

HD-U Series Intelligent High-Precision Optical Measuring System

PRODUCT BROCHURE



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Company Profile

Company Overview

Established in 2011, a national high-tech enterprise specializing in R&D, production, and sales of intelligent measurement and control instruments and vision automation systems.

Core Business

Focus on vision automation, image measuring instruments, and laboratory metrology equipment, providing comprehensive lab solutions.

Qualifications

Holding ISO9001:2015 certification and numerous patents, demonstrating our commitment to quality and innovation.

Global Presence

Serving 7000+ clients across 3C, mold, aerospace, etc. Offices in major Chinese cities and Vietnam ensure prompt service.



Certifications & Achievements



Innovation Driven

Continuous R&D investment for cutting-edge solutions

Product Introduction



HD-U Series: An intelligent high-precision optical inspection system designed for a wide range of industrial applications.



Industry Applications: Widely used in 3C, mold, hardware, plastic, electronics, cutting tools, die-cutting, PCB, semiconductor, medical devices, machinery processing, smart wearables, aerospace, and military industries.



HD-U Series Application Scenarios

Core Technology



Innovative Optical Design

Dual-image vision system breaks traditional boundaries, offering a wider measurement range.



High-Definition Zoom Lens

13.3:1 HD auto-zoom coaxial lens with multi-angle LED lighting for precise edge detection.



One-Click Flash Measurement

Combines large FOV flash measurement with high-magnification precision, boosting efficiency by 100x.



AI-CNC Software

Powerful software with one-click positioning, automatic product recognition, batch measurement & export.



AI-Powered Automation

Optional AI auto-measurement technology enables 100% automated inspection through deep learning.



Fixture-Free Measurement

Unique vision positioning system allows measurement without fixtures for irregular or delicate parts.



Dual Telecentric Lenses

Large field of view with low-magnification telecentric lenses for fast measurement of large products.



3D Measurement Capability

Optional laser and 3D probe systems for comprehensive 2D and 3D inspection.

Technical Specifications

Specification	HD-432U
Measurement Range (X/Y/Z)	Large FOV: 300×300×200 Small FOV: 400×300×200 Single FOV: 43×35×200 (mm)
Machine Dimensions (L×H×W)	700 x 1350 x 1662 mm
Load Capacity	30 Kg
CCD Camera	Large FOV: HD-500W Industrial; Small FOV: HD-500W Ultra HD Full Frame Rate
Optical Lens	Large: Dual Telecentric; Small: 13.1:1 Auto-Zoom Coaxial (0.6-8X Optical, 18-240X Image)
Measurement System	AI-CNC PRO
Power Supply	220V ±10%, 50/60Hz
Optical Scale Resolution	0.0001 mm
X/Y Measurement Accuracy	Large FOV: (5+L/200)μm Small FOV: (1.8+L/200)μm
Z Measurement Accuracy	5 μm
Repeatability	2 μm
Operating Environment	Temp: 20-25°C Humidity: 50%-60% Power: 220V

Optical Performance



Superior Optical Design

Industry-leading structure & HD components ensure perfect feature presentation with enhanced edge contrast.



High-Performance Cameras

Customized high-pixel cameras deliver high-contrast images and 60% faster edge detection.



Auto-Zoom Lens

Fully automatic magnification adjustment for precise measurement of even the smallest dimensions.



Multi-Angle Illumination

6-ring, 8-zone, 40-phase lighting system with optional coaxial light for clear boundary definition.



Parallel Backlight

Near-parallel design for sharp imaging of thick products and shaft parts without edge blurring.



Vision Positioning System

Industry-unique system allows automatic measurement without fixtures or datum setup.



Versatile Lighting Solutions

Optimized configurations for various materials: metal, plastic, rubber, ITO, transparent, etc.

Mechanical Structure



Marble Base

High-quality natural marble base and stage ensure minimal internal stress, deformation resistance, and permanent precision retention.



Ergonomic Design

Integrated design saves valuable space and provides easy access for loading and unloading parts efficiently.



High-Precision Components

Japanese THK linear guides and ground ball screws ensure smooth, low-noise, and high-speed movement up to 600MM/S.



Servo Motors

Panasonic 400W high-inertia servo motors with full closed-loop control ensure operational stability and long-term durability.



Stable Construction

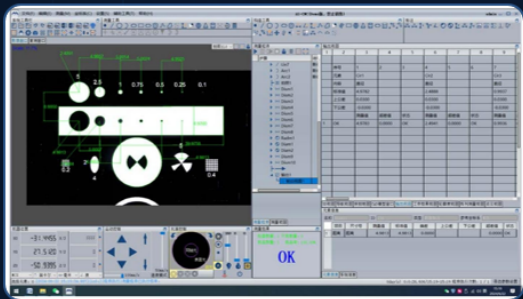
Wide base with a centered center of gravity design ensures long-term precision and significantly extends the service life.



Zero-Step Z-Axis

Z-axis design with full contact to the marble surface ensures superior spatial accuracy without any step errors.

Software Features



AI-CNC PRO Software Interface



3D Measurement Software

In-house developed for precise and efficient workpiece measurement.



Multi-OS Support

64-bit architecture compatible with Windows 7/10/11 for large datasets.



Automated Functions

Auto measurement, focusing, edge detection & lighting control.



Smart Recognition

One-click positioning, auto product recognition & batch measurement.



CAD Integration

CAD import for auto programming and profile export support.



Comprehensive Tools

Geometric measurement, shape construction & GD&T evaluation.



Flexible Data Output

Export to Excel, Word, PDF, CSV, TXT; multiple simultaneous outputs.



Advanced Scanning

Panoramic scanning & GPS navigation for quick point location.



3D Measurement Options

Compatible with KEYENCE laser & RENISHAW probing systems.

Empowering HD-U Series with intelligent, efficient, and accurate inspection capabilities.

System Configuration

Standard Configuration

- 01. Body & Stage:**Grade 00 Natural Marble Base/Stage/Column (1 Set)
- 02. CCD:**AI Ultra HD 500W+500W Industrial CCD (2 Pcs)
- 03. Lens:**Dual Telecentric & 13.3:1 Auto-Zoom Coaxial Lens (2 Pcs)
- 04. Light Source:**Coaxial + Telecentric Parallel + Ring Light (5 Pcs)
- 05. Vision System:**43*35mm Positioning System (1 Set)
- 06. Optical Scale:**Renishaw 0.1um Waterproof/Oil-Proof Scale (3 Pcs)

- 07. Motor:**Panasonic 400W High-Power Servo Motor (3 Sets)
- 08. Guide Rail:**THK P-Grade Linear Guide (3 Sets)
- 09. Ball Screw:**THK Precision Ground Ball Screw (3 Sets)
- 10. Software:**AI-CNC PRO (Dongle) (1 Set)
- 11. Controller:**HD-4000P Motion Controller (1 Pc)
- 12. Computer:**i7 CPU / 16G RAM / 500G SSD / 24" LCD (1 Set)

Optional Upgrades

- 13. Fly Shooting:**Intelligent Fly Shooting System
- 14. AI Measurement:**Intelligent AI System

- 15. Probe System:**Renishaw Probing System
- 16. Laser System:**High-Precision Laser / Scanning Spectral Laser

Operating Environment



General Environment

The instrument should be operated in a clean, dust-free indoor environment, free from shock, vibration, strong magnetic fields, and corrosive media.



Temperature & Humidity

Standard: Temperature $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, Relative Humidity $< 82\%$.

Precision-Critical: Temperature $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$, Humidity 45~55%.

Service Terms

🔧 Installation & Commissioning

On-site installation and commissioning provided. Remote guidance and documentation available for distant areas.

👤 Training & Follow-up

On-site training upon installation; remote video sessions available. Additional in-depth training can be scheduled.

✓ System Acceptance

Acceptance can be done independently or with assistance, strictly following technical agreements and national standards.

🛡️ After-Sales Service

- **Warranty:** 12 months free repair (non-human damage).
- **Lifetime Support:** Comprehensive maintenance service for the product lifecycle.
- **Response:** 2h response, 24h on-site (PRD), 48h elsewhere.



Global Service Network Coverage

Strategically located service centers ensure rapid response and support across key regions.