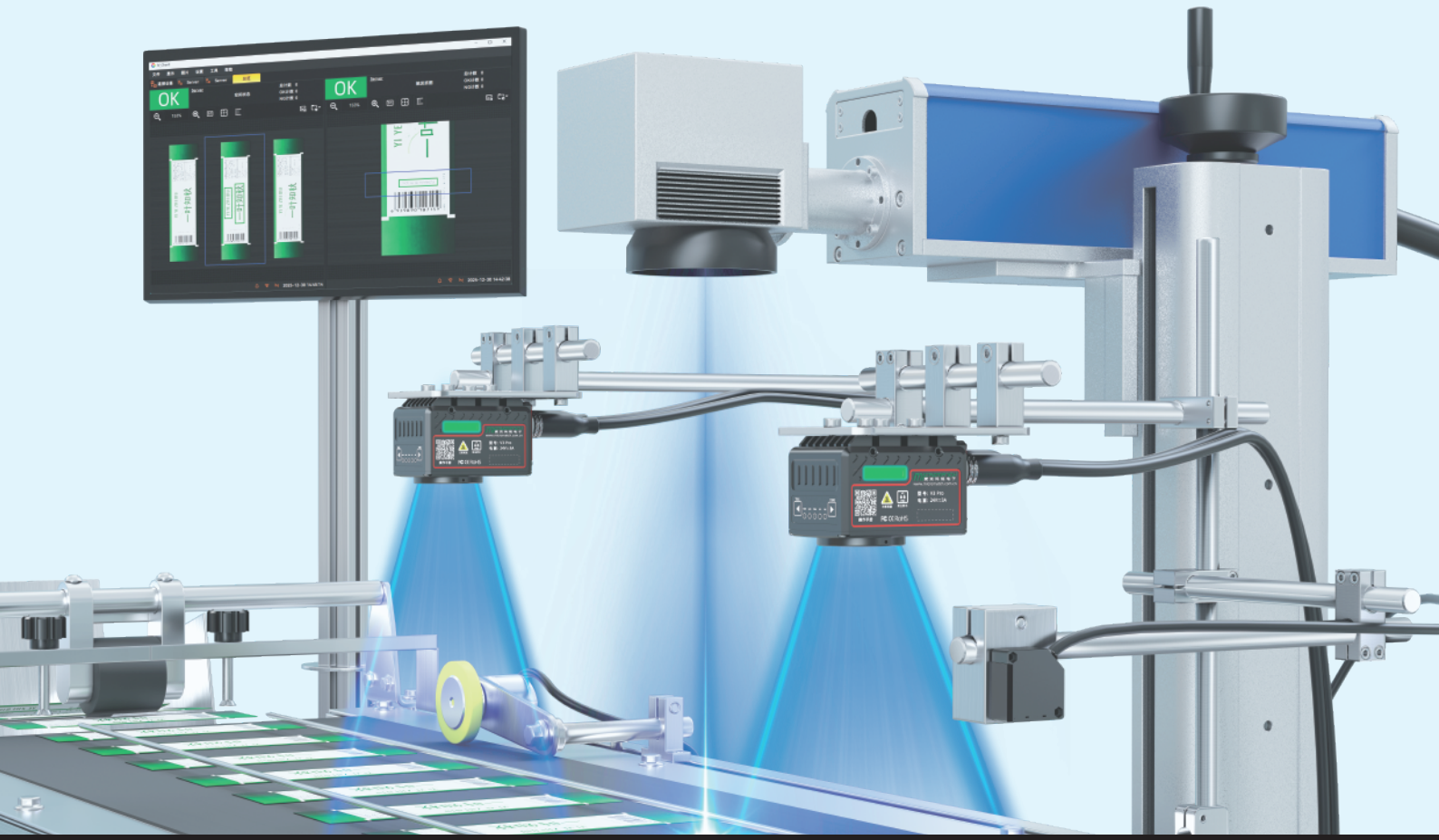
MICROMATCH®

Vision sensor powered by AI

V3/V3 Pro/CV3 Pro Series

AI Smart Camera



Xiamen Micromatch Electronic Information Technology Co. Ltd.
400 0059 906

Fearless of Harsh Industrial environments, Stable operation





Product Features

※ Powerful Computing Power, Ultra-Fast Response

Powerd by a dedicated neural network computing unit(NPU), it can handles complex algorithm workloads with ease, combining ultra-high performance with fast response capabilities to effortlessly meet the real-time data processing needs in high-load scenarios.

※ Extremely Simple Operation, Zero Threshold for Getting Started

Built on a user-centeric design philosophy, the software features streamlined workflows and intuitive interactions. Zero technical background is required, user can go from unboxing to full operation within minutes, significatly lowering the total cost of ownership(TCO).

※ In-depth AI Empowerment, Accurate Recognition

Deeply integrated with AI athe system leverages iteratively optimized core recognition algorithms to precisely capture target features while filtering out noise and interference. It delivers recognition accuracy and robustness that significantly outperform traditional solutions, maintaining stable output even in complex scenarios.

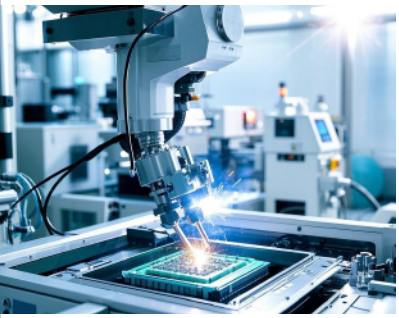
※ Integrated Design, Maximum Scene Adaptability

An all-in-one integration of multi-source lighting, a high-definition zoom lens, and a high-speed Wi-Fi module enables end-to-end operation spanning light-source adjustment, HD imaging, and wireless transmission—no external devices required. This plug-and-play architecture adapts to the flexible deployment needs in multiple environments.

※ Multi-Terminal Collaboration, More Efficient Management and Control

Supports direct connectivity across PC, smartphone, and tablet, catering to both solo moblie workflows and multi-user collaborative management. Compatible with centralized monitoring systems, it enables unified device management, control of multiple devices and data aggregation and analytics to improve overall operation and maintenance efficiency.

Application



Semi-conductor



Electronic components



Food,Daily Chemicals



Medical

AI-Powered Imaging

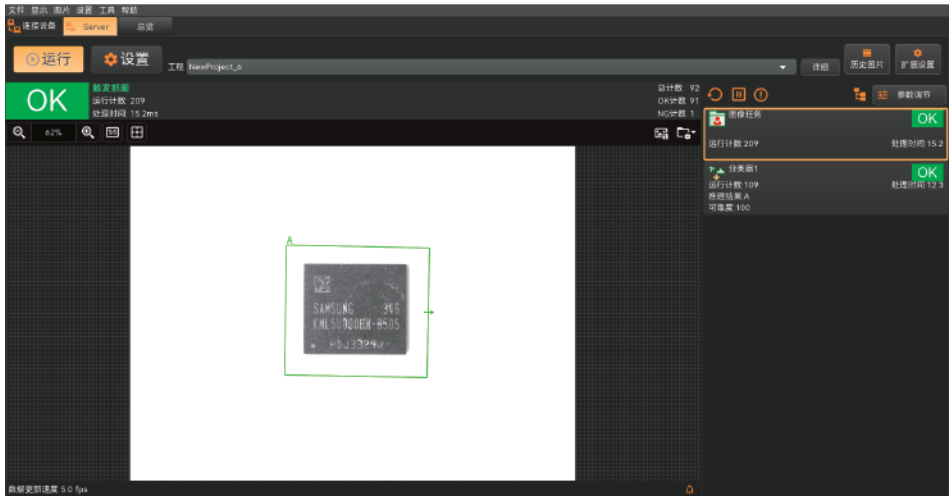
AI-Powered Imaging: Halo-Free Results via Intelligent Exposure Compensation

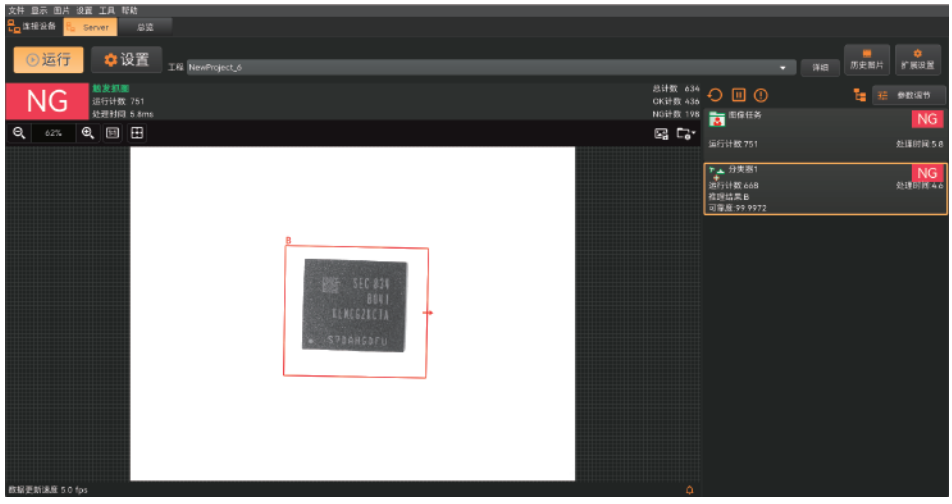
The AI-driven system autonomously optimizes lighting parameters—intensity, illumination, and exposure—through real-time environmental adaptation, ensuring consistent inspection quality across varying workpiece conditions.



Minimal Setup, Maximum Capability: Register OK/NG Samples Only, Let AI Handle the Rest

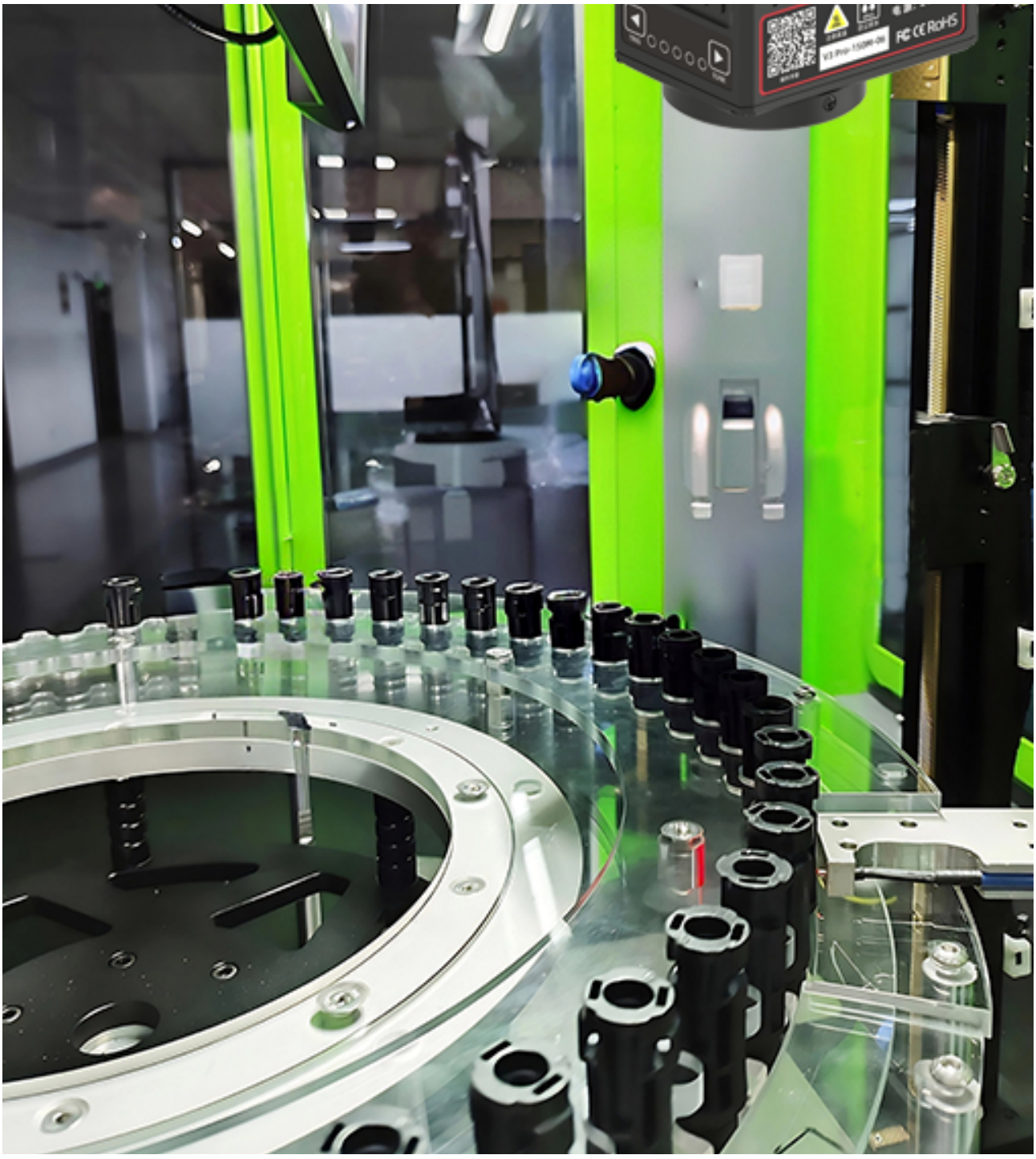
AI identifies differential features and auto-configures optimal parameters. This saliency-based detection ensures stable performance, unaffected by ambient light, individual variations, or surface conditions.





Semi-Automatic Assembly Equipment

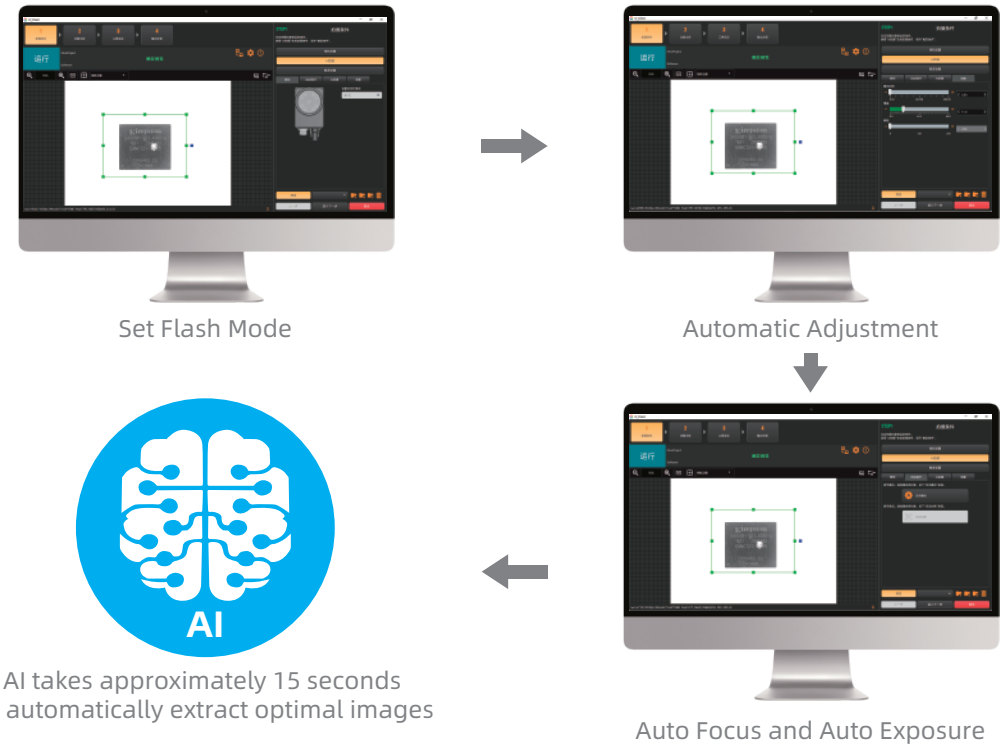
In semi-automatic assembly equipment, smart cameras provide visual guidance to operators, ensuring more accurate task completion. The guidance and inspection capabilities of smart cameras help reduce human error and improve product consistency.



AI-Powered Recognition: Effortless Acquisition of Detection-Optimized Images

Configuration Steps

An intuitive, guided interface-combined with the camera's built-in AI algorithms and multi-dimensional analysis-ensures precise and effective detection, enabling quick user onboarding and effortless operation.



AI-Recommended Image Auto-Extraction

The system intelligently selects 4-12 optimal images by automatically adjusting lighting modes and intensity, while scoring captured images based on three key criteria: color, shape, and capture duration. Simply specify the target area, and the AI will recommend the most suitable images based on multiple conditions.

Automated Shooting Condition Control

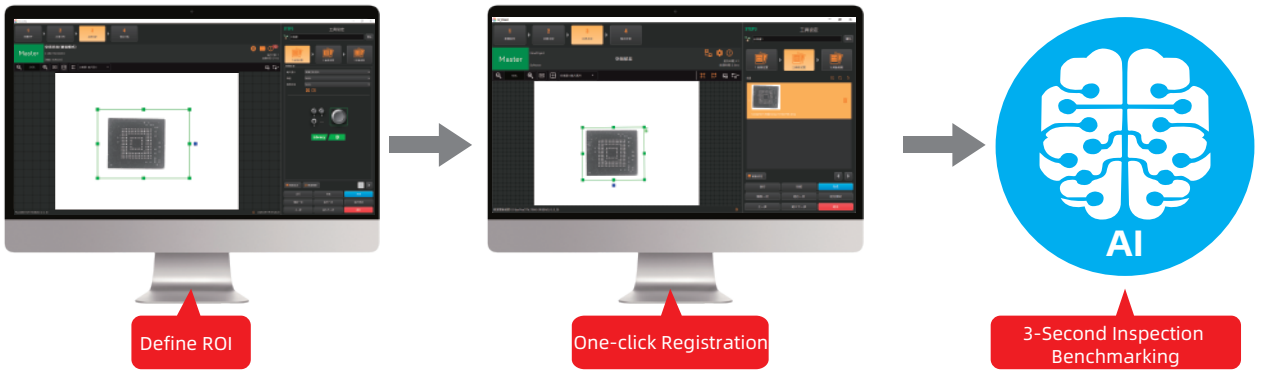


Automated Optimal Image Recommendation



AI-Driven Inspection: Ultra-Precise Detection, Zero-Friction Deployment

Configuration Steps



Define Inspection Area

Capture & Register OK/NG Samples

The AI automatically extracts features from OK/NG images and generates optimal detection parameters in approximately 3 seconds.

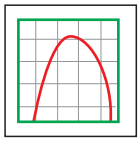
One-Click Operation: Rapid Parameter Modification and Streamlined Workflows

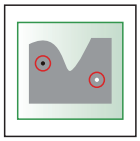
Even with diverse product defects, simply clicking "Add" updates OK/NG inspection standards. The AI then auto-learns new defect patterns without requiring visual expertise.

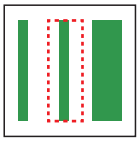


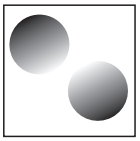
Smart algorithm

A comprehensive suite of vision inspection tools for diverse workpieces and applications.
Rapid inspection is achieved by simply selecting and marking the target region.

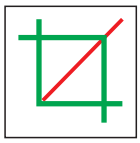

Gaussian Filtering

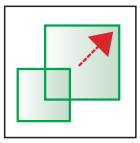

Median Filtering

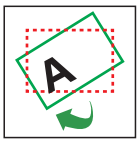

Edge Enhancement


Grayscale Morphology


Gray-level Stretching


Cropping

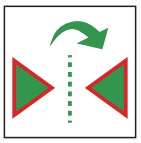

Scaling

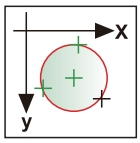


Rotation

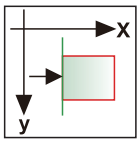


Polar Coordinate Transformation

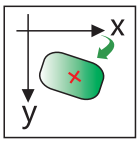

Geometric Transformation



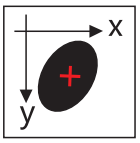
Circle Localization



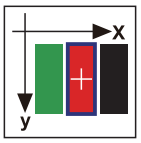
Coordinate positioning



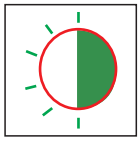
Contour matching

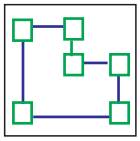


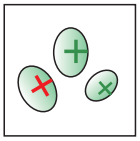
Grayscale matching

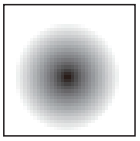


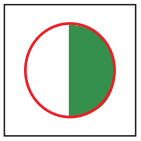
Color Matching

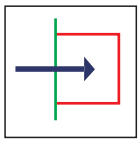

Brightness

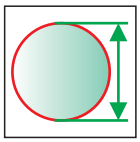

Create ROI

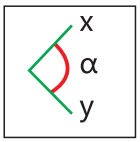

Blob Analysis


Region Morphology

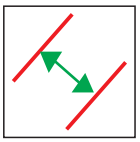

Contrast

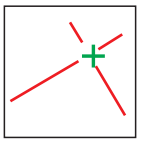

Edge Detection

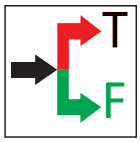

Circle Measurement



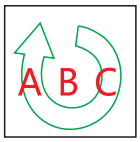
Angle Measurement


Line-to-Line Distance

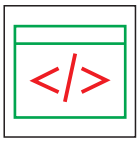

Line-Line Intersection



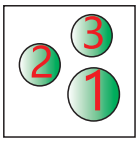
Branch



Loop



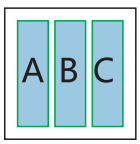
Script



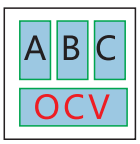
Counting


Delay


Code Reading



Character Recognition



Character Verification



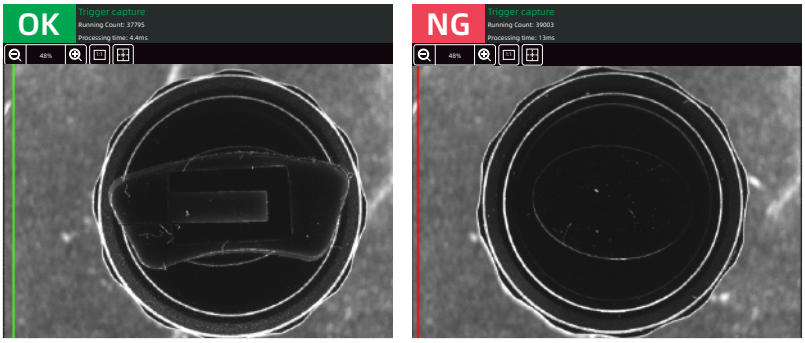
Color Classification


Deep Learning

Classifier

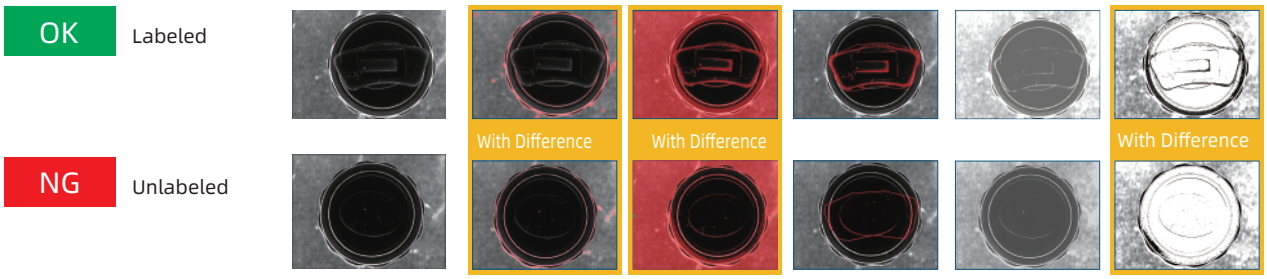
The AI precisely identifies target characteristics by capturing subtle differences and performing automated analysis, enabling efficient and intelligent detection and classification.

Simply input OK and NG samples, and the AI will automatically identify the key differences and generate optimal detection parameters—completing the setup without manual intervention.



Seamlessly integrates with other inspection tools, enabling flexible combinations to meet diverse detection needs while enhancing system compatibility and scalability.

Simply input OK/NG samples to quickly complete recognition training. Combining the learning module with other functional components significantly improves problem-solving efficiency and capability.



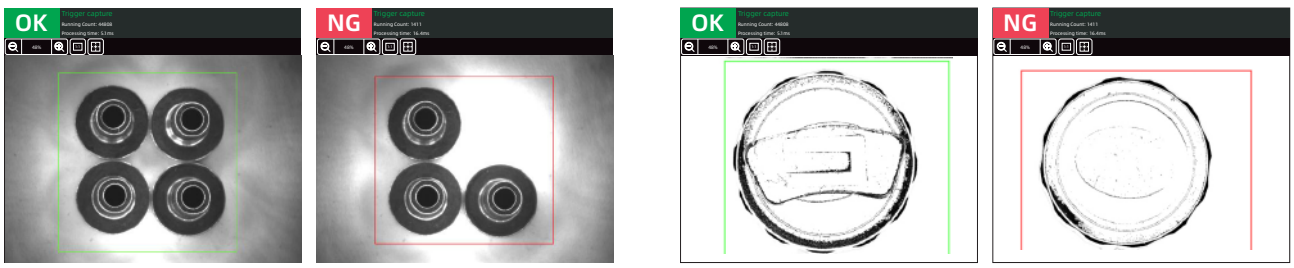
Extracts key features—color, shape, edges, etc.—through multiple modes, combined with intelligent algorithms to ensure precise identification and detection under varying conditions.

Counting

By quantifying regions of identical color through statistical analysis, it enables target object recognition and classification.

The "Area" parameter can be configured to determine whether specific regions should be included in the count, ensuring precise quantification of target objects. This functionality is applicable not only to quantity statistics, but also to anomaly detection, significantly enhancing inspection flexibility and accuracy.



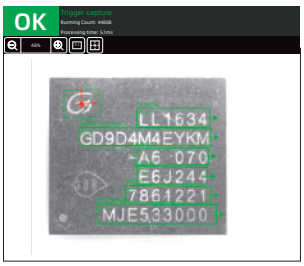


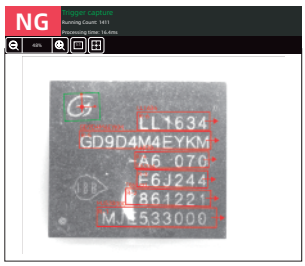
Inspection Tool

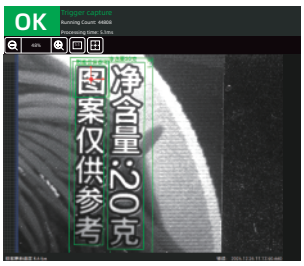
AI OCR

By identifying variations in characters, numbers, or dates through intelligent algorithm analysis, the system automatically rejects non-conforming products.

The system maintains accurate reading performance even when marking positions are offset or surface conditions are irregular. Through algorithm optimization for positional deviations and surface morphology of marked objects, reading accuracy and stability are further enhanced.









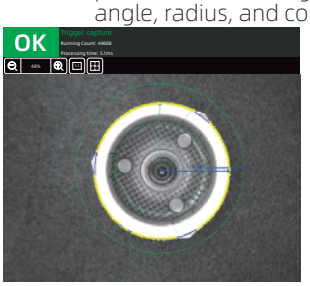
Barcode Reading

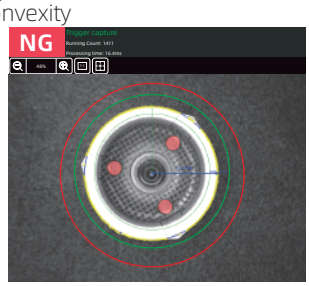
- Simultaneously reads multiple barcodes, with customized content extraction and individual comparison for each;
- Supports saving barcodes to a database for duplicate verification;
- Provides barcode quality grading.



Blob Analysis

Performs blob analysis on targets to obtain parameters including count, area, size, roundness, angle, radius, and convexity

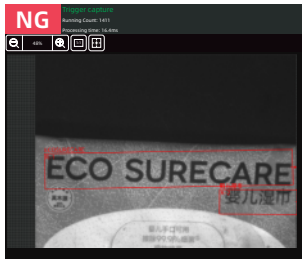




High-Speed OCR

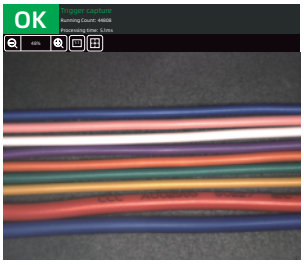
Utilizes high-speed OCR technology to inspect and verify product labels

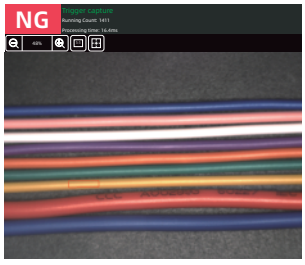




Color Inspection

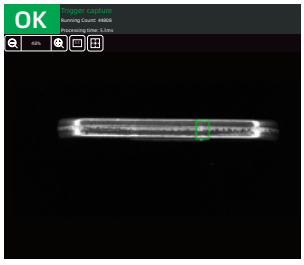
Employs color inspection tools to perform color difference detection on target regions

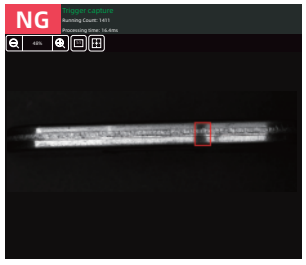




Blob Detection

Identifies features within specific grayscale ranges, with multi-feature filtering for blob characterization

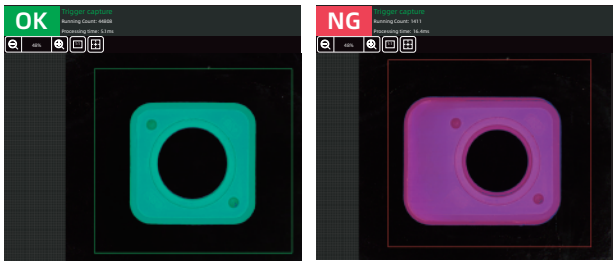




Inspection Tools

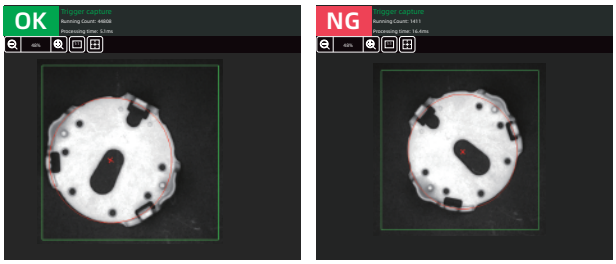
Color Area Measurement

Performs area measurement on target products using blob analysis tools.



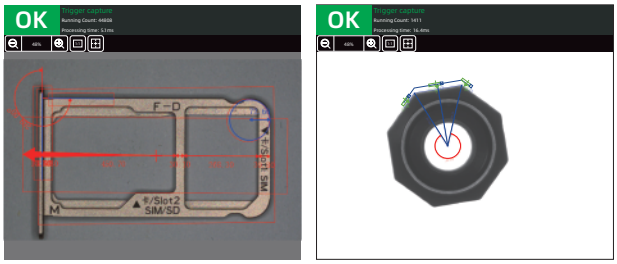
Contour Matching

Analyzes contours through blob analysis and characteristic evaluation.



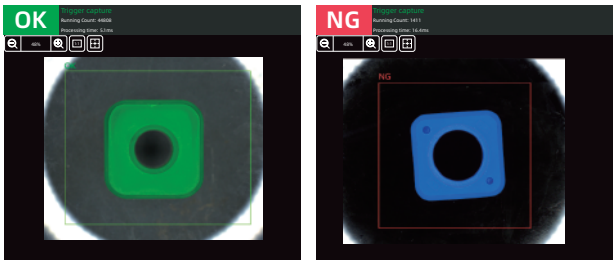
Angle Measurement

Measures product angles and circularity using dedicated angle measurement tools.



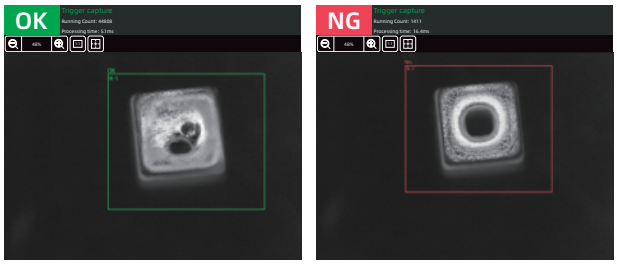
Color Classification

Classifies products using specialized color classification algorithms.



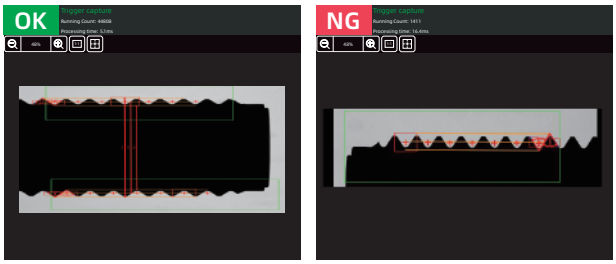
Solder Joint Inspection

Detects presence or absence of solder joints through advanced blob analysis.



Dimensional Measurement

Calculates thread pitch via geometric operations, and differentiates screw major, medium, and minor diameters.



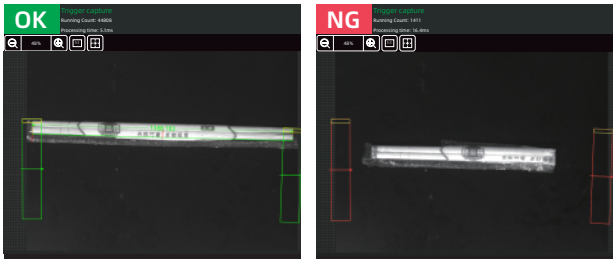
Code Reading

Identifies and verifies various code types in inspection areas using advanced decoding tools.



Line-to-Line Measurement

Precisely measures sample lengths between linear features.



Classification mode

AI classifier

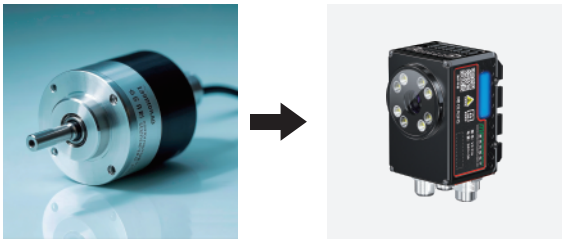
Suitable for category recognition and classification, while enabling product traceability, production process optimization, and significant , and significantly improve overall production efficiency.



Multiple modes can be pre-registered, and flexibly invoked to significantly improve production efficiency, for example achieving rapid type identification and classification, transmitting action instructions to the next process, and tracing and analyzing the causes of defective products and taking countermeasures.

Multi-Pattern Registration Support

The camera handles encoder tracking directly, eliminating the need for an external PLC.

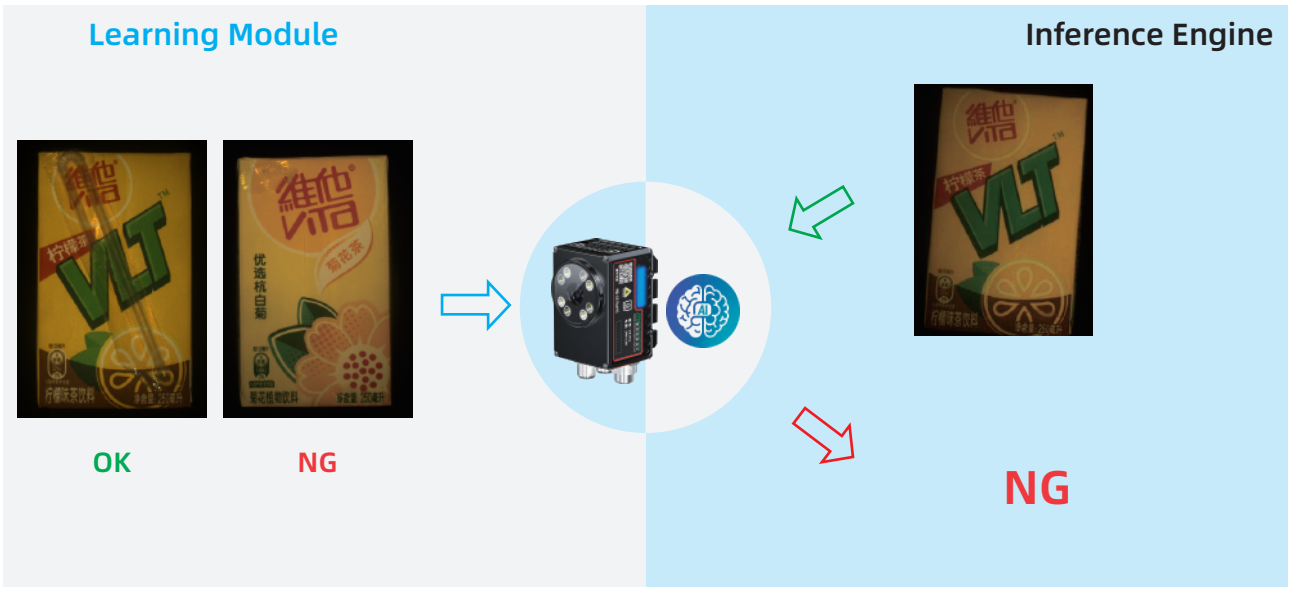


Rotary Encoder

V3 Pro series



Detects Product Double-Feed and Continuous Feeding



Classification Mode

Root Cause Tracing

By accurately identifying NG causes, the system trace the root cause of the problem, optimizes device design, and improve the reliability of the production process.

By accurately identifying the root causes of NG defects, the system enables issue traceability, facilitating equipment design optimization and enhancing production process reliability.



OK product

↓

OK



No Label

↓

Missing Label / Detached Label



Inverted Label

↓

Labels peeled off the backing paper in the wrong direction, causing inverted adhesion



Misaligned Label

↓

Uneven label material or insufficient adhesion causes shifting during application

Efficiency Improvement

By utilizing pre-registered patterns to rapidly determine product status and clarify operational requirements for the next process step, the system significantly enhances production equipment operating efficiency and overall throughput.

Through product orientation recognition, the system automatically determines subsequent operational steps, enabling highly efficient process handoff and precise production flow control.



OK product

↓

Apply label



Front

↓

Rotate270°



Back

↓

Rotate180°



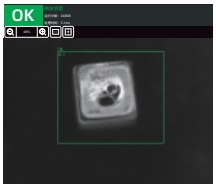
Right

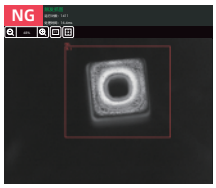
↓

Rotate 90 °

Applications

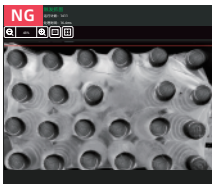
Fuse Solder Joint Inspection



Product Counting / Missing Product Detection



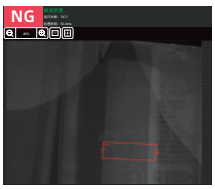
Food Mix-Up Detection



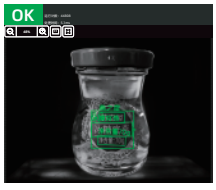



Mineral Water Bottle Label Completeness Check



Bottle Labeling Inspection: Presence / Misalignment / Overhang

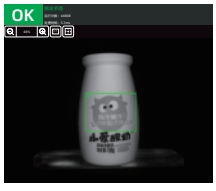


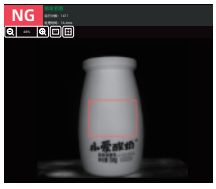
Product Type Identification



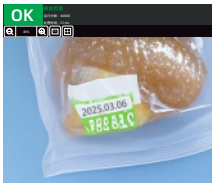



Yogurt Bottle Label Presence Verification



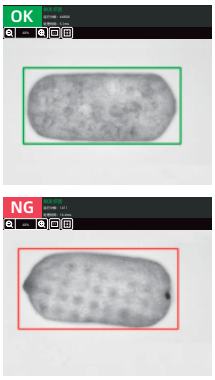
Bread Packaging Production Date Inspection

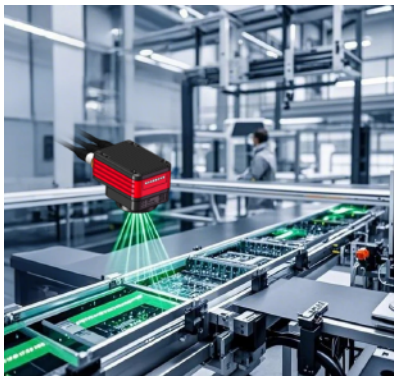


Applications

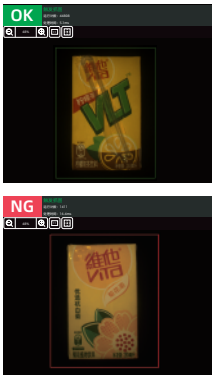
Food Appearance Inspection

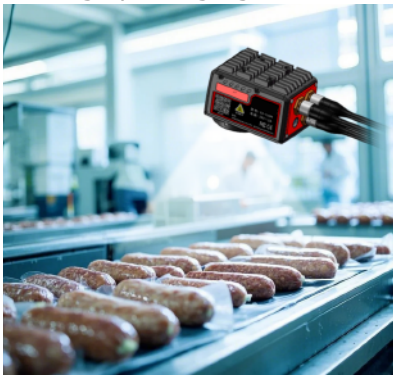
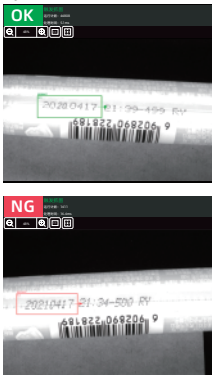
Component Character Detection



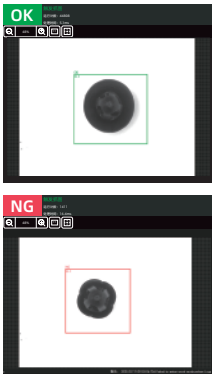

Straw presence verification & position offset detection

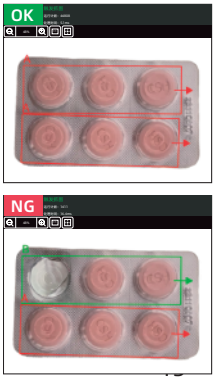
Sausage packaging date accuracy check

Product adhesive presence inspection

Pharmaceutical quantity verification

Medicine bottle barcode accuracy inspection



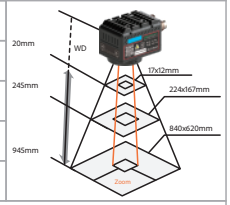
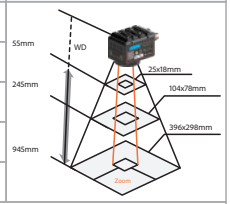
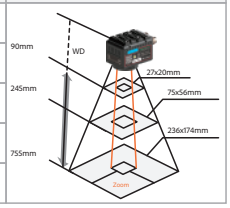

Cosmetic color detection




Technical Specifications

Parameter \ Model	V3-RM-150M	V3-RM-150C	V3-RM-500M	V3-RM-500C	V3 Pro-RM-150M	V3 Pro-RM-150C	V3 Pro-RM-500M	V3 Pro-RM-500C
Resolution	1.56M Pixel 1440x1080		5.0M Pixel 2560x1936	5.0M Pixel 2464x2064	1.56M Pixel 1440x1080		5.0M Pixel 2560x1936	5.0M Pixel 2464x2064
Frame Rate	60fps	60fps	40fps	60fps	60fps	60fps	40fps	60fps
Image Sensor	1/2.9" CMOS	1/2.9" CMOS	1/1.8" CMOS	1/1.8" CMOS	1/2.9" CMOS	1/2.9" CMOS	1/1.8" CMOS	1/1.8" CMOS
Pixel Size	3.45x3. 45μm	3.45x3. 45μm	2.8x2.8μm	2.74x2.74μm	3.45x3. 45μm	3.45x3. 45μm	2.8x2.8μm	2.74x2.74μm
Color	Monochrome	Color	Monochrome	Color	Color	Monochrome	Color	Monochrome
Exposure Mode	Global Shutter							
Input	4 inputs (including TRIGGER for smart camera snapshot triggering)							
Output	7 outputs (including FLASH-OUT for smart camera lighting control)							
Ethernet Port	Gigabit Ethernet							
Serial Port	RS232							
Communication Protocol	Free Protocol, MODBUS Protocol							
IP Rating	IP65							
Power / Power Consumption	DC24V 3A							
Light Source Power	8-24W							

Detection Range

Ordering P/N（8mm F2.8）		V3 Pro-RM-150M-08 / V3 Pro-RM-150C-08					
Working Distance WD (mm)	Field of View (mm)(H × V)	Single Pixel Precision(mm)	HFOV(mm)	HFOV(°)	VFOV(°)	DFOV(°)	Schematic diagram (mm)
20	17x12	0.04	22.02	44.39	33.4	57.67	
95	63x47	0.04	78.60	37.31	27.8	44.95	
245	224x167	0.16	279.40	49.73	37.02	59.38	
345	310x227	0.22	384.23	49.22	36.32	58.22	
945	840x620	0.58	1044.03	48.81	36.19	57.83	
Ordering P/N（12mm（F5.6）		V3 Pro-RM-150M-12 / V3 Pro-RM-150C-12					
Working Distance WD (mm)	Field of View (mm)(H × V)	Single Pixel Precision(mm)	HFOV(mm)	HFOV(°)	VFOV(°)	DFOV(°)	Schematic diagram (mm)
55	25x18	0.02	30.81	25.61	18.66	31.29	
95	41x31	0.03	51.40	24.35	18.33	30.28	
245	104x78	0.07	130.00	23.97	17.93	29.72	
345	145x107	0.1	180.21	23.74	17.69	29.27	
945	396x298	0.28	495.60	23.67	17.80	29.39	
Ordering P/N（16mm F5.6）		V3 Pro-RM-150M-16 / V3 Pro-RM-150C-16					
Working Distance WD (mm)	Field of View (mm)(H × V)	Single Pixel Precision(mm)	HFOV(mm)	HFOV(°)	VFOV(°)	DFOV(°)	Schematic diagram (mm)
90	27x20	0.02	33.6	17.06	12.75	21.15	
95	28x21	0.02	35	16.77	12.53	20.88	
245	75x56	0.05	93.6	17.40	12.99	21.63	
345	107x79	0.07	133	17.63	12.95	21.82	
755	236x174	0.16	293.21	17.77	12.99	21.98	

Company: mm

Standard Packaging Specifications



V3 Series Smart Camera



V3 Pro Series Smart Camera



Smart Camera power
IO connection cable
Micro-IO-17P-5M



Smart Camera network cable
Micro-5010-12P-5M

选配附件



Smart Camera HDMI cable
Micro-V3-HDMI-17P-3M



Camera Mounting Backplate

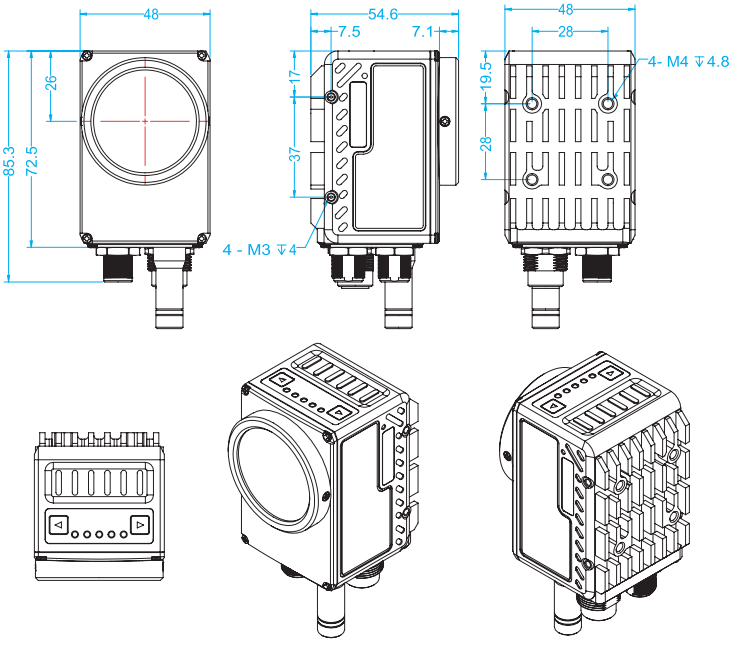


Universal Mounting Bracket



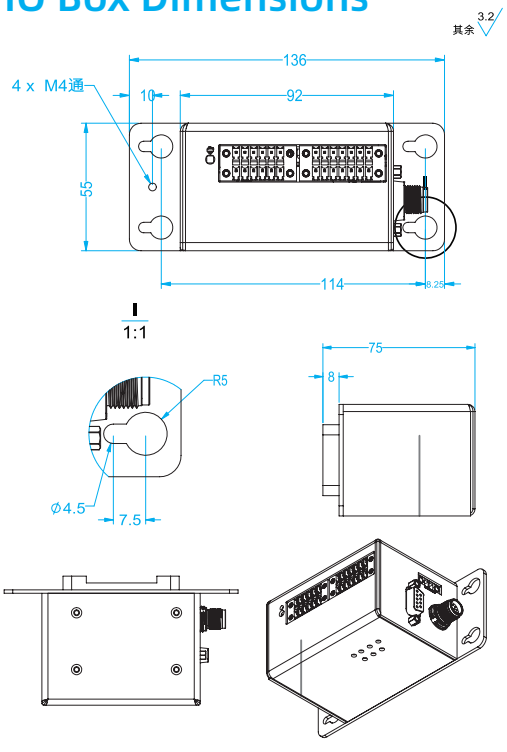
IO Box

External Dimensions



Company: mm

IO Box Dimensions



Technical Specifications

Parameter \ Model	CV3 Pro-RM-150M	CV3 Pro-RM-150C	CV3 Pro-RM-500M	CV3 Pro-RM-500C
Resolution	1.56M Pixel 1440×1080	1.56M Pixel 1440x1080	5.0M Pixel 2560x1936	5.0M Pixel 2464x2064
Frame Rate	60fps	60fps	40fps	60fps
Image Sensor	1/2.9" CMOS	1/2.9" CMOS	1/1.8" CMOS	1/1.8" CMOS
Pixel Size	3.45μm × 3.45μm	3.45x3. 45μm	2.8x2.8μm	2.74x2.74μm
Color Mode	Monochrome	Color	Monochrome	Color
Exposure Mode	Global Shutter			
Input	4 inputs (including TRIGGER for smart camera snapshot triggering)			
Output	7 outputs (including FLASH-OUT for smart camera lighting control)			
Ethernet Port	Gigabit Ethernet			
Serial Port	RS232			
Communication Protocol	Free Protocol, MODBUS Protocol			
IP Rating	IP45			
Power Supply/Power	DC24V 2A/8W			

Detection Range

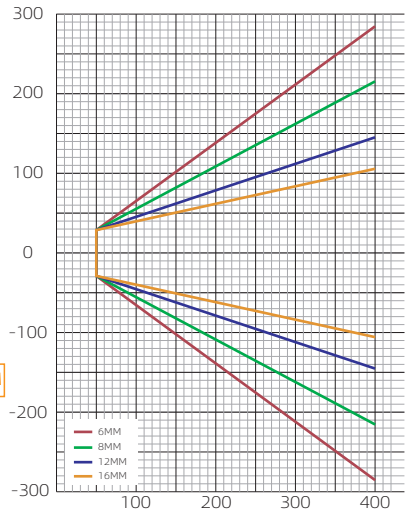
Ordering P/N	LENS FOCAL LENGTH \ Model / Working Distance (mm)		CV3 Pro-RM-150M				
			105	155	205	255	355
CV3 PRO-RM-150M-06	6mm	Field of View (FOV) (mm)	62 X 86	94 X 125	124 X 166	154 X 205	213 X 285
		Single-pixel Accuracy (mm)	0.06	0.09	0.12	0.14	0.20
CV3 PRO-RM-150M-08	8mm	Field of View (FOV) (mm)	49 x 65	72 x 96	96 x 126	117 x 156	162 x 217
		Single-pixel Accuracy (mm)	0.05	0.07	0.09	0.11	0.15
CV3 PRO-RM-150M-12	12mm	Field of View (FOV) (mm)	31 x 42	48 x 64	64 x 84	78 x 104	110 x 145
		Single-pixel Accuracy (mm)	0.03	0.04	0.06	0.07	0.10
CV3 PRO-RM-150M-16	16mm	Field of View (FOV) (mm)	22 x 29	33 x 45	45 x 60	57 x 75	80 x 106
		Single-pixel Accuracy (mm)	0.02	0.03	0.04	0.05	0.07

Ordering P/N	LENS FOCAL LENGTH \ Model / Working Distance (mm)		CV3 Pro-RM-500M			
			105	155	205	255
CV3 PRO-RM-500M-06	6mm	Field of View (FOV) (mm)	94 x 124	136 x 180	180 x 240	224 x 298
		Single-pixel Accuracy (mm)	0.05	0.07	0.10	0.12
CV3 PRO-RM-500M-12	12mm	Field of View (FOV) (mm)	46 x 60	68 x 95	90 x 120	112 x 149
		Single-pixel Accuracy (mm)	0.02	0.04	0.05	0.06
CV3 PRO-RM-500M-16	16mm	Field of View (FOV) (mm)	31 x 40	49 x 64	66 x 87	82 x 108
		Single-pixel Accuracy (mm)	0.02	0.03	0.04	0.04

Vertical field of view (mm)



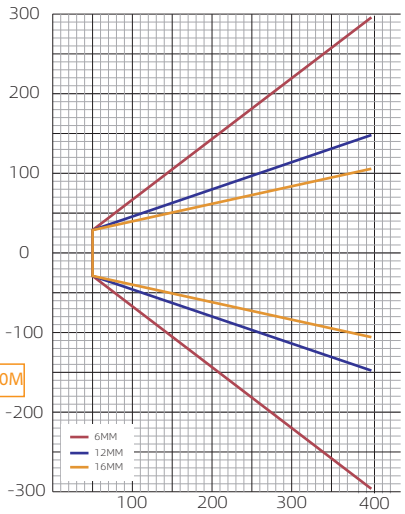
CV3 Pro-RM-150M



Vertical field of view (mm)



CV3 Pro-RM-500M



Standard Packaging Specifications



CV3 Pro Series Smart Camera



Smart Camera power
IO connection cable
Micro-IO-17P-5M



Smart Camera network cable
Micro-5010-12P-5M

选配附件



Smart Camera HDMI cable
Micro-V3-HDMI-17P-3M

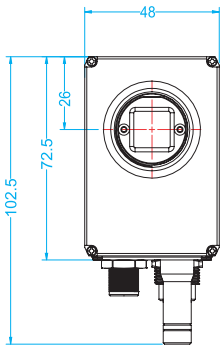


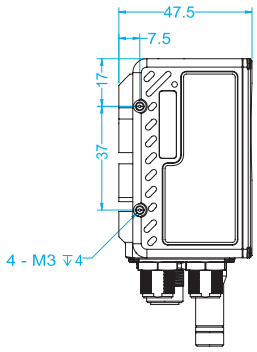
Camera Mounting Backplate

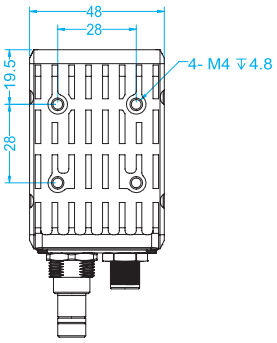


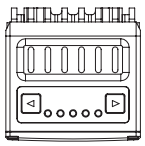
Universal Mounting Bracket

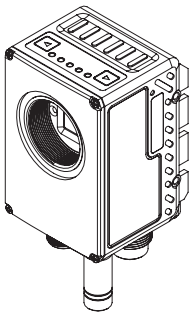
External Dimensions

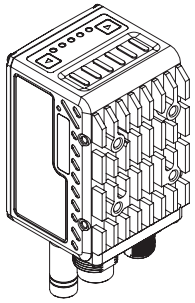












Company: mm

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