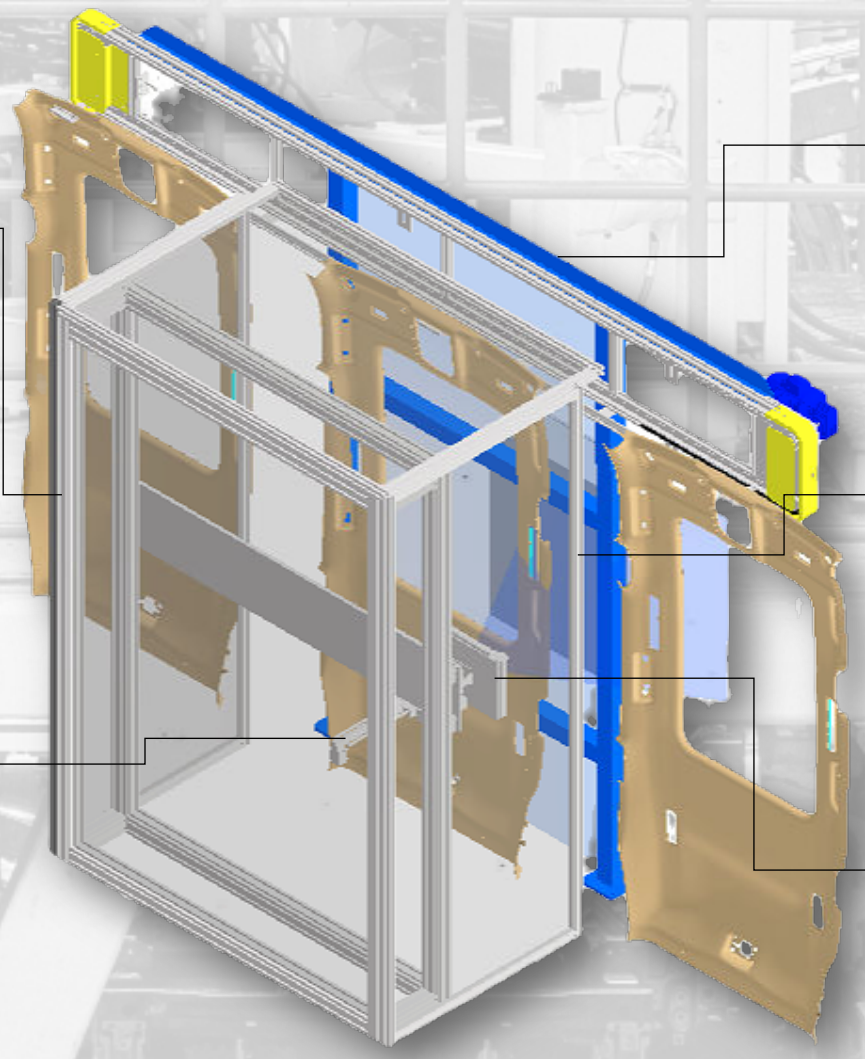
Measurement and Dimensional Verification Solutions

LM3 Technologies' **Measurement and Dimensional Verification solution** provides **highly accurate, automated measurements** for quality-critical components in **manufacturing environments**. This system ensures precise **dimensional compliance** through **AI-driven analysis** and integrates seamlessly with production processes to maintain **efficiency** and **reliability**. Designed for tasks like **threaded hole verification**, **flatness checks**, and **edge measurements**, this solution delivers consistency and eliminates manual errors.



PAQi Controller Unit
Centralized processing for real-time dimensional verification and seamless communication with production equipment.

Slide Mechanism for Measurement
Enables precise positioning of cameras and measurement devices for comprehensive dimensional checks.

Connection to Measurement Devices
Interfaces with external tools like laser displacement sensors and linear scales for advanced dimensional checks.

High-Resolution Camera
Captures detailed images of parts for accurate dimensional analysis and defect detection.

Adjustable Lighting Setup
Optimized illumination ensures consistent imaging conditions for precise measurements.

Technical Capabilities

- **Threaded Hole Verification:** Confirms thread depth, pitch, and positional accuracy for a variety of part sizes and shapes.
- **Flatness and Edge Detection:** Measures deviations in flatness, edge profiles, and overall surface quality with precision.
- **AI and Machine Vision Combination:** Leverages AI for advanced defect detection, including anomalies and outliers, while utilizing machine vision for rapid and repeatable dimensional checks.
- **Support for Multiple Part Types:** The system is easily reconfigurable to handle different parts, with adjustable fixtures and slide mechanisms tailored to accommodate varying dimensions and geometries.
- **Dynamic Slide Mechanism:** Allows flexible measurement setups, enabling the inspection of complex part geometries and hard-to-reach features.
- **Integrated Tolerance Monitoring:** Automatically checks dimensional features against pre-set tolerances, flagging out-of-spec components in real-time.
- **Multi-Sensor Integration:** Supports additional sensors such as laser displacement sensors, linear encoders, and thermal cameras for specialized measurements.

Part Evaluation
↓
Fixture Installation
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Camera & Lighting Configuration
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System Integration
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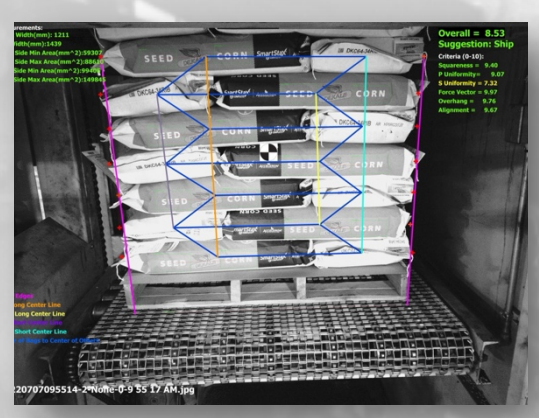
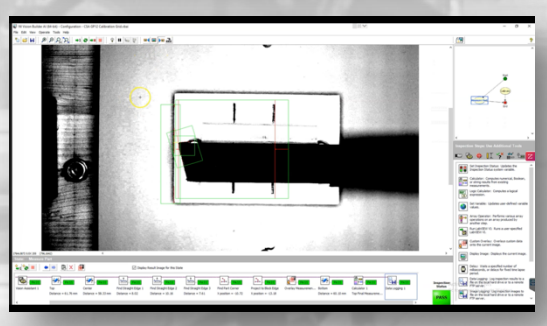
Part Variation Setup
↓
Validation and Testing





Advantages

- **Enhanced Accuracy:** Combines AI and traditional vision to achieve sub-micron measurement precision.
- **Dynamic Measurement:** Slide mechanisms ensure versatility, accommodating a range of part sizes, geometries, and inspection angles.
- **Increased Throughput:** Reduces inspection time by automating dimensional verification processes.
- **Integrated Feedback:** Provides instant measurement data to operators and production systems, reducing scrap and rework.
- **Scalable Solution:** Adapts easily to evolving production requirements and diverse part types.

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