

# HD-U Series Intelligent High-Precision Optical Measuring System

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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.



## One-Click Flash Measurement

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



## AI-Powered Automation

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



## Dual Telecentric Lenses

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



## High-Definition Zoom Lens

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



## AI-CNC Software

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



## Fixture-Free Measurement

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



## 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	<b>0.0001 mm</b>
X/Y Measurement Accuracy	Large FOV: (5+L/200)μm   Small FOV: (1.8+L/200)μm
Z Measurement Accuracy	5 μm
Repeatability	<b>2 μm</b>
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

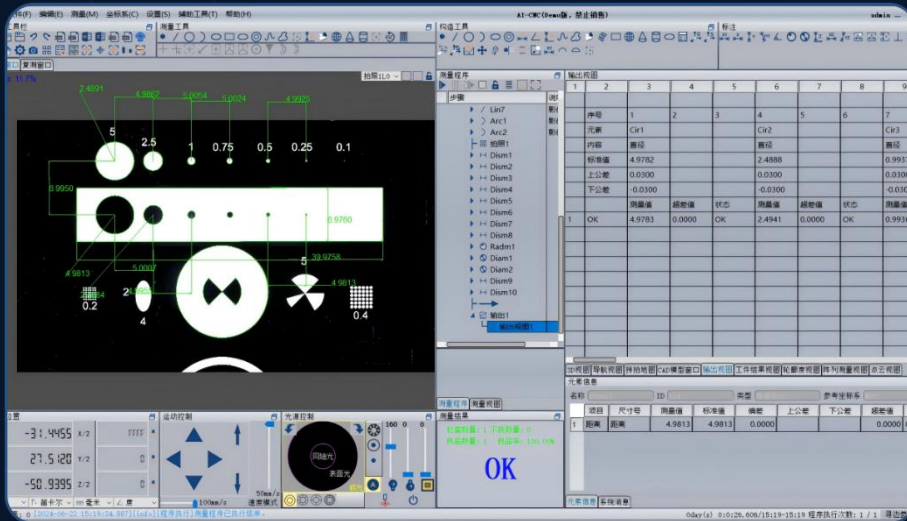
Wide base with a centered center of gravity design ensures long-term precision and significantly extends the service life.



## 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%.

