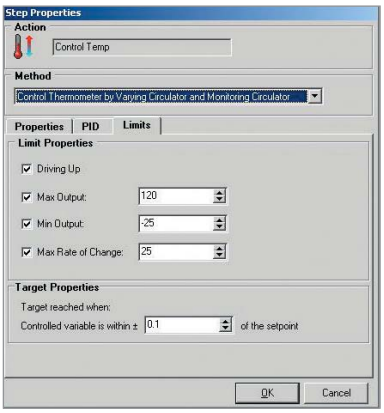
- Incorporate any number of steps involving any combination of sequential or parallel operations.
- Complete data logging of experimental parameters.
- Archive, recall and transfer recipes to ensure exact experimental reproducibility.
- Pause function allows full on-the-fly editing of the recipe during the running experiment.



Control of existing lab equipment

Lara can integrate and control standard third party RS232, analogue or digital devices.

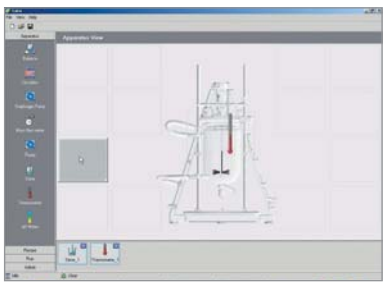
- Change your hardware configuration with ease whenever you you want to.
- Incorporate new hardware apparatus via a simple on-screen wizard.
- Define and create new or customised control loops.
- Have complete flexibility in your experimental set-up.



Hardware safety

The Lara software includes comprehensive alarms and fail-safe conditions.

- Assign an independent warning system and safety shutdown to each device.
- In-built recipe protection prevents operation outside user defined safety limits.
- Alarms displayed on screen and emailed to operator.



Tiered levels of user access

Control access to the Lara system.

- Allows full control of how the system is accessed and managed.
- Define levels of permissions for different users.
- Provides an intuitive and easy-to-use interface for new users.
- Provides advanced users complete access to the system allowing the definition of new control loops, altering of PIDs and integration of new devices.

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Technical Support

Our in-house technical support and service personnel have all received extensive training on the construction, fault diagnosis, repair and maintenance of the Lara hardware and software. They are backed by a team of service engineers, with a fully equipped workshop providing a fast response to your technical, on-site and 'back-to-base' servicing needs.

Lara Preventative Maintenance Agreement (PMA)

Our our Lara PMA include:

- Regular maintenance visits ensuring continued high performance and many years of reliable operation.
- Fast and efficient response to problems ensuring minimum downtime.
- Fixed costs for easy budgeting.
- Minimal administration for servicing, repairs and annual renewals.

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