



Z-Trak™ 3D LP1-1K Series

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

Z-TRAK LP1-1K SERIES

A Series of Factory Calibrated 3D Profile Sensors



FEATURES

- Factory calibrated ready to deploy
- Robust FIR-Peak detector algorithm delivers high accuracy and stable operations
- Wide model selection covers measurement range from 10 mm to 1100 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
- 3rd Party Software Support via 16-bit mono and GenICam standard

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

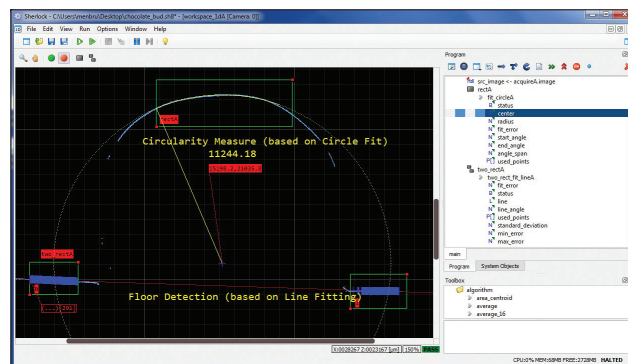
Z-Trak is a series of 3D profile sensors delivering high-resolution, real-time height measurements using laser triangulation. These lightweight IP67 rated profile sensors are ideal for in-line measurement, inspection, identification and guidance applications in automotive, electronics, semiconductor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

Z-Trak series delivers reliable and repeatable results in varying operating conditions. Z-Trak models handle object widths from 9.7 mm to 1520 mm and height range of 10 mm to 1100 mm. All Z-Trak models are factory calibrated and come with choice of laser options to suit the surface reflectance.

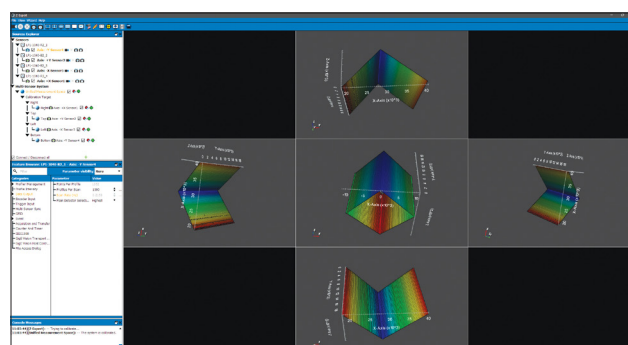
Z-Trak Series features real-time laser line optimization for uniform measurement results, multi-sensor synchronization using generic Gigabit network routers and Power-Over-Ethernet (POE) to simplify setup and configuration. Z-Trak series comes bundled with Teledyne DALSA's field-proven software packages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

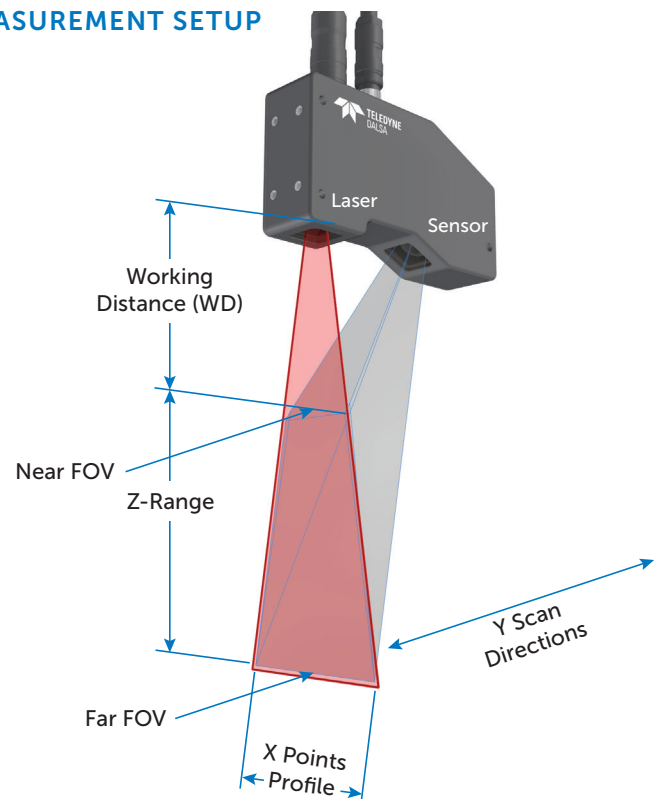


Z-Expert

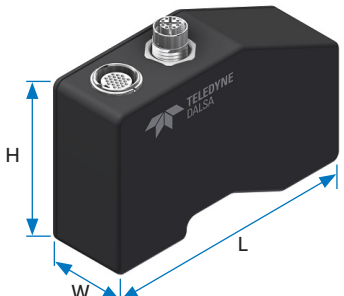
SPECIFICATIONS¹

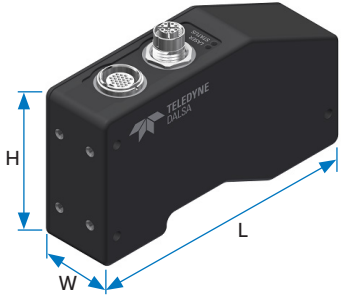
Function	Description
Scanning Rate	<ul style="list-style-type: none"> Full range profile rate starting from 215 to 740 Hz (varies by model) Up to 3300 (using ROI)
Connectors	<ul style="list-style-type: none"> 1 x M16 24 connector – data, controls and controls 1 x M12 8-pin X-coded – Ethernet port
Lasers	<ul style="list-style-type: none"> Red: 660 nm Blue: 405 nm Safety Class 2M : 15 mW² for 660 nm, 10 mW for 405 nm Safety Class 3R: 25 mW² for 660 nm, 20 mW for 405 nm
Laser control	<ul style="list-style-type: none"> Intensity: PWM duty cycle controlled from 0% to 100% or analog control Dynamic laser power control using
Output Format	<ul style="list-style-type: none"> Individual Profiles or Range Maps Each point includes: Depth (Z), Lateral (X), Reflectance (R) and Laser Peak Width (W) Output formats compatible with Linescan3D: GenICam 3.0 (SFNC 2.3) <ul style="list-style-type: none"> Calibrated Z with uniform X, Calibrated XZ, XZR+W Linescan1D: 16-bit mono Areascan 2D: 10-bit/mono World units in micrometers, millimeters and inches
Temperature	<p>Storage:</p> <ul style="list-style-type: none"> -40° C to +80° C (-4° F to +176° F) temperature 20% to 80% non-condensing relative humidity <p>Operating:</p> <ul style="list-style-type: none"> 10° C (50° F) to 50° C (122° F) Relative Humidity: up to 90% (non-condensing)
System	<ul style="list-style-type: none"> 1 Gigabit Ethernet 1000BaseT port
Requirements	<ul style="list-style-type: none"> 4GB or higher system memory
Input/Output	<ul style="list-style-type: none"> 2 real time opto-isolated GPI (configurable) 2 software driven opto-isolated GPO
Encoder Input	<ul style="list-style-type: none"> RS422 quadrature (AB) shaft-encoder inputs for external web synchronization Up to 20 MHz frequency, with built in bi-directional jitter tolerance
Power Supply	<ul style="list-style-type: none"> PoE via 8-pin X-code circular connector (optional) Separate power via 16M 24-pin connector +12V to 36VDC +/-10% with surge protection

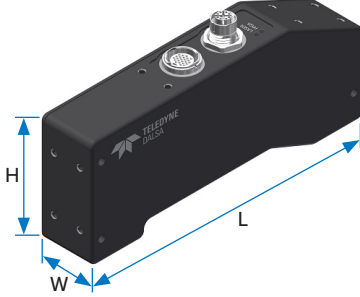
Function	Description
Enclosure	<ul style="list-style-type: none"> Machined aluminum IP67 4 x mounting holes
Software	<ul style="list-style-type: none"> Microsoft® Windows® 10 (32/64-bit) compatible Linux 32/64-bit: Ubuntu/Debian, RHEL/CentOS/Fedora, SLES/openSUSE Kernel: 2.6.32 or higher Fully supported by Teledyne DALSA's software packages: <ul style="list-style-type: none"> Sapera LT 8.60 (or higher) Sherlock 8.0 Microsoft Windows Sapera Processing 8.0 (or higher) Linux: Teledyne DALSA GevAPI Framework(SDK) ver. 2.40 or higher 3rd party software: <ul style="list-style-type: none"> MVTec® Halcon® NI® Max/Labview® Cognex® VisionPro® Stemmer CVB Application development using C++ and Microsoft .Net languages(C++, C# or Visual Basic)
Markings	<ul style="list-style-type: none"> FCC Class B, CE, ICE ROHS, China RoHS FDA

MEASUREMENT SETUP


SPECIFICATIONS¹

	Model	LP1-1010-B2	LP1-1040-B2	LP1-1060-B2
	Measurement Range (MR) (mm/in)	10 / 0.394	40 / 1.575	60 / 2.362
	Working Distance (WD) (mm/in)	36 / 1.417	45 / 1.772	66 / 2.598
	Field of View (X) (mm/in)	8.4–9.8 / 0.331–0.386	20–27.6 / 0.787–1.087	25.7–39 / 1.012–1.535
	Profile Rate (profiles/sec)	up to 3.3K using ROI		
	Repeatability ³ (µm/in)	0.2–0.3 / 0.000008–0.000012	0.4–0.6 / 0.000016–0.000024	0.5–0.7 / 0.00002–0.000028
	Linearity ⁴ (±)	< 0.025%	< 0.02%	< 0.02%
	X Res. (µm/in)	8.6–10 / 0.00034–0.00039	20–28 / 0.000787–0.001102	26–40 / 0.001024–0.001575
	Laser ⁵ (nm)	Blue:405		
	Laser Safety Class	2M		
	Case Style (mm)	X10 mm: 36(W); 84.8(H); 125.8(L) in: 1.4(W); 3.3(H); 5.0(L)	X20 mm: 36(W); 78.4(H); 138.6(L) in: 1.4(W); 3.1(H); 5.5(L)	X20 mm: 36(W); 78.4(H); 138.6(L) in: 1.4(W); 3.1(H); 5.5(L)

	Model	LP1-1120-R2	LP1-1200-R2	LP1-1250-R2
	Measurement Range (MR) (mm/in)	120 / 4.724	200 / 7.874	250 / 9.843
	Working Distance (WD) (mm/in)	86 / 3.386	150 / 5.906	175 / 6.89
	Field of View (X) (mm/in)	42.8–80.8 / 1.685–3.181	63.7–134.9 / 2.508–5.311	132–268 / 5.197–10.551
	Profile Rate (profiles/sec)	up to 3.3K using ROI		
	Repeatability ³ (µm/in)	1.5–3 / 0.000059–0.000118	0.7–1.5 / 0.000028–0.000059	1–4 / 0.000039–0.000157
	Linearity ⁴ (±)	< 0.01%		
	X Res. (µm/in)	44–83 / 0.001732–0.003268	65–139 / 0.002559–0.005472	137–275 / 0.005–0.011
	Laser ⁵ (nm)	Red:660		
	Laser Safety Class	2M		
	Case Style (mm)	X20 mm: 36(W); 78.4(H); 138.6(L) in: 1.4(W); 3.1(H); 5.5(L)	X20 mm: 36(W); 78.4(H); 138.6(L) in: 1.4(W); 3.1(H); 5.5(L)	X30 mm: 36(W) x 78.4(H) x 189.6(L) in: 1.4(W) x 3.1(H) x 7.5(L)

	Model	LP1-1400-R3	LP1-1800-R3	LP1-11100-R3
	Measurement Range (MR) (mm/in)	400 / 15.748	800 / 31.496	1100 / 43.307
	Working Distance (WD) (mm/in)	250 / 9.843	400 / 15.748	300 / 11.811
	Field of View (X) (mm/in)	223–520 / 8.78–20.472	400–1045 / 15.748–41.142	411–1520 / 16.181–59.843
	Profile Rate (profiles/sec)	up to 3.3K using ROI		
	Repeatability ³ (µm/in)	2–8 / 0.000079–0.000315	4–12 / 0.000157–0.000472	5–20 / 0.000197–0.000787
	Linearity ⁴ (±)	< 0.01%		
	X Res. (µm/in)	229–535 / 0.009–0.021	410–1075 / 0.016–0.042	423–1563 / 0.017–0.062
	Laser ⁵ (nm)	Red:660		
	Laser Safety Class	3R		
	Case Style (mm)	X30 mm: 36(W) x 78.4(H) x 189.6(L) in: 1.4(W) x 3.1(H) x 7.5(L)	X40 mm: 36(W) x 77.7(H) x 287.7(L) in: 1.4(W) x 3.0(H) x 11.3(L)	X40 mm: 36(W) x 77.7(H) x 287.7(L) in: 1.4(W) x 3.0(H) x 11.3(L)

- 1 Subject to change without notice
- 2 For fan angle of 30°
- 3 Mean $\pm 2\sigma$
- 4 As a % of full scale
- 5 Contact Teledyne Sales for other laser options


FOR MORE INFORMATION CONTACT:

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Revision Number:
Revision Date: 2025 01 20

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