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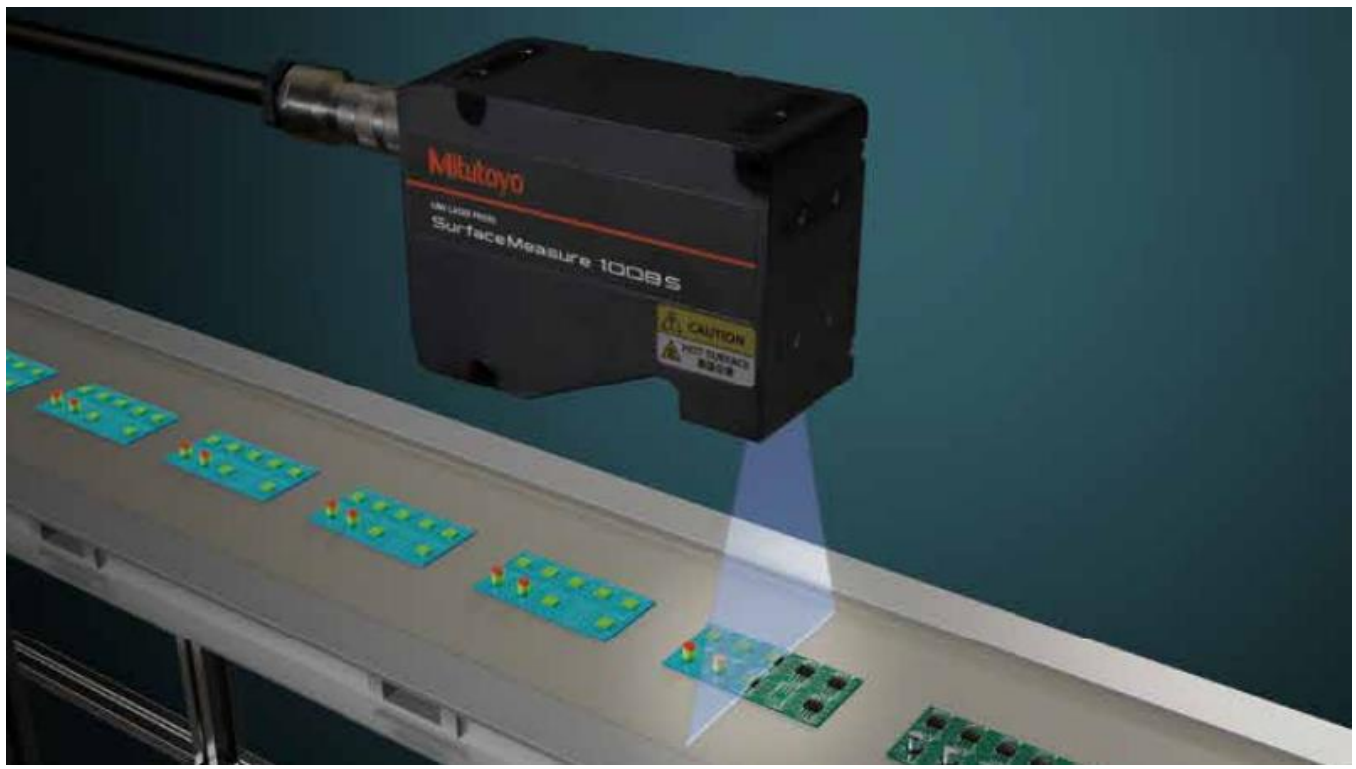
Fundamentals of Industrial Measurement Technology

Laser Scanning System



ProDSP Post Series Nr.26.

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Operating principle

- The line scanner measures a **2D cross-sectional profile**
- The **actuator increments the position** of the sensor or the workpiece
- Based on the **encoder signals,** the profiles are **combined into a 3D point cloud**

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Resolution limitations

- **One axis**: the resolution of the line scanner
- **The other axis**: the stepping speed permitted by the cycle time
- Together, these two factors **determine** the **3D resolution**

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Sensor-principle limitations

- **Blind spots** resulting from triangulation
- Often **two opposing sensor** heads are required
- **Shiny or inhomogeneous surfaces** can deflect the laser beam

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Advantage

- **Outstanding depth accuracy** on optimal surfaces

- It is important to note that **accurate motion control**, **feedback measurement**, and **dedicated software** are required for 3D reconstruction.

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