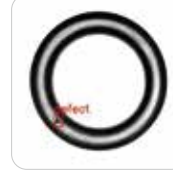


## AI-Based Vision Inspection Solutions Applicable to Various Industries

AI-based vision inspection technology guarantees excellent defect detection performance across various manufacturing fields, including steel, PCB, semiconductors, injection molding, textiles, and secondary batteries

Surface Defect Inspection	PCB & Semiconductor Inspection	Injection Mold Inspection & Measurement	Textile Inspection
 Black dot / white dot	 Misplaced	 Missing	 Stain
 Scratch	 Missing	 Crack	 Color difference
 Incomplete coating	 Reverse-Inserted	 Indentation	 Delamination
 Defect	 Crack	 Dimension Measurement	 Impurity
 Dent	 Contamination	 Angle Measurement	 Contamination
 Stain	 SMT defect	 Wire Bending	 Yarn coating inspection
 Roll Defect	 PSR Skip	 Contamination	

**BOM**  
INSPECTION

# BOM INSPECTION

## For Smart Factory

AI-BASED INTELLIGENT VISION INSPECTION

●●● PRODUCT INTRODUCTION | 4IND CO., LTD.



## AI-Based Vision Inspection **BOM INSPECTION**

Providing solutions tailored to customer needs using various AI models and developing custom AI models to ensure superior inspection performance.

### APPLICABLE INDUSTRIES



### APPLICABLE AI MODELS

<b>Object Detection</b>	<b>Classification</b>	<b>Anomaly Detection</b>	<b>Segmentation</b>
Recognizes presence, quantity and location of products or defects	Classifies product types or defect types	Detects abnormal parts by learning normal products	Identifies precise shapes of products or defects

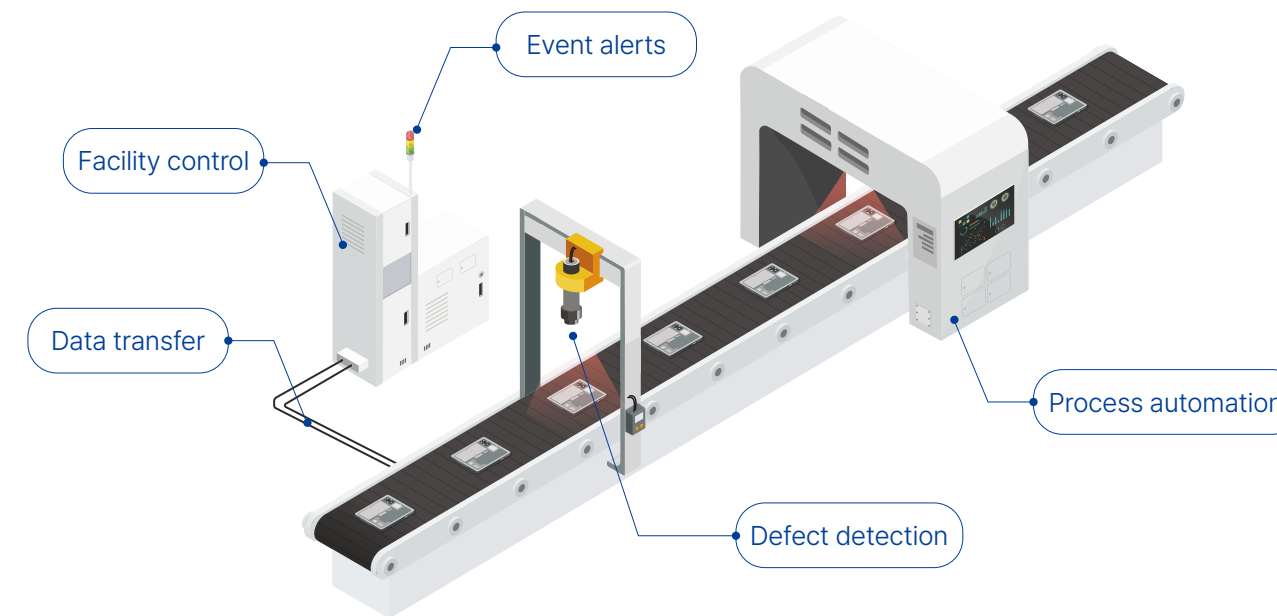
### AI VISION INSPECTION SOLUTION APPLICATION CASES

	<b>CASE.1</b> Steel Surface Inspection	<b>CASE.2</b> Automotive Parts Inspection	<b>CASE.3</b> Semiconductor Exterior Defect Inspection	<b>CASE.4</b> PBA Insertion Inspection
<b>Requirement</b>	Identify and classify the presence and types of defects	Check the presence of primer coating	Identify the presence and types of defects, count the quantity of each defect type.	Check for missing, misplaced and reverse-inserted components.
<b>Applied Custom Model</b>	Anomaly Detection + Classification	Segmentation + Anomaly Detection	Object Detection + Classification	Object Detection + Classification
<b>Process</b>	Roll To Roll	In-Line	In-Line	In-Line
<b>Product Size</b>	1800mm	500mm	5~10mm	200~450mm
<b>Velocity</b>	MAX 200MPM			
<b>product type</b>	Pre-Coated Metal, Hot Dip Aluminum Coated Steel, Galvanized steel	5types	64types	200types
<b>Performance</b>	International KOLAS Test report-based 97.7%	self-test 98%	International KOLAS Test report-based 99.3%	International KOLAS Test report-based 100%

### KEY FEATURES

<b>High-Speed Inspection</b> Capable of inspecting Roll To Roll large products at <b>speeds of up to 200MPM, detecting defects as small as 0.4mm.</b>	<b>Micro Defect Inspection</b> Detects micro defects in precision products, <b>identifying defects as small as 0.05mm.</b>	<b>Automated Solutions</b> <b>Automates inspection processes</b> without user intervention, tailored to production processes	<b>MES ERP Integration</b> <b>Integrates with existing MES ERP systems</b> to record inspection result data.

### - Build a Manufacturing process measurement analysis system



### PRE-TEST

Provides pre-tests based on customer requirements, providing reports on optical configuration, AI model application methods and solution implementation feasibility.

<b>Test Cost</b>	Free of charge
<b>Sample Data</b>	10 pieces of sample data per defect type (product or image)
<b>Test Duration</b>	1 month (subject to change based on data quality and difficulty)
<b>Requirement Definition</b>	Define customer requirements and the issues to be addressed through vision inspection.
<b>Optical Review</b>	Conduct optical configuration and testing using provided samples. * This step is skipped if image data is provided..
<b>AI Model Training</b>	Train AI models for testing and review defect detection feasibility.
<b>Reporting</b>	Deliver test result images, review reports, and quotations.

## Integrated Manufacturing Control & Management

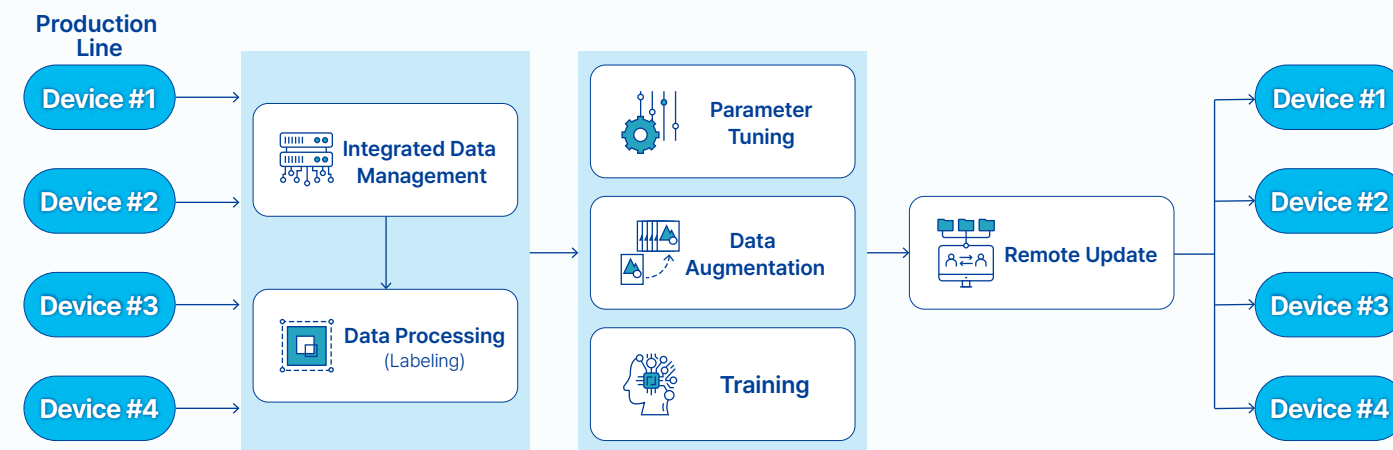
A cloud-based integrated quality control platform for monitoring and managing inspection results from multiple factories and production lines, allowing users to directly update AI models through self-learning features



<b>Integrated Monitoring</b> · Enables real-time monitoring of inspection status across production lines in manufacturing plants	<b>Integrated Dashboard</b> · Allows daily/monthly real-time integrated production status monitoring by production line	<b>Integrated Data Management</b> · Unified management of inspection result images and images for AI model training	<b>PLC Integration</b> · Rapid Cause Identification of Continuity Defects through Equipment Data Acquisition

### TRAINING & UPDATE PROCESS OF AI MODEL

Allows users to easily update AI inspection models for new product specifications without external requests.



	<b>Small Data Training</b> · Can be trained with approximately 100-200 pieces of small data, <b>enabling quick adaptation to new product specifications</b>		<b>Data Augmentation</b> · <b>Enhances performance</b> by supplementing data during small data training and <b>addresses data imbalance issues</b> through automatic data augmentation
	<b>Parameter Tuning</b> · Supports automatic calculation of essential parameters during AI training and allows manual adjustment of about 20 parameters for <b>flexible AI model training</b>		<b>Auto-Labeling</b> · <b>Reduces the time required for labeling</b> during the training data labeling process with AI-based auto-labeling features