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

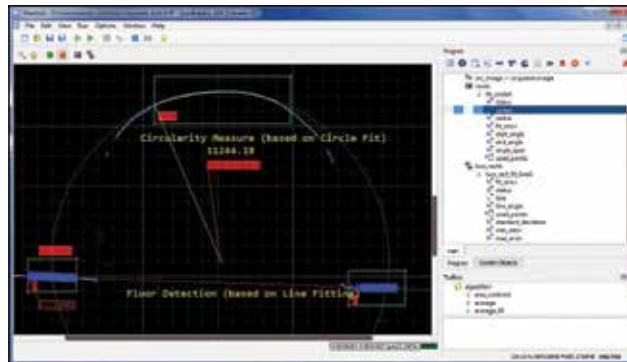# High-Performance 3D Profile Sensor for In-line Measurement and Inspection Applications

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.
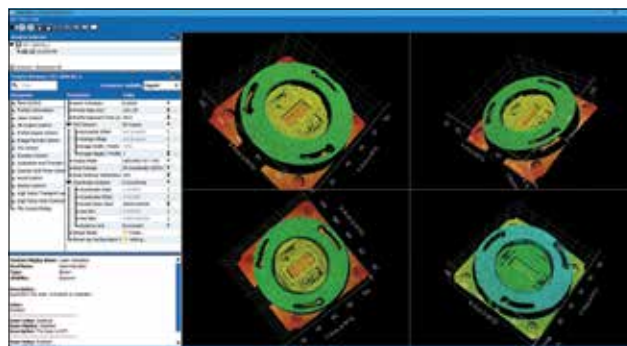
Z-Trak Series features real-time laser line optimization for uniform measurement results, multi-sensor synchronization using generic Gigabit network routers and Power-Over-Ethernet (POE) to simplify setup and configuration. Z-Trak series comes bundled with Teledyne DALSA's field-proven software packages – 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.
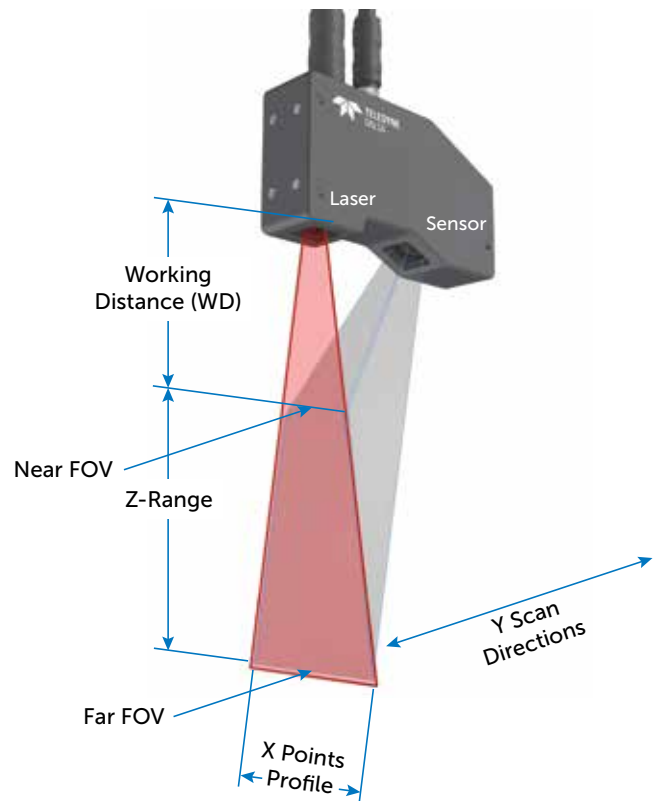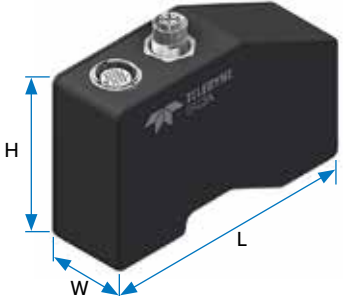
Sherlock 8

Z-Expert

SPECIFICATIONS[1]

Function	Description
Scanning Rate	• 210 profiles/sec (full frame) • Up to 3300 (using ROI)
Connectors	• 1 x M16 24 connector − data and controls • 1 x M12 12-pin X-coded − Ethernet port
Lasers	• Red: 660 nm • Blue: 405 nm • Safety Class 2M : 15mW[2] for 660 nm, 10mW for 405 nm • Safety Class 3R: 25mW[2] for 660 nm, 20mW for 405 nm
Laser control	• Intensity: PWM duty cycle controlled from 0% to 100% or analog control • Dynamic laser power control using
Output Format	• Individual Profiles or Range Maps • Each point includes: Depth (Z), Lateral (X), Reflectance (R) and Laser Peak Width (W) • Output formats compatible with GenICam 3.0 (SFNC 2.3) • Calibrated/Uncalibrated Z; Rectified Z, Calibrated ZR/ZR+W • 16-bit mono • Native values and world units (microns)
Temperature	**Storage:** • -40° C to +80° C (-4° F to +176° F) temperature • 20% to 80% non-condensing relative humidity **Operating:** • 10° C (50° F) to 50° C (122° F) • Relative Humidity: up to 90% (non-condensing)
System	• 1 Gigabit Ethernet 1000BaseT port
Requirements	• 4GB or higher system memory
Input/Output	• 2 real time opto-isolated GPI (configurable) • 2 software driven opto-isolated GPO
Encoder Input	• RS422 quadrature (AB) shaft-encoder inputs for external web synchronization • Up to 20 MHz frequency, with built in bi-directional jitter tolerance
Power Supply	• PoE via 8-pin X-code circular connector (optional) • Separate power via 16M 24-pin connector • +12V to 36VDC +/-10% with surge protection
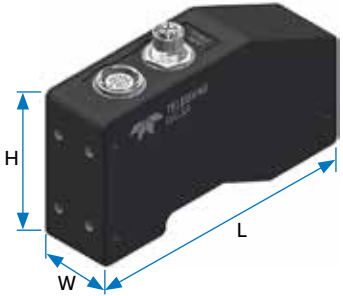
Function	Description
Enclosure	• Machined aluminum • IP67 • 4 x mounting holes

Software	• Microsoft® Windows® 7 and Windows 10 (32/64-bit) compatible
	• Fully supported by Teledyne DALSA's software packages:
	  • Sherlock 8.0
	  • Sapera Processing 8.0 (new 3D)
	• 3rd party software:
	  • MVTec® Halcon®
	• Application development using C++ and Microsoft
	• .Net languages(C++, C# or Visual Basic)

Markings	• FCC Class B, CE, ICE • ROHS, China RoHS • FDA

MEASUREMENT SETUP

TELEDYNE DALSA
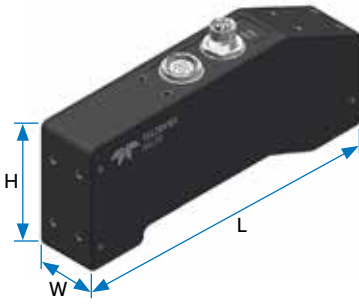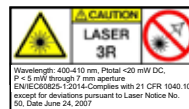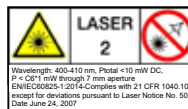Everywhere**you**look™
Part of the Teledyne Imaging Group

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SPECIFICATIONS[1]

X10	Model	LP1-1010-B2	LP1-1025-B2*
	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[3] (µm)	0.5 – 0.7	0.7 – 0.9
	Linearity[4]	< 0.02%	
	X Res. (µm)	8.6 – 10	14.3 – 19.1
	Laser[5] (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[3] (µm)	0.8 – 1.2	1.1 – 1.8	1.5 – 3	3 – 12
	Linearity[4]	< 0.02%			< 0.03%
	X Res. (µm)	20 – 28	26 – 40	44 – 83	65 – 139
	Laser[5] (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[3] (µm)	5 – 12	6 – 30	8 – 20	20 – 40	20 – 60
	Linearity[4]	< 0.03%	< 0.04%			<0.05%
	X Res. (µm)	135 – 270	198 – 420	235 – 537	342 – 976	957 – 1563
	Laser[5] (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

LASER 2
Wavelength: 655-665 nm, Ptotal <15 mW DC,
P < C6*1 mW through 7 mm aperture
EN/IEC60825-1:2014-Complies with 21 CFR 1040.10
except for deviations pursuant to Laser Notice No. 50, Date June 24, 2007

⚠CAUTION LASER 3R
Wavelength: 655-665 nm, Ptotal <25 mW DC,
P < 5 mW through 7 mm aperture
EN/IEC60825-1:2014-Complies with 21 CFR 1040.10
except for deviations pursuant to Laser Notice No. 50, Date June 24, 2007

LASER 2
Wavelength: 400-410 nm, Ptotal <10 mW DC,
P < C6*1 mW through 7 mm aperture
EN/IEC60825-1:2014-Complies with 21 CFR 1040.10
except for deviations pursuant to Laser Notice No. 50, Date June 24, 2007

⚠CAUTION LASER 3R
Wavelength: 400-410 nm, Ptotal <20 mW DC,
P < 5 mW through 7 mm aperture
EN/IEC60825-1:2014-Complies with 21 CFR 1040.10
except for deviations pursuant to Laser Notice No. 50, Date June 24, 2007