

## Jabil's SWIR Cameras: The Next Chapter in Agriculture Sensing

### *Improving Precision Agriculture through Sensing Innovation*

**ST. PETERSBURG, Fla. – Date –** Jabil Inc. (NYSE: JBL) will introduce several groundbreaking 3D cameras, including the world's first SWIR laser triangulation camera, at FIRA USA 2024, booth D6. Jabil's 3D cameras, offering unprecedented sensor performance in bright sunlight, lowlight, and mixed-lighting conditions, open the door for new agricultural applications in planting, weeding, harvesting, crop monitoring, and autonomous vehicle operation.

Jabil's SWIR-based cameras leverage the phenomenon of water molecules in the Earth's atmosphere, absorbing photons in specific SWIR wavelength bands such as 1350 nm–1400 nm and rendering the atmosphere nearly opaque in these regions.

"By operating in this SWIR wavelength band, Jabil's 3D cameras avoid interference from sunlight, which often hampers the performance and reliability of visible and NIR cameras. The unique characteristics of the SWIR band result in higher signal-to-noise ratios (SNR), improved laser eye safety, and extended range and functionality in the field," said Ian Blasch, Senior Director of Business Development at Jabil. "The performance benefits of 3D SWIR cameras will enable farmers and growers to implement more efficient and reliable processes, from planting to crop monitoring to harvesting."

### **Cameras to Be Showcased at FIRA USA 2024:**

#### **1. World's First SWIR Laser Triangulation Camera**

Historically, laser triangulation has operated in the visible and NIR bands, where ambient light conditions and laser safety limits often restrict performance. Jabil's SWIR laser triangulation camera, operating at 1370 nm, eliminates these limitations.

Key performance features of Jabil's laser triangulation camera:

- **Ambient light tolerance >100K Lux** for glare-free operation in direct sunlight.
- **100X laser power increase** over traditional visible and NIR cameras, extending performance range and measurement accuracy.
- **Moisture detection** with a 3-bit detection level in soil, vital for monitoring soil health and optimizing irrigation.
- Capability to **detect objects moving at speeds greater than 4.5 m/s**, essential for fast-moving agricultural machinery.
- **Plastic transparency detection** for identifying items like greenhouse coverings or packaging.
- Enhanced **dust and debris tolerance**, ensuring reliable laser line projection even in challenging environments.

Laser triangulation evaluation kits, available in November 2024, feature dual illumination options (1370 nm flood and 1370 nm line). The evaluation kits support an operating range from 20 cm to 1.5 m, making it highly adaptable for a host of agricultural applications. The camera's SDK operates on a Raspberry Pi 5.

**2. Indirect Time of Flight (iToF) SWIR Camera**

Jabil's iToF camera, based on 1130 nm or 1370 nm illumination sources, have demonstrated 1 % depth accuracy up to a 20 m distance, facing directly into the sun. With the enhanced ambient light tolerance, these cameras ensure accurate data capture in all lighting conditions, crucial for tasks like planting, harvesting in fields and orchards, and enabling autonomous operation of agricultural platforms.

**3. Dust-Tolerant 3D Camera (Active Stereo)**

Jabil will also introduce a dust-tolerant stereo camera based on event sensors and active beam steering. The camera prototype, still in development, was designed to operate in optically contaminated environments, a key requirement for autonomous platform operation in the agriculture, construction, mining, and off-road vehicle markets.

**Visit Jabil at FIRA USA, Booth D6**

Growers, farmers, dealers, investors, and researchers attending FIRA USA are invited to see firsthand how Jabil's innovative 3D SWIR cameras are setting new standards in agricultural sensing. From crop monitoring to autonomous equipment, these cameras are set to transform how farmers gather and utilize data, driving more efficient and sustainable farming practices.

**About Jabil:** At Jabil (NYSE: JBL), we are proud to be a trusted partner for the world's top brands, offering comprehensive engineering, manufacturing, and supply chain solutions. With over 50 years of experience across industries and a vast network of over 100 sites worldwide, Jabil combines global reach with local expertise to deliver both scalable and customized solutions. Our commitment extends beyond business success as we strive to build sustainable processes that minimize environmental impact and foster vibrant and diverse communities around the globe. Discover more at [www.jabil.com](http://www.jabil.com).

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Figure 1: SWIR Laser Triangulation Camera



Figure 2: Fruits - Measurement, object identification, detection of damage (bruising)



Figure 3: Moisture Detection



Figure 4: iToF SWIR Camera



Figure 5: iToF SWIR Camera Working in Direct Sunlight