



**TELEDYNE DALSA**  
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Part of the Teledyne Imaging Group



## Z-Trak™ 3D LP1-1K Series

High-Performance 3D Profile Sensor for  
In-line Measurement and Inspection Applications

## Z-Trak LP1-1K Series

A Series of Factory Calibrated 3D Laser Profilers



### FEATURES

- » Robust FIR-Peak detector algorithm delivers high accuracy and stable operations
- » Factory calibrated ready to deploy
- » Optimized optical path ensures sharp focus despite object height variations
- » Wide model selection covers measurement range from 10 mm to 1000 mm
- » Red or blue laser with laser safety class 2M and 3R for wide operating conditions
- » Compact IP67 housing for harsh operating environment
- » Free License for Sapera™ LT SDK, Sapera Processing RTL and Sherlock™ 8
- » Supports GenICam® and compliant 3rd party software platforms

## High-Performance 3D Profile Sensor for In-line Measurement and Inspection Applications

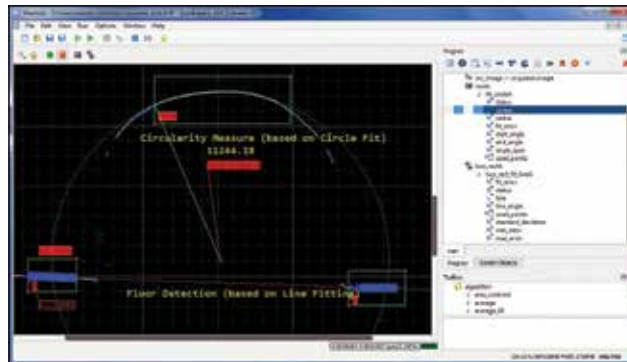
Z-Trak is a series of 3D profile sensors delivering high-resolution, real-time height measurements using laser triangulation. These lightweight IP67 rated profile sensors are ideal for in-line measurement, inspection, identification and guidance applications in automotive, electronics, semiconductor and factory automation markets.

Z-Trak series delivers reliable and repeatable results in varying operating conditions. Z-Trak models handle object widths from 8.5 mm to 1520 mm and height range of 10 mm to 1000 mm. All Z-Trak models are factory calibrated and come with choice of laser options to suit the surface reflectance.

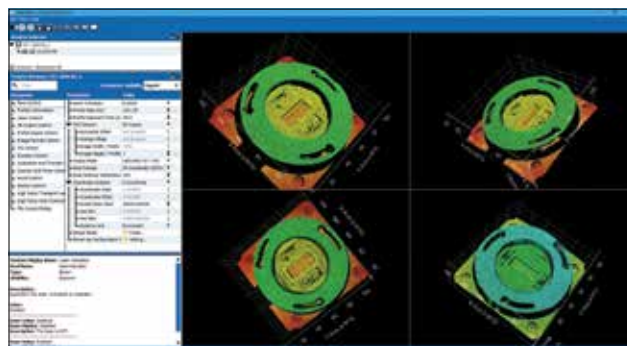
Z-Trak Series features real-time laser line optimization for uniform measurement results, multi-sensor synchronization using generic Gigabit network routers and Power-Over-Ethernet (POE) to simplify setup and configuration. Z-Trak series comes bundled with Teledyne DALSA's field-proven software packages – Sapera LT, Sapera Processing, and Sherlock 8 3D – at no extra cost. In addition, Z-Trak sensors can operate with 3rd party software packages using either GenICam® or proprietary interfaces.

### MULTI-SENSOR CONFIGURATION

Multiple Z-Trak sensors can be combined together to create expanded FOV or to eliminate occlusions. Multiple Z-Trak units can be synchronized together using standard network switches with better than 1µs precision. To further simplify the measurements, a unified coordinate system can be created using Z-Expert graphical tools bundled in Sapera LT. Z-Expert features an intuitive GUI to visualize profiles and 3D range images from multiple sensors at the same time and includes a system calibration wizard to facilitate setup.



**Sherlock 8**



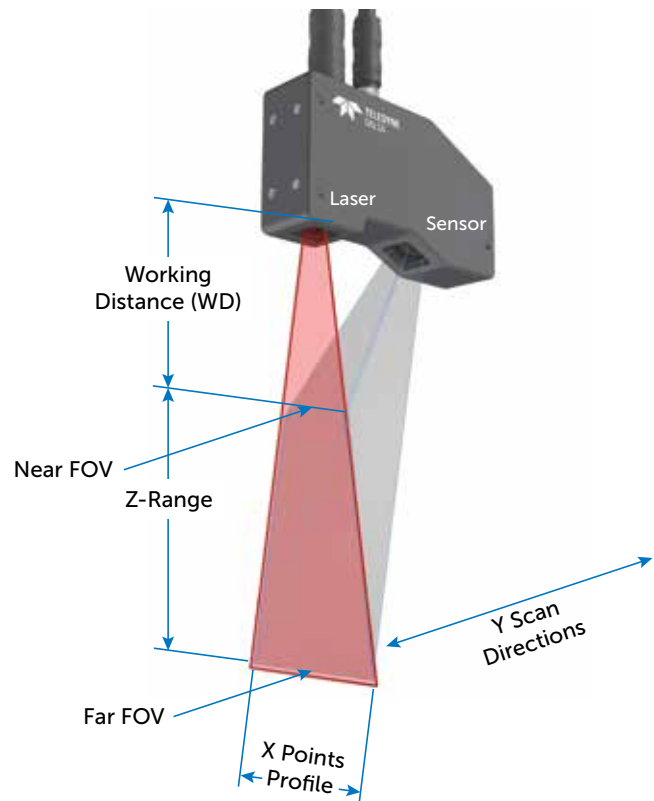
**Z-Expert**

### SPECIFICATIONS<sup>1</sup>

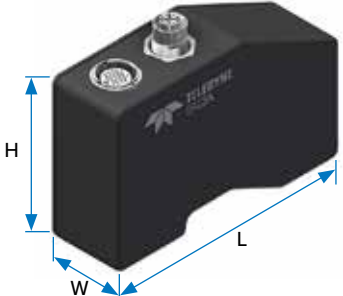
Function	Description
Scanning Rate	<ul style="list-style-type: none"> <li>• 210 profiles/sec (full frame)</li> <li>• Up to 3300 (using ROI)</li> </ul>
Connectors	<ul style="list-style-type: none"> <li>• 1 x M16 24 connector – data and controls</li> <li>• 1 x M12 12-pin X-coded – Ethernet port</li> </ul>
Lasers	<ul style="list-style-type: none"> <li>• Red: 660 nm</li> <li>• Blue: 405 nm</li> <li>• Safety Class 2M : 15mW<sup>2</sup> for 660 nm, 10mW for 405 nm</li> <li>• Safety Class 3R: 25mW<sup>2</sup> for 660 nm, 20mW for 405 nm</li> </ul>
Laser control	<ul style="list-style-type: none"> <li>• Intensity: PWM duty cycle controlled from 0% to 100% or analog control</li> <li>• Dynamic laser power control using</li> </ul>
Output Format	<ul style="list-style-type: none"> <li>• Individual Profiles or Range Maps</li> <li>• Each point includes: Depth (Z), Lateral (X), Reflectance (R) and Laser Peak Width (W)</li> <li>• Output formats compatible with GenICam 3.0 (SFNC 2.3)               <ul style="list-style-type: none"> <li>• Calibrated/Uncalibrated Z; Rectified Z, Calibrated ZR/ZR+W</li> </ul> </li> <li>• 16-bit mono</li> <li>• Native values and world units (microns)</li> </ul>
Temperature	<p><b>Storage:</b></p> <ul style="list-style-type: none"> <li>• -40° C to +80° C (-4° F to +176° F) temperature</li> <li>• 20% to 80% non-condensing relative humidity</li> </ul> <p><b>Operating:</b></p> <ul style="list-style-type: none"> <li>• 10° C (50° F) to 50° C (122° F)</li> <li>• Relative Humidity: up to 90% (non-condensing)</li> </ul>
System	<ul style="list-style-type: none"> <li>• 1 Gigabit Ethernet 1000BaseT port</li> </ul>
Requirements	<ul style="list-style-type: none"> <li>• 4GB or higher system memory</li> </ul>
Input/Output	<ul style="list-style-type: none"> <li>• 2 real time opto-isolated GPI (configurable)</li> <li>• 2 software driven opto-isolated GPO</li> </ul>
Encoder Input	<ul style="list-style-type: none"> <li>• RS422 quadrature (AB) shaft-encoder inputs for external web synchronization</li> <li>• Up to 20 MHz frequency, with built in bi-directional jitter tolerance</li> </ul>
Power Supply	<ul style="list-style-type: none"> <li>• PoE via 8-pin X-code circular connector (optional)</li> <li>• Separate power via 16M 24-pin connector</li> <li>• +12V to 36VDC +/-10% with surge protection</li> </ul>

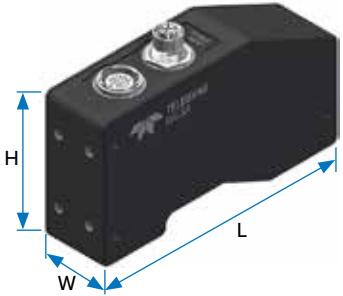
Function	Description
Enclosure	<ul style="list-style-type: none"> <li>• Machined aluminum</li> <li>• IP67</li> <li>• 4 x mounting holes</li> </ul>
Software	<ul style="list-style-type: none"> <li>• Microsoft® Windows® 7 and Windows 10 (32/64-bit) compatible</li> <li>• Fully supported by Teledyne DALSA's software packages:               <ul style="list-style-type: none"> <li>• Sherlock 8.0</li> <li>• Sopera Processing 8.0 (new 3D)</li> </ul> </li> <li>• 3rd party software:               <ul style="list-style-type: none"> <li>• MVTec® Halcon®</li> </ul> </li> <li>• Application development using C++ and Microsoft</li> <li>• .Net languages(C++, C# or Visual Basic)</li> </ul>
Markings	<ul style="list-style-type: none"> <li>• FCC Class B, CE, ICE</li> <li>• ROHS, China RoHS</li> <li>• FDA</li> </ul>


### MEASUREMENT SETUP



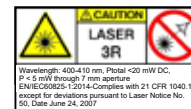
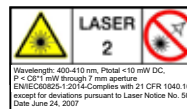
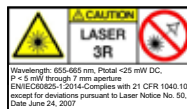
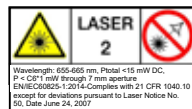
**SPECIFICATIONS<sup>1</sup>**

X10	Model	LP1-1010-B2	LP1-1025-B2 <sup>2</sup>
	Measurement Range (MR) (mm)	10	25
	Working Distance (WD) (mm)	30	24
	Field of View (X) (mm)	8.4 – 9.7	13.9 – 18.6
	Profile Rate (frames/sec)	up to 3.3K using ROI	
	Repeatability <sup>3</sup> (µm)	0.5 – 0.7	0.7 – 0.9
	Linearity <sup>4</sup>	< 0.02%	
	X Res. (µm)	8.6 – 10	14.3 – 19.1
	Laser <sup>5</sup> (nm)	Blue:405	
	Laser Safety Class	2M	
	Case Style (mm)	X10: 36 (W) x 84.8 (H) x 125.8 (L)	

X20	Model	LP1-1040-B2	LP1-1060-B2	LP1-1120-R2	LP1-1200-R2
	Measurement Range (MR) (mm)	40	60	120	200
	Working Distance (WD) (mm)	45	66	86	150
	Field of View (X) (mm)	20 – 27.6	25.7 – 39	42.8 – 80.8	63.7 – 134.9
	Profile Rate (frames/sec)	up to 3.3K using ROI			
	Repeatability <sup>3</sup> (µm)	0.8 – 1.2	1.1 – 1.8	1.5 – 3	3 – 12
	Linearity <sup>4</sup>	< 0.02%			
	X Res. (µm)	20 – 28	26 – 40	44 – 83	65 – 139
	Laser <sup>5</sup> (nm)	Blue:405		Red:660	
	Laser Safety Class	2M			
	Case Style (mm)	X20: 36 (W) x 78.4 (H) x 138.6 (L)			

X30 / X50	Model	LP1-1250-R2	LP1-1300-R3*	LP1-1400-R3	LP1-1800-R3	LP1-11000-R3	
	Measurement Range (MR) (mm)	250	300	400	800	1000	
	Working Distance (WD) (mm)	175	200	250	400	1500	
	Field of View (X) (mm)	131.1 – 262.2	192.9 – 408.5	332.5 – 950	380 – 988	931 – 1520	
	Profile Rate (frames/sec)	up to 3.3K using ROI					
	Repeatability <sup>3</sup> (µm)	5 – 12	6 – 30	8 – 20	20 – 40	20 – 60	
	Linearity <sup>4</sup>	< 0.03%	< 0.04%			< 0.05%	
	X Res. (µm)	135 – 270	198 – 420	235 – 537	342 – 976	957 – 1563	
	Laser <sup>5</sup> (nm)	Red:660					
	Laser Safety Class	2M	3R				
	Case Style (mm)	X30: 36 (W) x 78.4 (H) x 189.6 (L)			X40: 36 (W) x 75 (H) x 280 (L)	X50: 36 (W) x 74.3 (H) x 502.2 (L)	

- 1 Subject to change without notice
  - 2 For fan angle of 30°
  - 3 4Sigma
  - 4 As a percentage of full scale
  - 5 For other laser configurations contact Teledyne DALSA sales
- \* Contact Teledyne DALSA sales for availability



**Americas**  
 Boston, USA  
 +1 978-670-2000  
 sales.americas@teledynedalsa.com

**Europe**  
 Krailling, Germany  
 +49 89-89-54-57-3-80  
 sales.europe@teledynedalsa.com

**Asia Pacific**  
 Tokyo, Japan  
 +81 3-5960-6353  
 sales.asia@teledynedalsa.com

Shanghai, China  
 +86 21-3368-0027  
 sales.asia@teledynedalsa.com