



## **pivotSCAN**

Scanning with Perfect Telecentricity

- Accurate Single Pivot-point
- Superior Telecentricity
- Highest Precision

## pivotSCAN for Precise Laser Material Processing

Discover the new pivotSCAN that revolutionizes the efficiency and precision of your laser material processing. With a three-mirror design, the laser beam originates always from a single pivot-point on the final mirror. This advanced system enables superior telecentricity compared to conventional two-mirror scanners.

### Key Features

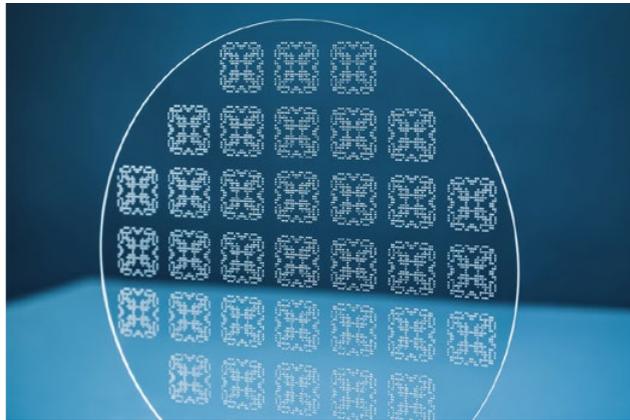
- **Fixed Pivot-Point:** The deflected laser beam originates from a single spot, ensuring precise and consistent scanning results.
- **Superior Telecentricity:** The single pivot-point permits optimal optical configurations. This is key for realization of telecentric systems over the entire scan field.
- **High Precision:** The optical configuration allows less aberrations and improved focus quality
- **Advanced Control:** The control is based on SCANmotionControl and features precise control algorithms for optimal beam positioning and stability. The pivotSCAN can be combined with additional axes, e.g. excelliSHIFT and 3D XLSCAN.

### Target Applications

- **Large Scale Display Applications:** Display foil cutting with the entire work piece in the field of view.
- **Two-Photon Polymerization:** Achieve exceptional precision in microfabrication processes, ensuring the laser beam's incidence is optimal for creating intricate structures.
- **Selective Laser Etching:** Enhance the accuracy and consistency of etching processes, particularly where the solid/air optical interface is critical.
- **Drilling:** Enhance the hole quality in high speed drilling applications and increase the throughput for instance in Through Glass Via drilling applications



Glass cutting

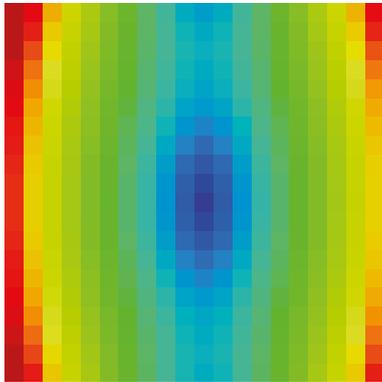


Micro drilled glass wafer

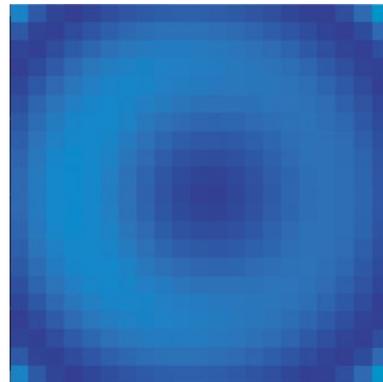
## Telecentricity

pivotSCAN enables unparalleled telecentricity, ensuring that the laser beam remains perpendicular to the scanning surface across the entire scan field.

A) Standard 2-mirror scan system



B) pivotSCAN



Angle of incidence (°)

The diagrams show the angle of incidence for a standard 2-mirror scan system and the pivotSCAN

As a result of non-telecentricity the incident angle varies over the field of view of a standard 2-axis scan system <sup>(A)</sup>.

pivotSCAN greatly improves telecentricity <sup>(B)</sup>.

The angle of incidence with the 2-axis scan system varies between 0° in the center and 2° at the edge of the field. With pivotSCAN the angle varies between 0° and 0.3°. The remaining non-telecentricity is completely caused by the nonoptimized f-theta lens (f=100 mm, fused silica). If a custom f-theta lens is used this value can be improved further.

Scan area: 45 x 45 mm<sup>2</sup>

## Specifications

<b>Aperture</b> [mm]	14
<b>Optical Configuration</b>	
Typical scan angle [rad]	± 0.34
Wavelength [nm]	1034
Maximum average laser power [W]	200
Position accuracy of pivot point [µm]	100
<b>Dynamics</b>	
Tracking Error	0
Acceleration [rad/s <sup>2</sup> ]	48,000
Max speed [rad/s]	20

All angles are optical angles.

<b>Precision</b> <sup>(1)</sup>	
8h-drift (after 30 min warm-up)	
Gain [ppm]	40
Offset [µrad]	60
24h-drift (after 3h warm-up)	
Gain [ppm]	40
Offset [µrad]	60
<b>Electronics &amp; Control</b>	
Control Interface Digital	SL2-100
Power Requirements [RMS]	48 V DC (± 2 V), 5 A
<b>System Requirement</b>	
RTC6 or RTC6 Ethernet, SCANmotionControl, Water cooling	
<b>Other Specifications</b>	
Weight [kg]	10

<sup>(1)</sup> Preliminary

# Technical Drawings

