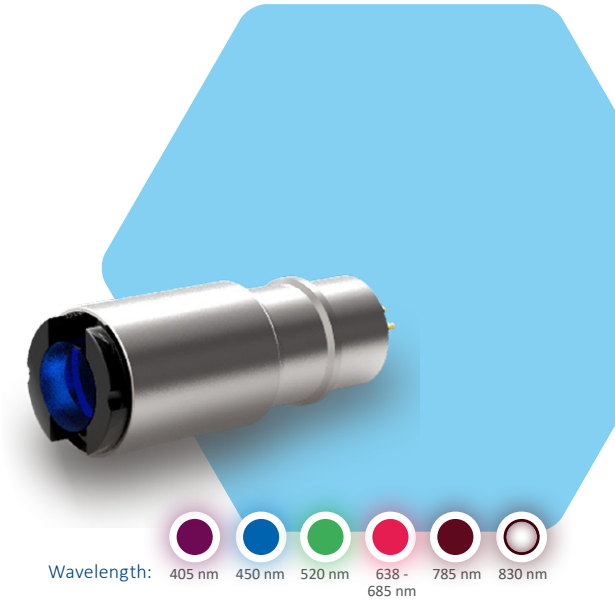
Z-LASER
An Exaktera Company

ZX10-LD & ZX10-ND
Small size, high performance

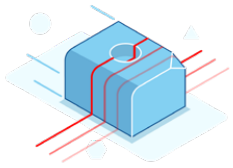


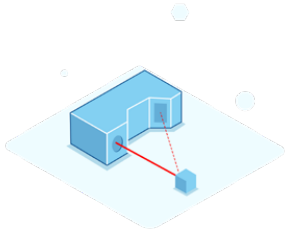
The ZX-laser series offers diverse, application specific customization possibilities. The user can choose from violett to infrared wavelengths depending on the application and material to be inspected. The focusing optics achieves a boresight of less than 0.8 mRad. The industrial-suited design along 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).

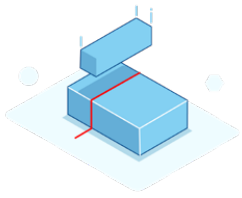
IP 50 (IP 67 optional)
Boresight Accuaracy
High Process Reliability
Compact Size

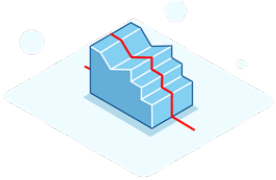
Highlights

- 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)


Machine Vision


Triangulation Sensors


Positioning Tasks


3D-Measurement

Order Code

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

System specifications

Wavelength	nm	405	450	520	635-685	785	830
Wavelength tolerance	nm (typical)	±10	±10	-5 +10	±10	±10	±4
Wavelength drift	nm / K (typical)	0,06	0,02	0,06	0,25	0,25	0,25
Output power (elp)	mW	≤ 160	≤ 60	≤ 40	≤ 160	≤ 80	≤ 200
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					
Line orientation [2]	mrad	< 10					
Pointing stability	µrad / K	< 10					
Long-term power stability (24h)	%	±3 over operating temperature range					
Start-up time	µs	< 70					
Laser operation mode		Depending on the LD driver					

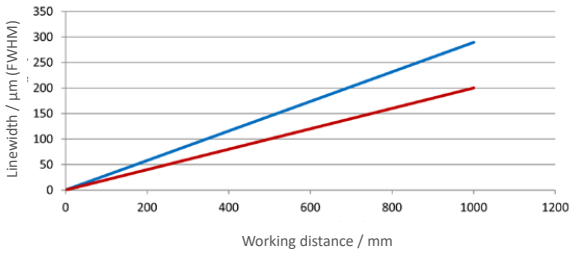
Optical specifications

Fan angles [3]	Degrees °	10	20, 30, 45, 60, 75, 90 (homogeneous line)
Line straightness [4]	% (of line length)	< 0.08	< 0.05
Line uniformity [5]	% (typical)	< 25	
Dot		Point elliptical	
DOE		Multi line, crosses, grids, etc.	
Focus range	mm	< 100 up to 10,000 (only available as fixed focus)	

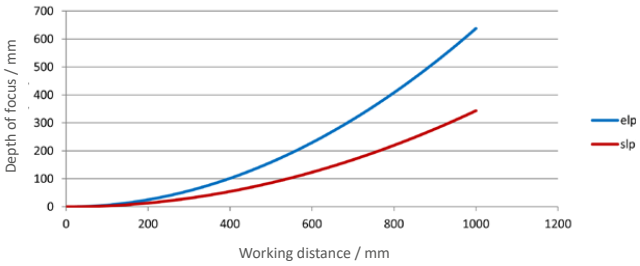
Keynotes

[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] Line length / fan angle	at > 13,5 % I_{max}
[4] Line straightness	Deviation from best fit line over the middle 80% of the line, for homogeneous lines
[5] 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	
		slp	*elp*	*slp*	*elp*
Blue	405 nm	0.62	0.82	0.70	1.02
Blue	450 nm	0.67	1.83	1.74	4.29
Green	520 nm	0.78	1.20	0.80	2.61
Red	640 nm	1.28	1.00	1.70	0.95
Red	660 nm	1.00	1.00	1.00	1.00
Red	685 nm	1.68	1.40	1.97	1.99
IR	830 nm	1.30	2.11	1.03	2.20

Optical configurations for several line settings are available.
- *slp* = standard line Powell; standard setup with medium line thickness and depth of focus.
- *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: 10° - 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 / 0.02
Length	mm / inch	22.5 / 0.89
Diameter head ø	mm / inch	10h7 / 0.39
Connection		LD pins
Material		Stainless steel
Protection class		IP 50

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Model: ZX10-LD | ZX10-ND