



large field scanning solution

XLSCAN is a combined scanning solution jointly developed by SCANLAB and ACS Motion Control. Its innovative concept enables wide-area marking and processing of large substrates by extending the working field.

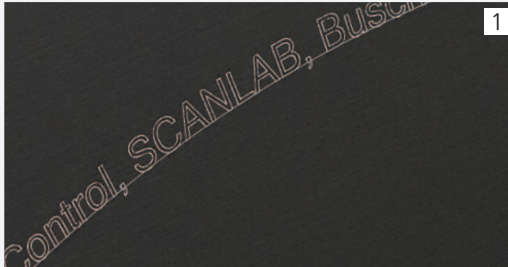
Key Advantages of Simultaneous Motion

- Very large field of view
- Significantly increased throughput possible (up to 40 % more compared with conventional systems)
- No stitching errors
- Enhanced accuracy
- Smooth processing with high dynamics and no stage vibrations

The XLSCAN scanning solution extends a laser scan system's working field by simultaneously controlling and moving a scan head and an XY-stage, thus delivering clear laser processing advantages, such as high processing throughput with an unprecedented level of accuracy.

Typical Applications

- Large-area laser processing
- Glass cutting
- Drilling of large-area PCBs
- Micromachining



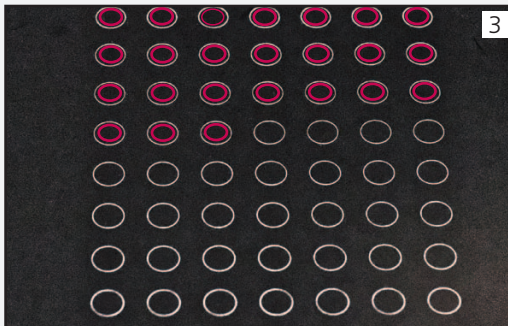
Large circle with detailed marking



Stitching motion
(piecewise processing)



Simultaneous movement yields
better processing results



Simultaneous movement enables 41% higher throughput
(the number of additionally marked circles is indicated by the
red marking)

XLSCAN's Processing Advantages

Until now, laser processing possibilities were often limited by the scan system's image field. When a larger working field was needed, conventional production methods would be slow, with step-by-step tiled processing that typically generated stitching errors (marking displacements at image field boundaries).

XLSCAN, the newly developed scanning solution for simultaneous processing, not only avoids these problems but also offers decisive processing advantages:

Fast Circular Marking

Combined sequencing of scan head and XY-stage motion allows process time to be significantly reduced when marking large, highly detailed circular paths (figure 1), and it also eliminates errors.

No Stitching Errors

Because simultaneous motions of a scan head and a precision XY-stage eliminate the need for dividing working fields into individual tiles, processing takes place all in one go, thus fully eliminating stitching errors (figure 2).

Higher Throughput with Improved Accuracy

For numerous applications, combining motions of the scan head and XY-plane will increase throughput considerably. Figure 3 impressively demonstrates how simultaneous processing for small circular markings increases throughput by 41%.

Process accuracy significantly improves, too, because a scan system's positioning error rises linearly with the image field size. The XL SCAN solution's combined motions at higher accuracy will use a smaller image field, thereby reducing this error.

And an advanced control algorithm prevents errors from workpiece vibration induced through the stage's high dynamics.

High-End Laser Processing

The block diagram depicts the structure of the XLSCAN which combines SCANLAB's tried-and-proven scan head control with an XY-stage managed by ACS' innovative 'motion control system'.

The motion path of the laser beam, relative to the piece to be processed, is automatically split into two separate motions executed simultaneously. The one by the scan head that provides the high speed and the other one by the stage that extends the working plane.

Typical System Components

SCANLAB

- syncAXIS control software package for extended image field processing
- RTC6 control board
- excelliSCAN 14 scan system

ACS

- SPiiPlusEC Motion Controller & EtherCAT Master
- XLSCAN control software package
- ACS drives to fit the stage specifications
- SLEC interface between RTC6 and SPiiPlusEC

Suitable XY-Stage

- Available from different suppliers

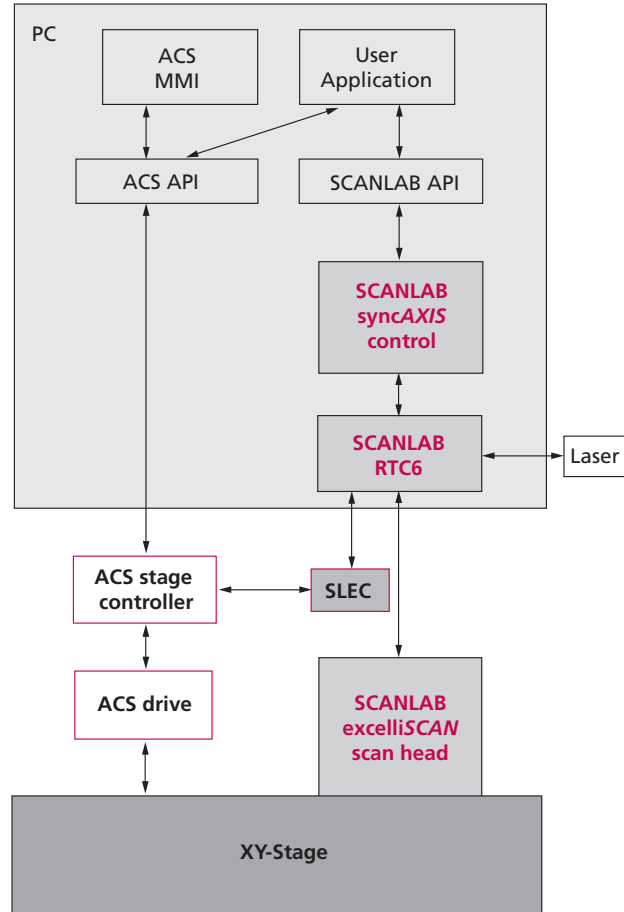
Specifications

excelliSCAN 14

Focal length (lens)	100 mm telecentric; FoV (54 x 54) mm
Speed	< 20 m/s
Acceleration	< 32 000 m/s ²
Control error dynamic	< 5 µm (typical < 3 µm)

ACS components

To be defined according to system requirement.
Contact ACS Motion Control.



Block diagram XLSCAN

Overview of selected methods of operation (with scan system and XY-stage) for the processing of large workpieces:

Solution	Flexibility	Throughput	Accuracy	Cost	GUI	Applications
Stitch and Scan	++	○	○	++	Yes	Frequently-changing marking applications
2D Processing on-the-fly	-	++	○	○	No	Similar patterns produced in large quantities
XLSCAN	-	++	++	-	No	Similar patterns produced in large quantities

(++ good; ○ moderate)

Stitch and Scan

- Separate movement of scan system and XY-stage
- Solution is available from SCANLAB and ACS
- Any SCANLAB scan head can be used
- Available with GUI (graphical user interface) which is provided by the laserDESK software

2D Processing on-the-fly

- Simultaneous movement of scan system and XY-stage
- Solution is available from SCANLAB
- Not supported by laserDESK

XLSCAN

- Motion path of laser spot is automatically split into a path for the scanner and a path for the XY-stage
- Solution is available from SCANLAB and ACS
- Not supported by laserDESK



Since 1985 ACS Motion Control has developed and manufactured advanced multi-axis motion controllers and integrated control modules for applications demanding the highest accuracy and ultimate throughput.

ACS Motion Control · 1 Ha-Ta'asiya St. · Ramat Gabriel Industrial Park · P.O. Box 984
Migdal Ha-Emek 2307037 · ISRAEL
Tel. +(972) 4 6546-440 · Fax +(972) 4 6546-443
info@acsmotioncontrol.com · www.acsmotioncontrol.com



With over 30,000 systems produced annually, SCANLAB GmbH is the world-leading and independent OEM manufacturer of scan solutions for deflecting and positioning laser beams in three dimensions.

SCANLAB GmbH · Siemensstr. 2a · 82178 Puchheim · Germany
Tel. +49 (89) 800 746-0 · Fax +49 (89) 800 746-199
info@scanlab.de · www.scanlab.de

SCANLAB America, Inc. · 100 Illinois St · St. Charles, IL 60174 · USA
Tel. +1 (630) 797-2044 · Fax +1 (630) 797-2001
info@scanlab-america.com · www.scanlab-america.com