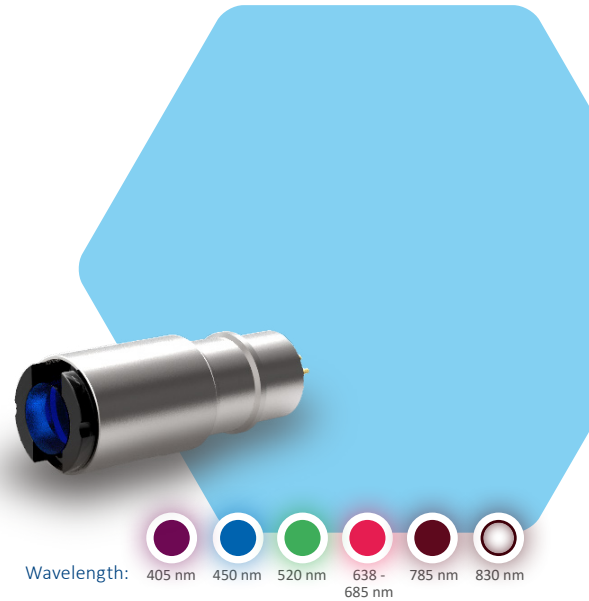


ZX10-LD & ZX10-ND

Small size, high performance

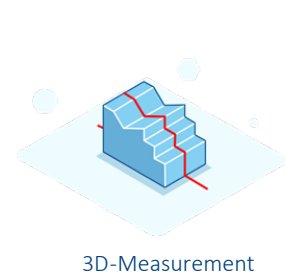
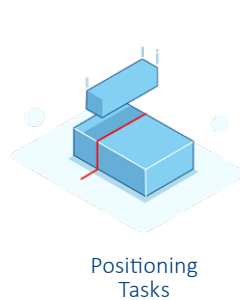
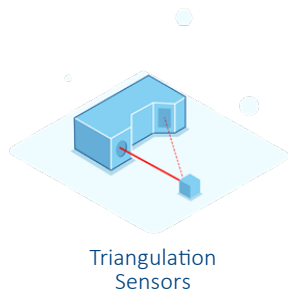
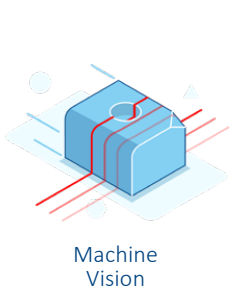
The ZX-laser series offers diverse, application specific customization possibilities. The user can choose from violette to infra-red wavelengths depending on the application and material to be inspected. The ZX-laser reaches an unrivalled accuracy with its boresight error of less than 0.8 mrad. The industrial-suited design along with stable performance works perfectly as an integrated module in machine vision applications, sensors or processing machines. The laser module contains no driver electronics (ZX10-ND) and is therefore ideally suited for OEM applications. Upon request, licensing and integration of the Z-LASER electronics can be provided (ZX10-LD).



- 
 IP 50
 (IP 67 optional)
- 
 Boresight
 Accuracy
- 
 High Process
 Reliability

Highlights

- Repeatable high product quality due to automated production processes
- Highest reproducibility of beam quality
- Optical output power up to 200 mW
- Wavelengths from 405 nm - 830 nm
- Fixed focus
- IP 50 (optional IP 67)
- ZX-LD = "License driver"
- ZX-ND = "No driver" (optic / diode package)



Order Code

Z??	X10	?	?	?
Power	Product family Size of head	Electronics	Wavelength	Optics

System specifications

		405 nm	450 nm	520 nm	635-685 nm	785 nm	830 nm
Wavelength	nm						
Wavelength tolerance	nm (typical)	±10 nm	±10 nm	-5 nm +10 nm	±10 nm	±10 nm	±4 nm
Wavelength drift	nm / K (typical)	0,06 nm	0,02 nm	0,06 nm	0,25 nm	0,25 nm	0,25 nm
Output power (elp)	mW	≤ 160 mW	≤ 60 mW	≤ 40 mW	≤ 100 mW	≤ 80 mW	≤ 200 mW
Output power (flp)	mW	≤ 120 mW	≤ 45 mW	≤ 30 mW	≤ 90 mW	≤ 60 mW	≤ 150 mW
Spatial mode	(typical)	Single Transverse Mode					
RMS noise	(20 Hz to 20 MHz, typical)	< 0,5 %					
Peak-to-Peak Noise	(20 Hz to 20 MHz, typical)	< 1 %					
Boresight error ⁽¹⁾	mrad (typical)	< 0.8 mrad					
Line orientation ⁽²⁾	mrad	< 10 mrad					
Pointing stability	μrad / K	< 10 μrad / K					
Long-term power stability	(24 h)	±3 % over operating temperature range					
Start-up time	μs	< 70 μs					
Laser operation mode		APC					

Electrical specification ⁽³⁾

Operating voltage	VDC	-
Operating current	(max. at 25 °C)	-
Protection		-
Electrical isolation		-
Connection		-
Power consumption		-

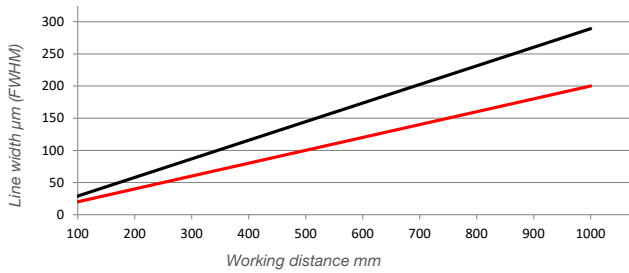
Optical specification

Fan angles ⁽⁴⁾	Degrees	5°, 10°, 20°, 30°, 45°, 60°, 75°, 90° (homogeneous line) 90° (Gaussian line profile)
Line straightness ⁽⁵⁾	% (of line length)	< 0.05 %
Line uniformity ⁽⁶⁾	% (typical)	< 25 %
Dot		Point elliptical
DOE		Multi line, crosses, grids, etc.
Focus range	mm	< 100 mm up to 10,000 mm (only available as fixed focus)

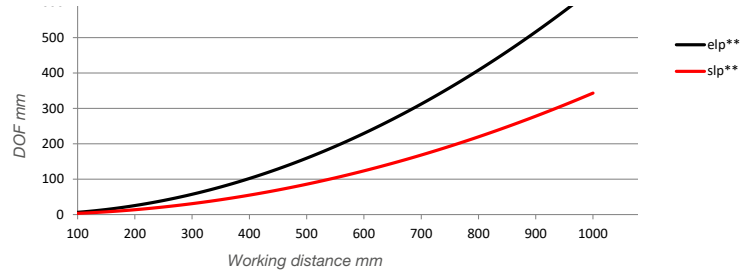
Keynotes

¹ Boresight error	Also known as pitch and skew
² Line orientation	Also known as line tilt (roll), with reference to the indentation in the clamping area
³ Depending on laser diode	
⁴ Line length / fan angle	at > 13,5 % I _{max}
⁵ Line straightness	Deviation from best fit line over the middle 80% of the line, for homogeneous lines
⁶ Line uniformity	Maximum relative optical power variation over the middle 80% of the line, for homogeneous lines and fixed focus

Line thickness vs. working distance*



DOF vs. working distance*



Wavelength	Calculation factor for line width		Calculation factor for depth of focus	
	flp**	elp**	flp**	elp**
Blue 405 nm	0.66	0.82	0.75	1.02
Blue 450 nm	1.03	1.83	1.49	4.29
Green 520 nm	0.97	1.20	0.99	2.61
Red 640 nm	1.05	1.00	1.04	0.95
Red 660 nm	1.00	1.00	1.00	1.00
IR 830 nm	1.42	2.11	1.71	2.20

Optical configurations for several line settings are available.

- flp** = fine line Powell; thin lines for all working distances with smaller depth of focus (recommended for fan angles between 5° - 60° at working distances < 500 mm and for fan angle of 90° at working distances > 500 mm). This optical configuration cannot supply the maximum output mentioned on page 2. Only approx. 75% can be achieved.

- elp** = extended line Powell; lines with advanced depth of focus and thicker lines. Recommended for fan angles > 75° at working distances < 500 mm.

The graphs above show the values for line width and depth of focus of a 660 nm laser. To get the values for a different wavelength the factor from the table above has to be multiplied by the values from the graphs.

Example: 660 nm laser focused at 500 mm working distance: line width approx. 150 µm (@ elp** optic); Depth of focus approx. 175 mm (values from the graphs)

Calculated: 405 nm laser focused at 500 mm working distance: line width approx. 150 µm x 0.82 = 123 µm; Depth of focus approx. 175 mm x 1.02 = 179 mm

* Values in the graphs for homogenous line profiles

** Fan angle: 5° - 90°

Environmental conditions

Operating temperature	°C / °F	Depending on laser diode
Storage temperature	°C / °F	Depending on laser diode
Humidity	%	< 90 %, non-condensing
Dissipated heat	W	Depending on laser diode
Shock and vibration		According to IEC EN 61373:2011, cat. 2

Mechanical specifications

Weight	g / lbs	10 g / 0.02 lbs
Length	mm / inch	22.5 mm / 0.89 in
Diameter head ø	mm / inch	10h7 mm / 0.39 in
Connection		LD pins
Material		Stainless steel
Protection class		IP 50

