



Scanner based manufacturing

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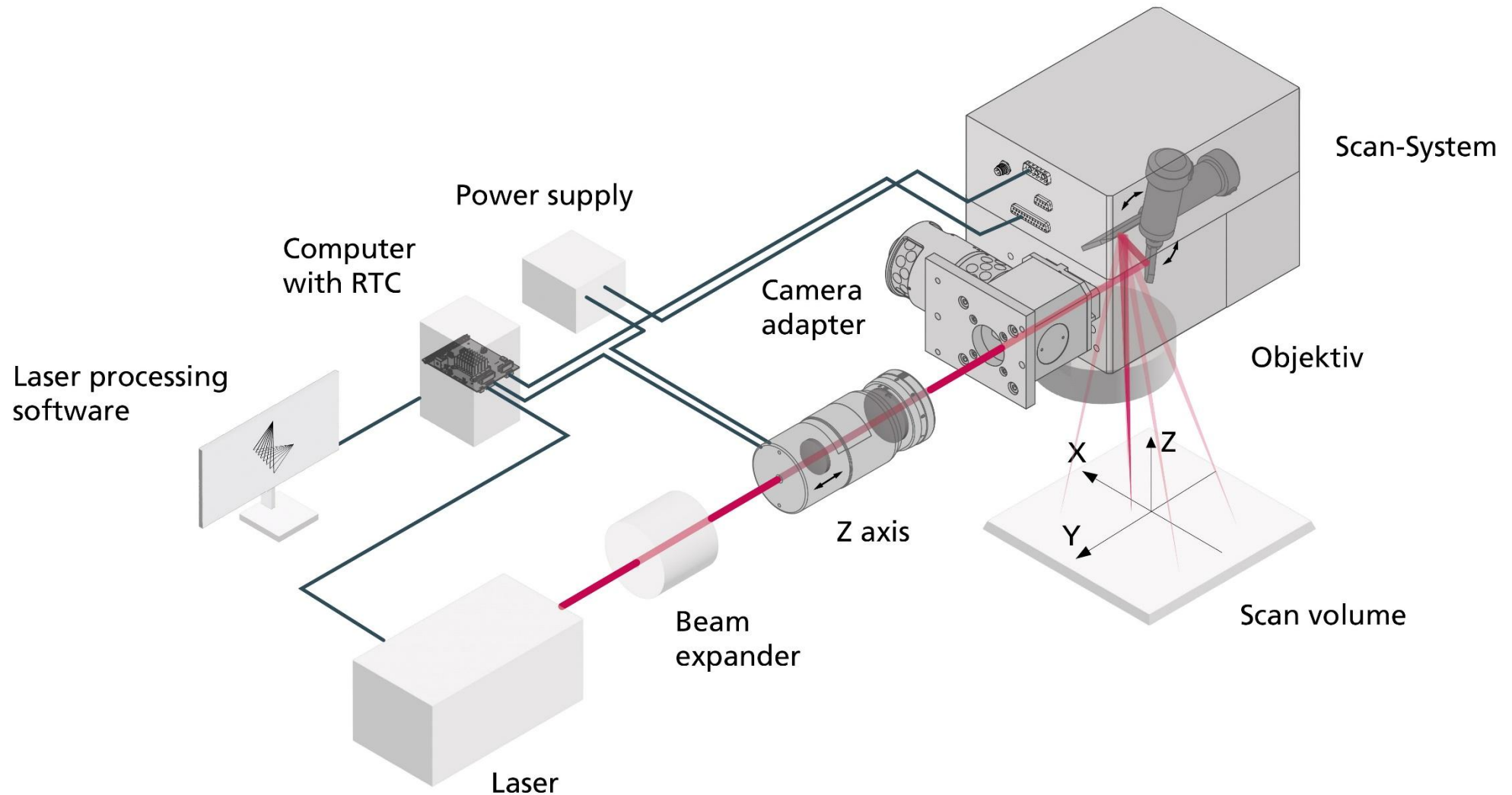
SCANLAB at a Glance – Facts & Figures



- **Worldwide leading OEM manufacturer of scan solutions** for deflecting and positioning laser beams
- Our **high-performance components are the core** of, e.g., 3D printers, laser welding robots, medical laser systems and micro-structuring equipment
- About **40,000 units** manufactured and installed annually
- Founded in 1990 – **over 30 years of experience**
- **530 employees from 36 countries** – around half of our highly qualified and growing team are engineers and scientists
- **Headquarters** with production site in **Puchheim** near Munich
- **Trendsetting developments** in the fields of electronics, mechanics and optics

Scan head principle

Setup of a Laser Processing System



Setup of a galvanometer scan system

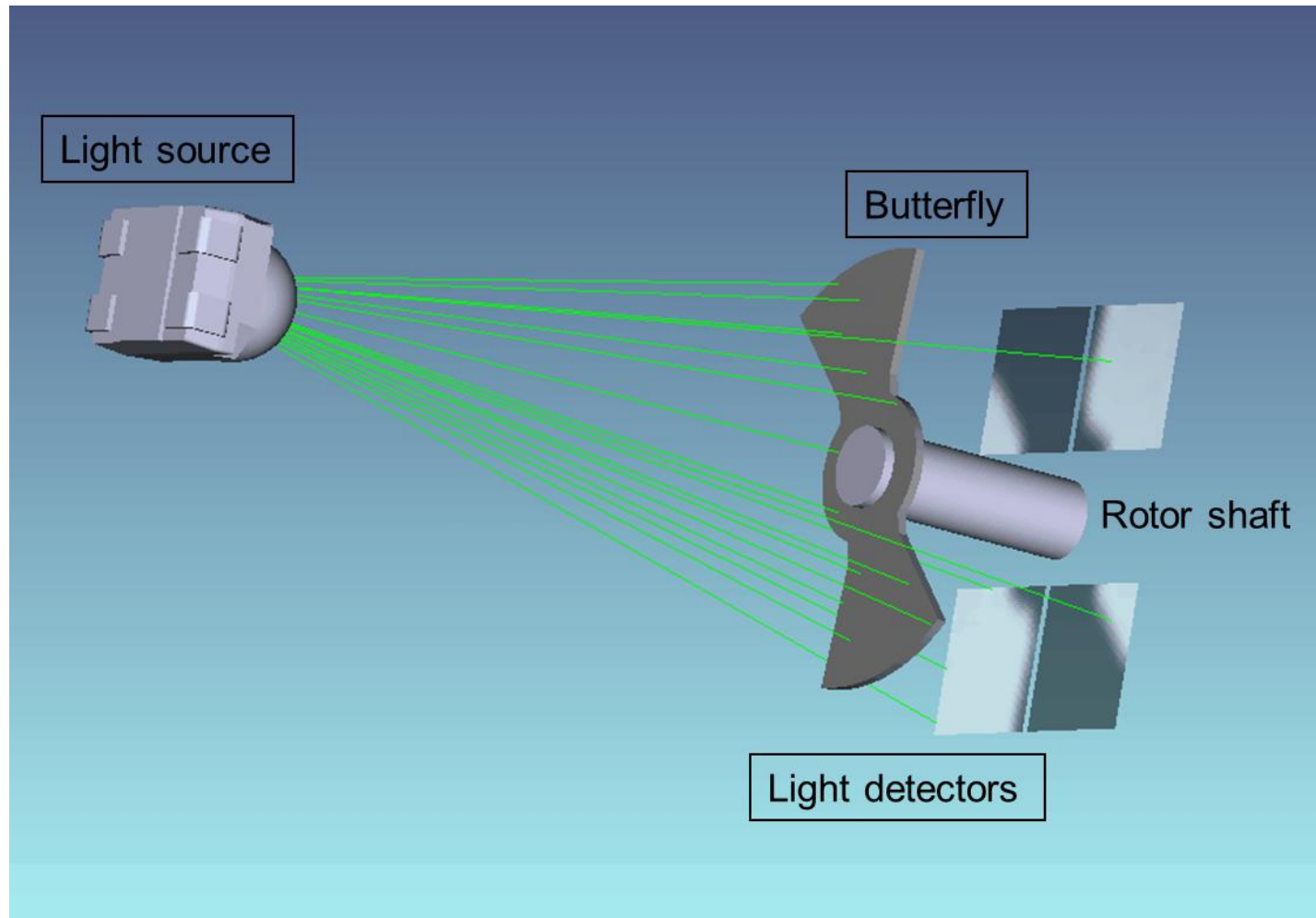


Mirror

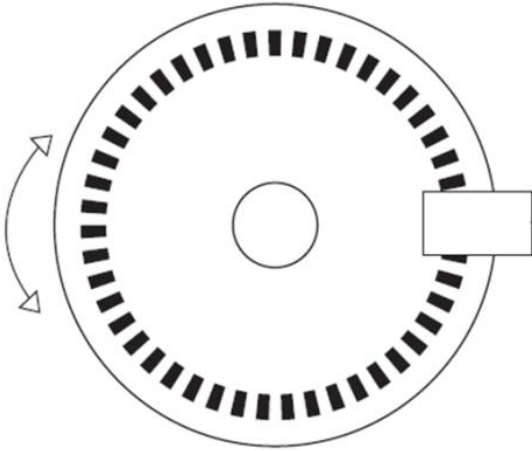
Motor

Position
detector

Optical Position Detectors – Basic Principle

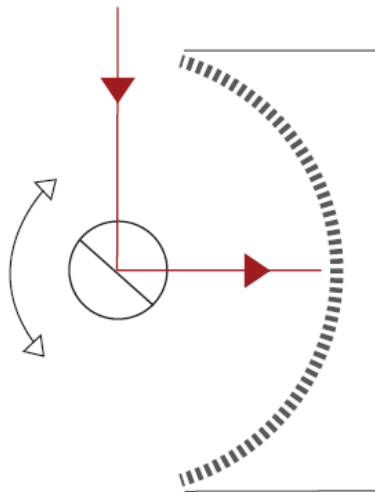


Digital Position Detectors – Operation Principle



Key differences in construction of digital position detectors:

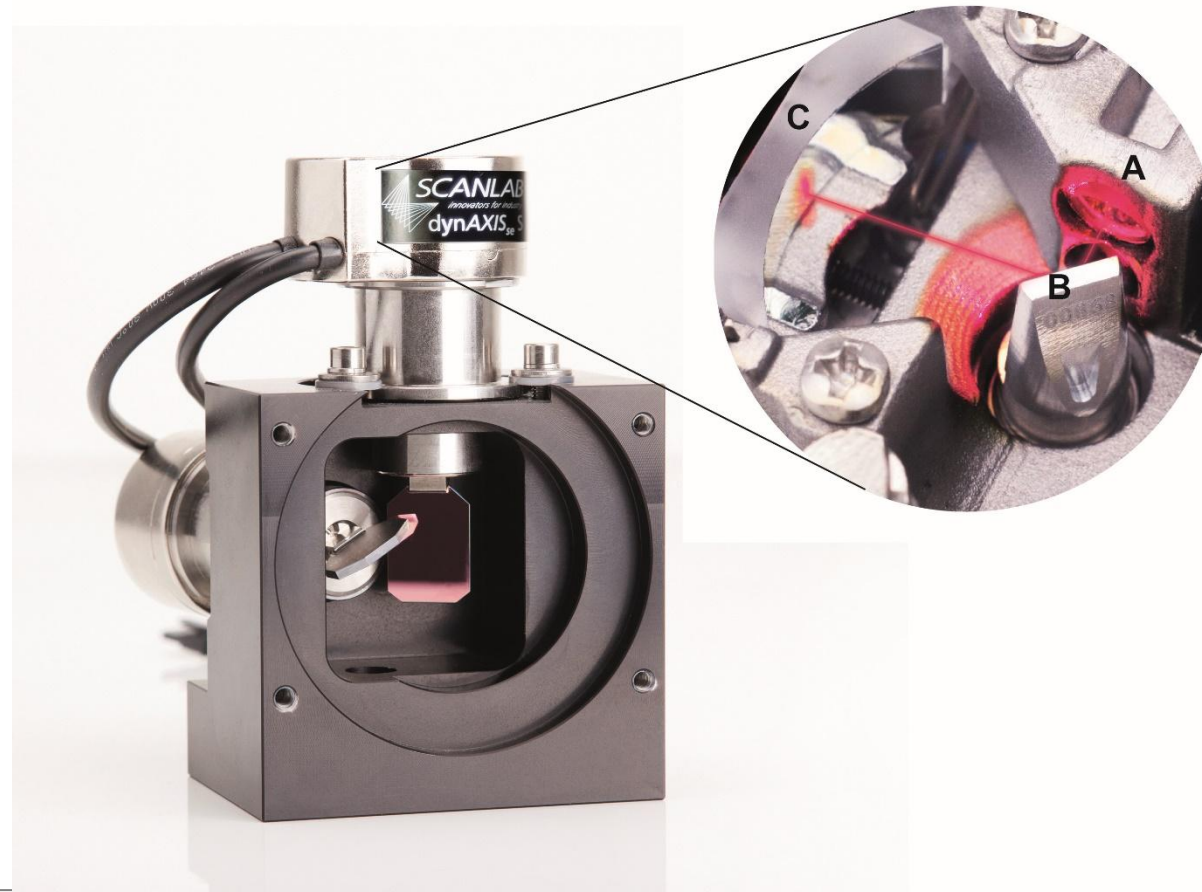
Common principle of digital encoders employing an **encoder disc**



SCANLAB's patented
'light-pointing encoder' design
with reduced-inertia, mirror at rotor end

Technical realization of SCANLAB se-encoder

The se-encoder's massless laser beam (A) scans the stationary scale (C). Other than the inertia-reduced mirror (B), no further components are required that can increase inertia.



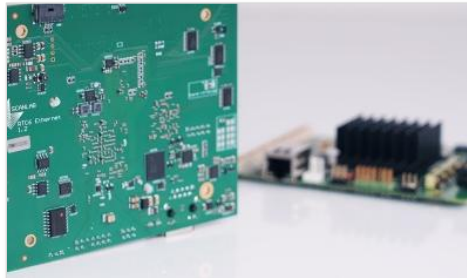
Agenda

- **Components of a laser scanning system**
- **Example laser applications**
- **Conventional scanning solutions**
- **Next generation scanning solutions to improve productivity**
- **Scan head selection**
- **Q&A**

Example Applications



Automotive



Electronics &
Communications
Devices



Packaging & Food



Watches, Jewelry &
Life Style



Lightweight
Construction



Mechanical
Engineering &
Metalworking



Medical Technology



Solar Power
(Photovoltaics)



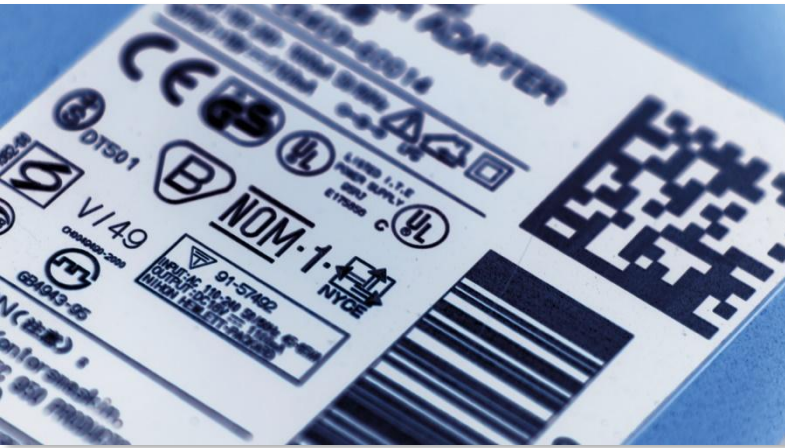
Pharma &
Life Sciences



Textiles

Application Laser Marking

(Perforating, Scribing, Coding)



Requirements:

- Precision processing of stationary and moving work pieces (on-the-fly)
- High marking speeds more than 1000 cps

Examples:

- Laser marking with dynamic data
- Laser marking on 3D profiles
- Laser perforating and scribing
- Combined laser processes (like marking and cutting)

SCANLAB Products:

SCANcube, basiCube, intelliSCAN

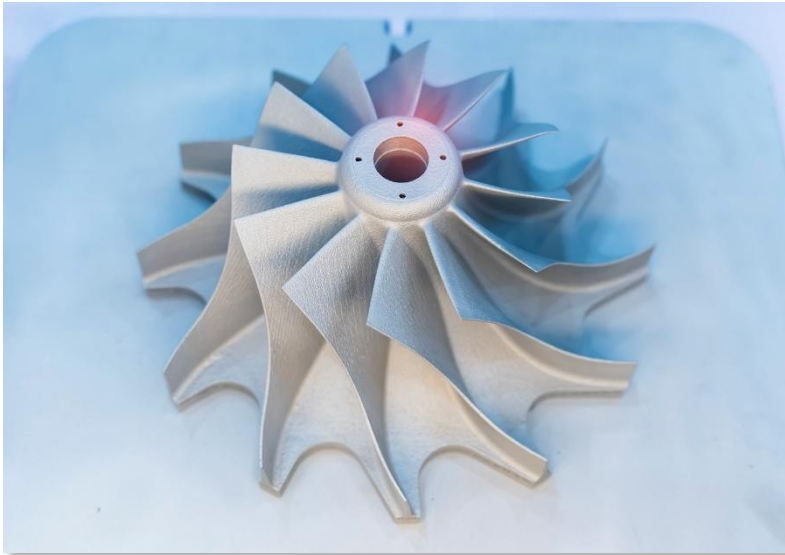
Roadmap:

Resonant scanner for even higher speeds



Application Additive Manufacturing

(Laser-based Powder Bed Fusion, Laser Sintering)



Requirements:

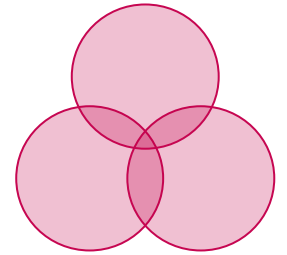
- Laser with very good beam quality and a wide range of wavelengths from UV to IR
- High long-term stability required (minimal dither and drift, best linearity)
- High dynamics

Characteristics:

- Powder bedding process
 - Metal melting
 - Laser sintering of plastics or ceramics
- Stereolithography
- Rapid prototyping / rapid manufacturing / rapid tooling

SCANLAB Products:

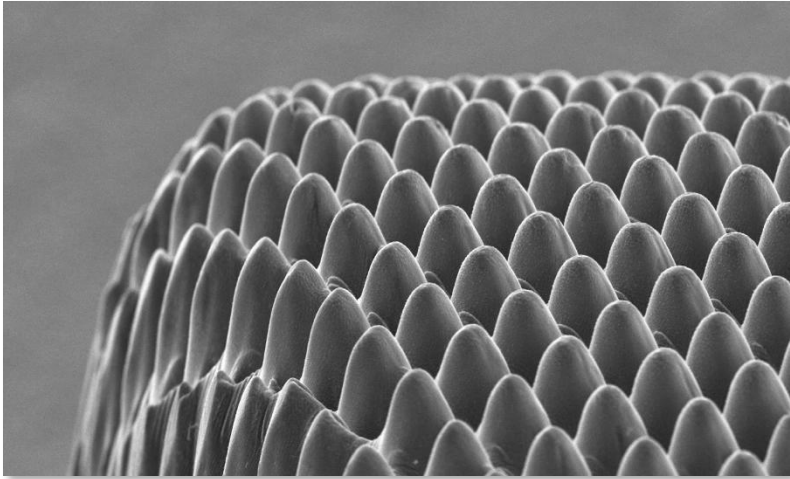
excelliSCAN, intelliSCAN_{se}, fiberSYS



[Zur Produktübersicht](#)

Application Micro Structuring

(e.g. Flatpanels, Photovoltaics)



Requirements:

- Minimal dither and drift, best linearity
- Maximum angular resolution
- High dynamics

Characteristics:

- Micro structuring (full-surface structuring of silicon wafers)
- Laser micro drilling for backside contacting of solar cells
- Micro cutting (displays, foils)

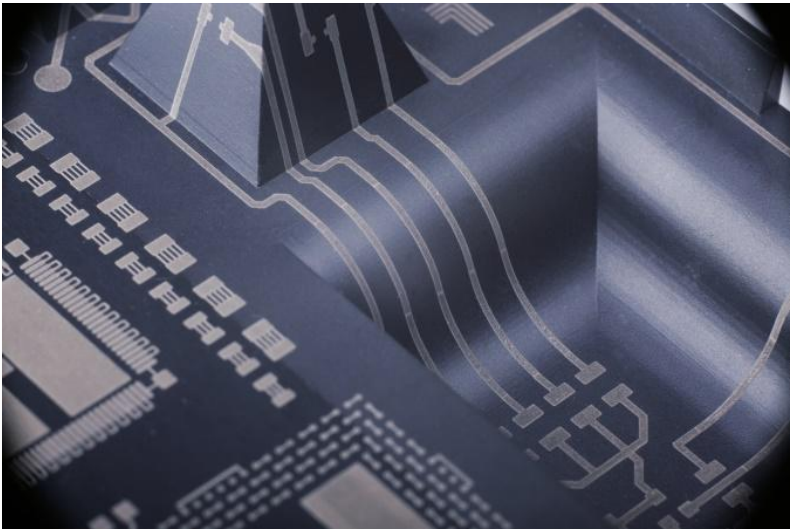
SCANLAB Products:

excelliSCAN, intelliSCAN, intelliSCAN_{se}, XL SCAN



Application Micromachining

(Micro Material Processing)



Requirements:

- Minimal dither and drift, best linearity
- Maximum angular resolution
- Highest dynamics

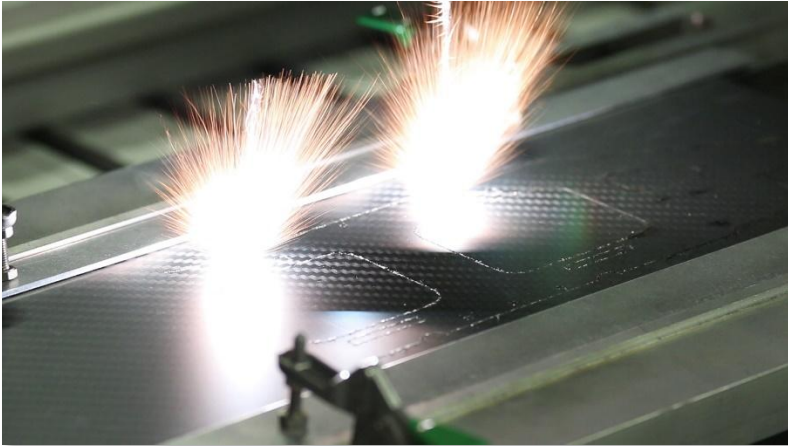
Characteristics:

- Micro drilling (Jump and Shoot, Metal Wrap Through, etc.) and applications with freely selectable drilling geometries
- Micro engraving and sintering
- Deep engraving
- Microstructuring (functionalization of surfaces)

SCANLAB Products:

excelliSCAN, intelliSCAN, intelliSCAN_{se}, XL SCAN, precSYS

Application Laser Cutting



Requirements:

- High laser powers of different lasers from UV to IR
- Large working distance
- Precise processing even of moving work pieces (on-the-fly)

Characteristics:

- CO₂ cutting processes for organic material
 - Paper, cardboard and wood
 - Technical textiles, fabrics and leather
 - Plastics and film
- Fiber and YAG cutting processes for
 - Glass and ceramics
 - Metals

SCANLAB Products:

intelliSCAN, powerSCAN, weIDYNA

Micro-electronics Applications – Example Smartphones

Display Module (LCD or OLED)

LTPS Annealing
Laser Lift-Off
Glass Cutting
OLED Cutting
Polarizer Film Cutting

Camera Module / Sensor

Sapphire Lens Cutting
CMOS Image Sensor Anneal

Main PCB

Micro Via Drilling
Laser Direct Imaging
Marking / Coding

Home Button & Fingerprint Sensor

Sapphire Cutting
Flex Circuit Cut / Drill

Display Light Guide / Backplane

Patterning of Light Guide Panel
Dicing LEDs

IC Logic/Memory / Modem Components

DUV Photolithography
Bare & Patterned Wafer Inspection
Reticle Inspection
Wafer Dicing / Low-k Scribe
RDL Structuring
SiP Cutting/Trenching
Wafer & Package Marking

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