

CONCRETE PRO

LASER PROJECTION SYSTEMS

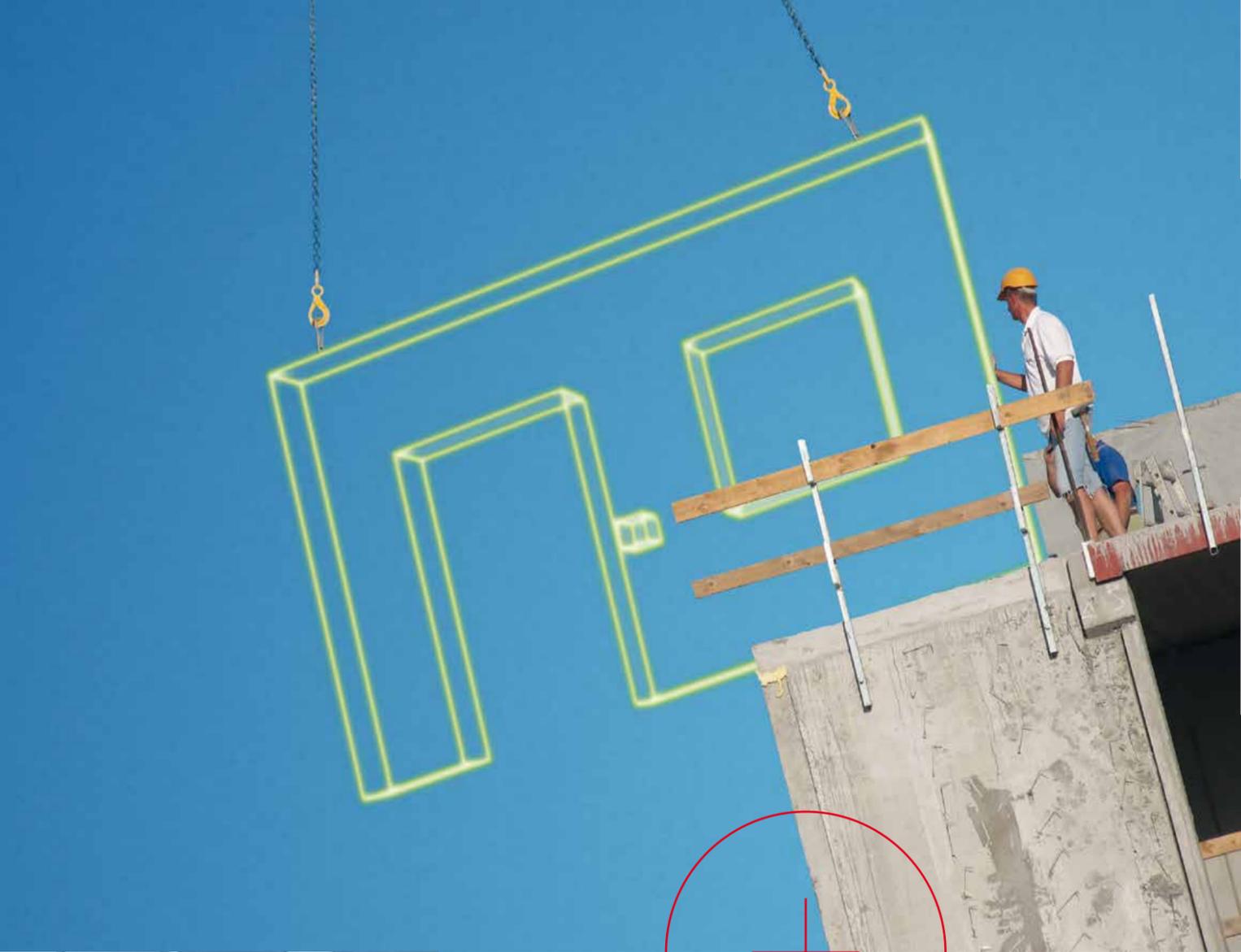
for the manufacture of prefabricated concrete parts



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PLACEMENT ON PALLETS.
QUICK AND PRECISE WITH A LASER.





CONCRETE PRO IS THE DIGITAL LASER TEMPLATE FOR PREFABRICATED PARTS



CONCRETE PRO is a laser system for the projection of line segments and outlines on work surfaces and workpieces, e.g. on circulating pallets or objects placed on these. The projected laser lines are based on your

technical drawings (CAD data). The outlines are reproduced on the work surface on a one-to-one scale.

With CONCRETE PRO, you can optimise the process sequence and your production quality. In the manufacture of practically all prefabricated concrete parts, you can work faster, more flexibly and more precisely than with mechanical templates, colour plotters or other aids for measuring and positioning. Utilise projection "at the speed of light" instead of time-consuming alignment using straight edges, angles or stops.

In contrast to plotters, with which you must mark all the operations on the pallet at one time, you can call up and then process projection files on a step-by-step basis using a remote-control unit. Thanks to LAP Multicolour, it is possible to project images in different colours for different or important steps in the process. Or you can project the outline of an object onto the pallet in green and, for verification purposes, project the profile of the positioned element on its upper surface in red. After production of the concrete part, it is no longer necessary to clean the colour marks off the pallet, since the lasers do not leave any traces behind.

Utilise the advantages of **CONCRETE PRO** for your prefabricated parts production.

3 IN 1
CONCRETE PRO is a complete package of elements (projector, software, and service) designed specifically for the prefabricated concrete market.

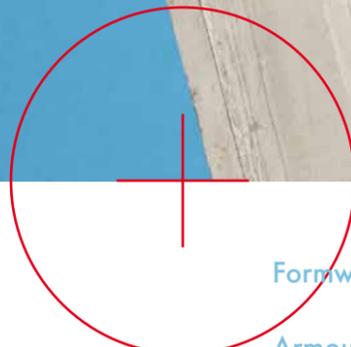
MORE PRECISE
For fast placement of items on pallets, this is the most accurate technology currently available.

FASTER
Save working time: on average, you will work 25% faster than with conventional template systems or colour plotters.

SIMPLER
Populating pallets is simpler with the laser; no plans need to be read, and the template is controlled by a remote-control.

MORE RELIABLE
Achieve your quality standards by performing a final check of the populated pallets.

MORE COST EFFECTIVE
In comparison with a colour plotter, CONCRETE PRO costs only about a tenth of the price, so the return on investment is just a few months.



Formwork elements

Armoured parts

Prefabricated concrete parts

Cut-outs

Floors

Mounting parts

Walls

Electrical sockets

Balconies

Reinforcements

Garages

Installation conduits

Stairs

Lattice girders

Roofing elements

Gussets

Special parts

Chamfers



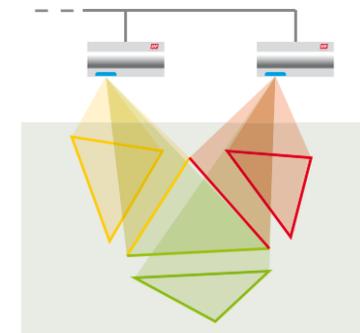
LAP CONCRETE PRO

Laser projectors are mounted over the working area. They can be attached to ceilings and beams in a fixed position, or to pivot arms or rails so that they can move.

An industrial PC controls one or more laser projectors. The projectors depict the outlines individually or simultaneously.

The projection displays the shape or major profile segments on a one-to-one scale in the desired work area. The next item to populate the pallet can be positioned precisely within the projected outline.

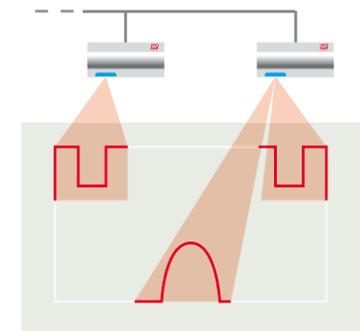
In addition to outlines, letters and numbers can also be projected. It is also possible to use user-defined signs and symbols.



LAP MULTICOLOUR

Contours can be set up and projected in multiple colours by one or more projectors. Changes in colour are possible between figures or even within figures.

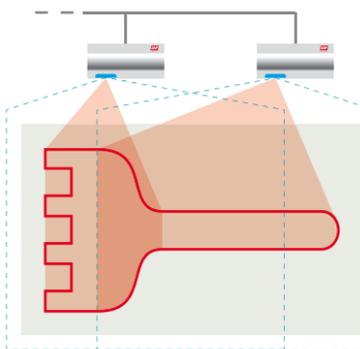
APPLICATION: multicolour display of position on the pallet and checking the outline on the object.



VIEWPORT

A complex projection can be limited to one or more subregions. The sections highlighted in this manner are selected on the PC using the mouse.

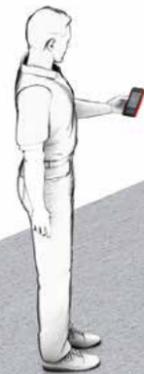
APPLICATION: better visibility of important locations.



LOAD-BALANCING

Projection files are not only distributed according to the geometric arrangement of the projectors, but also automatically distribute the projection load capacity wherever projection regions overlap.

APPLICATION: to consistently project as fast as possible.



PRECISE CALIBRATION – PRECISE PROJECTION

An accurate projection requires a precise point of reference. For this purpose, reflectors, also referred to as targets, are fitted at precisely calibrated positions. The projector's laser beam is steered onto the target, and the target's position is recorded in terms of two angles. For precise projection, at least four targets are required per projector. Depending on the size of the projection surface, further targets can be useful or necessary. The targets can be recorded manually, semi-automatically or fully automatically. Manual

recording is only necessary during system installation and, after any four targets have been recorded, the system switches to automatic recording. Semi-automatic recording is used for movable installations; here a maximum of four targets is prescribed. For systems that are fixed in space, the calibrations are fully automatic after the system has been installed. In the case of projection systems in a fixed installation, the targets can be mounted on floor stands to protect them from contamination and so as not to restrict the transport of the pallets, or other work surface. If the shapes and sizes of the pallets are very different, it can be useful to attach the targets directly onto the pallets. The exact position of each target is recorded photogrammetrically. Alternatively, a purely manual calibration without targets is possible.



CALIBRATE WITH NO LOSS OF TIME, FULLY AUTOMATICALLY OR SEMI-AUTOMATICALLY – TARGETS ARE INSTALLED IN FIXED OR MOVABLE POSITIONS DEPENDING ON THE APPLICATION.



PRECISION IS EXTREMELY IMPORTANT FOR BÜRKLE. HERE IS AN EXAMPLE OF LEADERSHIP IN PRACTICE: THE FLOATING BASEMENT.

CONCRETE PRO – DEVELOPED FOR PERFECT RESULTS AND TESTED UNDER HARSH, EVERYDAY CONDITIONS



THE BÜRKLE GROUP IN SASBACH PRODUCES INDIVIDUALLY PLANNED BASEMENTS WITH ONE OF THE MOST MODERN AND HIGH-PERFORMANCE FACILITIES FOR PREFABRICATED PARTS IN ALL OF EUROPE.

The production of prefabricated concrete parts is very demanding: architecture requires ever more complex geometries, delivery times are getting shorter, last-minute modifications are more frequent and the price must be right. Nevertheless, the dimensional accuracy and quality of the elements must be guaranteed. At Bürkle, based in Sasbach (Baden-Württemberg, Germany), they have been using LAP laser projection systematically since 2007. The projected laser contours mark cut-outs and mounting parts with millimetre accuracy on the formwork table and replace colour plotters and templates. With LAP laser technology, the company saves the time needed for plotting and removal of the drawings.

In contrast to applied drawings, the laser lines can work in several planes; the items populating the pallet can either be marked on the upper surface or at the foot. At Bürkle, an additional installation supplies the precise pattern for a final check of the fully populated pallets before casting. This way, any possible defects are discovered and can quickly be corrected. Bürkle confirms that time is saved using laser projection and that the company's high quality standards can be assured. Thus, the laser solution is much more cost-effective than using a plotter.





CONCRETE PRO IS RELIABLE AND EXTREMELY PRECISE

LAP has delivered laser-based projection and measuring systems for different applications all over the world since 1984. Thousands of LAP lasers are proving their capabilities every day – sometimes under very difficult working conditions. This experience is put into every LAP product and makes our systems incomparably reliable and precise.



OPERATING UNIT

We have developed the **CONCRETE PRO Software** together with engineers from prefabricated parts production. The focus is on ease of operation and avoiding operating errors. The computer screen displays the current working state as an outline drawing. If projection is underway, a changeover between contours or contracts is made with the production-standard remote-control or by using the PC. The software provides compatibility with the most important 2-D and 3-D CAD data (e.g. also for UNITECHNIK). Production data can be archived and assigned to contracts.

Performance features:

- Compatible with all CAD data formats commonly used in the field (UNITECHNIK, dxf, c4d, ...)
- Visualisation of projected shapes and process sequences
- Depiction of process operations with status recorder for production times
- Recorder for production sequences
- Documentation and archiving of projects with process operations, status, checking operations, time data, users ...
- User administration
- Calibration that is adaptable to the specific situation (fully automatic, semi-automatic or manual)
- Currently the fastest automatic calibration available for fixed-location systems
- Operating elements that correspond to the complexity of the task: a remote control can be used for working on the workpiece while a keyboard and mouse can be used for more complex tasks



LAP Multicolour enables three-colour projection. The colours can be used for alerts, information or defining groups of items.



LAP Speedswitch enables colours and/or shapes to be changed in real time. There are no disruptive dwell times.



PROJECTION SYSTEM

The laser projectors are the heart of each **CONCRETE PRO** installation. The projector operates with extreme precision and is designed for a long service life in industrial environments. The workstation is calibrated initially using the targets supplied with the system; subsequently, the system is self-calibrating, either semi-automatically or fully automatically, depending on the situation. The projector can be easily controlled by the operator(s) directly from the production area using the remote control.

Performance features:

- Projection areas for large surfaces using multiple projectors
- Projection in red, green or three-colour red/green/yellow (LAP Multicolour)
- Changes in colour and shape without disruptive dwell times (LAP Speedswitch)
- Compact and light construction despite separate sections for the projector (hermetically sealed) and cooling unit (access to ambient air)
- Swivel mounting with snap-in fastener for rapid, simple installation

SERVICE PACKAGE

LAP stays right by your side before, during and after the installation of a **CONCRETE PRO** system. International experience acquired over decades in the installation and maintenance of laser systems across virtually all industries makes us a reliable and competent partner. Before you make your decision, we will give you plenty of advice and explain both the possibilities and also the limitations of the technology. We will support you in the planning and installation of the system onsite. After commissioning, we will stay with you during your first steps using the laser projection system until its use has been optimised. Each customer has different requirements regarding maintenance cycles, reaction times and protection from down times. LAP therefore offers each customer an individually tailored package, which can extend far beyond the guarantee and standard working hours. Do you want to have replacement equipment on site? Emergency service available at all times? A 24-hour hotline? Or is replacement within 24 hours, support during the working day, and regular training of your personnel sufficient for your needs? Just tell us what you want - we will find a suitable solution for you.



Customer-specific adaptations of the system

- Support during the planning of the work area(s)
- Supply of individual accessories closely related to the system (mounting options, pivot arms, traversing systems, ...)
- Software adaptations and extensions (connection to the company network, barcode scanners, ...)

Installation and commissioning

Training

Maintenance

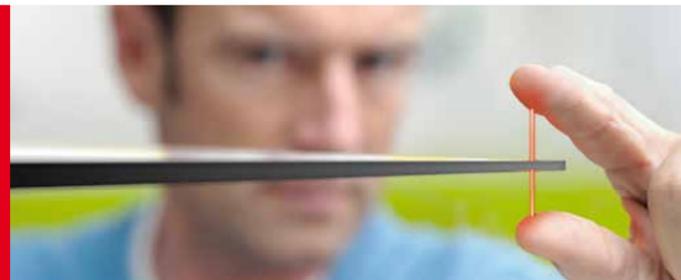
- Replacement equipment (loaners)
- Replacement of expendable parts
- Cleaning
- Adjustment

Updates for software and firmware

Repair

THERE'S EVEN MORE. LAP ENABLES YOU TO MEASURE GEOMETRICAL FEATURES WITHOUT CONTACT

www.LAP-LASER.com



NEVER GO WRONG AGAIN: LAP LINE LASERS FOR ALIGNMENT AND POSITIONING

www.LAP-LASER.com



TECHNICAL DATA FOR LASER-PROJECTOR

Laser type	Red: Diode, 635 nm
LAP Multicolour	Green: DPSS (solid body), 532 nm
	Yellow: Superposed projection of red and green
Accuracy*	± 0.1 mm/m**
Repeatability*	± 0.025 mm/m**
Beam width*	0.5 mm FWHM
Max. projection angle	80° x 80°
Laser power	from 5 mW
Laser Class	2M (3R, 3B)
Protection Class	IP 54
Conditions for use	0-40 °C, 35-85 % rel. humidity, non-condensing.
Power Supply	24 VDC, max. 3 A
Connection	RS 485, Ethernet via Interface
Dimensions (L x W x H)	300 x 110 x 110 mm
Weight	approx. 3 kg



*within a ± 30° range of projection, beam projected at right angles to the surface; equipment optimally focussed and calibrated; at least 30 minutes warm-up time.

** mm per m separation distance between projector and surface.