Image processing for various inspections and measurements can be easily made with user-friendly touch screen operated with finger or stylus pen.

VISUAL STATION
Next-generation image sensor camera
“VISUAL STATION”
VISUAL STATION is the next-generation image sensor camera that pursues usability, visibility, and comprehensibility.

Inspections and measurements using an image sensor camera used to require a lot of experience and time of an operator to select equipment and set up the system. Now, Sharp's VISUAL STATION, the next generation image sensor camera, can integrate all the experiences and know-how of image processing experts into one unit. It offers the complete range of functions of image processing including operation and maintenance.

Especially, new functions to support start set-up that used to take up man hours and labor are also integrated in this system. By simply following the displayed instruction and directly entering parameters in touch screen with a finger or a stylus pen, even a beginner can set up the camera easily and quickly. VISUAL STATION eliminates the deviation among individual operators in terms of the inspection/measurement results, and contributes to standardization and stabilization of inspection/measurement results, reduction of man hours and shortening of time.
You can directly enter your parameters in touch screen. Screen view shows operation procedure at a glance.

**Easy pen-touch entry and new menu system**

VISUAL STATION offers you easy LCD touch screen operation. By simply following the displayed instruction, even a beginner can set up the camera easily and quickly. Newly employed menu system can realize operationality and handiness better than ever.

**It used to be...**

- Troublesome and time consuming to enter the parameters and set-up items by moving cursor with set-up key pad,
- Difficult for a beginner or a less-experienced operator to know how and what to set up, and
- Hard to see the screen with the inspection screen view and the menu overlapped.

**With our VISUAL STATION...**

- Even a beginner can start the operation without any difficulty by simply following this flow system.
- Realized free-shape drawing in the measuring area.
- Measuring area can be designated in detail by each dot by using stylus pen or specifying numeric values. Suitable for accurate depiction.

**SVGA monitor with improved visibility**

Easy-to-see screen view with a split display screen for inspection and menu.

Help function can quickly give you the definition of unknown word on the screen.

New menu system helps you select from inspection purpose.

You can see what to start with, end with and what to set up at a glance.

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* Essential items to set up will be highlighted in orange.
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Measuring area can be freely and quickly drawn with stylus pen.

You can select the appropriate menu without having image processing expertise.

This is suitable for...:

- Existence of work and size inspection
- Inspection for missing dot of LCD, existence of debris
- Inspection for existence of connector pin
- The number of projected parts and the width, interval, etc.
- IC lead width inspection
- Inspection for intervals, number, and diameter of BGA solder ball
- Shape degree of match inspection
- Shape of ball bearing/gear
- Inclination/misalignment of labels and seals
- Workpiece counting
- Workpiece counting of confection before wrapping
- Inspection for missing capsule/tablet

As of June 2003 for image sensor cameras

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Extraction of appropriate binary processed image requires no experience or technical knowledge of user.

Image processing procedure automatic generating expert (Industry’s first)(patent pending)

VISUAL STATION is equipped with Image processing procedure automatic generating expert developed based on the know-how of image processing experts, and the analysis and collection of academic data. By simply entering the parameters according to the instruction on the screen and draw round the inspecting area with stylus pen, processing procedure will be automatically generated and executed. Image will be quickly extracted. Reducing the personal difference and shortening the time, this system improved efficiency and uniformity of the work.

It used to be...
○Difficult for a less-experienced operator to know what kind of image processing should be conducted in what procedures in order to obtain an appropriate inspection image,
○Difficult to stabilize the quality since there were some deviations when setting up image processing parameters among individual operators, and
○Uncertain and time consuming to set up correct parameters for image processing.

With our VISUAL STATION...

●Drawing around the inspecting area and entering inspection purpose and parameters will automatically generate appropriate image processing procedure and execute binary processing.

Automatically correct distortion of image. (Patent pending)

Camera inclination and lens distortion automatic correction function

It used to be...
○Difficult to conduct stable image detection when the camera was inclined and created distortion in the image, and
○Difficult to eliminate the errors caused by the lens distortion depending on the inspected position.

With our VISUAL STATION...

●Automatically correct measurement error caused by inspected position resulted from image distortion.

Correct focus position will be informed for clearer image.

Informing function of optimum focus

It used to be...
○Relying on the individual operator’s sense to focus, not knowing whether it was the optimum focus.

With our VISUAL STATION...

●Optimum focus can be confirmed from bar display.

Distortion of the image will be automatically corrected.

Place the separately-sold reference plate for distortion correction under the camera, and enter the correct scale distance, then execute.

Turn the focus adjuster to the point at which the bar display shows the maximum value.

Easy focusing.

Automatically generates and executes appropriate image processing.

Extraction of appropriate binary processed image requires no experience or technical knowledge of user.
During the operation, the light volume on the workpiece used to be inconsistent due to the changes of surrounding environment. Inconsistency of the light volume could change the image's light level, and hinder the stable inspection/measurement results. VISUAL STATION uses light level automatic adjustment system with illuminance monitoring function that provides the stable screen image with the consistent light level.

High basic performances together with various maintenance functions

New algorithm (S search) reinforces search function.

New algorithm reinforces the functions of conventional gray search (correlation for normalization). This system provides a stable search even if the workpiece you wish to search is partially hidden or chipped. (Patent pending)

Light level of the image is kept consistent by light level automatic adjustment function.

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Reliable maintenance with lighting control

VISUAL STATION is equipped with lighting control function. When lighting power source for lighting control is used, general-purpose serial interface can control ON/OFF of the lighting, diagnose the light volume, and remotely control the lighting volume. This function allows you to prevent from improper detection caused by the lowered light volume.

High speed camera and partial image capture function greatly reduce the inspection time.

VISUAL STATION can work with double-speed/quadruple-speed cameras with progressive system CCD. Partial image capture function speed up the image-capturing. And further reduction of time can be possible by selecting from 4 modes to suite your inspection/measurement purpose.

With window for trigger set up, no need for any external sensor even for moving measurement. You can select your trigger detection method from binary processing, average light level and gray search. Gray search can be used for the workpieces for which setting of the light range is tricky.

Contact our sales representative for the recommended lighting power source.
High speed network that allows measured data and NG images to be sent to upward personal computer

**Equipped with Ethernet interface**

VISUAL STATION is equipped with Ethernet interface that allows fast communication to upward personal computer. You can see measured data and NG images at a personal computer which is located away from the inspection site. Parameter setting support software (IV-S51SPM) can be installed at a personal computer.

- The set parameters can be read out.
- Equipped with data collecting function that forwards measured data and NG images to upward computer.
- Equipped with version upgrade function.

**Not for sale** Contact our sales representative for further details of this product.

Parameter setting support software for IV-S51M series,
**IV-S50SPM**

- This support software can be used for management and analysis of inspection results.
  - The set parameters can be read out.
  - Equipped with data collecting function that forwards measured data and NG images to upward computer.
  - Forwarded screen view can be read out.
  - Equipped with version upgrade function.

It used to be so time consuming to confirm the inspection status and conduct defect analysis, making it so difficult to provide the prompt feedback.

With our VISUAL STATION...

● Measured data and NG images from multiple IV-S51Ms can be immediately sent to upward computer to reduce the number of NG products.

*One to up to 63 IV-S51Ms can be connected to an upward computer.*
**System configuration of IV-S51M (When an IV monitor is not directly connected)**

- **Controller**: IV-S51M
- **Camera**: IV-S30C1/G mount, IV-S30C2/F17 mm mount, IV-S30C4/F17 mm mount, 2X, 4X
- **Camera cable**: IV-S30KC3/Cable for IV-S30C3/C1 camera, 3 m, IV-S30KC5/Cable for IV-S30C3/C1 camera, 5 m, IV-S30KC7/Cable for IV-S30C1 camera, 7 m
- **IV LCD monitor**: IV-08MP 8.4” TFT color LCD with a built-in 7F touch panel (with stylus pen) for SVGA. The monitor can be directly mounted to IV-S51M. Screen image of display has 65,000 colors.
- **IV LCD monitor cable**: IV-S50MC2/Cable for IV LCD monitor (IV-08MP), 2 m
- **Parameter setting support software**: IV-S50SPM Control/analysis of inspection data can be set up on the Windows screen (runs on Windows2000/XP/98).
- **Optical system selection expert**: IV-S50SPM/Software (not for sale)

**External dimension (Unit: mm)**

- **Camera lens (IV-S20L16)**: 34.5 x 28.5 x 50.3
- **Standard camera (IV-S30C1)**: 43 x 30 x 30
- **Standard camera (IV-S30C3)**: 43 x 30 x 30
- **Micro camera (IV-S30C2/C4)**: 16.5 x 14.7 x 30
- **Micro camera (IV-S30C3)**: 30 x 20 x 30
- **Micro camera (IV-S30C4)**: 30 x 20 x 30
- **Controller (IV-S51M)**: 176.4 x 183.7 x 7.3
- **Controller (IV-S51M)**: 176.4 x 183.7 x 7.3
- **IV LCD monitor (IV-08MP)**: 242 x 145.5 x 42

**Application**

VISUAL STATION offers various installation options to suit your installed location and environment. The monitor and the controller can be connected directly or with monitor cable, and the connector can be placed either vertically or horizontally. (Use the accessory angle brackets for vertical/horizontal placement.)
Specifications of IV-S51M controller

**Image processing**
- Monochrome 256 gray levels
- One screen for one captured image per camera

**Optical system**
- 84 object types

**Image memory**
- 64 object types

**No. of cameras to be connected**
- Up to 2 cameras

**Image capturing time**
- 16.7 ms (full mode), 8.3 ms (half mode)

**Gray search time**
- 8ms (model: IV-S30C3, search area: 256x256, when the speed is prioritized)

**Resolution time**
- For my conditions: 360, Pixel, 16 pixel by 16 pixel of 1208/4, search area: 714x714

**Gray search, edge detection process**
- Sub-pixel

**Gray image processing**
- Histogram widening

**Noise elimination**
- Median

**Nonlinearity**
- Edge detection (primary differentiation, secondary differentiation), horizontal edge, vertical edge

**Binary threshold value**
- Fixed and threshold value correction (variation difference/variation ratio)

**Expansion correction, and area filter**
- Expansion correction + contraction = expansion correction + area filter

**Positional correction method**
- X/Y correction, rotation correction

**Wavelength correction**
- Reflection, transmission, transmittance, and area filter

**Position detection**
- Object: single workpiece, multiple workpieces can be processed simultaneously
  - Output: coordinate
  - Object: single workpiece, multiple workpieces can be processed simultaneously
  - Output: coordinate, angle

**Shape degree of match inspection**
- Measurement: 1. no individual workpiece, 2. individual workpiece
  - Output: area

**Working position measurement**
- Object: all the workpieces, 2. designated workpieces
  - Output: number of object detected

**Number of measurement program**
- Maximum 8 measurements/program (maximum 1000 object types) + 1 measurement item 0 - camera 2, and measurement item 1

**Arithmetical operation**
- Four basic operations (\( +, -, \times, \div \))
  - Maximum, minimum, average, and total

**NI image memory function**
- Year, month, day, hour, minute and second

**Optical system**
- CCD camera

**Image adjustment 1**
- 1. Focus adjustment, 2. contrast adjustment

**Image adjustment 2**
- 1. Image distortion compensation & calibration

**Specifications of camera**

- **Camera body section**
  - IV-S30C2: 30 (W)
  - IV-S30C4: 32 (H)

- **Head section**
  - IV-S30C2: 85% (non-condensing), free from corrosive gases or dust
  - IV-S30C4: 85% (non-condensing), free from corrosive gases or dust

- **Weight**
  - Approx. 50 g (not including the lens)

**Specifications of camera lens (IV-S520L16)**
- **Aperture range**
  - 1.6 to 16 close

- **Filter installation diameter**
  - M25.5, P = 0.75, 1/2

- **Mount diameter**
  - C mount

**Compatibility camera**
- 8400-1600 pixels (Recommended 1024 x 1024, 16500 colors)

**Specifications of IV-LCD monitor (IV-S08MP) or IV-LCD monitor cable (IV-S00MC2)**

**Screen of the image display**
- 4.4&05IFEFUBJMTJOUIJTQBNQIMFUXFSFDPSSFDUBTPG"QSJM

**Operating environment of parameter setting support software (IV-S05SPM)**
- The environment where the Windows 2000/XP can be operated

**Specifications of II terminal**
- RS-232C/RS-422 (2-wire/4-wire system)
  - DC24V (0.10%) 2W
  - DC24V (95% RH (non-condensing))

**Camera body section**
- IV-S30C3: 30 (W)
  - 128 MB or more

**Head section**
- IV-S30C4: approx. 140 g
  - Approx. 1.5 kg

**Connection to controller**
- Connection using custom camera cables (IV-S00MC2: 3m, IV-S00MC3: 5m, and IV-S00MC7: 9m)

**Camera body section**
- 30 (W) x 32 (H) x 40 (D) mm

**Head section**
- IV-S30C2: approx. 125 g
  - IV-S30C4: approx. 140 g
  - approx. 125 mm (approx. 1.5 kg)

**Weight**
- 50 g (not including the lens)

**Operation ambient temperature/temperature**
- -40 to 70°C (30% RH (non-condensing))

**Control Number of control**
- 4 systems, 2 controls/1 system

**Input trigger (parallel interface)**
- External trigger
  - Output: yes or no
  - Parallel interface
  - Interrupt input (parallel interface) 1 point

**External interface**
- USB host
  - USB 2.0 specifications 2-channel

**Output**
- High level automatic
  - DIGITAL OUT

**Input**
- General input
  - Common for input: 1 point

**Operation input**
- TOUCH PANEL

**Input trigger (parallel interface)**
- External trigger
  - Output: yes or no

**Output: area**
- Measurement: 1. no individual workpiece, 2. individual workpiece

**Documents and Trademarks**
- This document may be changed without prior notice.

**Color of the actual product**
- The color of the actual product may vary from that shown in the image.