

High-quality flexible beam splitter module

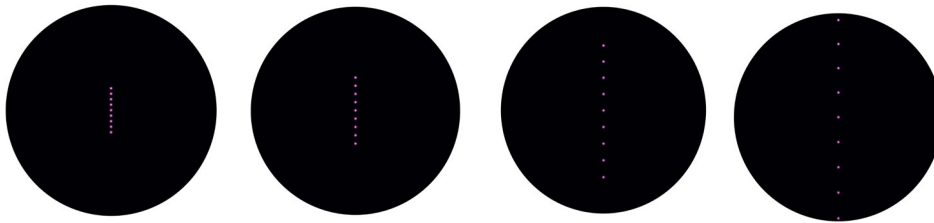
CANUNDA-SPLIT beam splitter module

Cailabs designs and manufactures a range of beam splitter modules with unique properties to increase the efficiency of laser processes:

- › A choice of five different patterns or five different spacings for each module with motorized exchange between patterns or spacings
- › High transmission for improved process efficiency
- › Homogeneity between spots for optimal processing

- › Compatibility with ultrashort (femtosecond) lasers with no chromatic effects
- › Module compatible with industry standards (galvanometer scanner, F-theta lenses, etc.)

Currently, two sets of patterns are available that allow the spacing between the spots or the pattern of the spots to be adjusted. This takes place either in the near infrared or in the visible range (green).



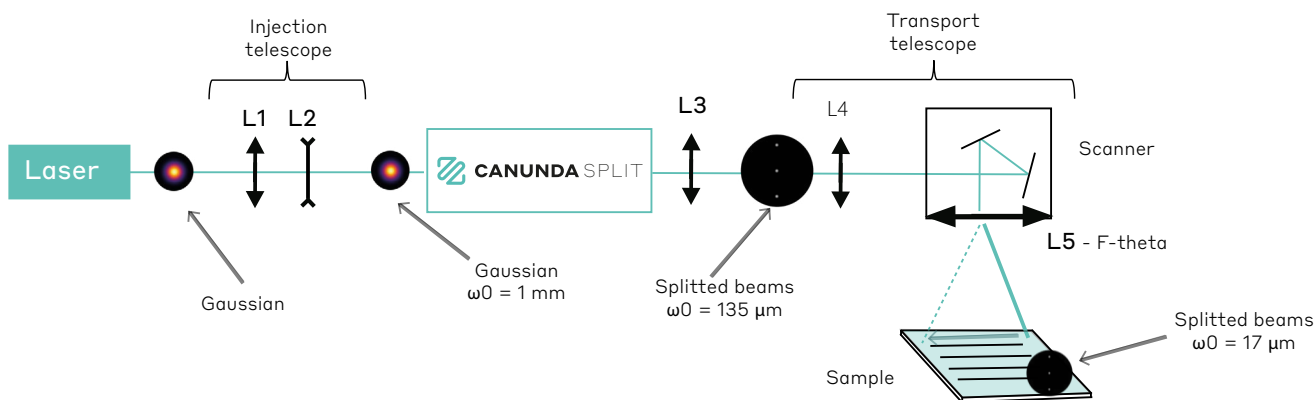
CANUNDA-SPLIT Catalog

Values at 20°C, 50% RH

Parameter	Pattern set P01	Pattern set P02	Comment
Spot configuration	● 1x9, 1D	● 1x5, 1D vertical ● 1x5, 1D horizontal ● 1x9, 1D vertical ● 1x9, 1D horizontal ● 7x7, 2D	Additional pattern: no splitting, input beam preserved
Spot separation angle	● 1.5 mrad ● 2 mrad ● 2.5 mrad ● 3 mrad ● 3.5 mrad	● 2 mrad	
Rotation angle	10° to 14°		The beam splitter module compensates for the angle induced by the scanner, generally between 10 and 14 degrees, to be specified at time of order
Homogeneity	> 96 %		Standard deviation
Transmission	> 90 %		Energy in the pattern after the beam splitting module divided by the energy entering the module
Wavelength	515 nm or 532 nm or 1030 nm or 1064 nm		
Nominal input beam waist	1 mm		Up to 4 mm acceptable - different input waist will give different separation angle.
Input beam M ²	< 1.3		
Minimum pulse duration	300 fs		
Maximum energy per pulse	1 mJ		
Maximum average power	60 W		
Module dimensions	100 mm x 175 mm x 104 mm		
Beam height	45 mm		
Pattern exchange	Motorized		Communication through USB cable, software provided

Possible operational configurations

There are several possible configurations for ultrashort laser micromachining (details of lens selection and settings can be found in the installation procedure):



The injection telescope adjusts the laser output waist to match the input waist of the CANUNDA-SPLIT module. In addition to the relay telescope, the L3 lens, allows the split beams to be propagated to the process plane. As an example, after a lens L3 with a focal length of 400 mm, each spot waist is 135 μm and the pitch between spots varies from 600 μm (1.5 mrad separation) to 1400 μm (3.5 mrad separation).

There are several possible dimensions (spot diameter and spacing), depending on the selected installation. Some configurations are given below and Cailabs can communicate additional options on request:

Pattern set P01

spot diameter @ 1/e ² (μm) spot separation (μm)		F-theta focal length (mm)			
		50	100	160	250
L4 lens focal length	400	34	68	108	169
		75; 100; 125; 150; 175	150; 200; 250; 300; 350	240; 320; 400; 480; 560	375; 500; 625; 750; 875
L4 lens focal length	1000	14	27	43	68
		30; 40; 50; 60; 70	60; 80; 100; 120; 140	96; 128; 160; 192; 224	150; 200; 250; 300; 350

Pattern set P02

spot diameter @ 1/e ² (μm) spot separation (μm)		F-theta focal length (mm)			
		50	100	160	250
L4 lens focal length	400	34	68	108	169
		100	200	320	500
L4 lens focal length	1000	14	27	43	68
		40	80	128	200

Ordering information

Product part number: **CASP-PXX-YYY**

YYY: central wavelength in nm
PXX: pattern set choice