LS-Scan

High acceleration laser head

Dedicated to laser **micromachining** and **high accuracy marking**, the LS-Scan is LASEA's unique scan head.

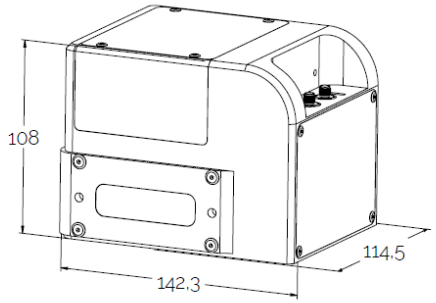
While conventional marking applications require high scanning speeds with accuracies around 30µm, micromachining still requires **speed to prevent from heat accumulation**, but the accuracy is a lot more critical, and the drawings often feature a lot more details with constant **needs for accelerations**.

The LS-Scan's technology, based on **flat moving coil motors**, is different from conventional moving magnet technology.

Moving coils being **lighter than magnets** and the technology having a **5 times less current consumption**, the LS-Scan reduces thermal drifts and offer acceleration ramps about **20% smaller** than traditional moving magnet scanners.

Thanks to these performances, **more laser power** can be used without degrading the machining accuracy and hence the cycle time can be reduced.

Finally, all main electronic controls are integrated into LASEA's control rack, increasing even more the thermal stability of the LS-Scan. The motors are simply connected to this rack and the rack is connected to the computer through an Ethernet interface. All inputs and outputs are easily accessible from the rack back panel. And the process is driven by our software KYLA™, a full **micromachining software** able to communicate with several stages, cameras, and lasers.



Key features

- High acceleration
- Low thermal drifts
- Low electrical consumption
- Air-cooled
- 3D available
- Easy interfacing with KYLA micromachining software
- XY2-100 protocol compatible

Dynamics		LS-Scan XY 10	LS-Scan XY 15	LS-Scan XY 20
Scanner aperture		10 mm (Advised beam diameter of max 6 mm)	15 mm (Advised beam diameter of max 9 mm)	20 mm (Advised beam diameter of max 12 mm)
Step response time[1]	1 % of full field	0,4 ms	0,44 ms	0,6 ms
	10 % of full field	1,8 ms	2,0 ms	3,1 ms
Maximum scanning speed		64 rad/s		

[1] Time to accelerate and decelerate to a new position with a settling amplitude below 0,1 % of full field (+/- 0,05 %)

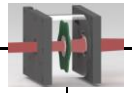
Precision

Positioning resolution	1 µrad
Repeatability	+/- 1 µrad
Thermal drift (after an 8h job)	+/- 20 µrad
Accuracy	Given by field curvature compensation procedure

Common specifications

Full field	640 x 640 mrad
Cooling	Passive
Interface to steering board (control rack)	2 coax connectors (Shared Data/Power connection)
Size	142 x 115 x 108 mm

LS-Scan Z



Input aperture		20 mm (Advised beam diameter of max 10 mm)
Beam diameter modification		x 1,33
Step response time[1]	1 % of full field	2,5 ms
	10 % of full field	6 ms
Size		109 x 70 x 80 mm³

Control rack

Interface to PC	Ethernet
Inputs and Outputs	Gate signal Laser trigger depending on scanning speed Up to 3 stepper drivers output (PULSE/DIR) to support 3D on-the-fly processing (infinite field) Various other programmable inputs and outputs

Available objectives

Focal length	50 mm	60 mm	100 mm	160mm	255mm
Min spot size (M^2- 1,1, 1.030 nm, LS-Scan 20)	10 µm	12 µm	16 µm	22 µm	35 µm
Scanning field	10 x 10 mm	15 x 15 mm	60 x 60 mm	100 x 100 mm	180 x 180 mm
Z field (with LS-Scan Z option)	0,8 mm	1 mm	3,2 mm	8 mm	20 mm
Working distance	60 mm	66 mm	126 mm	176 mm	317 mm

These data can change according to laser beam quality, LS-Scan input aperture, telecentricity requirements, or wavelength