



TLS Kanga

Laser Micromachining Platform for Industrial Manufacturing, Product Development and R&D

Modularity to be versatile: The TLS Kanga can be reconfigured for your specific needs to fit the right laser source, beam delivery, motion systems, and integration of custom product fixtures, making this an extremely versatile machine that can support early process & product development. Configuration upgrades (page 2) include advanced metrology for part alignment, adaptive processing, 3D galvo, 5-axis motion and more.

Industrial robustness for manufacturing: Including an electrical and software framework to enable integration with factory automation, remote control, and automatic loading and unloading, the TLS Kanga is ready for high-volume manufacturing.

Specifications

Model	TLS Kanga
Dimensions (WxDxH)	1.88 m x 1.19 m x 1.95 m
Weight	1700 kg (approx)
Laser source	Variety of ultrafast, nanosecond, fiber, UV and CO2 lasers
Scanner	Variety of 2D and 3D galvo scanners with various field-of-views and focal spot sizes Standard lenses: include f = 50, 63, 80, 100, 163, 255mm Other lenses: available upon request Repeatability: typically <1um depending on model chosen Galvo speeds: >10m/s possible for certain models
Software	TLS Proprietary CAD/CAM - laser control
Stage travel options	500 x 400 x 20 mm 500 x 400 x 100 mm 400 x 400 x 150 mm other motion options available
Max Workpiece size	Up to 300 mm wafers, 400 x 300 mm sheets
XY Stage repeatability	+/-2.5um (ISO 230-2) on linear XY stages. Gantry and air-bearing stage options upon request
Stage error mapping	TLS proprietary method using SEMI-grade wafer. Accuracy typically +/-5um (3-sigma) for XY stack, other accuracy options available for different stage configurations.
Environmental controls	FFU and Temperature control units optional
Chiller	Air and water-cooled options available
Debris handling	Fumex and ionized air
Vision	Capable of sub-micron precision, 0.4 um to 2.2 um resolution options

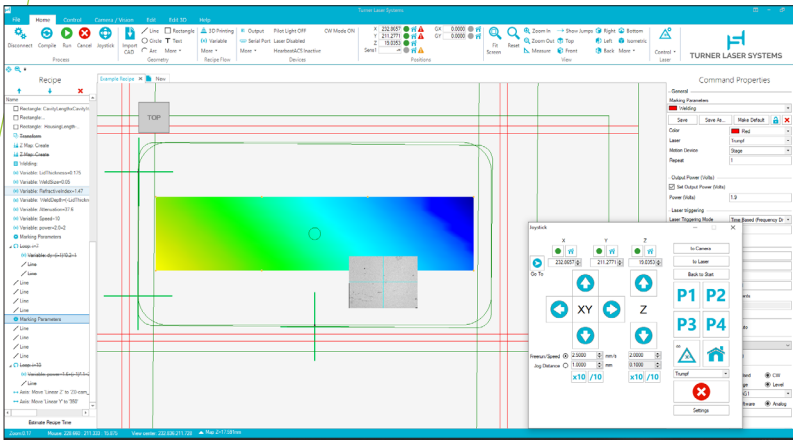
TLS Micromachining Software

Flexibility, precision, and control meets ease of use

Included with the TLS Kanga, our turn-key software provides the user control of the laser, motion system, galvo scanner, sensors, vision and other devices in a single graphical interface.

Features include:

- CAD file import (e.g. dxf, dwg, gerber, STL)
- CAM features such as lead in/out
- Recipe library
- Multi-level user-access
- Automatic vision alignment
- 3D part mapping
- Process development tools
- Data logging
- Math & logic features for advanced tool control
- User-level access control



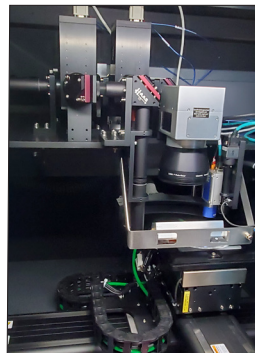
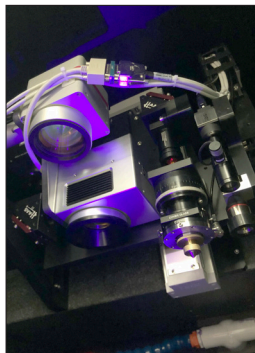
Our standard platform includes:

- Customized laser engine and beam delivery (configurable to application)
- High precision XYZ motion (configurable to application)
- **TLS Micromachining Software** for 2D and 3D CAD CAM, recipe development, automation and full tool control
- Class 1 laser safety enclosure (CDRH compliance)
- Integrated fume extraction with HEPA filtration
- Ergonomic HMI with adjustable position and angle
- Electrical & pneumatic sub-systems (NFPA79)

Configuration upgrades

Selected based on specific applications:

- A variety of laser options including:
 - femtosecond, picosecond and nanosecond laser sources
 - IR (1030-1080nm), GREEN (515-540nm), UV (343-355nm) and CO2 (10.6) wavelengths
 - low, mid and high power options
 - Beam delivery options:
 - galvo scanner ultra high-speed
 - galvo scanner high-speed
 - gas-assist fixed head
 - glass cutting head
 - glass welding head
 - varioscan capability
 - Precision vision system for part alignment:
 - Automatic part position and angle correction
 - Algorithms for part scale and skew correction
 - Algorithms for adaptive processing to correct for part distortion, warpage and manufacturing tolerances
 - 3D height sensor for auto focusing
 - Off the shelf and custom fixtures and chucks
 - Various additional rotary stages
 - Automatic part loading add-ons available (e.g. EFEM, 6-axis robot etc.)
 - Semi-automated multi-tool offsite calibration
- And many other custom upgrades available.



The low-risk path to the right tool solution

Choosing the right tool for the job when there are endless options (such as choosing the right laser) can be daunting. Our 360-Mastery Methodology, a process unique to TLS, was built to help you choose a hardware configuration that's optimal for your application.

By thoroughly understanding your needs, providing a technology roadmap including systematic design-of-experiments crafted for your needs, our experts can take you from research, through experimentation to manufacturing success — avoiding development-pitfalls and saving you business time and resources.



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