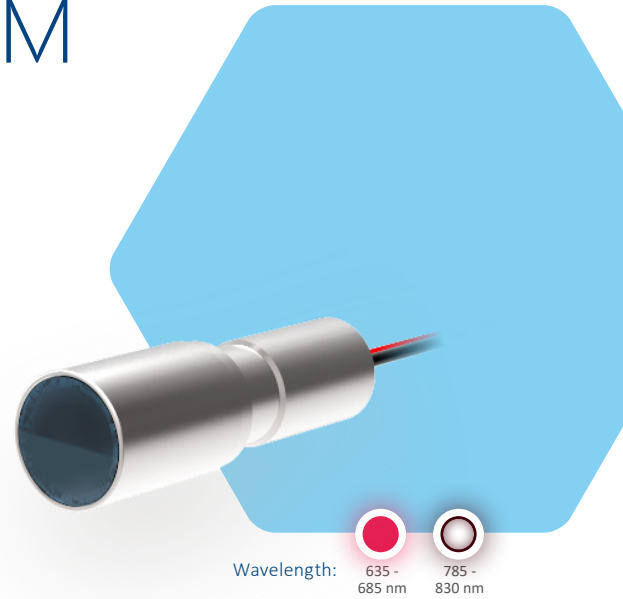


Product Family ZX10-M

Small size, high performance

The ZX-laser series offers diverse, application specific customization possibilities. The user can choose from IR and red wavelengths depending on the application and material to be inspected. The ZX-laser reaches an unrivalled accuracy with its boresight error of typically 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.

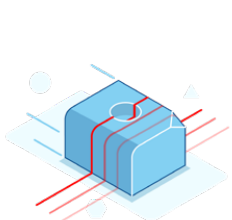


Wavelength: 635 - 685 nm 785 - 830 nm

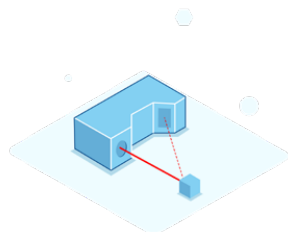


Highlights

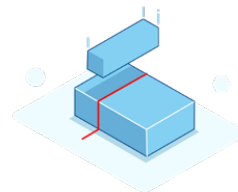
- Repeatable high product quality due to automated production processes
- Highest reproducibility of beam quality
- Optical output power up to 100 mW
- Wavelengths from 635 nm - 830 nm
- Fixed focus
- IP 50 (optional IP 67)



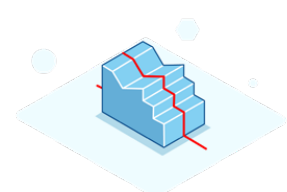
Machine Vision



Triangulation Sensors



Positioning Tasks



3D-Measurement

Order Code

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

System specifications

		640	660	685	785	850
Wavelength	nm	±10	±10	±10	±4	±4
Wavelength tolerance	nm (typical)	< 0,25	< 0,25	< 0,25	< 0,25	< 0,25
Wavelength drift	nm / K (typical)	30	40	40	80	40
Output power	mW	Single transverse mode				
Spatial mode	(typical)	< 0.5				
RMS noise (20 Hz to 20 MHz, typical)	%	< 1				
Peak-to-Peak Noise (20 Hz to 20 MHz, typical)	%	< 0.8				
Boresight error ⁽¹⁾	mrad (typical)	< 10				
Line orientation ⁽²⁾	mrad	< 10				
Pointing stability	µrad / K	±3 over the entire temperature range				
Long-term power stability (24h)	%	< 70				
Start-up time	µs	APC				
Laser operation mode						

Electrical specification⁽³⁾

Operating voltage	VDC	3.5 - 5.5
Operating current (max. at 25 °C)	mA	< 250 mA
Protection		LED status indicator, reverse polarity protection, ESD
Electrical isolation		Potential-free housing
Connection		flying leads
Power consumption	W	< 1.5

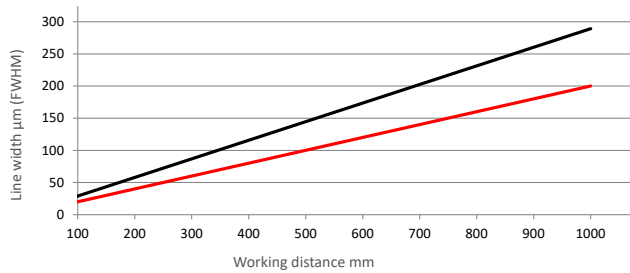
Optical specification

Fan angles ⁽⁴⁾	Degrees	10°, 20°, 30°, 45°, 60°, 75°, 90° (homogeneous line)
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 up to 10,000 (only available as fixed focus)

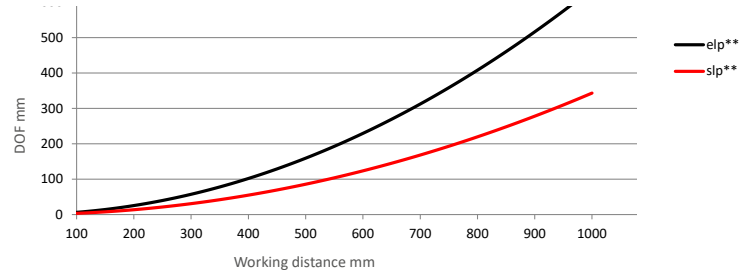
Keynotes

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 In combination with M-electronic (M=mini).	Also available as ND-version (no driver) without driver electronics for OEM applications.
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	
	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
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	-10 to +50 / 14 to +122
Storage temperature	°C / °F	-40 to +85 / -40 °F to +185
Humidity	%	< 90 non-condensing
Dissipated heat	W	< 1
Shock and vibration		According to IEC EN 61373:2011, cat. 2

Mechanical specifications

Weight	g / lbs	30 / 0.07
Length	mm / inch	33 / 1.30 in
Diameter head ø	mm / inch	10h7 / 0.39 in
Length of cable	mm / inch	2,000 / 78.74 in
Connection		2 flying leads (optional Texas plug)
Material		Stainless steel
Protection class		IP 50 (IP 67 optional)

