Ver.2021/7

汇萃视觉

Comprehensive Intelligent High-speed Machine Vision System

HCvision System

杭州汇萃智能科技有限公司
Mstar Technologies, Inc.

Who We Are

Mstar Technologies, Inc, as a leading provider of a comprehensive Machine Vision System in China, was founded in March 2012, located in Zhejiang Overseas High-Level Talents Innovation Park with a registered capital of RMB 11.11 million.

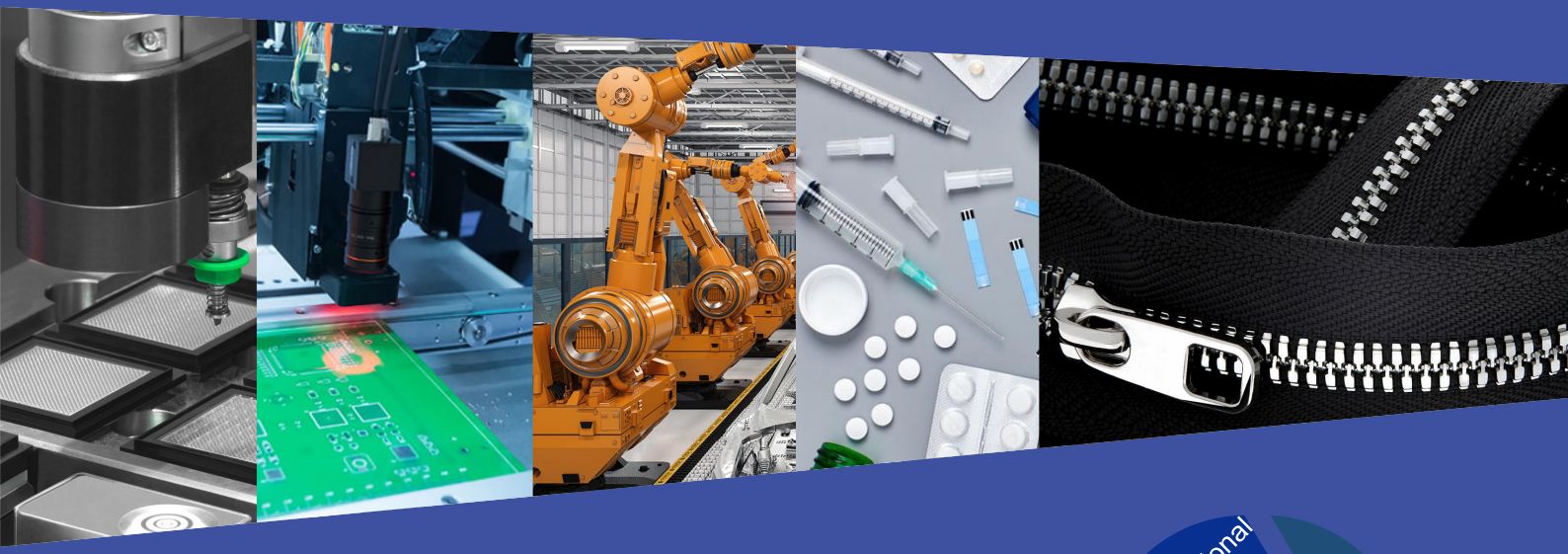
With superior teams of R&D, manufacturing, pre-sale and customer service, Mstar offers high quality product and service as well as customized systems to satisfy and even exceeds customers' requirements and expectation.

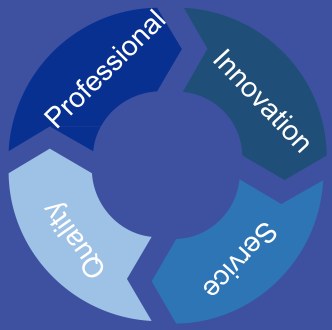
High quality product, excellent customer service and professional technical support have made Mstar obtaining good reputation. We are always committed to provide better product and service, and then to push the development of machine vision.

Mstar Technologies, Inc, introduced a number of technical elites from the United States, Japan, Canada, Sweden and other countries, and talents domestic famous universities, including Tsinghua University, Huazhong University of Science and Technology, Zhejiang University and etc. The core R&D team includes IEEE Fellow, National Thousand Talents Plan experts, Zhejiang Thousand Talents Plan experts, Hangzhou 521 talents, etc. Now, the number of our R&D team is up to 80, of which 80% have master's degree or above, and 100% have bachelor's degree or above. It is one of the largest and most powerful machine vision r&d teams in China.

ISO International Organization for Standardization
9001 : 2015

汇萃视觉





Our Mission

Provide core technology of comprehensive high-speed machine vision to achieve a better future of man-machine perception.

- **2011** Build a team with over 10-years algorithms experience.
- **2012** Founding the company
- **2015** Launch vision platform software V1.0
- **2016** Named As Hangzhou high-tech enterprise, Hangzhou innovation and Startup tea
- **2017** Named as National high-tech enterprise/Launch vision platform software V2.0
- **2018** Launch software V5.0 (3D) / Annual sale up to ¥40 Million
- **2019** Launch software V3.0 / Annual sale up to ¥80 Million
- **2020** Annual sale up to ¥150 Million

COMPREHENSIVE INTELLIGENT HIGH-SPEED MACHINE VISION SYSTEM

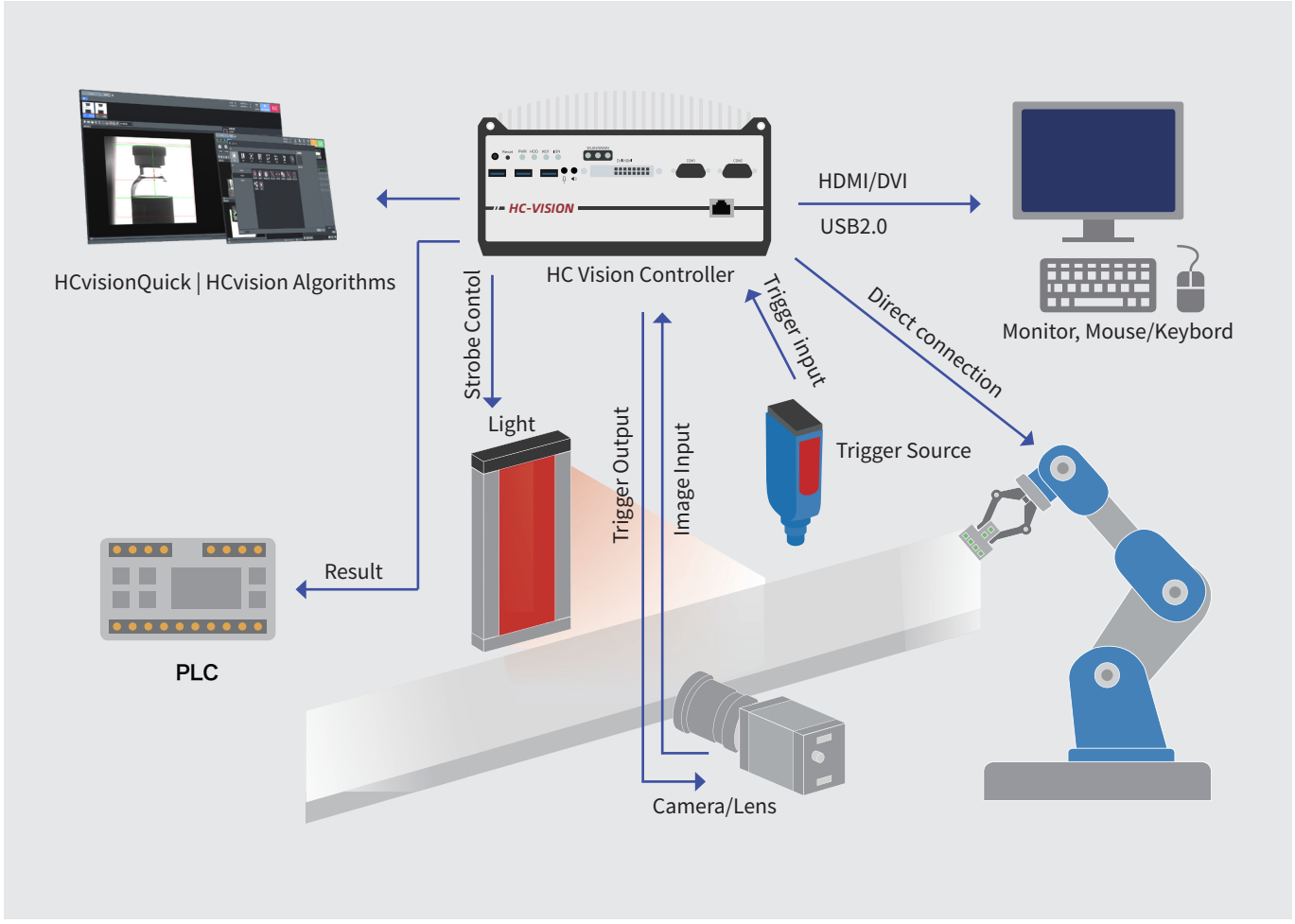
HCVISION SYSTEM

Detection Measurement Recognition Location

Robotic Infrared Thermal 3D Vision

HCvision System is an innovative, comprehensive high-speed vision system which is developed by mStar Technologies,Inc. independtly. The built-in machine vision software-HCvisionQuick mainly has four parts of functions, including detection, measurement, recognition, and location. HCvision System uses high performance cameras to solve inspection applications across all manufacturing industries. HCvision system incorporates cameras and lighting to stably image parts in-line to improve efficiency and ensure quality. Industries served include automotive, electronics, medical, food and packaging, and any process that requires inspection on high-volume parts. Common applications include defect detection and surface inspection, presence of parts and features, assembly verification, vision guided robotics, measurement, and code reading.

Typical System Structure



COMPREHENSIVE INTELLIGENT HIGH-SPEED MACHINE VISION SYSTEM

100% developed indepently
First one has complete independent intellectual property rights in China

Abundant algorithms and vision tools
With 2000+machine vision and AI algorith and 100+ vision tools

High Stability
Performance is close to international high-end vision system

High Compatibility
Compactible with most kinds of industrial cameras, robotic arm and PLC.

Built-in Software | HCvision Quick

The built-in comprehensive high-speed machine vision software(HCvisionQuick) has different versions according to the different functions. There are four module version(detection/measurement/recognition/location), robotic version, general version and flagship version. The user can select a right version according to their needs. The chart below shows the functions of different version.

Functions	Versions							
	Detection	Measuement	Recognition	Location	Robotic	General	Flagship	3D
Presence detection	✓					✓	✓	✓
Defects detection	✓					✓	✓	✓
Printing detection	✓					✓	✓	✓
Quantity detection	✓					✓	✓	✓
Intelligent Learning						✓	✓	✓
Detect spot		✓				✓	✓	✓
Detect circle		✓			✓	✓	✓	✓
Detect line		✓			✓	✓	✓	✓
Angle mesurement		✓			✓	✓	✓	✓
Center point		✓			✓	✓	✓	✓
Detect length		✓				✓	✓	✓
Detect width		✓			✓	✓	✓	✓
Locate position			✓	✓	✓	✓	✓	✓
Locate graphics						✓	✓	✓
Locate profile						✓	✓	✓
Recognition			✓			✓	✓	✓
Guide robotics					✓	✓	✓	✓
Line scan camera						✓	✓	✓
3D detect							✓	✓
3D dispensing guide							✓	✓
3D grab								✓

Icon-based, easy-to-understand GUI

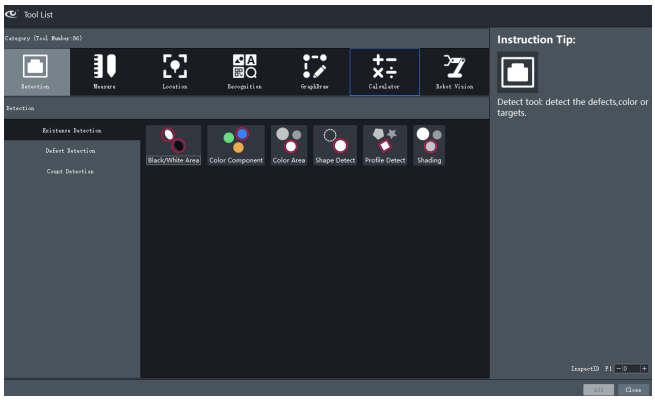
The Icon-based, easy-to-understand GUI of HCvisionQuick enable the user to build a vision project by just dragging and dropping the tools without programming. The added tools are displayed as thumbnail previews in the tool bar.

Tool Bar Displaying Thumbnail Previews

Added tools are displayed in thumbnails. Because the inspection region is displayed in a thumbnail, it becomes easy to understand which part is being inspected.

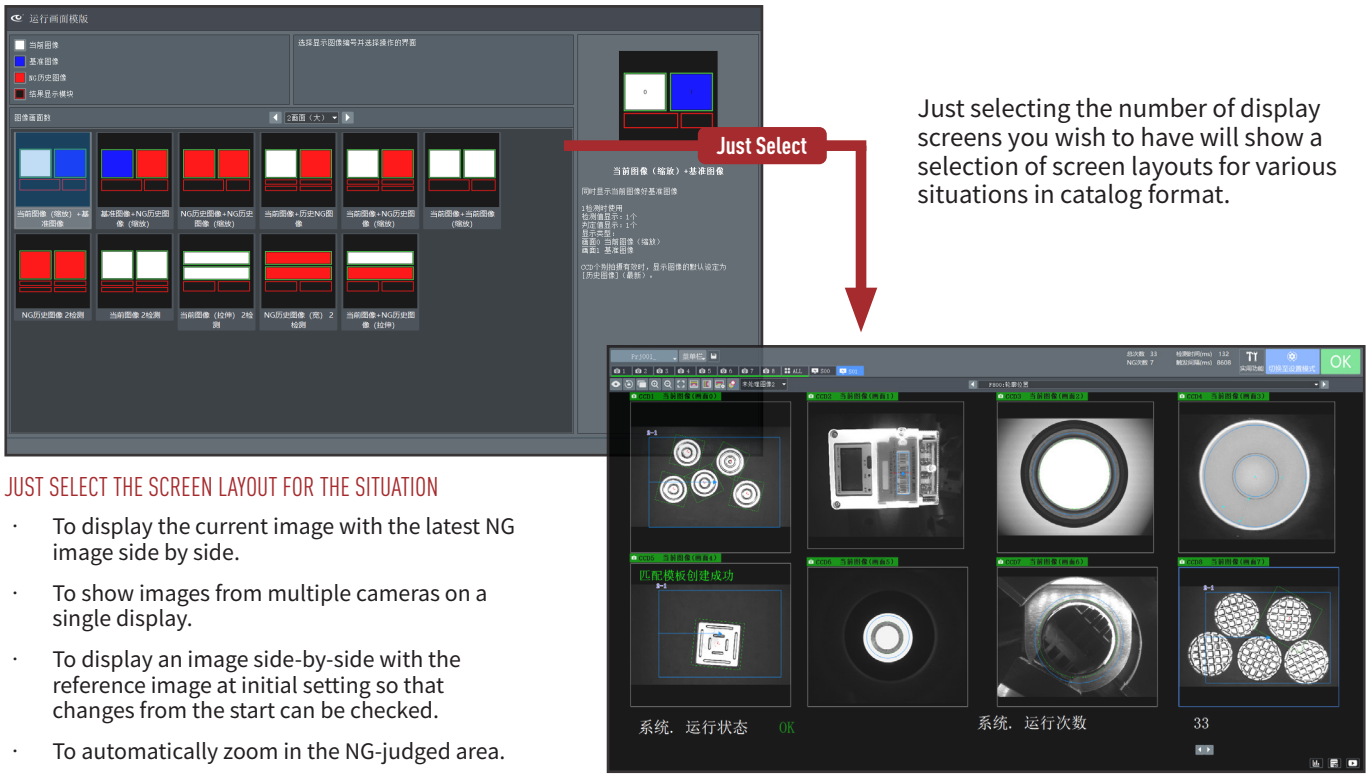
Tool Selection Catalog

A tool catalog that makes it easy to understand which tool is best to use from the features that you wish to inspect has been adopted. This makes it possible for the users to select the best tools without comprehensively understanding all the included algorithms.



Operator Screen Catalog

To greatly simplify the customization of operation screens and improve visualization of the process, an operation screen catalog function is incorporated along with many custom functions.



Just selecting the number of display screens you wish to have will show a selection of screen layouts for various situations in catalog format.

JUST SELECT THE SCREEN LAYOUT FOR THE SITUATION

- To display the current image with the latest NG image side by side.
- To show images from multiple cameras on a single display.
- To display an image side-by-side with the reference image at initial setting so that changes from the start can be checked.
- To automatically zoom in the NG-judged area.

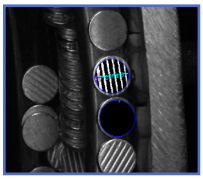
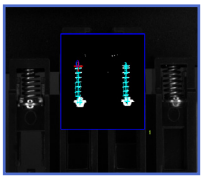
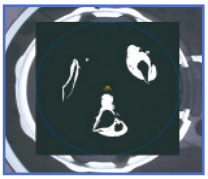
Software Functions

Detection/Measurement/Recognition/Location Versions

Detection

APPEARANCE/DEFECT DETECTION

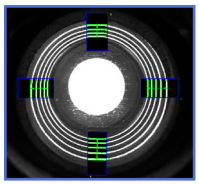
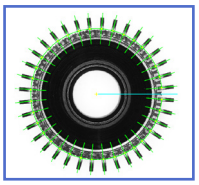
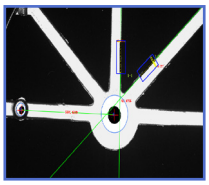
The detection tools detect defects, flaws and other contamination by comparing them to the surrounding area. In addition to excellent detection ability, the tool also features a function to only identify defects that you want to detect, by size, intensity, shape, color, and count.

Measurement

ALIGNMENT/DIMENSION MEASUREMENT

In most cases, dimension/geometric measurement for image processing requires multiple tools and complicated calculation processing. In HCvision Quick, measurements & dimensions tools can be performed with an easy point-and-click method. Points, lines, and circle information from other tools can also be referenced making it much easier to develop programs with multiple dimensions requiring inspection.

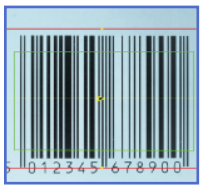
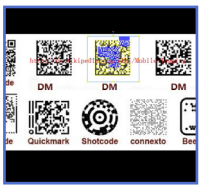




Recognition

OCR, 1D/2D CODE READING

Read printed characters and 1D/2D codes on products.

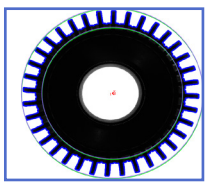
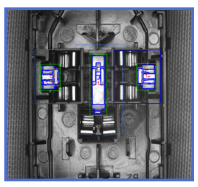
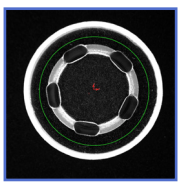
Simply select the area for inspection and with a press of a button, the image processing settings will automatically be tuned for the best results. Any user can set the tool up.

Location

GRAPHICS/PROFILE LOCATION

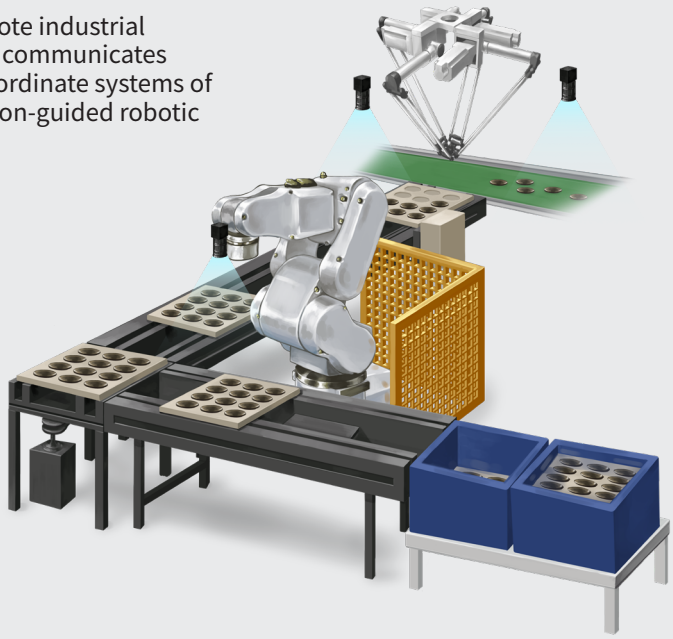
The locations tools have high robustness, which Allows accurate searching even if the capture conditions change from the original registered image, such as chips, flaws, and contrast changes. The tools also offer very accurate search performance as a position adjustment reference for other inspection tools.

Vision-guided Robotic System

Realize a direct communication with a variety of robots to easily build a vision-guided robotic system.

Vision-guided robotic system is widely used to promote industrial automation and improve efficiency.HCvision system communicates directly with a variety of robots, synchronizes the coordinate systems of the vision system and robot, and provides stable vision-guided robotic operation.



Supports a wide range of robot manufacturers

Easily establish direct communication between the robot and HCvisionQuick by simply selecting the robot manufacturer

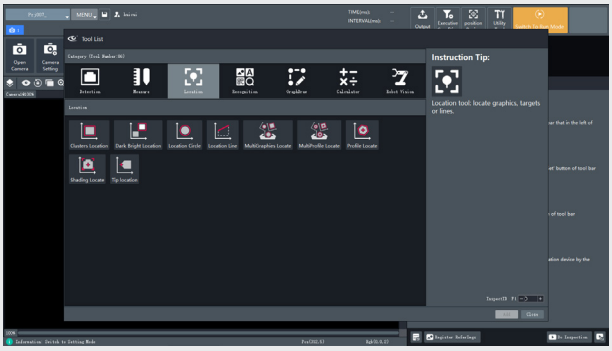
FANUC KUKA ABB
YASKAWA STÄUBLI Kawasaki
YAMAHA EPSON NACHI
HRG EFORT SIASUN 新松

Excellent locations tools

High Speed: Reach the leading level compared with competing products

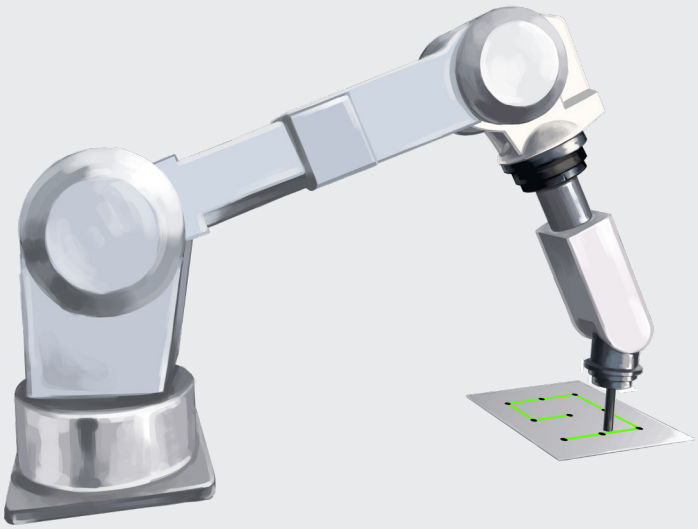
High accuracy: Reach subpixel level

High robustness: Anti-interference, anti-noise, anti-occlusion, support rotation, scaling, affine transformation, etc



Auto -calibration function

Calibration is the most difficult aspect of constructing and running a system linking a robot and vision system. The auto-calibration function provides highly accurate and effortless calibration. The result is reliable and stable calibration without the subjectivity of a manual process.



9 mark points calibration

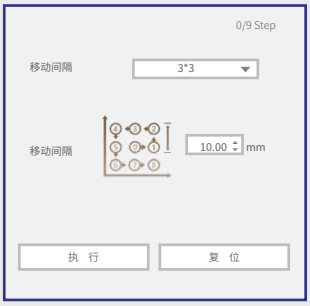
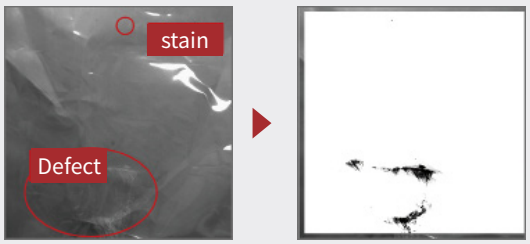


IMAGE ENHANCE FILTERS

HCvisionQuick provides many types of image enhancement filters to significantly compensate for changes in inspection conditions caused by part variations and external environments.

SHADING CORRECTION

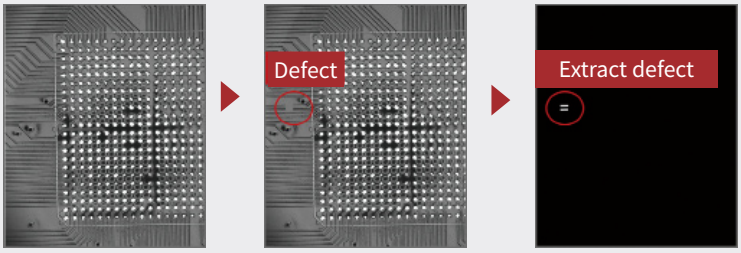
Cancels shading or uneven brightness occurring on the workpiece surface to optimize images for inspection. Even if shading conditions change every time, this filter corrects images in real time to only extract defective sections.



Only defects are extracted by canceling random shading in real time.

SUBTRACTION

Compares the current image with a previously registered master image to extract sections that differ. It is also possible to take individual differences in non-defective workpieces into account and adjust how much differences should be recognized as defective.

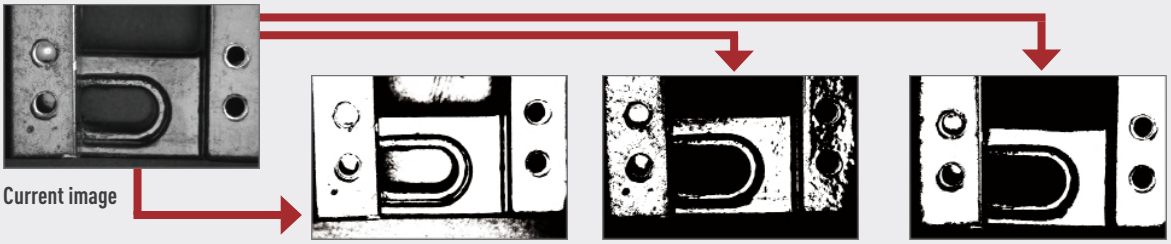


Reference image (OK product) Current image (NG product) Subtracted image

Only defective sections are extracted even for targets having complex shapes.

PRESERVE INTENSITY

Corrects changes in image brightness due to light intensity fluctuation.



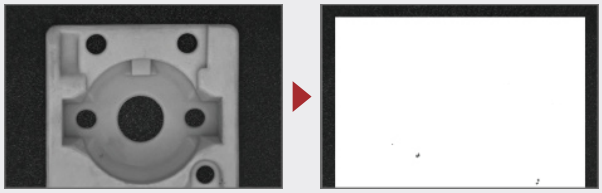
Binary image(Lower Light) With preserve intensity

Binary image(Lower Light) Without preserve intensity

Binary image

NOISE ISOLATION

Eliminates or extracts noise having a specified area r smaller. This filter is effective for ignoring a rough background that hinders image processing or for extracting subtle defects for easier detections.



Extract minute flaws on a plastic mold.

Remove the bright and dark noise to extract the characters.

Operating Instructions by Using HCvisionQuick to Establish a Vision Project

01 Image Acquisition

Get images by the "Get Images" button of tool bar that in the left of the window, have some way you can select.

02 Camera Setting

Adjust the camera parameters by the "Camera Set" button of tool bar.

03 Add Function

Add a tool function by the "Add Function" button of tool bar.

04 Out Control

Output the result by connecting the communication device by the "Out Control" button of tool bar.

COMMUNICATION AND CONTROL

A wide variety of communication methods are available to satisfy communication control needs, including logging of images and data, PLC control of the vision system through commands, and various display and monitor functions are available to improve operation and security. Various monitor functions useful at startup and other times are also available to improve operability and security.

PLC LINK

PLCs made by several manufacturers can be linked via RS-232C/Ethernet.

SUPPORTED PLC MANUFACTURERS:

Omron SYSMAC series, Mitsubishi Electric FX series and Q/L series, Panasonic FP series, Inovance H1U/2U series

FTP OUTPUT FUNCTION

Supports image/measured value output to an FTP server.

IO TERMINAL

Support DI control capturing, DO output detection

MODBUS

Through MODBUS RTU、MODBUS TCP communication to achieve read and write PLC operation.

MONITOR FUNCTION

Allow the user to check the communication status which can help troubleshoot.

EtherNet/IP ™ - and PROFINET

Note: Only AQL series is compatible with EtherNet/IP ™ - and PROFINET

NON-PROTOCOL COMMUNICATION

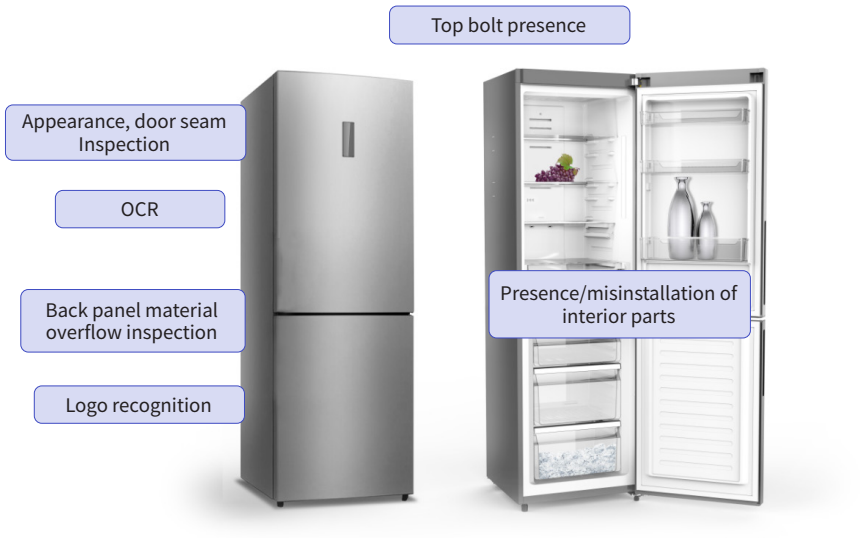
Communicate with PLC through RS-232C or Ethernet.

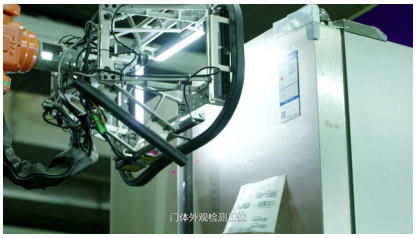
INDUSTRY/APPLICATIONS

HCvisionSystem can be widely used in various industries of industrial automation, including semiconductors, electronic components, packaging, home appliances, automobiles, machine tools, automation equipment and so on.

Cases

Home Appliances | Inspection of Refrigerator





Medical Supplies| Inspection of Masks

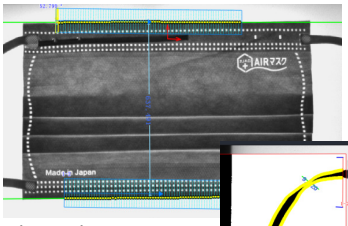
Ear strap adhesion inspection

Inspection for foreign particles

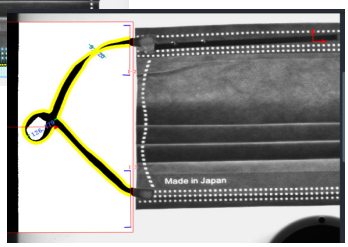
Nose bridge presence/ position inspection

Ear strap inspection

Dimension measurement



Dimension measurement



Ear strap inspection

Packaging| Inspection of Bottles

Provide a complete packaging vision inspection solution for water/drinking/dairy/beer/medicines and other industries.

Tilted cap inspection

Inspection for flaw in bottle lip

Aluminum film presence/ position inspection

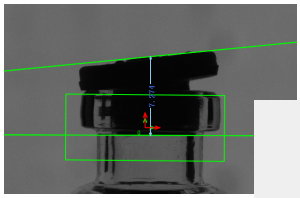
Liquid level inspection

Lable position inspection

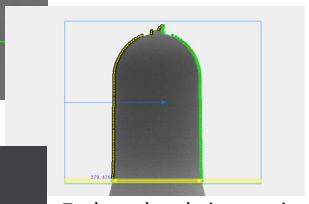
Label presence

Dimension measurement

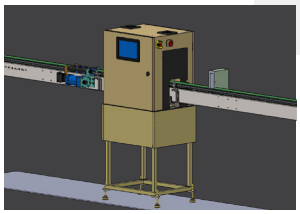
Inspection for the bottom center of bottle



Cap inspection



Embryo bottle inspection



Packaging inspection equipment

Automobiles| Inspection of Auto Parts

Hub 3D inspection

Motor components inspection

Inspection for defects in Airbag cover

OCR

Screw holes position inspection

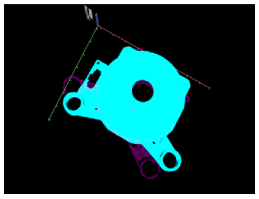
Engine housing inspection

Cooling plate inspection

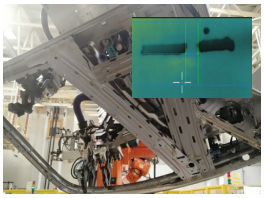
Apperance inspection

LED color temperature inspection

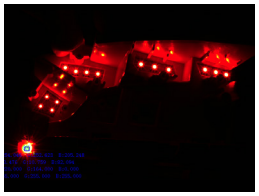
Automatic locking screws for front and rear axle and chassis



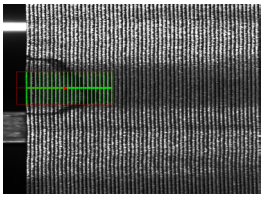
Hub 3D inspection



Glue inspection



LED color temperature inspection



Inspection for defects in Motor components

WIDE SELECTION OF CAMERAS

The quality of an industrial camera defines the stability and reliability of a vision system. Mstar selects high quality cameras in order to provide a complete product bundle to customers.

The technology of industrial cameras has greatly improved in recent years and having access to a reliable and robust high resolution camera with good quality/price ratio is very easy nowadays. With such a vast selection available on the market, choosing the right camera for an application becomes a critical decision while designing and building a vision system.

GiGE VISION GEN<i>CAM

High quality sensors

A wide selection

Compact Design

Model No.	Sensor	Mega-pixels	Resolution	Format	Pixel size	Shutter Mode	Frame rate	Interface	Mono/ Color
HC-CE130-50GM/GC	Sharp RJ33	1.3	1280×960	1/3'' CCD	3.75 μm	Global	30 fps	GigE	M/C
HC-CE200-10GC	Sony IMX290	2.0	1920×1080	1/2.8" CMOS	2.9 μm	Rolling	58 fps	GigE	C
HC-CE500-30GM	ON Semi MT9P031	5.0	2592×1944	1/2.5'' CMOS	2.2 μm	Rolling	14 fps	GigE	M
HC-CE500-31GM/GC	ON Semi AR0521	5.0	2592×1944	1/2.5'' CMOS	2.2 μm	Rolling	24 fps	GigE	M/C
HC-CE1000-30GM/GC	ON Semi MT9J003	10.0	3850×2748	1/2.3'' CMOS	1.67 μm	Rolling	7 fps	GigE	M/C
HC-CE1000-31GM	ON Semi MT9J003	10.0	3850×2748	1/2.3'' CMOS	1.67 μm	Rolling	11 fps	GigE	M
HC-CE1200-10GM/GC	Sony IMX226	12.0	4024×3036	1/1.7'' CMOS	1.85 μm	Rolling	9.6 fps	GigE	M/C
HC-CE2000-10GM/GC	Sony IMX183	20.0	5472×3648	1'' CMOS	2.4 μm	Rolling	5.9 fps	GigE	M/C
HC-CA030-20GM/GC	ON Semi PYTHON300	0.3	640×480	1/4'' CMOS	4.8 μm	Global	336 fps	GigE	M/C
HC-CA040-10GM/GC	Sony IMX287	0.4	720×540	1/2.9'' CMOS	6.9 μm	Global	312.9 fps	GigE	M/C
HC-CA050-20GM/GC	ON Semi Python480	0.5	808×608	1/3.6" CMOS	4.8 μm	Global	116 fps	GigE	M/C
HC-CA130-20GM/GC	ON Semi Python1300	1.3	1280×1024	1/2" CMOS	4.8 μm	Global	90 fps	GigE	M/C
HC-CA160-10GM/GC	Sony IMX273	1.6	1440×1080	1/2.9'' CMOS	3.45 μm	Global	78.2 fps	GigE	M/C
HC-CA200-10GM/GC	Sony IMX430	2.0	1624×1240	1/1.7" CMOS	4.5 μm	Global	60 fps	GigE	M/C
HC-CA200-20GM/GC	ON Semi Python2000	2.3	1920×1200	2/3" CMOS	4.8 μm	Global	52.7 fps	GigE	M/C
HC-CA230-10GM/GC	Sony IMX249	2.3	1920×1200	1/1.2" CMOS	5.86 μm	Global	41 fps	GigE	M/C
HC-CA320-10GM/GC	Sony IMX265	3.2	2048×1536	1/1.8" CMOS	3.45 μm	Global	37.5 fps	GigE	M/C
HC-CA500-10GM/GC	Sony IMX264	5.0	2448×2048	2/3" CMOS	3.45 μm	Global	24.1 fps	GigE	M/C
HC-CA500-20GM/GC	ON Semi Python5000	5.3	2592×2048	1'' CMOS	4.8 μm	Global	22 fps	GigE	M/C
HC-CA600-10GM/GC	Sony IMX178	6.0	3072×2048	1/1.8" CMOS	2.4 μm	Rolling	17 fps	GigE	M/C
HC-CH890-10GM/GC	Sony IMX267	8.9	4096×2160	1'' CMOS	3.45 μm	Global	13 fps	GigE	M/C
HC-CH1200-10GM/GC	Sony IMX304	12.0	4096×3000	1.1" CMOS	3.45 μm	Global	9.4 fps	GigE	M/C
HC-CH2500-21GM/GC	ON Semi Python25K	25.0	5120×5120	23×23 mm	4.5 μm	Global	4.64 fps	GigE	M/C
HC-CH2500-90GM	Gpixel GMAX0505	25.0	5120×5120	1.1" CMOS	2.5 μm	Global	4.5 fps	GigE	M
HC-CH3100-10GM/GC	Sony IMX342	31.0	6464×4852	22.3×16.7 mm	3.45 μm	Global	3.9 fps	GigE	M/C

VISION CONTROLLERS

The lineup includes multiple controller types available according to the number and types of cameras to be connected, capacity, and application.

		HC-SYS100	HC-SYS200	HC-SYS300
				
Model		HC-SYS110III-23S	HC-SYS220IV-12 HC-SYS220IV-12P	HC-SYS332VIII-12S
Supported Software Version		Location/Measurement/ Detection/Recognition/Robotic/ General Version	Location/Measurement/ Detection/Recognition/Robotic/ General/Flagship Version	Location/Measurement/ Detection/Recognition/Robotic/ General/Flagship Version
CPU		i5	i7	i7
Max. no. of connectable cameras		3 pcs	4 pcs	8 pcs
Supported cameras	0.3 to 2MP	✓	✓	✓
	3.2 MP	✓	✓	✓
	5.0 MP	<=2	✓	✓
	10 MP	<=2	✓	✓
	29 MP	1	1	<=2
	2K/4K/8K Line Scan	1	✗	<=4
	3D Camera	✗	✗	<=8
	IR-CAM	✗	✓	<=8

		HC-AQL			
					
Model		HC-AQL6200S	HC-AQL6210P	HC-AQL6410P	HC-AQL6821P
Supported Software Version		Location/Measurement/Detection/Recognition/Robotic/General/Flagship Version			
CPU		I3	I3	I5	I7
Max. no. of connectable cameras		2	2	4	8
Supported cameras	0.3 to 2MP	✓	✓	✓	✓
	3.2 MP	✓	✓	✓	✓
	5.0 MP	✓	✓	✓	✓
	10 MP	<=2	<=2	<=4	<=8
	29 MP	1	1	<=2	<=2
	2K/4K/8K Line Scan	1	1	<=2	<=4
	3D Camera	✗	✗	✗	✗
	IR-CAM	✗	✗	✗	✗

HCVISION SYSTEM

www.hc-vision.cn

Mstar Technologies, Inc.

4/F, Building 19, No. 998 Wenyi West Road, YuHang District Hangzhou Zhejiang 311121 China

Tel: 86-571-26280523

E-Mail: fangjl@hc-vision.cn