



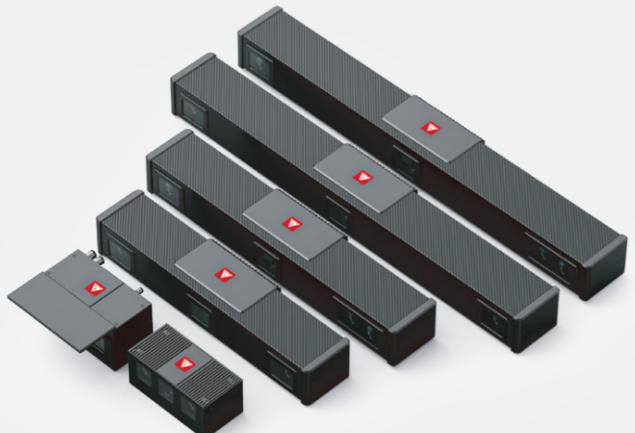
# RVC Product Manual

Professional 3D Cameras  
Engineered for Processes

# RVC Product Portfolio Overview

## Leading Provider of Structured Light 3D Cameras

As a pioneer in the 3D sensing field, RVBust Technology leverages over a decade of core algorithm R&D and industry application experience, specializing in professional solutions for critical scenarios such as inspection, measurement, reconstruction, and grasping. Our four major series—I, P, G, M—cater to industries including automotive, 3C electronics, semiconductor, steel structure, smart agriculture, medical aesthetics, and health, empowering customers to achieve efficient and precise 3D perception and intelligent upgrading. We not only provide standardized products but also customize exclusive solutions for more than 10 industry-leading enterprises to meet personalized needs. With the acceleration of intelligentization trends, the demand for 3D sensing in segmented industries will continue to grow. RVBust Technology will continue to deepen core technologies, closely align with vertical industry needs, and create more professional and thoughtful 3D sensing products and solutions to create greater value for customers.



## RVC-M Series

**Pioneering One Machine, Three Modes |**  
**AreaScan + SwingLineScan + FixedLineScan |**  
**Unafraid of Strong Light & High Reflection**

Pioneering one-machine three-mode technology supports area scanning, swing line scanning, and fixed line scanning, significantly enhancing adaptability to anti-ambient light and high-reflection materials. Widely applied in complex scenarios including automotive, 3C electronics, steel structures, and outdoor inspection.



## RVC-G Series

**Binocular Laser Surface Scanning | Large Field of View |**  
**Large Depth of Field | Resistant to Strong Light**

Equipped with binocular laser surface scanning technology and a 5MP camera, it completes a 3×2.5m large FOV scan in 1.5 seconds. With outstanding anti-ambient light capability, it's specially designed for large-scale measurement and robot guidance in scenarios like automotive parts and steel structure processing.



## RVC-P Series

**Binocular Structured Light | 0.01mm Precision |**  
**High-Accuracy Measurement & Grasping**

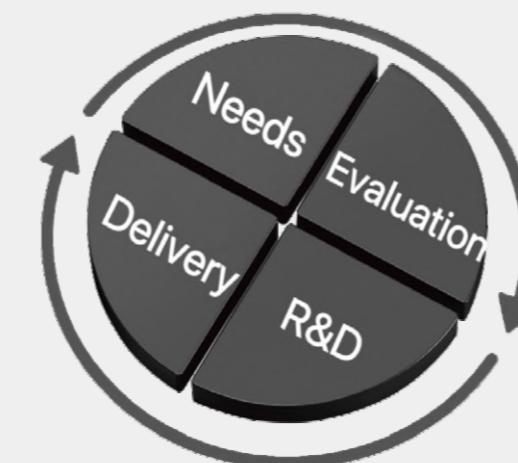
Based on binocular DLP structured light with 0.01mm precision, supporting multiple light source configurations. Suitable for indoor size measurement, 3D reconstruction, and robot grabbing, favored by 3C electronics and automotive manufacturing industries.



## RVC-I Series

**Monocular Structured Light | Micron-Level Accuracy |**  
**0.4s High-Speed Acquisition**

Utilizes monocular DLP high-speed structured light imaging technology, the Z-direction accuracy reaches up to 0.001 mm, with high-speed acquisition capability of 3 frames per second. The modular design facilitates integration, widely applied in precision inspection scenarios such as 3C electronics, PCBA, and automotive electronics.



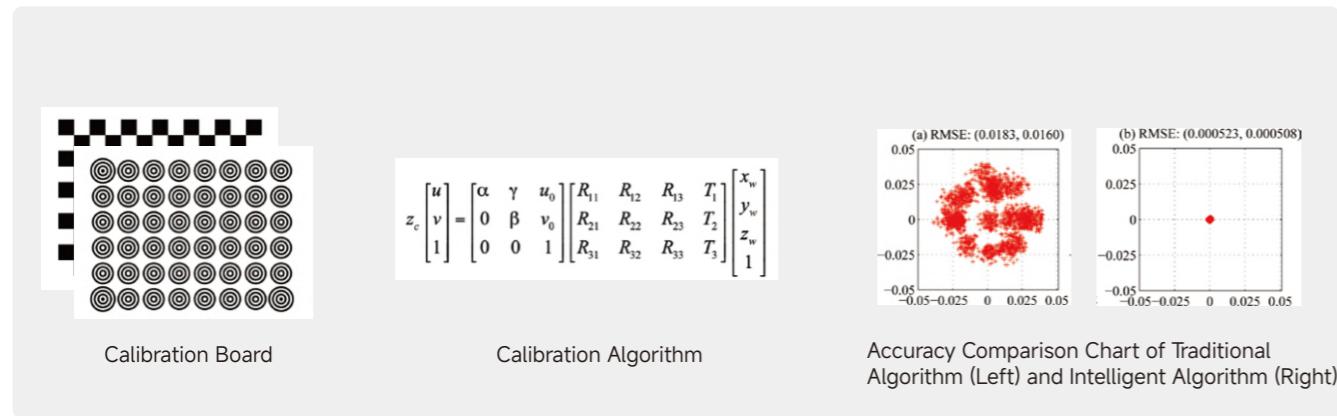
## Customized Solutions for Your Needs

**Demand Research | Solution Design |**  
**Collaborative R & D | Efficient Delivery**

For vertical industry equipment customers, we provide customized product solutions tailored to their equipment process requirements to maximize meeting their process needs. Meanwhile, we form a deep cooperative relationship with customers to ensure continuous and stable iteration and upgrade and high-quality delivery.

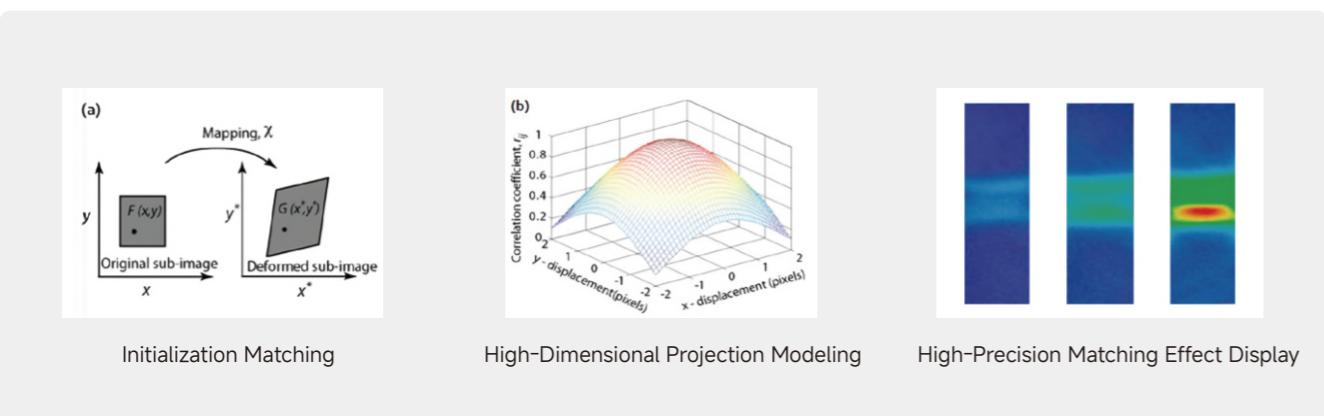
## Leading 3D Sensing Algorithms Ensure Superior Quality

As a leader in the 3D sensing field, Rvbust Technology has successfully built a top-tier 3D sensing algorithm system with over a decade of deep R&D. From the ultimate optimization of high-precision optical calibration algorithms to the intelligent enhancement of data image correlation algorithms, from the real-time response of dynamic stripe structured light algorithms to the precise restoration of point cloud denoising algorithms, every technical detail has undergone countless verifications and optimizations. Our R&D team insists on being guided by vertical process requirements, continuously iterating hardware modules and algorithm systems to ensure products maintain an industry-leading position in core indicators like stability, precision, and point cloud quality. Whether in industrial measurement.



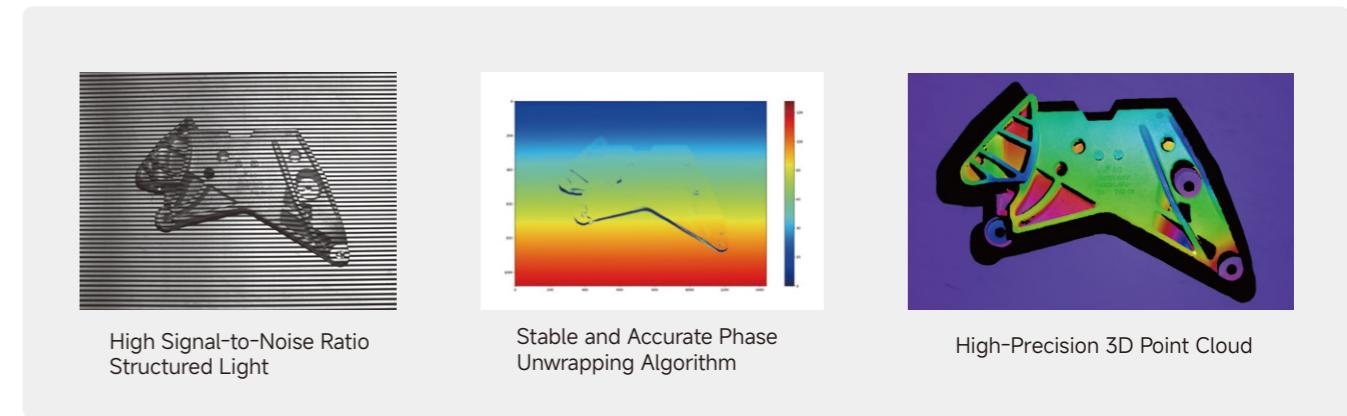
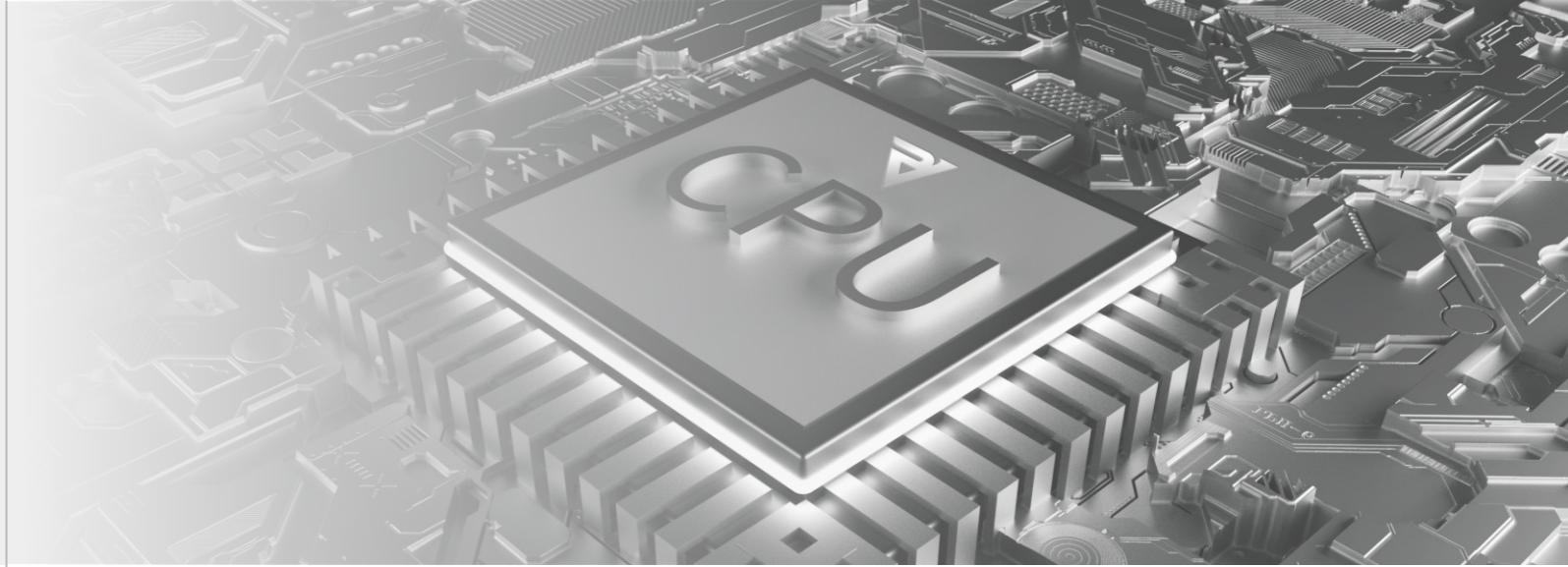
### High-precision Optical Calibration Algorithm

Adopting multi-plane cross-calibration technology combined with self-developed non-linear distortion compensation models, achieving calibration precision at the 0.01-pixel level. The original temperature drift adaptive correction mechanism ensures measurement consistency during long-term use. Compared with traditional calibration methods, measurement error is reduced by 85%, providing a reliable geometric basis for all subsequent algorithms.



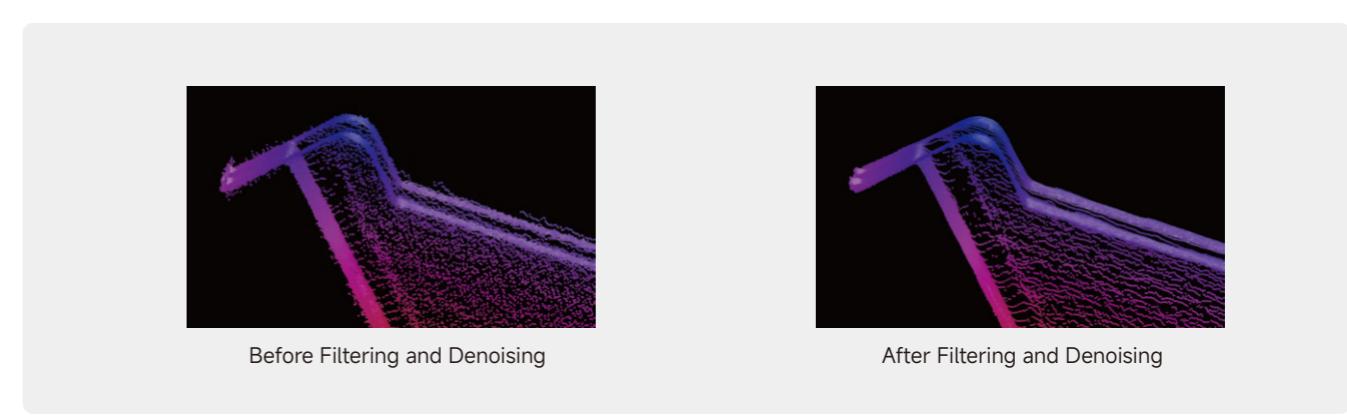
### Intelligent Image Correlation Algorithm

Based on a deep learning-based feature extraction network, fusing multi-scale texture information and geometric constraints. Using an adaptive window matching strategy, the matching success rate in low-texture areas increases by 40%. The innovative temporal consistency inspection mechanism effectively suppresses mismatches, ensuring stable recognition in complex scenarios with sub-pixel level matching precision.



### High-precision Dynamic Structured Light Imaging Algorithm

Breaking through traditional structured light encoding/decoding methods, using self-developed high SNR encoding/decoding stripe projection technology to achieve high-precision measurement with a single projection. The dynamic exposure control algorithm adapts to surfaces with different reflectivity, expanding the dynamic range. Phase unwrapping precision reaches  $\lambda/1000$ , maintaining stable performance in complex ambient light scenes with a 60% speed improvement.



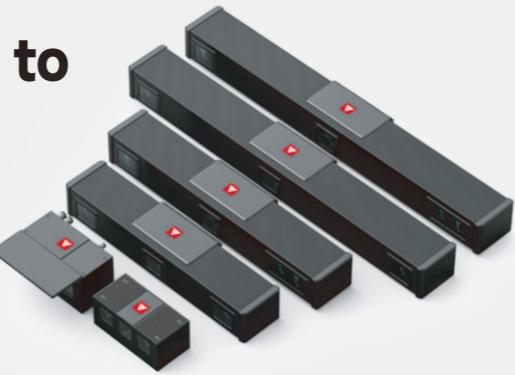
### High-fidelity Point Cloud Filtering & Denoising Algorithm

Incorporating a hybrid denoising framework of statistical filtering and geometric constraints, it intelligently identifies and retains edge detail features. The adaptive noise estimation model dynamically adjusts filtering parameters based on local point cloud density. Compared with traditional methods, it removes 95% of noise while preserving 99% of effective features, ensuring high fidelity and integrity of point cloud data.

# RVC-M Series Products

## Triple-Mode Operation | Resistant to High Reflectivity & Strong Light

The RVC-M series 3D camera innovatively integrates line scan and area array imaging functions into one unit. Ambient light resistance exceeds 600,000 Lux, with exceptional resistance to high reflectivity and multiple reflections. IP65 protection rating and compact design enable rapid and stable output of high-precision 3D point cloud data.



### Triple-Mode On-Demand Switching

Innovatively integrates three imaging modes in one camera: Area Structured Light + Wobulation Scan + Fixed Line Scan, solving the challenge of 3D imaging throughout the entire welding process.

### Innovative Algorithms Handle High Reflectivity

Applies binocular dynamic compensation algorithms to obtain high-quality point clouds even.

## Product Specifications

3D camera custom development services are provided. Consultation Hotline: 400-0419-900

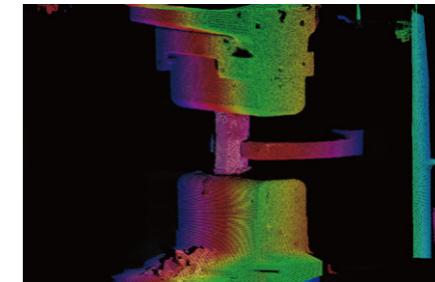
Model	RVC-M2600	RVC-M2600C	RVC-M51000	RVC-M52000	RVC-M52000C
Resolution (MP)	1440*1080(1.6M), Binocular, Greyscale	1440*1080(1.6M), Binocular, Color	2448*2048(5.0M), Binocular, Greyscale	2448*2048(5.0M), Binocular, Greyscale	2448*2048(5.0M), Binocular, Color
Working Distance Range (mm)	400-1000	400-1000	700-1500	1200-3000	1200-3000
Near Field of View (mm)	350*220 @ 400	365*231 @ 400	700*500 @ 700	1200*700 @ 1200	1038*1020 @ 1200
Far Field of View (mm)	860*650 @ 1000	924*640 @ 1000	1480*1200 @ 1500	2850*2250 @ 3000	2898*2598 @ 3000
XY Resolution (mm)	0.25 @ 400; 0.7 @ 1000	0.27 @ 400; 0.66 @ 1000	0.33 @ 700; 0.65 @ 1500	0.5 @ 1200; 1.2 @ 3000	0.55 @ 1200; 1.34 @ 3000
Z Single Point Repeatability 1σ (mm)	0.04 @ 1000	0.04 @ 1000	0.01 @ 1500	0.03 @ 3000	0.03 @ 3000
Z Area Repeatability 1σ (mm)	0.02 @ 1000	0.02 @ 1000	0.02 @ 1500	0.03 @ 3000	0.03 @ 3000
Anti-ambient Light Intensity (Lux)	>600 000 (Fixed & Swing Line Scan)	>600 000 (Fixed & Swing Line Scan)	>600 000 (Fixed & Swing Line Scan)	>600 000 (Fixed & Swing Line Scan)	>600 000 (Fixed & Swing Line Scan)
Normal Mode Shooting Time (s/frame)	0.98-2.26	1.1-2.3	1.7-31	1.7-31	1.81-3.05
Shortest Swing Line Scan Speed (s/frame)	11	1.2	1.42	1.42	1.5
Shortest Shooting Time (s/frame)	200fps (Configurable to >200 FPS)	200fps (Configurable to >200 FPS)	60fps (Configurable to >200 FPS)	60fps (Configurable to >200 FPS)	60fps (Configurable to >200 FPS)
Light Source	Laser	Laser	Laser	Laser	Laser
Communication Interface	GigE	GigE	GigE	GigE	GigE
Camera Weight (kg)	0.95	1.2	2.8	29	2.7
Camera Size (mm)	148*73.5*73.5	170*74.5*73	392*94*81	692*94*81	692*94*81
Working Temperature (°C)	-20-50	-20-50	0-50	0-50	0-50
Protection Level	IP67	IP65	IP65	IP65	IP65
Working Voltage/Current/Peak Power	DC 24V/3.75A/48W	20-80 (non-condensing)	ROHS/CE/Laser Class:Class 3R	Power adapter, power cable, data cable	
Working Humidity (%RH)					
Camera Certification					
Standard Accessories					
Third-party Development Support			Supported		
Supported Development Languages			C/C++/C#/Python		
Supported Development Platforms			Linux/Windows		

## Application Cases



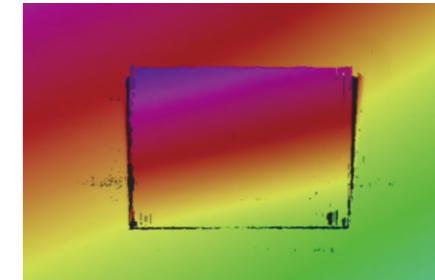
### M52000 for Aviation Titanium Alloy Forging

The RVC-M52000 3D camera captures high-temperature calcined metals with clear and complete point clouds, suitable for long-distance precise measurement of high-temperature calcined metals.



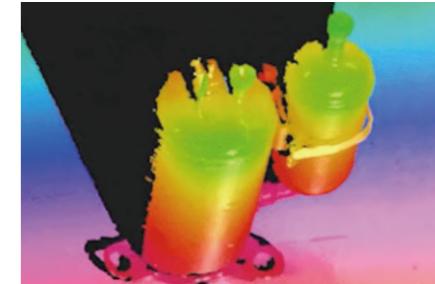
### M52000 for Mirror Shooting

The RVC-M52000 3D camera, with extremely high structured light SNR and binocular dynamic compensation algorithm, obtains high-quality point clouds even under smooth mirror reflection conditions.



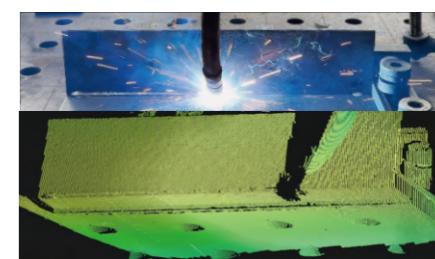
### M51000 for Black High-gloss Compressor Shooting

The RVC-M51000 3D camera accurately images both white and black high-reflection workpieces with single exposure. Shooting black high-reflection compressor housings, it precisely identifies complex structures like deep holes and grooves in a single image, eliminating the need for multiple fill lights or multi-angle scanning.



### M2600 applied to Weld Recognition for High-Reflective Objects

The RVC-M2600 3D camera enables easy imaging of high-brightness and reflective aluminum alloy parts, assisting robots in better addressing high-precision visual positioning guidance applications such as weld seam extraction, position tracking, outdoor positioning measurement, material handling, unstructured grasping, and workpiece assembly.



### M2600 for Welding Arc Shooting

The RVC-M2600 3D camera, with 600,000 Lux anti-ambient light capability, directly faces strong welding arcs to shoot while welding, maintaining complete point cloud imaging. Its rugged protective body and slag-blocking cover structure assist robots in handling various welding scenarios with ease.



# RVC-G Series Products

## Large Field of View Large Depth of Field

Adopting binocular laser imaging, combined with advanced image fusion and HDR technology, significantly enhancing the camera's ambient light adaptability. Widely applicable to various fields such as automotive manufacturing, logistics, electronic products, heavy machinery, food, and home appliances.



### Higher Precision

Using laser projection technology and high-resolution binocular 5-megapixel cameras, the point cloud quality is higher, with the highest precision reaching 0.1mm.

### Super Strong Body

High-strength carbon fiber body design, high structural stability, not easy to deform, and the weight is less than 3kg.

## Product Specifications

3D camera custom development services are provided. Consultation Hotline: 400-0419-900

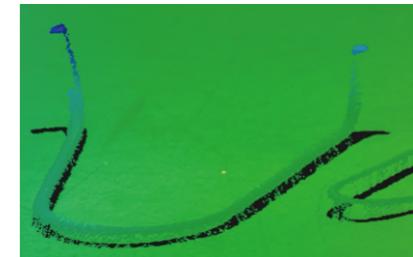
Model	RVC-G51000	RVC-G52000
Resolution ( MP)	2448*2048 (5MP) , Binocular, Greyscale	2448*2048 (5MP) , Binocular, Greyscale
XY Direction Resolution (mm)	0.29-0.54	0.5-1.2
Z-Single Point Repeatability 1σ (mm)	0.1 @ 1500	0.4 @ 3000
Z-Area Repeatability 1σ (mm)	0.01 @ 1500	0.03 @ 3000
Working Distance Range (mm)	700-1500	1200-3000
Near Field of View (mm)	633*623 @ 700	1050*1000 @ 1200
Far Field of View (mm)	1471*1230 @ 1500	2900*2500 @ 3000
Shortest Shooting Time (s/frame)	1.7	1.7
Light Source	Laser	Laser
Communication Interface	GigE	GigE
Camera Weight (kg)	2.8	2.9
Camera Size (mm)	492*93.5*81	692*93.5*81
Working Voltage/Current/Peak Power	DC 24V/3.75A/48W	
Protection Level	IP65	
Working Temperature (°C)	0-50	
Working Humidity (%RH)	20-80 (non-condensing)	
Camera Certification	ROHS/CE/Laser Class:Class 3R	
Standard Accessories	Power adapter, power cable, data cable	
Third-party Development	Supported	
Supported Development Languages	C/C++/C#/Python	
Supported Development Platforms	Linux/Windows	
Third-party Software Libraries	Halcon/OpenCV/Open3D/PCL/VisionPro	

## Application Cases



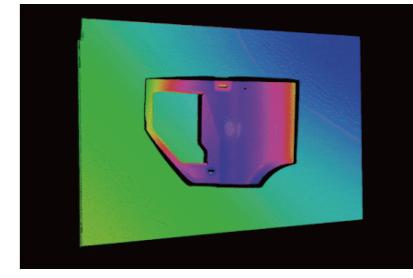
### G52000 Applied to Rebar Positioning Guidance

The RVC-G52000 large field of view 3D camera features sub-millimeter accuracy, good point cloud stability, and excellent anti-ambient light performance, capable of quickly measuring various objects such as rebars and steel plate workpieces and outputting high-quality 3D point cloud data, widely suitable for typical depalletizing and handling scenarios in logistics, express delivery, and heavy machinery.



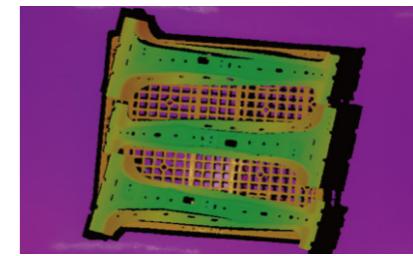
### G52000 Applied to Door Positioning and Grasping

The RVC-G52000 large field of view 3D camera has an ultra-large field of view of 2.9×2.5@3m, a large depth of field of 1.8 meters, and excellent anti-ambient light performance, capable of quickly identifying and positioning black-bright, white-bright, and reflective door workpieces and outputting high-quality 3D point cloud data, providing precise positioning guidance for automotive production automation.



### G52000 Applied to Body B-pillar Welding

The RVC-G52000 large field of view 3D camera still outputs fine point clouds when shooting groove right angles, and can image complex structures with multiple reflections in a single exposure. The camera has a super-strong body of high-strength carbon fiber and high protection, suitable for various welding scenarios with large fields of view.



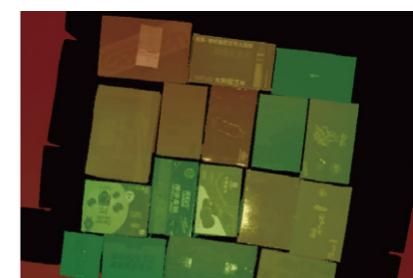
### G51000 Applied to Aluminum Angle Piece Detection

The RVC-G51000 medium field of view 3D camera features high precision, high protection, and excellent anti-ambient light performance, capable of easily identifying reflective aluminum angle pieces and outputting complete point cloud maps, providing precise positioning data and accurate guidance for unordered grasping of workpieces.



### G51000 Applied to Carton Depalletizing

The RVC-G51000 medium field of view 3D camera features high precision, high protection, and excellent anti-ambient light performance, capable of accurately identifying tightly stacked cartons and outputting complete and precise high-quality 3D point cloud data through scanning, providing precise guidance for automated depalletizing.



# RVC-P Series Products

## Indoor Positioning and Guidance

Adopting binocular structured light technology, with stable performance, waterproof and dustproof, high-temperature resistance, and adaptability to factory environments with heavy dust, water vapor, and oil pollution. Widely applied to indoor robot guidance scenarios such as grasping, cutting, grinding, spraying, positioning assembly, and gluing.



### High Precision

Single-point repeatability up to 0.01mm, enabling high-precision shooting in medium field of view and long distance, easily handling various workpieces with complex structures and tight stacking.

### Innovative Algorithms Handle High Reflectivity

Applies binocular dynamic compensation algorithms to obtain high-quality point clouds even under near-mirror reflection conditions.

### Product Specifications

3D camera custom development services are provided. Consultation Hotline: 400-0419-900

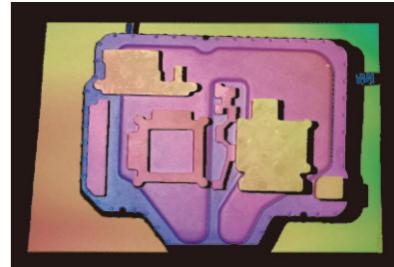
Model	RVC-P5330	RVC-P31300	RVC-P3270	RVC-P2600
Resolution (MP)	2448*2048 (5.0M) Binocular, Greyscale	2048*1536 (3.2M) Binocular, Greyscale	2048*1536 (3.2 M) Binocular, Greyscale	1440*1080 (1.6M ) Binocular, Greyscale
Working Distance Range (mm)	380~580	1200~2000	250~350	800~1200
Near Field of View (mm)	263*171 @ 380	1010*636 @ 1200	220 * 135 @ 250	465*308 @ 800
Far Field of View (mm)	373*252 @ 580	1551*1012 @ 2000	289 * 186 @ 350	684*466 @ 1200
XY Resolution (mm)	0.11-0.17	0.5-0.7	0.11-0.15	0.35-0.52
Z Single Point Repeatability 1σ (mm)	0.025-0.046	0.10-0.46	0.012-0.020	0.016-0.348
Z Area Repeatability 1σ (mm)	0.0017-0.0044	0.008-0.019	0.0004-0.0012	0.010-0.026
Shortest Shooting Time (s/frame)	2.0	1.8	1.43	1.42
Light Source	Blue LED	RGB LED	Blue LED	RGB LED
Communication Interface	GigE	GigE	GigE	GigE
Camera Weight (kg)	1.7	2.6	1.6	1.7
Camera Size (mm)	250*135*57	560*135*58	250*135*57	220*135*57
Working Voltage/Current/Peak Power	DC 24V/3.75A/60W			
Protection Level		IP65		
Working Temperature (°C)		0-45		
Working Humidity (%RH)		20-80 (non-condensing)		
Camera Certification		ROHS		
Standard Accessories		Power adapter, power cable, data cable		
Third-party Development		Supported		
Supported Languages		C/C++/C#/Python		
Supported OS		Linux/Windows		
Adapted Third-party Software Libraries		Halcon/OpenCV/Open3D/PCL/VisionPro		

## Application Cases



### P5330 Applied to Casting Dimension Detection

The RVC-P5330 high-precision 3D camera is suitable for high-precision detection of casting surface defects and structural dimensions, capable of outputting high-precision point clouds for various complex workpieces, metals, plastics, and other typical objects, meeting most industrial application needs.



### P31300 Applied to Undercarriage Detection

The RVC-P31300 medium-large field of view 3D camera has a single-point repeatability of up to 0.1mm, enabling high-precision shooting in large field of view and long distance, easily handling undercarriage environment detection. It is available in multiple versions of blue light and white light to meet customer needs in multiple scenarios.



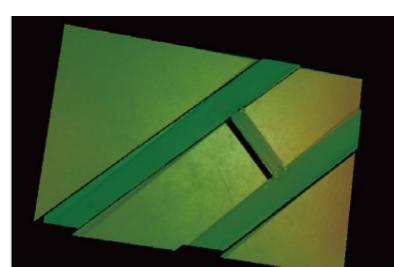
### P31300 Applied to Soft Package Depalletizing

The RVC-P31300 medium-large FOV 3D camera features high precision, fast imaging, and excellent anti-ambient light capability. It captures high-quality 3D point cloud data for densely stacked and unordered objects, providing precise positioning guidance for soft package depalletizing.



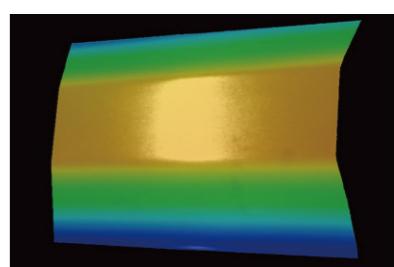
### P2600 for Vehicle Workpiece Spraying Guidance

The RVC-P2600 high-precision 3D camera, leveraging self-developed dynamic stripe structured light technology, enhances anti-ambient light interference capability for simultaneous shooting and detection of multiple materials. It captures complete and clear images of reflective vehicle workpieces, providing precise spraying guidance.



### P2600 Applied to Welding Workpieces

The RVC-P2600 high-precision 3D camera features high precision, fast imaging speed, stable performance, waterproof and dustproof, high-temperature resistance, and can be applied to workpiece welding, widely used in high-precision visual positioning scenarios such as welding, cutting, grinding, spraying, positioning assembly, and gluing.



# RVC-I Series Products

## 2D+3D High-Precision Inspection

Adopting monocular DLP high-speed structured light imaging technology, the Z-direction accuracy reaches the micron level, with a high-speed acquisition capability of 4 frames per second. The modular design facilitates integration, making it widely applicable to precision inspection scenarios such as 3C electronics, PCBA, and automotive electronics.



### Ultra-High Accuracy

Self-developed machine vision high-precision calibration algorithm, with single-point repeatability up to the micron level.

### Fast Shooting Speed

Self-developed acceleration hardware and point cloud generation algorithm enable sub-second imaging speed, with the fastest shooting speed of 0.4s/frame.

## Product Specifications

3D camera custom development services are provided. Consultation Hotline: 400-0419-900

Model	RVC-I5140	RVC-I540	RVC-I3360	RVC-I2370	RVC-I2120
Resolution (MP)	2448*2048 (5MP), Greyscale	2448*2048 (5MP), Greyscale	2048*1536 (3.2M), Greyscale	1440*1080 (1.6M), Color	1440*1080 (1.6M), Greyscale
Working Distance Range (mm)	280-320	265-280	400-700	400-800	230-330
Near Field of View (mm)	158*129 @ 280	45*37 @ 265	244*177 @ 400	248*164 @ 400	100*75 @ 230
Far Field of View (mm)	179*143 @ 320	49*41 @ 290	413*301 @ 700	500*331 @ 800	120*100 @ 330
XY Resolution (mm)	0.065-0.073	0.02-0.025	0.13-0.21	0.17-0.34	0.07-0.09
Z Single Point Repeatability 1σ (mm)	0.0069-0.0103	0.0023-0.055	0.007-0.0022	0.047-0.140	0.013-0.028
Z Area Repeatability 1σ (mm)	0.0005-0.0011	0.0005-0.0009	0.002-0.005	0.005-0.018	0.001-0.005
Shortest Shooting Time (s/frame)	11	0.8	0.8	0.4	0.4
Light Source	Blue LED	Blue LED	Blue LED	RGB LED	RGB LED
Communication Interface	GigE	USB3.0	USB3.0	GigE	GigE
Camera Weight (kg)	1.5	1.5	1.5	1.2	0.5
Camera Size (mm)	220*135*57	220*135*57	250*135*57	150*135*57	107*75*50
Working Voltage/Current/Peak Power	DC 24V/3.75A/60W				
Protection Level		IP65			
Working Temperature (°C)		0-45			
Working Humidity (%RH)		20-80 (non-condensing)			
Camera Certification		ROHS/CE			
Standard Accessories		Power adapter, power cable, data cable			
Third-party Development		Supported			
Supported Languages		C/C++/C#/Python			
Supported OS		Linux/Windows			
Adapted Third-party Software Libraries		Halcon/OpenCV/Open3D/PCL/VisionPro			

## Application Cases



### I540 Applied to Height Difference Detection of Headphone Joint Lines

The RVC-I540 ultra-high-precision 3D camera, equipped with a 5-megapixel high-resolution camera, has a Z-axis single-point repeatability reaching up to the micron level, easily detecting the height difference of headphone mold joint lines.



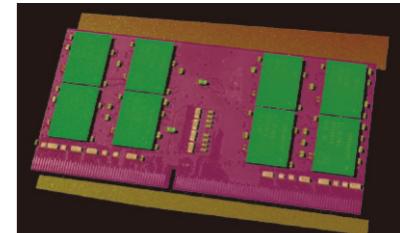
### I5140 Applied to Air Conditioner Blade Defect Detection

The RVC-I5140 is a micron-level 3D camera that can detect dimensions, spacing, hole positions, defects, flatness, etc., of workpieces with different materials and sizes, suitable for scenarios such as automotive component installation hole position and size detection, glue path detection, and concrete block flatness detection.



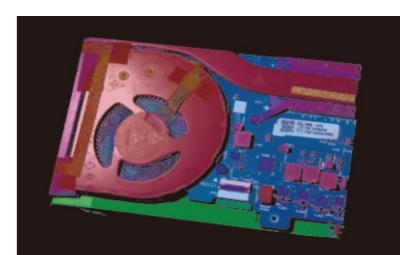
### I360 Applied to PCBA Board Detection

The RVC-I360 micron-level 3D camera can detect flatness, height, step difference, hole position, defects, etc., of complex-structured, small-detail, and special-shaped objects such as PCBA boards, lithium batteries, headphones, and mobile phones, meeting the detection and measurement needs of high-precision industries such as 3C, electronic components, and automotive manufacturing.



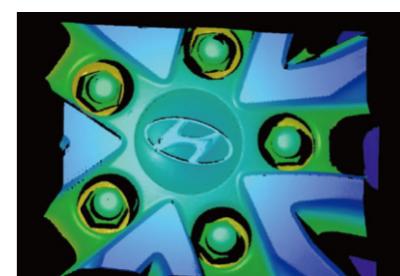
### I5140 Applied to Computer Motherboard Detection

The RVC-I5140 micron-level 3D camera features ultra-high precision, fast shooting speed, and anti-reflection, capable of detecting local glue paths, screws, installation parts, defects, etc., on computer motherboards, mobile phone frames, and other objects, quickly outputting high-precision 3D point cloud data, greatly improving the quality detection level and efficiency.



### I2120 Applied to Bolt Positioning on Automotive Wheels

The RVC-I2120 is a lightweight 3D camera with a body size of only 107\*75\*50mm and a weight of only 0.5kg, easily adaptable to lightweight industrial robots with flexible deployment. It can assist robots in better handling high-precision visual positioning guidance applications such as structure detection, material transfer, unordered grasping, assembly, loading/unloading, welding, and component sorting.





Sensing for Intelligence



## RVBUST Technology.Ltd.

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