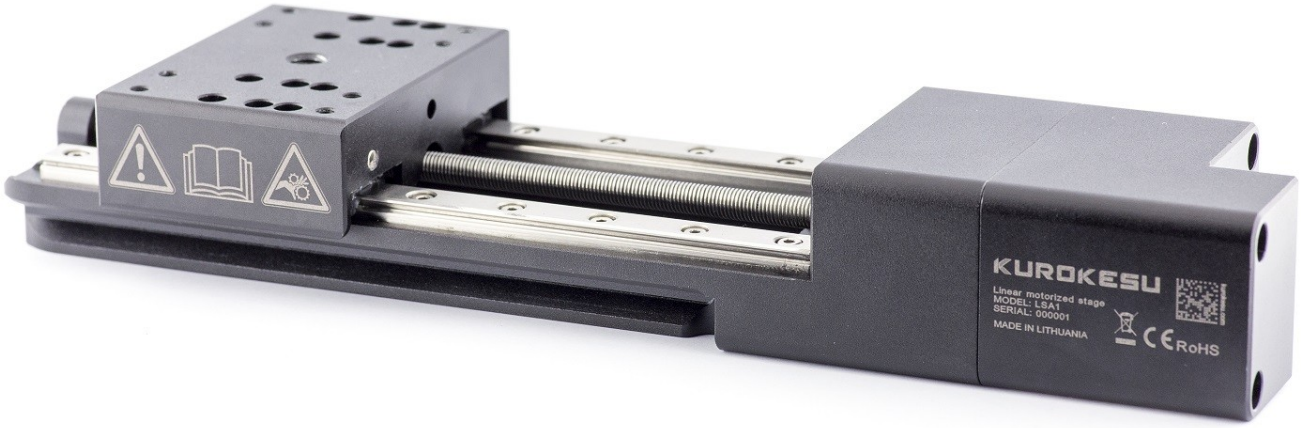
LSA1

Motorized precision linear actuator

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Overview

LSA1 linear motorized actuator designed for automated DOF stacking photography and other precision automated tasks. Can be connected to 4 channel SCE2-MOTION controller over standard RJ45 cable.



- Anodized CNC machined aluminum construction
- Arca-Swiss compatible quick release base
- Multiple 1/4" mounting holes
- 90mm travel length
- Precision homing position with hall sensor
- Multiple lead screw options: 0.635mm, 1.27mm, ...
- Precision linear guideways with light preload

Specifications

LSA1 specifications

Feature	Value	Units
Travel length	90	mm
Max drive speed	500	mm/min
Lead screw options	• 0.635 • 1.27 • 6.35	mm
Static load	>200	N
Push/pull force	>50	N
Weight	517	g

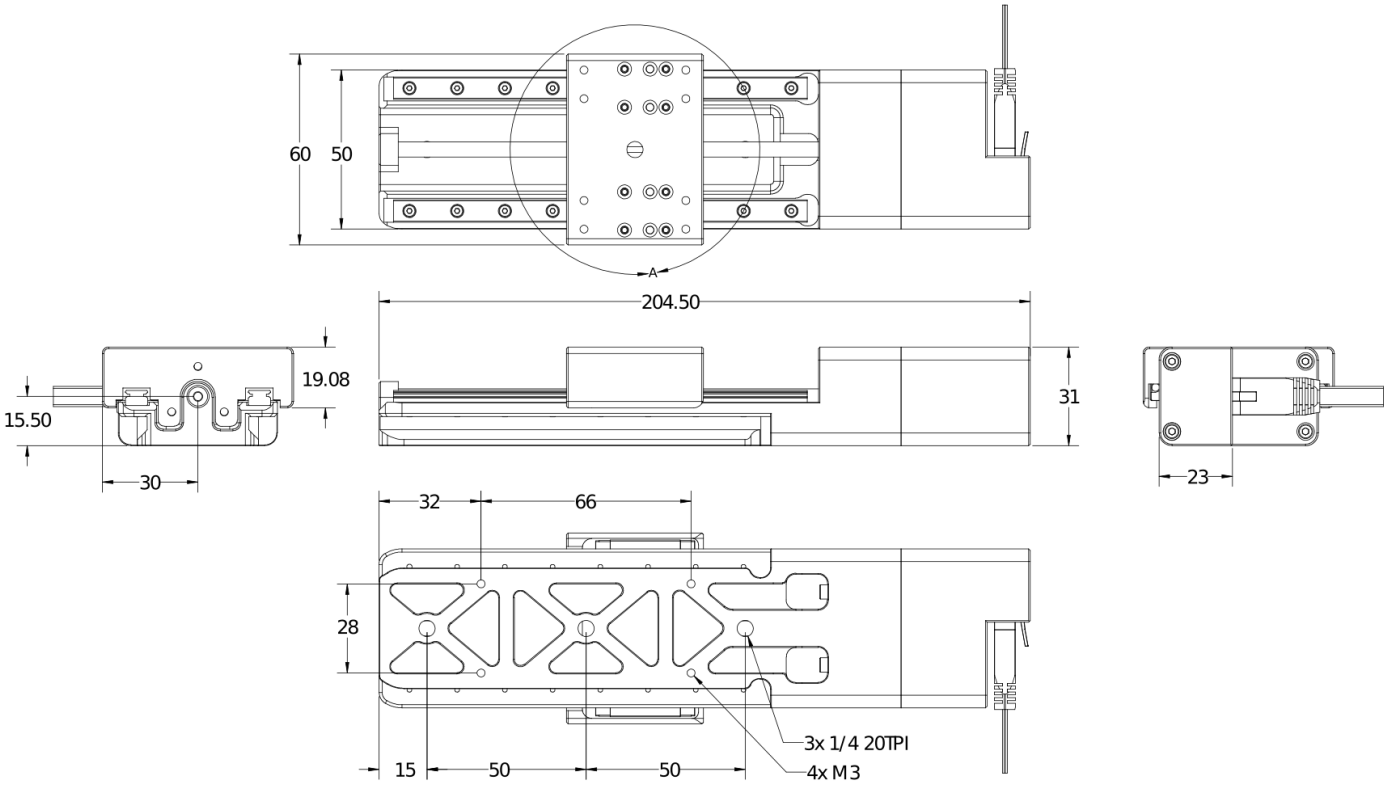
Notes

> Homing position at 11mm (for pinch safety, but after homing zero position can be driven to -11mm)

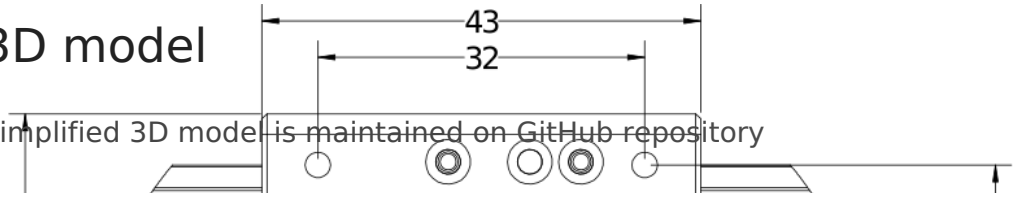
Dimensions

External dimensions

LSA1 external dimensions [mm]: 204.5 x 60 x 31



LSA1 carriage dimensions



3D model

Simplified 3D model is maintained on GitHub repository

Wiring

RJ45 pinout

Pin	Signal
1	GND
2	5V
3	SIG1
4	A1
5	A2
6	SIG2
7	B1
8	B2

SIG1 is used for homing signal

Drive train specifications

Lead screw

LSA1 can be fitted with different spring loaded lead screws

Parameter	Pitch 0.635mm	Pitch 1.27mm	Pitch 6.35mm	Unit
Push pull force	>50	>40	TBD	N
Backlash	5	TBD	TBD	µm

Motor

Parameter	Value	Unit
Size	NEMA11	
Step angle	1.8 ±5%	deg
Phase count	2	
Rotor inertia	12	$g*cm^2$
Mass	180	g
Rated voltage	4.5	V
Rated current	0.75	A
Resistance per phase	6.7 ±10%	Ω
Inductance per phase	3 ±20%	mH
Holding torque	95	mN*m

GRBL motion settings

Recommended GRBL parameters

Motion controller needs to know about actuator capabilities.

> Assume motor is connected to Y axis.

LSA1 pitch 0.635mm

GRBL parameter	Value	Definition
$101	10078.740158	Y steps/mm
$111	250.000	Y Max rate, mm/min
$121	40.000	Y Acceleration, mm/sec^2
$131	90.000	Y Max travel, mm

LSA1 pitch 1.27mm

GRBL parameter	Value	Definition
$101	5039.37008	Y steps/mm
$111	500.000	Y Max rate, mm/min
$121	50.000	Y Acceleration, mm/sec^2
$131	90.000	Y Max travel, mm

LSA1 pitch 6.35mm

GRBL parameter	Value	Definition
$101	1007.87402	Y steps/mm
$111	2500.000	Y Max rate, mm/min

$121	300.000	Y Acceleration, mm/sec^2
$131	90.000	Y Max travel, mm

Calculating steps/mm constant

Variable	Value	Definition
p	6.35	Lead screw pitch
s	200	Stepper motor steps per revolution
m	32	Microstepping

const = 1/(p*s*m)

Ordering

LSA1 linear actuator can be ordered directly on Kurokesu e-store