

Laser Micro Line Generator 13LR...

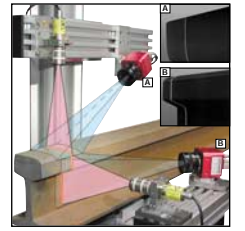
Laser fan with homogeneous intensity distribution and constant line width

Laser Macro Line Generator 13LRM...

Laser line with extended depth of focus

- Fan angle 12°, 25°, and 40°
- Intensity profile homogeneous in direction of line, perpendicular Gaussian (type 13LRM... approx. Gaussian)
- Constant line width along the entire line (s. Fig. X1)
- Line width starting at 0.04 mm (1/e²)
- Line length from 26 mm to 2840 mm
- Integrated focussing mechanism
- Metal housing \varnothing 25/28 mm
- Laser output power up to 100 mW
- Laser wavelength 635 to 980 nm optional 408 nm or 1064 – 1550 nm
- Integrated power control
- Output power adjustable <1 - 100%
- External modulation TTL up to 250 kHz and analog up to 100 kHz
- Supply voltage 5V DC

Application



3D profile measurement with laser light section method

Line width factor F

Properties of the laser diode beam source, like beam diameter and wavelength, affect width and Rayleigh range/ depth of focus of the laser line:

line width: multiply by F
Rayleigh range/ depth of focus: multiply by $1/F^2$

Laser micro line generator 13LR.../13LRM...

- 1 Focussing the laser line to the working distance
- 2 Locking/unlocking of the focus position, 3 Potentiometer for laser output power, X1 Line shape

The line lengths and line widths listed in table 1 and table 3 are valid for the nominal working distance of the line optics. Deviating working distances can be reached by refocussing, considering the given focussing range. The line length and line width approximately change proportional with the working distance.

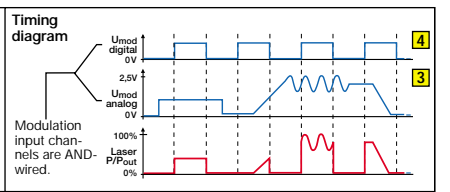
Laser micro line generators 13LR... and laser macro line generators 13LRM... are characterized by a homogeneous intensity distribution and a constant line width along the entire line length. In addition, type 13LRM... has an extended depth of focus. The laser line generators have an integrated electronics and can be modulated externally. The beam shaping optics define the beam parameter fan angle and line length, the optimum working distance, and the focussing range, see table 1 and table 3 respectively. The used laser module defines the wavelength and the output power and so the laser safety class, see table 2 and table 4 respectively.

Laser Micro Line Generator 13LR...								Order Code	55CM - 660 - 26 - M01-T12 - C - 6											
Beam Parameters				Line Optics				Table 2												
Table 1				13LR				Laser Diode Source	Wavelength [nm]	P _{out} [mW]	LD Code	Lens	Electronics	Cable	Safety Classification	Edge Intensity [%]	Line Width Factor F			
Fan angle $\alpha = 12^\circ$	26	0.043	120	3.0	100 - 205	1.4	12	55CM	-635	-10	H10	-T12	-C	-...	3B	>80	0.95			
	52	0.072	248	12.2	205 - 415	0.7	8	55CM	-638	-22	N09	-T12	-C	-...	3B	>80	1.09			
	103	0.144	496	48.8	415 - 815	0.3	8	55CM	-660	-26	M01	-T12	-C	-6	3B	>80	0.79			
	201	0.288	977	195	815 - 1300	0.2	8	55CM	-660	-100	M25	-T12	-P	-...	3B	>80	0.79			
Fan angle $\alpha = 25^\circ$	55	0.043	119	3.0	100 - 205	1.4	12	55CM	-660	-44	M26	-T12	-C	-...	3B	>80	0.88			
	109	0.072	249	12.2	205 - 415	0.7	8	55CM	-685	-26	M21	-T12	-C	-...	3B	>80	0.86			
	217	0.144	496	48.8	415 - 815	0.3	8	55CM	-780	-39	H06	-T12	-C	-...	3B	>80	0.98			
	425	0.288	977	195	815 - 1300	0.2	8	55CM	-785	-7	Y03	-T12	-C	-...	3B	>80	0.72			
Fan angle $\alpha = 40^\circ$	90	0.065	120	3.0	100 - 205	1.4	15	55CM	-785	-61	N08	-T12	-C	-...	3B	>80	1.17			
	180	0.108	245	12	205 - 410	0.7	10.5	55CM	-830	-105	N07	-T12	-C	-...	3B	>80	1.42			
	357	0.216	492	49	410 - 815	0.3	10.5	55CM	-980	-9	W01	-T12	-C	-...	3B	>80	1.46			
	698	0.433	973	195	815 - 1290	0.2	10.5	Electr. Cable: • 1.5 m shielded conn. cable 4xAWG 26CUL 0.14 mm ² ... 1 • as 1, with connector type Lumberg SV50 6 • cabel specified by customer. 5												
Each line optics can be combined with all laser modules								YO3: Laser diodes with low coherence lengths in the lower power range Further wavelengths/ output powers on request.												

Laser Macro Line Generator 13LRM...								Order Code	55CM - 660 - 23 - M01-T12 - C - 6											
Beam Parameters				Line Optics				Table 4												
Table 3				13LRM				Laser Diode Source	Wavelength [nm]	P _{out} [mW]	LD Code	Lens	Electronics	Cable	Safety Classification	Edge Intensity [%]	Line Width Factor F			
Fan angle $\alpha = 12^\circ$	26	0.08	113	21	95 - 195	0.69	18.9	55CM	-635	-7	H10	-T12	-C	-...	3B	>80	0.95			
	52	0.16	236	83	195 - 355	0.34	18.9	55CM	-638	-16	N09	-T12	-C	-...	3B	>80	0.95			
	103	0.32	472	332	355 - 780	0.17	18.9	55CM	-660	-23	M01	-T12	-C	-6	3B	>80	0.99			
	201	0.65	965	1327	780 - 1330	0.09	18.9	55CM	-660	-53	M25	-T12	-P	-...	3B	>80	0.99			
Fan angle $\alpha = 25^\circ$	55	0.08	111	21	95 - 195	0.69	18.9	55CM	-660	-28	M26	-T12	-C	-...	3B	>80	0.99			
	109	0.16	238	83	195 - 355	0.34	18.9	55CM	-685	-16	M21	-T12	-C	-...	3B	>80	0.86			
	217	0.32	472	332	355 - 780	0.17	18.9	55CM	-780	-24	H06	-T12	-C	-...	3B	>80	1.16			
	425	0.65	966	1327	780 - 1330	0.09	18.9	55CM	-785	-3	Y03	-T12	-C	-...	3B	>80	1.17			
Fan angle $\alpha = 40^\circ$	90	0.08	111	21	105 - 195	0.69	23.4	55CM	-785	-42	N08	-T12	-C	-...	3B	>80	1.17			
	180	0.16	240	83	195 - 355	0.34	18.9	55CM	-830	-79	N07	-T12	-C	-...	3B	>80	1.24			
	357	0.32	472	332	355 - 785	0.17	18.9	55CM	-980	-6	W01	-T12	-C	-...	3B	>80	1.46			
	698	0.65	968	1327	785 - 1340	0.09	18.9	Electr. Cable: • 1.5 m shielded conn. cable 4xAWG 26CUL 0.14 mm ² ... 1 • as 1, with connector type Lumberg SV50 6 • cabel specified by customer. 5												
Each line optics can be combined with all laser modules								YO3: Laser diodes with low coherence lengths in the lower power range Further wavelengths/ output powers on request.												

Integrated electronics		
Electronics type	P	C
Supply voltage	+5 V \pm 0.2 V	
Current consumption	max. 250 mA	
Max. modulation frequency	analog 10 Hz	100 kHz
TTL modulation logic	250 kHz	100 kHz
With potentiometer adjustable outp. power	<5-100% <1-100%	
TTL modulation logic	Laser ON	TTL high
Analog control voltage	P _{min} to P _{max}	0...2.5 V

Modulation: The laser has two AND-wired modulation input channels, U_{mod1} [3] and U_{mod2} [4]. The laser is OFF in case of an open modulation input. Using the digital modulation input the laser can be modulated. If only one modulation input channel is used the other has to be set to +5 V, (see timing diagram).
The voltage U_{analog} at analog modulation input [3] linearly controls the laser output power between \leq 1% and 100% of the optical power set with the potentiometer.



Dimensions	
Laser micro line generator 13LR...	
Laser macro line generator 13LRM...	
A = working distance	
B = line width L = line length	
α = fan angle	
β = beam convergence	

Pin-out	
Cable	Conn.
black	1 GND
red	2 +5V
br	3 U _{mod} analog
or	4 U _{mod} TTL
5	n.c.
shield	case

