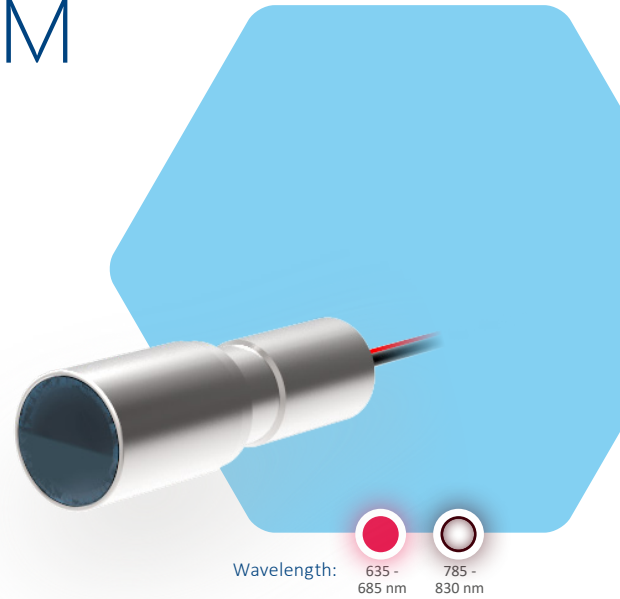


# Product Family ZX10-M

## 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 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.

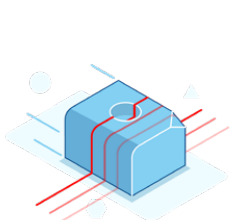


Wavelength: 635 - 685 nm    785 - 830 nm

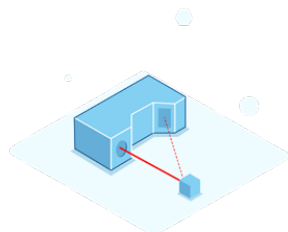


## Highlights

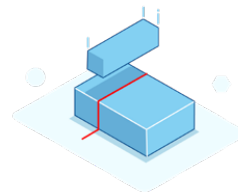
- Repeatable high product quality due to automated production processes
- Highest reproducibility of beam quality
- Optical output power up to 100 mW
- Wavelengths from 635 nm - 830 nm
- Fixed focus
- IP 50 (optional IP 67)



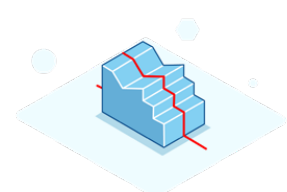
Machine Vision



Triangulation Sensors



Positioning Tasks



3D-Measurement

### Order Code

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

## System specifications

		635-685 nm	785-830 nm
Wavelength	nm		
Wavelength tolerance	nm (typical)	±10 nm	±4 nm
Wavelength drift	nm / K (typical)	< 0,25 nm	< 0,25 nm
Output power	mW	≤ 100 mW	≤ 100 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 <sup>(1)</sup>	mrad (typical)	< 0.8 mrad	
Line orientation <sup>(2)</sup>	mrad	< 10 mrad	
Pointing stability	μrad / K	< 10 μrad / K	
Long-term power stability	(24 h)	±3 % over the entire temperature range	
Start-up time	μs	< 70 μs	
Laser operation mode		APC	

## Electrical specification <sup>(3)</sup>

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

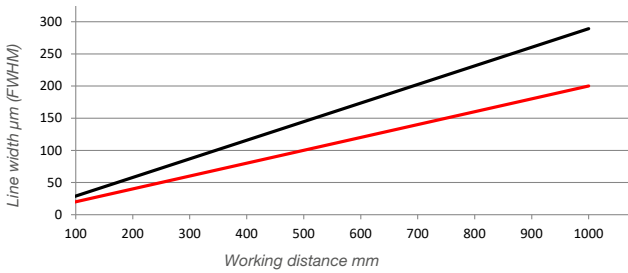
## Optical specification

Fan angles <sup>(4)</sup>	Degrees	5°, 10°, 20°, 30°, 45°, 60°, 75°, 90° (homogeneous line) 90° (Gaussian line profile)
Line straightness <sup>(5)</sup>	% (of line length)	< 0.05 %
Line uniformity <sup>(6)</sup>	% (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)

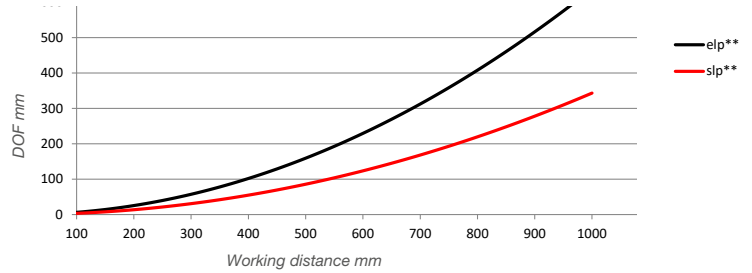
## Keynotes

<sup>1</sup> Boresight error	Also known as pitch and skew
<sup>2</sup> Line orientation	Also known as line tilt (roll), with reference to the indentation in the clamping area
<sup>3</sup> In combination with M-electronic (M=mini).	Also available as ND-version (no driver) without driver electronics for OEM applications.
<sup>4</sup> Line length / fan angle	at > 13,5 % I <sub>max</sub>
<sup>5</sup> Line straightness	Deviation from best fit line over the middle 80% of the line, for homogeneous lines
<sup>6</sup> 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**
Red 640 nm	1.28	1.00	0.70	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 1 m working distance:  
line width approx. 200 µm (@ slp\*\* optic); Depth of focus approx. 350 mm (values from the graphs)

Calculated: 830 nm laser focused at 1 m working distance:  
line width approx. 200 µm x 1.30 = 260 µm; Depth of focus approx. 350 mm x 1.03 = 360,5 mm

\* Values in the graphs for homogenous line profiles.

\*\* Fan angle: 5° - 90°

## Environmental conditions

Operating temperature	°C / °F	-10 °C to +50 °C / 14 °F to +122 °F
Storage temperature	°C / °F	-40 °C to +85 °C / -40 °F to +185 °F
Humidity	%	< 90 %, non-condensing
Dissipated heat	W	< 1 W
Shock and vibration		According to IEC EN 61373:2011, cat. 2

## Mechanical specifications

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

