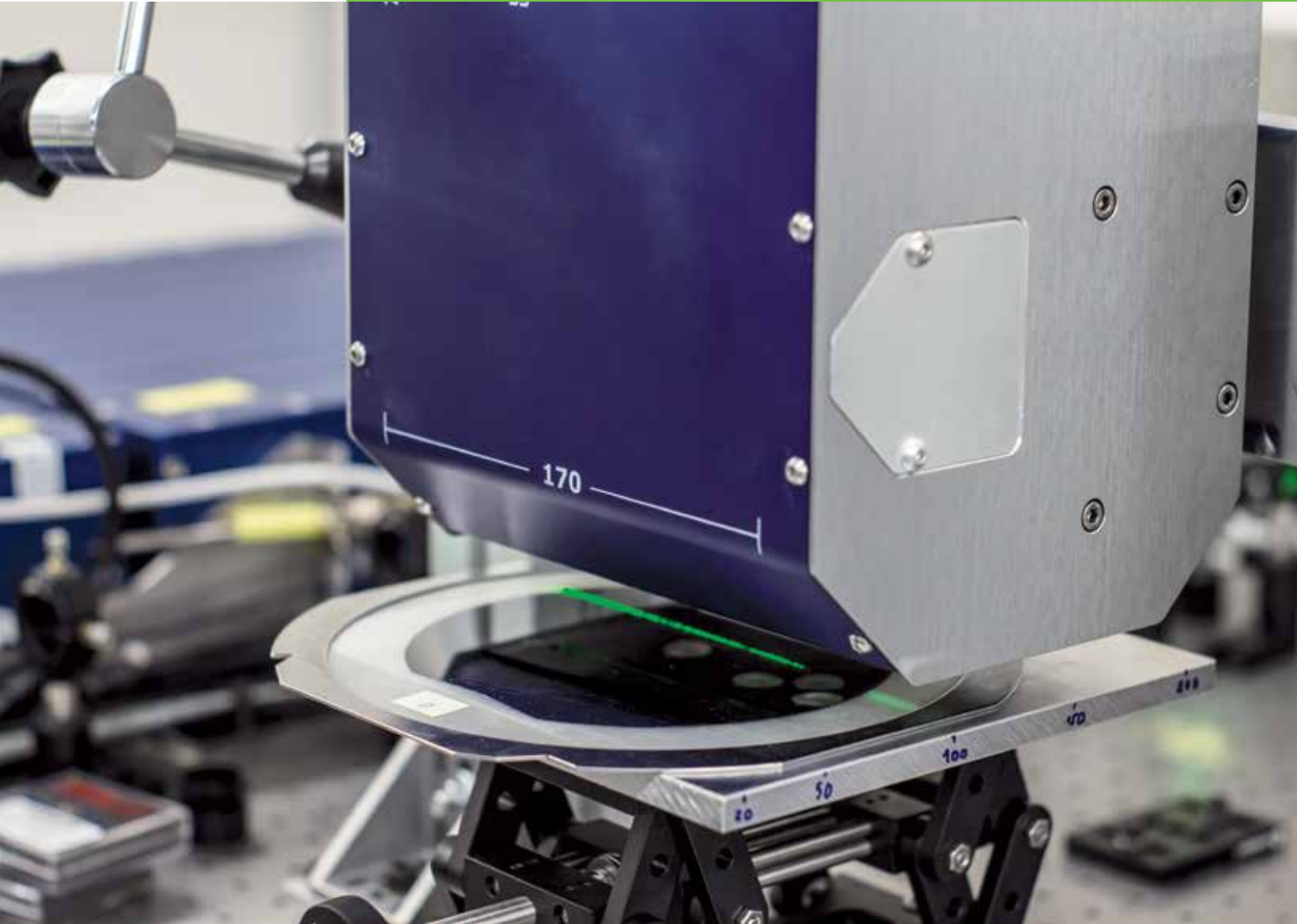




High Performance Polygon Scanner Systems



Next Scan Technology provides superior throughput and precision for laser machining through novel scanner systems for both legacy and ultrashort pulsed lasers.

The key to Next Scan Technology is a compact all-in-one polygon scanner head, featuring its patent pending mirror optics providing small spot sizes fully telecentric over the entire scan area. This ready-to-use solution enables exceptional performance through innovative features such as SuperSync™ Control, TrueRaster Technology and High NA optics

Superior Throughput

Ultrafast lasers are now being adopted as the new workhorse in the processing of materials such as glass, silicon, ceramics, engineered plastics and thin film. To increase average power, laser manufacturers have increased pulse rates to 1 MHz and beyond which easily exceeds the speed of traditional scanning techniques.

The Laser Scan Engine (LSE) polygon laser scan head solution speeds up advanced material processing by a factor of 10-50 compared to conventional processes which are limited by the response time of the laser deflection techniques from typical scanning systems.

Problem Solved

Using the latest class of MHz and multi-MHz lasers requires pulse firing timing of nanosecond accuracy to ensure the focused laser beam hits the target within micron-scale position. To ensure the bitmap data is accurately reproduced at high resolution on the laser machined part our proprietary **SuperSync™** Control takes care of the fine time synchronization between the high speed rotating polygon, the exact timing of laser pulsing and material transport to permit 'on-the-fly' micromachining whether the substrate is on a mechanical stage or uses a web-based transport.

Combining the Line Scan Engine enables the construction of a simple yet very high performance system. Due to the mirror based optics the scan grid shows no pincushion distortion and no error compensation tables are required to achieve accuracy better than 5 microns. However, in applications demanding absolute accuracy our **TrueRaster** Technology provides enhancements never seen before in resolution for high speed large area scanning applications. Supported by the small spot sizes our **HNA optics** delivers, laser processing quality is elevated to an unprecedented level.

The off-the-shelf LSE solution allows you to leverage and benefit from new laser technologies with a more accurate and the highest throughput material processing commercially available. But what if your laser process requires a different scan size or non-listed feature? Contact us for our **OEM customization** to drive your application into a new realm of cost-efficient laser-based production.

LSE, Polygon Scanner Systems

High speed Line Scan Engine featuring the unique mirror based f-theta optics

- > Diffraction limited quality optics providing small focused spot sizes
- > Available in 170 and 300 mm scan width
- > Supports both VIS and NIR wavelengths in one design
- > UV optics for the smallest features
- > Substrate scan speeds ranging from 25 to 100 m/s
- > Line scanning from 50 up to 400 lines per second

Advanced control electronics and software features

- > easy integration with linear stages & roll-to-roll motion control
- > interface for both legacy and ultrashort pulsed lasers
- > bitmap data streaming enabling non-stop laser processing
- > job dithering for super smooth processing
- > interleave mode for advanced scanning strategies

Optional features

- > H(igh)NA to apply small spot sizes on large areas
- > SuperSync Controls to ensure high spot repeatability $< 3 \mu\text{m}$
- > TrueRaster Technology to achieve absolute grid accuracy $\pm 1 \mu\text{m}$

Applications

Thin Film Patterning

Until now, there hasn't existed a laser scanning technique fast enough to compete with chemical etching for the patterning of TCO for products such as touch screens. The LSE polygon scanner mated with MHz pulse rates breaks through this barrier offering a flexible and competitive solution.

High Density Hole Drilling

Whether micro-drilling or perforating materials, throughput is the key to commercial success. The LSE has demonstrated unmatched throughput and economic viability in these demanding applications.

Surface Treatment

Using lasers to modify or strip the surface of a material requires high density laser pulses delivered over large areas. With the LSE's scanning performance of hundreds of lines per second, industrial production is now a reality.

Semiconductor Processing

Drilling, grooving and micromachining are just some of the laser processes used in wafer processing which can benefit from the LSE.

Tool & Part Manufacturing

Through MHz pulse rates, bitmap data streaming and large field optics the LSE offers a competitive solution for traditional etching and EDM.



Patterning thin film



'On the fly' drilling

OEM Customization services

The modular design allows fast adaption of individual requirements such as:

- > custom scan width for optimal efficiency
- > higher scanning speeds to increase throughput
- > tailored modulation for (Q)CW and ns pulsed fiber lasers

Process Development Kit

To explore your potential in the shortest period of time Next Scan Technology offers a Process Development Kit (PDK). The LSE170STD polygon scanner is complimented with beam guiding optics, beam expander and high quality linear stage mounted on a 600 x 600 mm base plate. With the controls and synchronization already in place, this compact lab-ready set up for instant material processing will save your company valuable integration and commissioning efforts.

The PDK is ready for demonstration in our demo center where lab time is also available for customer process development and testing. The PDK is available for sale or even on a monthly rental basis. The system is easily integrated and after a basic training on site you can start testing advanced laser manufacturing techniques within only a few hours.

Next Scan Technology offers to specify your individual scanner & process requirements by:

- > integration and commissioning support
- > training on bitmap raster scanning
- > live processing with the LSE170
- > joint evaluation of scan results and performance improvements



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