

## Z-TRAK2 S-2K SERIES

Factory Calibrated High-Performance 3D Profile Sensors



### 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 environments
- Free bundled software:
  - Sherlock™ for rapid application deployment
  - Sopera LT SDK for scan and control
  - Sopera Pro run-times
  - 3<sup>rd</sup> party software support for 3D image processing

## 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.

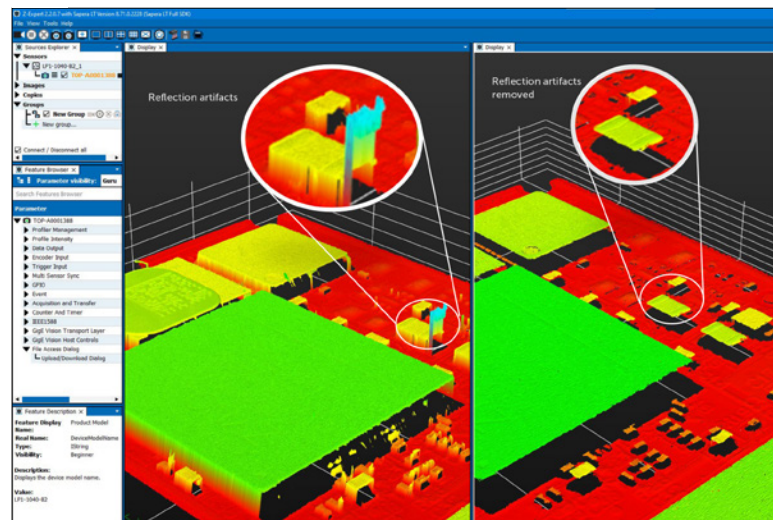
The Z-Trak2 S-2K Series delivers 2K points per profile with a larger FOV and scan speeds beyond 45K profiles/sec. Combined with its hardware-based reflection compensation algorithms and single-scan HDR capabilities, the Z-Trak2 S-2K Series supports a variety of FOVs with blue and red laser configurations.

### 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.

### REFLECTION ELIMINATION AND IN-LINE PROCESSING

Z-Trak LP2C features in-line processing capabilities to improve and enhance the profiles. In addition, it can generate additional meta data that can be used by up-stream algorithms to eliminate unwanted reflections. Cleaner 3D scans help applications produce accurate and dependable results.



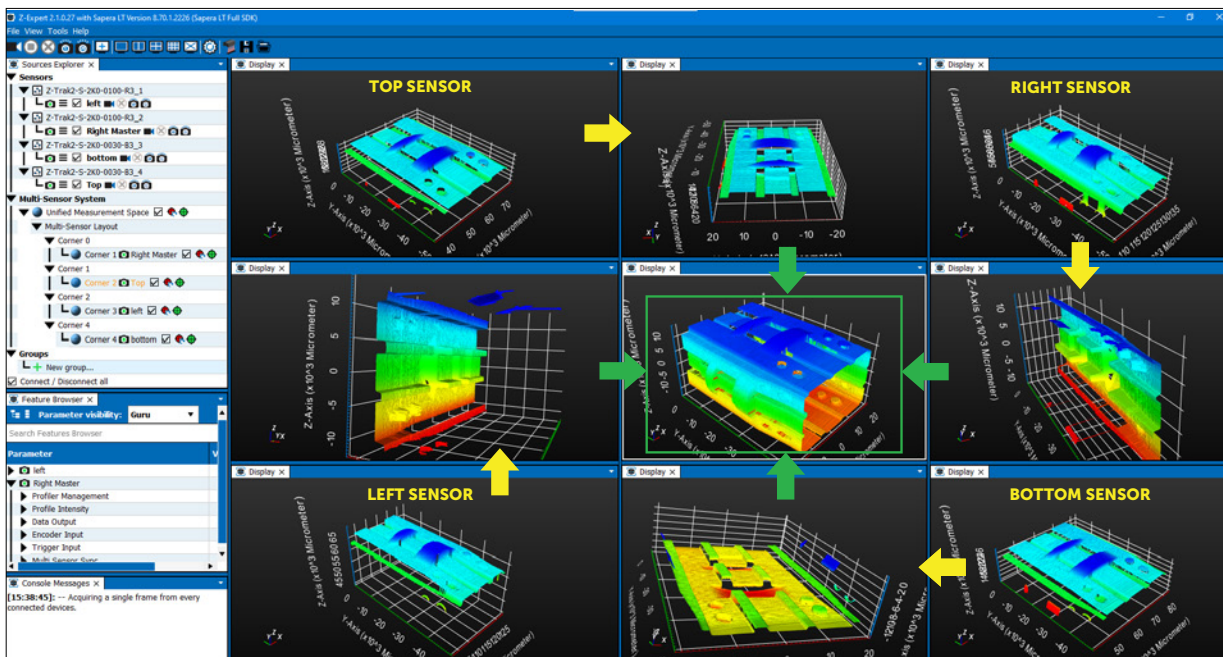
## MULTI-SENSOR CONFIGURATION AND UNIFIED MEASUREMENT SPACE (UMS)

3D inspection applications requiring 360° views, thickness measurement, an extended horizontal field of view without sacrificing the z-resolution or removing occlusion etc. require the combination of multiple profile sensors.

Combining and synchronizing multiple Z-Trak LP sensors helps create a Unified Measurement Space so that applications view the resulting 3D measurements from the point of view of the entire system. The 3D applications benefit from consistent, accurate and easier to handle object measurements and for added flexibility, the Z-Trak LP architecture also enables models with different measurement ranges and laser colors to be combined.



## Z-TRAK UNIFIED MEASUREMENT SPACE

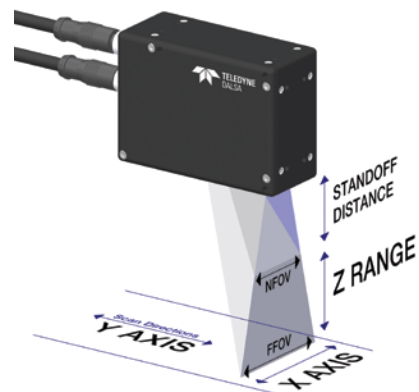


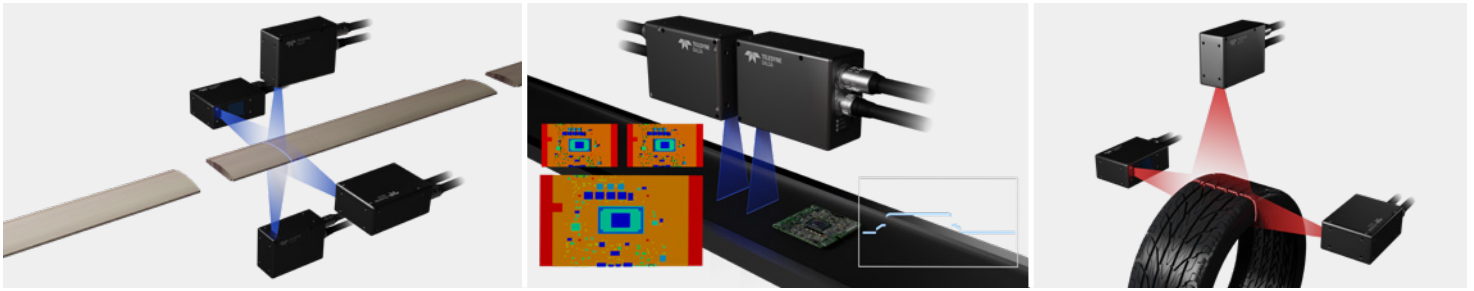
## Z-EXPERT 360° View Using 4 Synchronized Z-Trak Sensors

## SPECIFICATIONS<sup>1</sup>

Function	Description
Scanning Rate	<ul style="list-style-type: none"> <li>• AOI: Up to 45,000 profiles/sec</li> </ul>
Connectors	<ul style="list-style-type: none"> <li>• 1 x M12 17-pin: Controls</li> <li>• 1 x M12 8-pin X-Coded: Data Ethernet port</li> </ul>
Image Enhancements	<ul style="list-style-type: none"> <li>• Single scan HDR</li> <li>• Reflection elimination</li> <li>• Specular configuration</li> <li>• Filters: programmable median</li> <li>• Horizontal and vertical flip</li> <li>• Unified Measurement Space</li> </ul>
Multi-Sensor Sync	<ul style="list-style-type: none"> <li>• Single low-cost wiring using off-the-shelf network switches</li> <li>• Sensor grouping</li> <li>• Configuration wizard to ease timing setup</li> </ul>
Lasers	<ul style="list-style-type: none"> <li>• Red: 660nm 2M or 3R</li> <li>• Blue: 405 nm 2M or 3R</li> </ul>
Reflectance Management	<ul style="list-style-type: none"> <li>• Time integration</li> <li>• Laser power control: Automatic or manual</li> <li>• Gain control</li> </ul>
Output Format	<ul style="list-style-type: none"> <li>• Individual profile, range map and 3D point cloud</li> <li>• Depth (Z), Lateral (X), Reflectance (R) or Laser Peak Width (W)</li> <li>• GenlCam 3.0 (SFNC 2.3) compatible 3D Data output formats compatible with</li> <li>• Calibrated Z; Rectified Z; Calibrated ZR/ZR+W</li> <li>• Native values and world units (microns/mm/inch)</li> <li>• 16-bit mono (1D line-scan mode)</li> <li>• 10-bit mono (2D area-scan mode)</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 Requirements	<ul style="list-style-type: none"> <li>• 5, 2.5 or 1 Gigabit Ethernet</li> <li>• 4 GB or higher system memory</li> </ul>
I/O	<ul style="list-style-type: none"> <li>• 2 opto-isolated input</li> <li>• Configurable as a trigger input or as a start/stop trigger</li> <li>• 2 opto-isolated output</li> <li>• Serial communication port<sup>2</sup> or Analog output<sup>2</sup> 4–20 mA</li> </ul>

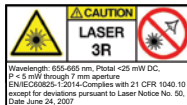
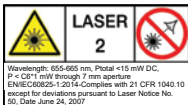
Function	Description
Encoder Input	<ul style="list-style-type: none"> <li>• Quadrature (AB) shaft-encoder inputs</li> <li>• RS422/TTL</li> <li>• Up to 5 MHz (20M tick rate)</li> <li>• Backlash compensation</li> </ul>
Scan Control	<p><b>Profile Trigger</b></p> <ul style="list-style-type: none"> <li>• Encoder input, Internal timer/counter</li> </ul> <p><b>Fixed Scan</b></p> <ul style="list-style-type: none"> <li>• External input; Software; Timer/counter</li> </ul> <p><b>Variable Scan</b></p> <ul style="list-style-type: none"> <li>• Part in place; Start/Stop pulse</li> </ul>
Unified Measurement Space	<ul style="list-style-type: none"> <li>• Intuitive GUI for rapid setup</li> <li>• Up to 16 sensors</li> <li>• Supports multiple sensors in side-by-side, circular and in-line configurations</li> <li>• Combine red and blue laser models</li> <li>• Supports models with different measurement ranges</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 12M 17-pin connector</li> <li>• +12V to 36VDC +/-10% with surge protection</li> </ul>
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® 10 (32/64-bit) compatible</li> <li>• Linux 32/64-bit: <ul style="list-style-type: none"> <li>• Ubuntu/Debian, RHEL/CentOS/Fedora, SLES/openSUSE</li> <li>• Kernel: 2.6.32 or higher</li> </ul> </li> <li>• Fully supported by Teledyne DALSA's software packages (bundled free): <ul style="list-style-type: none"> <li>• Sherlock 8.0</li> <li>• Sapera LT 8.60 (or higher), Sapera Processing 8.0 (or higher) RTL</li> </ul> </li> <li>• Linux: Teledyne DALSA GevAPI Framework (SDK) ver. 2.40 or higher</li> <li>• 3rd party software: <ul style="list-style-type: none"> <li>• MVTec® Halcon®</li> <li>• NI® Max/Labview®</li> <li>• Cognex® VisionPro®</li> <li>• Stemmer CVB</li> </ul> </li> <li>• Application development using C++ and Microsoft .Net (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> </ul>




**SPECIFICATIONS<sup>1</sup> (Continued)**

Models	S2K-0004-B3	S2K-0015-B3	S2K-0030-B3	S2K-0100-B3
Z-Range (mm)	4	15	30	100
Standoff Distance (mm)	33.15	32.7	43.7	64.5
Data Interface	5 GigE, 2.5 GigE, 1 GigE			
Z-Resolution (µm)	1 - 1	1 - 2	3 - 5	8 - 14
NFOV-FFOV (mm)	14.3 - 15.2	27 - 32	53 - 72	97 - 185
X-Resolution (µm)	7.03 - 7.80	14 - 17	27 - 37	50 - 95
Repeatability (+/-µm) <sup>2</sup>	0.15 - 0.15	0.25 - 0.25	0.3 - 0.4	0.5 - 0.75
Linearity (% of F.S.)	<0.05%	<0.04%	<0.03%	<0.02%
Laser (nm) <sup>3</sup>	405	405	405	405
Laser Class	2M / 3R	2M / 3R	2M / 3R	2M / 3R
Housing Type	T10	T20	T20	T20

Models	S2K-0150-R3	S2K-0250-R3	S2K-0300-R3	S2K-0400-R3	S2K-0650-R3
Z-Range (mm)	150	250	300	400	650
Standoff Distance (mm)	135	175	195	463	558
Data Interface	5 GigE, 2.5 GigE, 1 GigE				
Z-Resolution (µm)	14 - 25	22 - 45	34 - 74	43 - 71	81 - 156
NFOV-FFOV (mm)	129 - 228	157 - 325	230 - 508	400 - 659	624 - 1211
X-Resolution (µm)	66 - 117	81 - 167	118 - 261	206 - 339	321 - 623
Repeatability (+/-µm) <sup>2</sup>	1 - 1.5	1.5 - 2	2 - 4	3 - 10	4 - 12.5
Linearity (% of F.S.)	<0.02%	<0.02%	<0.02%	<0.02%	<0.02%
Laser (nm) <sup>3</sup>	660	660	660	660	660
Laser Class	2M / 3R	2M / 3R	2M / 3R	2M / 3R	2M / 3R
Housing Type	T30	T30	T30	T40	T40



1. Subject to change without prior notice
2.  $\pm 2\sigma$
3. Contact Teledyne DALSA for other laser options

Housing Type	Size (L x H x W) (mm)
T10	165 x 97 x 49
T20	116 x 83 x 49
T30	177 x 83 x 49
T40	380 x 83 x 49

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