■Main specifications

Model name	SI-C1500	
	M-type	L-type
Image processing system	Color image processing (CCD color camera system/ High-intensity white LED)	
Resolution	15.5μm/pixel	22.0μm/pixel
Field of view	19.3 mm x 15.5 mm / frame (L type: 28.6 mm x 22.7 mm/ frame with 22.0 μm/pixel)	
Objective component	0201CR, 0.3LSI, 1005CR, Transistor, Tantal Capacitor, Connector, Al capacitor, Coil, etc.	
Detected defects	Inaccurate component mounting, reversed components, incorrect polarity, missing solder, bridging, solder quantity, missing components, etc.	
Board size	50 x 50 mm ~ 250 x 330 mm With automatic PWB width adjustment function	50 x 50mm～460 x 510mm
Board thickness	0.4 ~ 1.6mm	0.4 ~ 2.0mm
Clearance	Upper side: 20 mm / Lower side: 30 mm	Upper side: 20 mm / Lower side: 60 mm
Position reference	Front-side-rail origin (Back-side rail origin optionally available)	
Flow of work	Left to right or right to left	Left to right or right to left (To be specified at factory set-up)
Conveyor height	900 mm -10 mm + 60 mm	
Inspection speed	0.23 sec / frame (upper image, side image)	0.30 sec / frame (upper image, side image)
Operating system	Windows2000	
Program capacity	200 models	
Others	Automatic conveyer width adjustment function (M type only), PWB back-up, NG printer	
Power supply /consumption	AC 100V Max 1.5kVA (Other power rating optionally available)	AC 200-240V Max 1.5kVA (Other power rating optionally available)
Air pressure	0.49MPa dry air	
External dimensions	1300(W)x900(D)x1692(H)mm (Machine status light height 1860mm)	1300(W)x1070(D)x1730(H)mm (Machine status light height 1860mm)
Weight	350kg	850kg
Optional functions	NG marking unit, LAN compatible server, off-line data generator, NG repair system, centralized confirmation control, automatic data conversion program, stencil function, automatic conveyer width adjustment (L type only), loader & unloader extension conveyer (L type only)	

■External view

Mtype

Ltype

Unit：mm
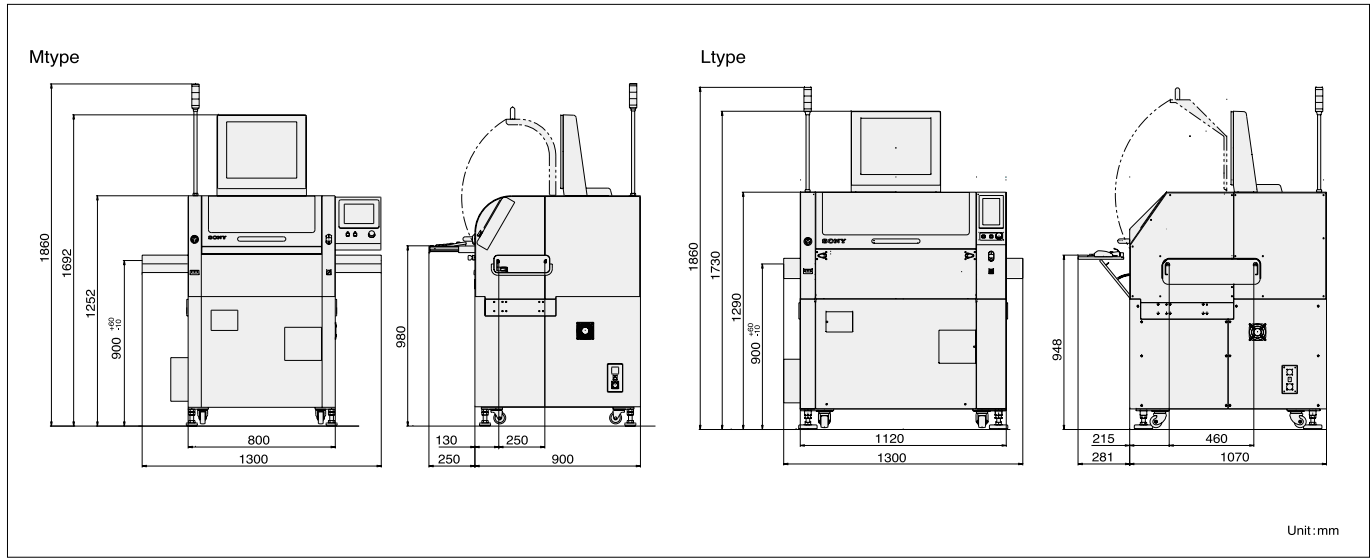
■Operating support options

LAN Support

Systems running on Windows 2000 are linked to the network via the server. All the SI-C1500 data can be stored in the hard disk on the server and managed centrally within the worksite.

Server
Windows 2000

TCP/IP, Netware, etc.

SI-C1500
#1

SI-C1500
#n

Off-line data
generator system
Windows 2000

NG repair
system Windows
2000

Centralized
confirmation
control
Windows 2000

* The off-line data generator system and NG repair system can be used independently, without being connected to the LAN.

Off-line Data Generation System

Using images acquired with the camera from the main system, process libraries and PWB data can be generated and modified off-line. Data can be generated in the same way as data created on the main system using the same simple operations.

SI-C1500 system

Off-line data
generation system

MO-disk

LAN

NG Repair System

Picture data of NG PWBs is stored to support repair off-line. The data can also be accumulated.

(Off-line repair support system /
Data accumulation function)

Automatic Data Conversion System

Inspection data can be automatically generated from CAD data and/or mounter data.

SI-C 1500 Data Converter

⚠ Safety Notice: For your safety, please read the instruction manual carefully before using the product.
●Specifications and appearance are subject to change without prior notice. ●Windows® is a trademark of Microsoft Corporation.

SONY

PWB Visual Inspection Machine
SI-C1500

Equipped with the unique color image processing technology MOSAIC making full use of the power for "after-reflow" PWB inspections
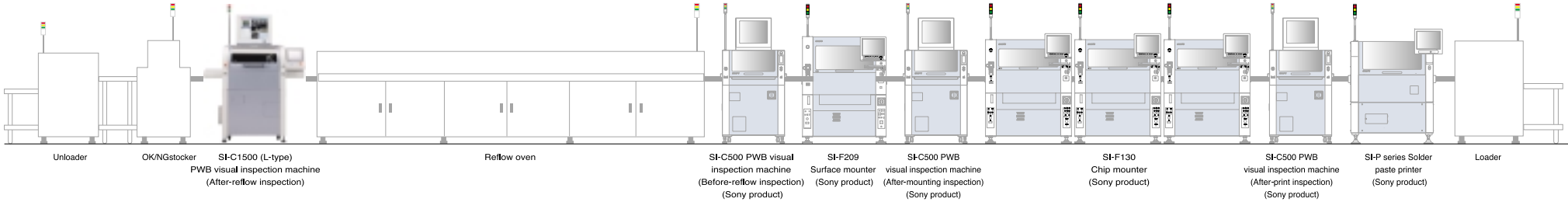
SI-C1500

PWB VISUAL INSPECTION MACHINE

🌐 **Sony Manufacturing Systems Corporation**

Equipped with the color processing function MOSAIC to extract color elements from the image.
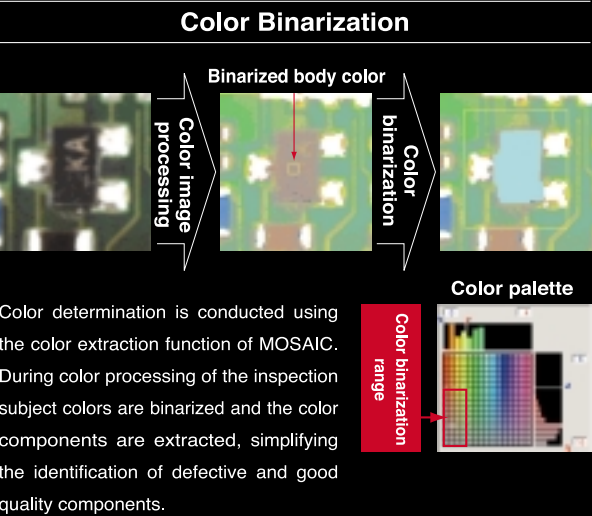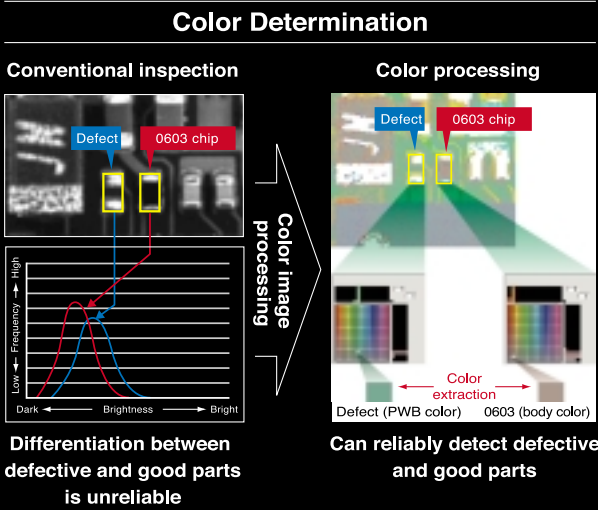# Achieves high-speed, high-precision inspections of mounted PWBs.

High-resolution 15.5 μm/pixel covering a wide 19.3 x 15.5 mm field of view. The SI-C1500 is a PWB visual inspection machine performing high-speed, high-precision "after-reflow" inspections as the final step of PWB assembly line. The system includes a 1.3 megapixel high-resolution color camera and the state-of-the-art color processing function MOSAIC to extract color elements from the captured image. Recognizing device surface and board surface having low contrast, that is difficult to identify with gray scale system, provides stable inspection of the component mounted on the PWB.

| Unloader | OK/NGstocker | SI-C1500 (L-type) PWB visual inspection machine (After-reflow inspection) | Reflow oven | SI-C500 PWB visual inspection machine (Before-reflow inspection) (Sony product) | SI-F209 Surface mounter (Sony product) | SI-C500 PWB visual inspection machine (After-mounting inspection) (Sony product) | SI-F130 Chip mounter (Sony product) | SI-C500 PWB visual inspection machine (After-print inspection) (Sony product) | SI-P series Solder paste printer (Sony product) | Loader |

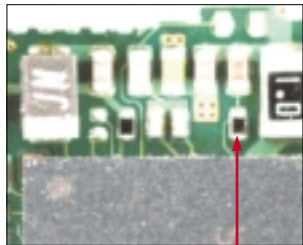## Improved inspection results using color determination
Equipped with MOSAIC color processing

Inspections are performed by extracting the color elements using color processing (MOSAIC function). Even for sections that have conventionally been difficult to inspect stably due to the similar contrast of the components and the board surface can be reliably inspected using the color determination. A newly-developed image processing board now provides even faster image processing.

Color Determination

Conventional inspection

Defect | 0603 chip

High — Low (Frequency)
Dark — Brightness — Bright

Differentiation between defective and good parts is unreliable

Color processing

Defect | 0603 chip

Color extraction
Defect (PWB color)   0603 (body color)

Can reliably detect defective and good parts

Color Binarization

Binarized body color

Color image processing → Color binarization

Color palette

Color binarization range

Color determination is conducted using the color extraction function of MOSAIC. During color processing of the inspection subject colors are binarized and the color components are extracted, simplifying the identification of defective and good quality components.

SI-C1500
PWB VISUAL INSPECTION MACHINE

High resolution / High-speed processing

1.3 megapixel, high-resolution color CCD camera

The 1.3 megapixel, high-resolution color CCD camera provides high-resolution (15.5 μm) covering a wide field of view (19.3 x 15.5 mm). Detection is possible even for 0402 and 0603 chips, and 0.3 mm pitch QFP leads. The color image processing offers reliable verification of NG points.

0603 Chip Components

Rapid data generation
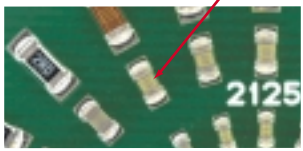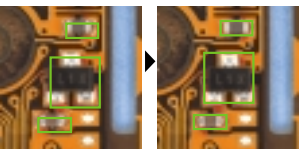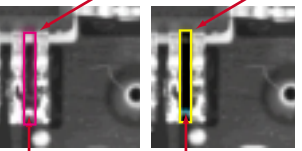
Easy operation with friendly User-interface

● The 18.1-inch color monitor provides excellent operability
● Components with polarity can be programmed automatically by one direction and converted to other directions. This way number of components to be programmed can be reduced.
● The inspection program utilizes packaging (process packaging function) of each inspection item (defects, misalignment, solder inspection, etc.) , resulting in simple and speedy programming.

Reliable Quality and Performance

Over 1,300 units have been installed worldwide.

The reliability and performance of this series are proven by the fact that more than 1,300 units have been installed.

Other Useful Functions

OCR function (optional)

OCR function enables reading characters on the board and components

TSOP28

Ability to handle angle-mounted components

The window can be rotated by 1-degree incrementation
Angled window

2125

Auto-window function

Automatic positioning correction is performed to match the actual PWB even when the window shifts on a flexible PWB, etc.

Silk deletion function

It is possible to delete only the portion of silk print and leave bridge defect image.

Silk   Silk deletion

Bridge   Bridge