Z-TRAK2 S-2K Series (Preliminary)
Factory Calibrated High-Performance 3D Profile Sensors

The new Z-Trak2 family of 3D Profile Sensors delivers 45,000 profiles/sec for in-line measurement and inspection applications.

The Z-Trak2 S-2K Series combines speed and performance with easy to use software to deliver highly accurate, real-time results for a wide variety of 3D measurement and inspection applications in electronics, PCB, wafer, flat-panel, factory automation, food processing, and secondary battery markets.
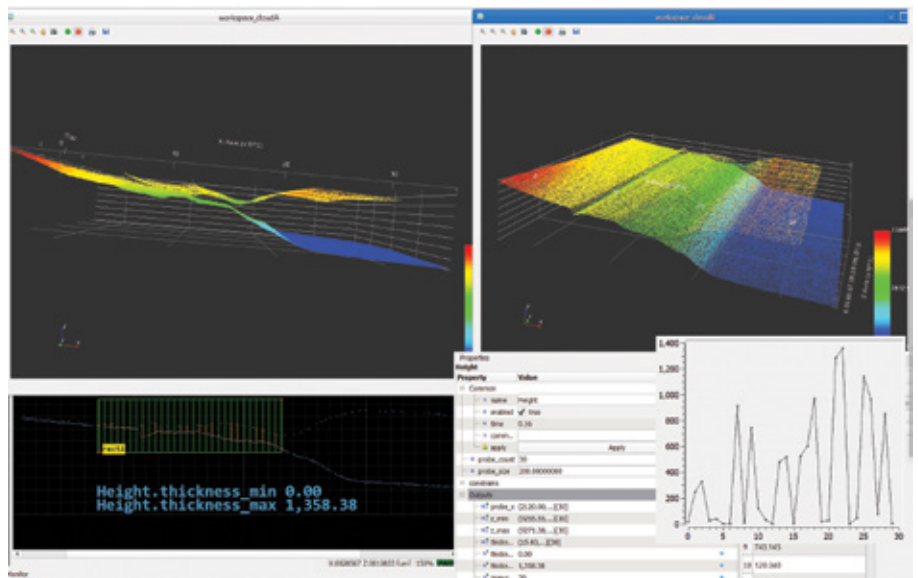
The Z-Trak2 S-2K Series delivers 2K points per profile with a larger FOV and scan speeds beyond 45K profiles/sec. Combined with its hardware-based reflection compensation algorithms and single-scan HDR capabilities, the Z-Trak2 S-2K Series supports a variety of FOVs with blue and red laser configurations.

HIGH DYNAMIC RANGE (HDR) IMAGING

Powered by Teledyne's 3D image sensor technology, the Z-Trak2 family features built-in single-scan HDR capability. This allows Z-Trak2 to scan objects made of highly reflective surfaces like machine aluminum/glass and low reflectivity materials like rubber, plastic, etc. at the same time. The HDR capability helps reduce processing complexity and time, thereby improving system efficiency.

MULTI-SENSOR CONFIGURATION AND UNIFIED MEASUREMENT SPACE (UMS)

Multiple Z-Trak2 sensors can be combined and synchronized to create a unified measurement space, to measure an object in 360° or to eliminate occlusions. Multi-sensor synchronization can be accomplished using off-the-shelf Ethernet switches with better than +/- 1 μs precision. In addition, the Z-Trak2 series offers flexible connection topologies and a choice of calibration targets.

FEATURES

» Scan speed 45K profiles/sec, 2,000 points/profile
» Factory calibrated real-time measurements in real-world units
» Unified Measurement Space for 360° in-line inspection and measurements
» Handles highly reflected surfaces
» Built-in reflection compensation algorithms
» Multi-Sensor synchronization
» Simplified cabling
» Compact IP67 housing for harsh operating environment
» Free bundled software:
  » Sherlock™ for rapid application deployment
  » Sapera LT SDK for scan and control
  » Sapera Pro run-times 1D, 2D and 3D image processing
  » 3rd party software support for 3D image processing

SPECIFICATIONS

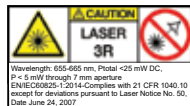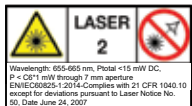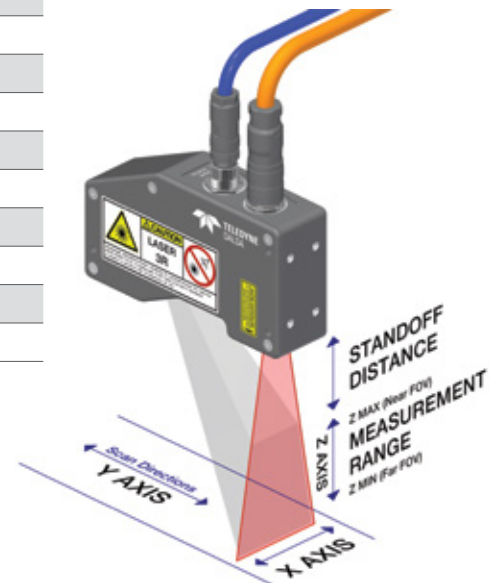| Function	Description
Scanning Rate	• AOI: Up to 45,000 profiles/sec
Connectors	• 1 x M12 17-pin: Controls • 1 x M12 8-pin X-Coded: Data Ethernet port • 1 x M12 12-pin: Aux. I/O
Image Enhancements	• Single scan HDR • Reflection elimination • Specular configuration • Filters: programmable median • Horizontal and vertical flip • Unified Measurement Space
Multi-Sensor Sync	• Single low-cost wiring using off-the-shelf network switches • Sensor grouping • Configuration wizard to ease timing setup
Lasers	• Red: 660n m 2M or 3R • Blue: 405 nm 2M or 3R
Reflectance Management	• Time integration • Laser power control: Automatic or manual • Gain control
Output Format	• Individual profile, range map and 3D point cloud • Depth (Z), Lateral (X), Reflectance (R) or Laser Peak Width (W) • GenICam 3.0 (SFNC 2.3) compatible 3D Data output formats compatible with • Calibrated Z; Rectified Z, Calibrated ZR/ZR+W • Native values and world units (microns/mm/inch) • 16-bit mono (1D line-scan mode) • 10-bit mono (2D area-scan mode)
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 Requirements	• 5, 2.5 or 1 Gigabit Ethernet • 4 GB or higher system memory

Function	Description
I/O	• 3 opto-isolated input • Configurable as a trigger input or as a start/stop trigger • 3 opto-isolated output • Serial communication port or Analog output 4 – 20 mA
Encoder Input	• Quadrature (AB) shaft-encoder inputs • RS422/TTL • Up to 20 MHz frequency • Backlash compensation
Scan Control	**Profile Trigger** • Encoder input, Internal timer/counter **Fixed Scan** • External input; Software; Timer/counter **Variable Scan** • Part in place; Start/Stop pulse
Unified Measurement Space	• Intuitive GUI for rapid setup • Up to 16 sensors • Supports multiple sensors in side-by-side, circular and in-line configurations • Combine red and blue laser models • Supports models with different measurement ranges
Power Supply	• PoE via 8-pin X-code circular connector (optional) • Separate power via 12M 17-pin connector • +12V to 36VDC +/-10% with surge protection
Enclosure	• Machined aluminum • IP67 • 4 x mounting holes

Software	• 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 (bundled free):
	  • Sherlock 8.0
	  • Sapera LT 8.60 (or higher), Sapera Processing 8.0 (or higher) RTL
	  • Linux: Teledyne DALSA GevAPI Framework (SDK) ver. 2.40 or higher
	• 3rd party software:
	  • MVTec® Halcon®
	  • NI® Max/Labview®
	  • Cognex® VisionPro®
	  • Stemmer CVB
	  • Application development using C++ and Microsoft .Net (C++, C# or Visual Basic)

Markings	• FCC Class B, CE, ICE (pending) • ROHS, China RoHS (pending)

SPECIFICATIONS

	Z-TRAK2 S-2K-0004	Z-TRAK2 S-2K-0015	Z-TRAK2 S-2K-0030
DOF	4 mm	15 mm	30 mm
Standoff (mm)	15	55	65
FOV (mm)	9 - 10	23 - 27	46 - 57
X-Res (µm)	4.6 - 5.1	12-14	23 - 29
Z-Res (µm)	1	2	3
Repeatability (±µm)	0.25	0.35	0.4 - 0.5
Linearity (±) % of F.S.	<0.025%	<0.025%	<0.02%
Laser (nm)	Blue405-2M	Blue405-2M	Blue405-2M
Options	3R, Red660	3R, Red660	3R, Red660
Interface	5/2.5/1 GigE	5/2.5/1 GigE	5/2.5/1 GigE
Case Size	T10	T20	T20

	Z-TRAK2 S-2K-0100	Z-TRAK2 S-2K-0250	Z-TRAK2 S-2K-0600
DOF	100 mm	250 mm	600 mm
Standoff (mm)	90	180	380
FOV (mm)	95 - 157	166 - 325	428 - 978
X-Res (µm)	49 - 81	85 - 167	219 - 503
Z-Res (µm)	12	40	120
Repeatability (±µm)	0.75 - 1.25	2.5 - 6.0	7.5 - 15
Linearity (±) % of F.S.	<0.02%	<0.02%	<0.02%
Laser (nm)	Red660-2M	Red660-3R	Red660-3R
Options	3R, Blue405	2M, Blue405	2M, Blue405
Interface	5/2.5/1 GigE	5/2.5/1 GigE	5/2.5/1 GigE
Case Size	T30	T30	T40

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

STANDOFF DISTANCE
Z MAX (Near FOV)
MEASUREMENT RANGE
Z MIN (Far FOV)
Z AXIS
Scan Direction
Y AXIS
X AXIS