



# **O+K Visual Online Inspection System**

**OK4000/8000**



## **User Guide**

# Catalogue

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## Safety Instructions

Before installation, operation, maintenance and inspection, please read this manual and its related documents well in order to use the visual online inspection system correctly.

- ⚠ The system uses AC 220V/50HZ power supply. If the voltage fluctuation range is large (exceeding the range of 187~242), it will cause system failure or even damage. At this time, an automatic voltage stabilizer above 1100W must be installed for use. .

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- ⚠ It is necessary to use an independent dedicated power interface and conduct reliable grounding. The power cord of this series of products is equipped with a large number of three-wire (grounding) plugs. Under any circumstances, do not cut or remove the third pin of the power supply.

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- ⚠ Do not let the cabinet pinch the power cord, or step on the power cord. When moving the display and control cabinet, please be careful not to roll or damage the power cord .

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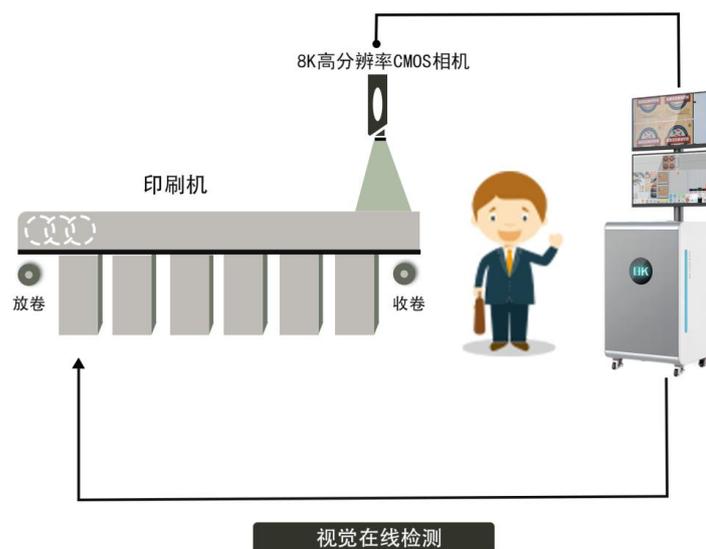
- ⚠ Do not place unstable objects (heavy objects, containers with water, etc.) on the display and control cabinet, so as not to fall and hurt people or cause leakage due to water overflow.

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- ⚠ Do not pull out the plug by pulling the power cord, be sure to hold the plug and pull it out directly from the socket .

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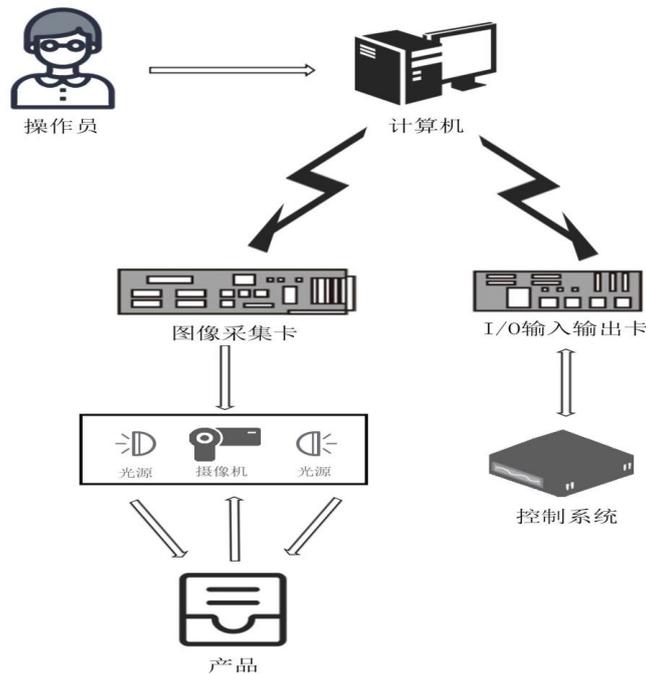
- ⚠ During cleaning and maintenance, the main power supply of the system and the UPS power supply should be turned off to prevent electric shock .





## **1. Brief Introduction**

The visual online inspection system is a high-speed quality inspection system for printing surface defects. It is based on machine vision technology to achieve 100% inspection of products. The principle is to use a high-speed line scan camera to scan the inspected object to obtain the image of the printed surface of the product, which is converted into two-dimensional color data by the image acquisition card and sent to the industrial computer for real-time processing. On the one hand, the image is directly displayed on the man-machine interface for the reference of the operator; on the other hand, the processor is used to identify and analyze the collected image, and then upload the result to the control system for quality inspection personnel to process.



检测时扫描成像过程示意图

### Advantages of the visual online inspection system:

1. Instead of manual quality inspection, greatly improving production efficiency;
2. The detection system has strong processing ability, which improves the printing speed and detection accuracy;
3. Widely applicable to food packaging, medicine packs, wallpaper, cigarette labels, aluminum foil and other fields;
4. Pay attention to key defects such as knife wire, overprint, burrs, foreign matter, holes, ink dragging, stains, and wrinkles on the printing surface;



5. friendly user interface and rich product functions, which is convenient for users to use and manage;
6. Improving product quality, it reduces production costs for enterprises.

## 1.1. System Configuration

Item	Description
Inspection Software	Visual Online Inspection
Core Hardware	High speed /resolution line scan CMOS camera 1 set High-speed image acquisition card 1 set High-resolution encoder 1set High resolution lens 1 set LED bright light source (with power supply) 1 set High-speed industrial computer (including CPU, memory, built-in board,hardware, and monitor, keyboard and mouse) 1 set
Accessories	Control cabinet (including built-in air switch,switchingpower supply, SSR, Relay, and cooling fan, etc.) 1set Alarm lamp and buzzer 1 set Camera mounting bracket, shielding cover and cooling fan 1 set Supporting cable (camera cable, power cord) and plug/seat 1 set



Camera and lens

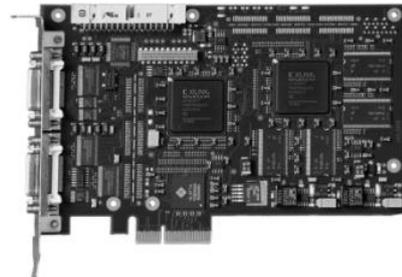
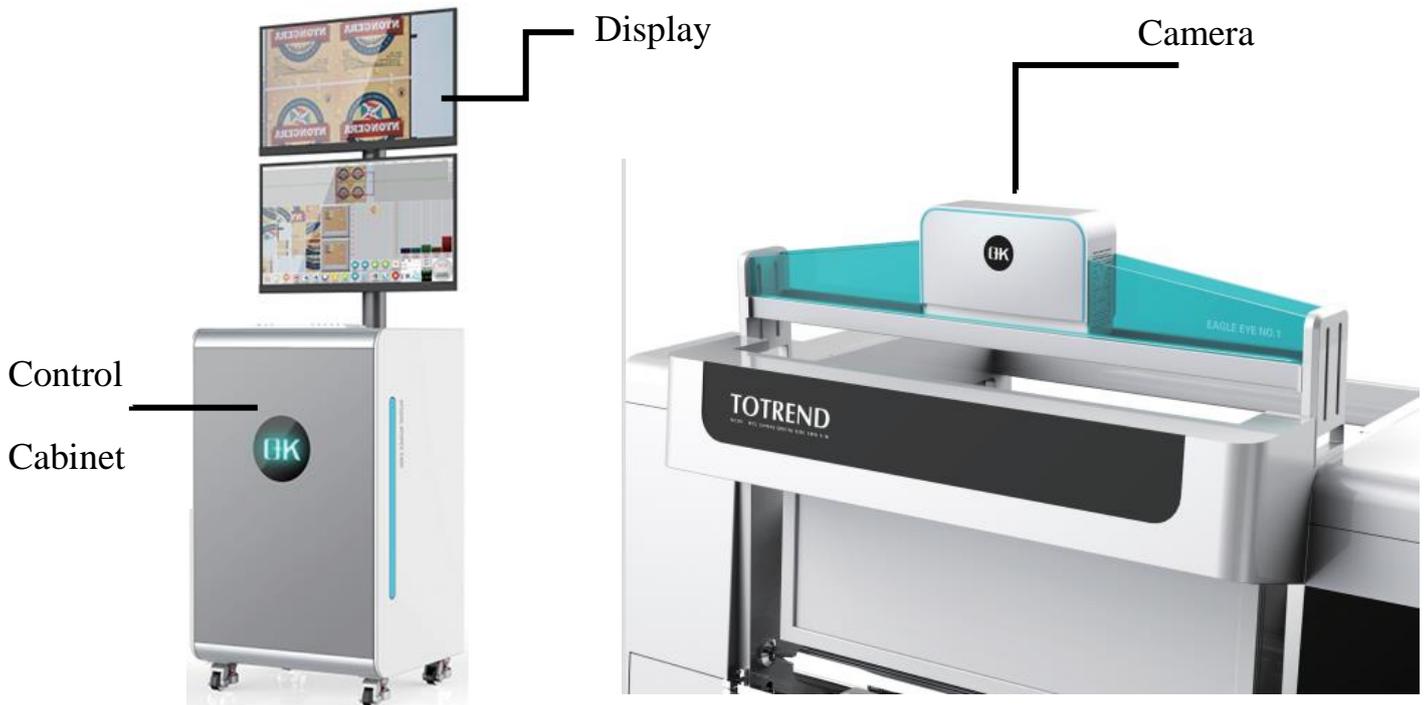


Image acquisition card



Composition of System

## 1.2 Technical Specifications

Item	Parameter	Remark
horizontal resolution	0.15mm	Web width 1200mm
vertical resolution (remark)	0.15mm	
Detection width	10mm-1500mm	
Top speed (remark)	450m/min	
Point defect detection accuracy	defect area $>0.2\text{mm}^2$	Stains, missing prints, foreign objects, etc.
Streak detection accuracy	defect area $>0.1\text{mm} \times 5\text{mm}$	
Registration detection accuracy	horizontal $>0.15\text{mm}$ , vertical $>0.25\text{mm}$	



remark: The vertical detection resolution is related to the maximum detection speed, and the minimum vertical resolution can reach 0.05mm. The design maximum speed of 450/min refers to the maximum speed that can be achieved at a resolution of 0.15mm.

## 1.3 Term



### **Automatic modeling**

After inputting the standard model information, the software automatically selects the standard model picture and positioning data through algorithm analysis, and directly enters the detection state. The image is collected first, and then a reference image is drawn from the image, which is used for comparison with each inspection image during the inspection process.



### **Split screen comparison**

During manual modeling, a graphic with obvious features is drawn from the reference image, which is used to compare each detection image with the reference image during the detection process.

### **Sensitivity**

Also known as Detection Sensitivity, it is a measure used to screen and identify defects from inspection images, or called Detection Threshold .

Each defect has its own independent sensitivity.

The greater the value of the sensitivity, the more obvious the defects that the system can detect (only obvious defects will be detected), in other words, the fewer defects the system can detect.

The value of sensitivity can neither be set too large nor too small.

The visual online inspection system has been configured with a default sensitivity when it leaves the factory.

## 2.Operation

### 2.1 Power on and off

Power on: Power on the equipment (the main power switch on the side of the electric cabinet) → turn on the UPS → Start the industrial computer through the desktop button switch → open the desktop detection software



Shutdown: Close the detection software → shut down the computer normally (through the operating system

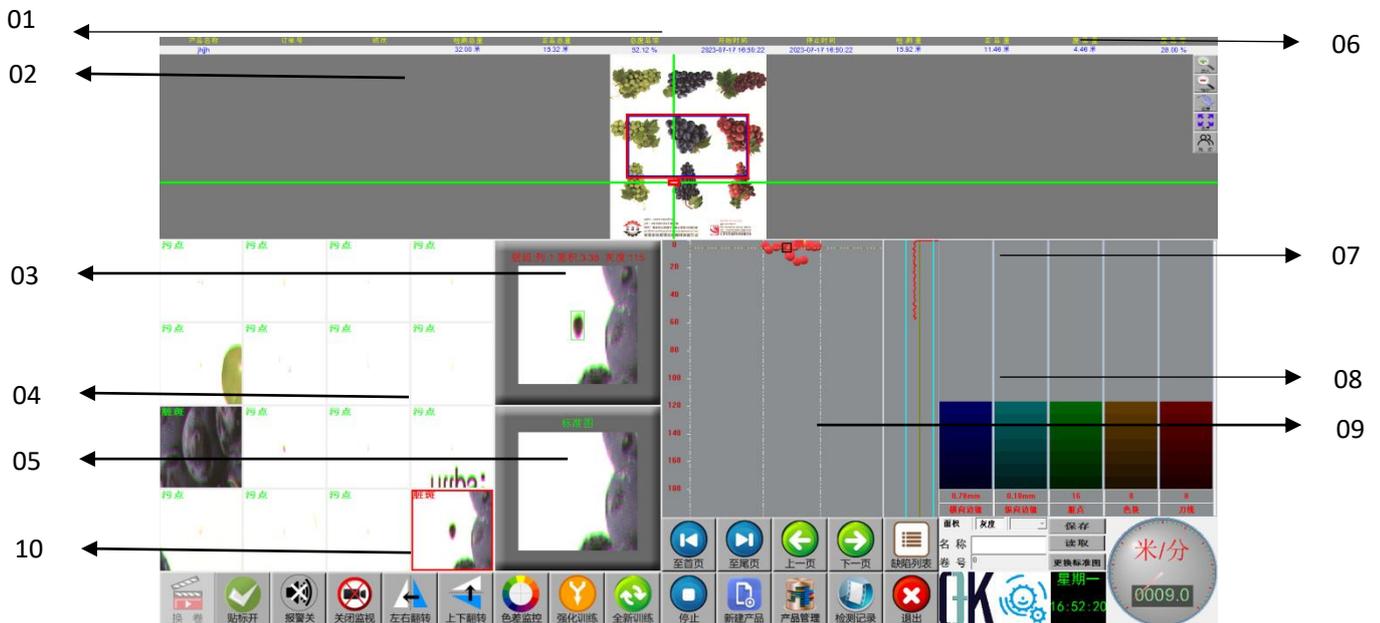
Go to "Shutdown" in the start menu) → turn off the UPS → power off the equipment (the main power switch on the side of the electric cabinet)

## 2.2 Software

1) .Click OKSTART



2) .Interface Introduction



### Display area description

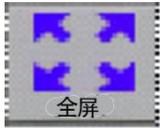
- (01) Standard template display area: display the established standard template pattern, when a defect is detected, it can display the location of the defect.
- (02) Product information: Display the basic information of the tested product.
- (03) Defect map: It shows the image of the defect in the inspection process.
- (04) Defect map display area: display the detected defect images.
- (05) Standard image: display template image.
- (06) Still picture control area
- (07) Plate cycle changes
- (08) Detection strictness adjustment area: adjust the degree of strictness of detection, the higher the level is more strict.

(09) Defect map and defect list: display the defect location and defect attributes.

(10) Function button area

Functions:

	Machine speed		Start inspection/Stop
	Create new template		View or recall, modify, delete created template information
	Inspection history/records		control the display of defect map and defect list area
	Training template		Exit the system
	Display the link status of the operation and detection		Intensive training on the detection template being used
	Open or close the color difference monitoring window		The template image is flipped left and right
	Template image flipped upside down		Turn still image on or off
	Turn on or off the sound and light alarm		Turn labeling control on or off
	Manually change the roll and create a new roll number		Zoom in for still image display

	<p>Zoom out for still image display</p>		<p>Exit full screen</p>
	<p>Display in full screen</p>		<p>The still picture display area follows the current defect area</p>

### 3. Create template

1. Click to create product.

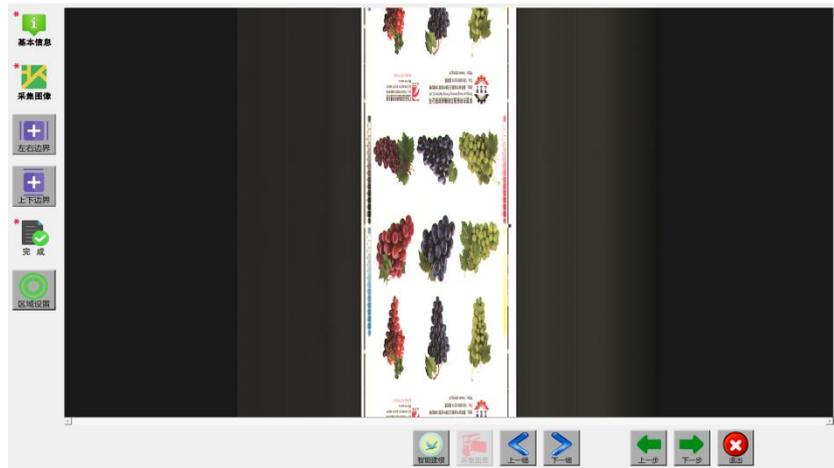


2. Enter the product height (i.e. printing perimeter), product name, set the number of rows and columns, and click Next.

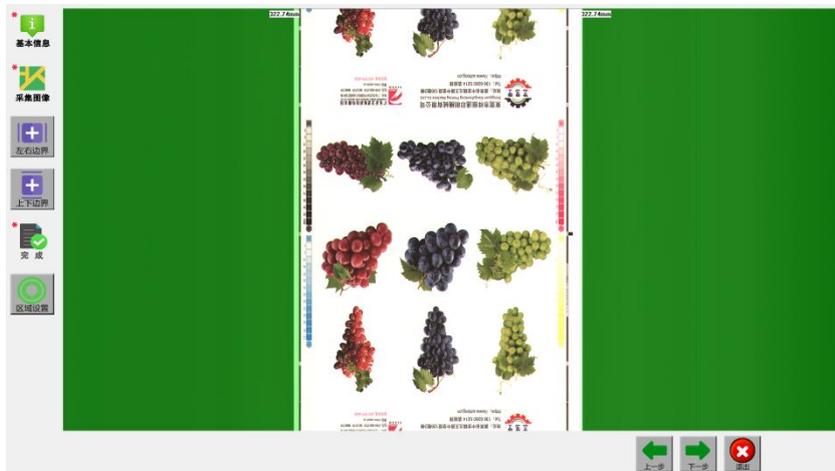
<p>模式</p> <p>表印</p> <p><input type="radio"/> 反向 <input checked="" type="radio"/> 正向</p>	<p>行/列信息</p> <p>行数量 1</p> <p>列数量 1</p>	<p>产品信息</p> <p>产品高度 400.00 mm 订单号</p> <p>产品名称 班次</p>
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3. Click start, then the camera starts to collect and transmit images, wait for about 10 seconds, click the previous or next image after the image appears, select an image that can display a complete cycle, and click next.

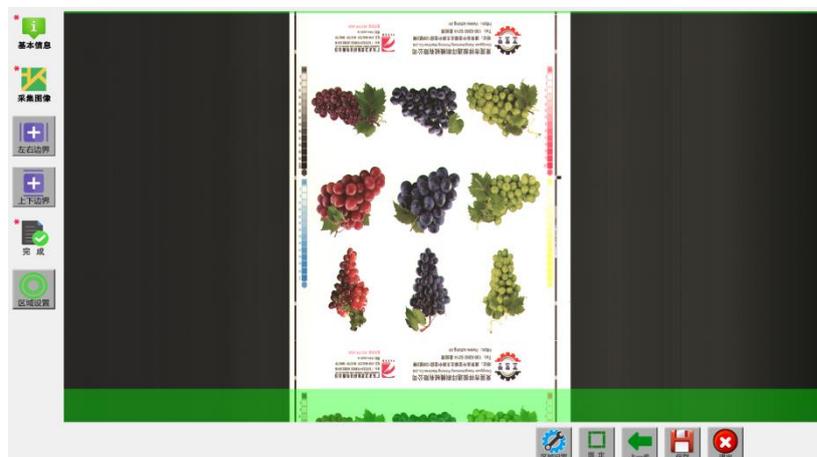




4. Adjust the left and right borders of the template image.



5. Adjust the upper and lower boundaries of the template image (the default is to bind the height of the product, click to unbind to adjust the upper and lower boundaries)



6. Manual positioning (If you don't need manual animation positioning, you can directly skip to "Save")

1). If there is a deviation in positioning, you can also enter the same interface by clicking "Area Settings" or modifying it through template management, as shown in the figure below:



Icon button description: The button is dark gray, indicating the effective selection status

2). Select the detection area: select the "Detection Area" button, make sure that the "Add" button is valid, and then drag the detection area with the left mouse button, as shown in the figure below, the green area is the detection area (selection: the product edge retracts 3-5mm )



3). Sub-identification selection: the button operation is the same as 2), select a unique identification in the leftmost column image within a cycle of plate length (selection principle: unique, high image contrast)



4). Partial logo selection: the button operation is the same as 2). In the four corners of the modeling week, select a unique logo (only in the small sheet, the selection principle: unique, high image contrast, and the same printing color (**very important!**))



7. Save

8. Click Detect, and the detection system starts the normal printing quality detection.

## 4. Maintenance

1. According to the temperature and humidity of the site, the cooling water of the electric cabinet air conditioner is processed in time.

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2. The cleaning of the electric control cabinet must be wiped with a dry towel or blown with a dry noisy wind when the power is cut off and the UPS power supply is turned off. It is strictly forbidden to wipe with water. Special lens paper is used for wiping. If there is dust inside the camera or the lens, it must be handled by a professional. It is strictly forbidden to disassemble the camera.

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3. The system saves a large number of detection records, and deleting the detection records according to the actual situation can improve the operation efficiency of the industrial computer.

## 5.FAQ

1. The detection always reports the blind image:

Solved by manual animation positioning

2. Too many false positives detected:

First check whether the pattern circumference curve is smooth. The flatter the curve, the better the detection effect. If the offset exceeds 1mm, it will cause positioning deviation and cause more errors;

[The reason for the large offset]

① Product tension is unstable (adjust tension stability)

② Unreasonable choice of positioning core (handling method: manual animation positioning core, select a single color for local positioning);

If the overprint deviation is too large during the roll change or printing process, and it is acceptable, you can go through extended training. If the extended training fails, you need to conduct new training and then expand the training.

3. Open the software and report an error, and the detection cannot be used:

Method 1: Back up problematic software, and make normal backup software at the same time and use it.

Method 2: Check the network of the industrial computer of the detection system, open the desktop "teamview", and after the current device ID number and password are displayed normally, take a photo of the window to the manufacturer's technical staff for help.

Android mobile phone sharing network method: it must be an Android system, insert the mobile phone data cable into the USB port of the detection industrial computer, and it will appear. Prompt to set data transmission or only charging, indicating that the phone can be connected normally, otherwise the data cable does not match; after the phone is connected normally, operate the phone in turn "Settings---Wireless and Operation---Mobile Network Sharing---USB Sharing Network" , the Internet connection is successful.

4. Batch errors are not detected:

- 1). Adjust the detection sensitivity.
- 2). Re-establish the template.

5. The image is black:

**【cause of issue】**

- ① The camera lens cover cannot be opened.
- ②The light source failed to turn on.

**【troubleshooting】**

- ① Open the lens cover of the camera, and be careful not to turn the lens when opening the lens cover, otherwise the focal length will change and the image will be blurred.
- ② Turn on the light source.

6 The industrial computer cannot be started:

**【cause of issue】**

- ① A USB flash drive is inserted into the industrial computer.
- ② Whether the UPS is turned on or not.

**【troubleshooting】**

Pull out the USB flash drive. Press and hold the POWER button of the UPS, and hear a long beep that the UPS is turned on successfully (note: the UPS cannot be turned on for a long time without being connected to the power supply).