Work Inspection Camera

# RICOH SC-20

RICOH
imagine. change.

JUMAVIS
OPTICAL QUALITY CONTROL

RICOH

**Prevent Work Errors**
Real-time Inspections During a job

**High-precision Judgment**
8 Megapixel Sensor

**Traceability**
Image Log Storage

**Compatible with a Wide Range of Workpiece Sizes**
C-mount FA Lens

# Cannot conduct exterior inspections.
# This camera is for manual work quality inspections.

The RICOH SC-20 is a work inspection camera that detects mistakes during the assembly process. It can conduct real-time quality checks during a job, something exterior inspection cameras are not capable of. It can perform automatic checks of assembly status such as similar parts, missing parts, and work order, and perform batch inspections after a job is completed. Because the system is easy to set up without the need for a computer, it is easy to begin digital inspections.
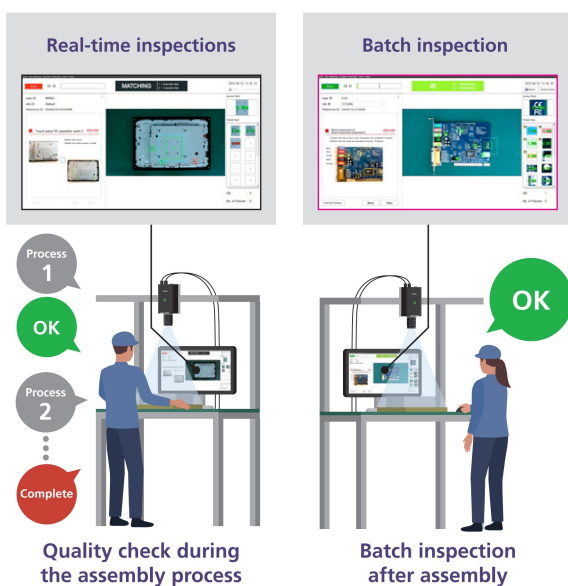
Work Inspection Camera **RICOH SC-20**

## Digital image inspections during or after a job
*point* **01**

Image recognition automatically checks assembly status during the job. Digitalization of visual inspections helps maintain consistency. You can set up to 20 check points and perform batch inspections after a job is completed.

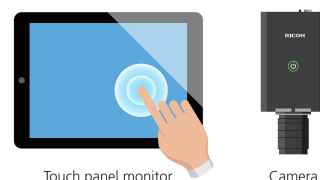### Digitalization of visual inspections helps maintain consistency

**Real-time inspections**

**Batch inspection**



Process 1 — OK
Process 2 — ⋮ — Complete

OK

**Quality check during the assembly process**

**Batch inspection after assembly**

## Easy installation without the need for a computer
*point* **02**

The camera, image recognition, and software are integrated. The system is easy to set up if you have a mouse, keyboard, and monitor. If you have a touch panel monitor, you don't need a mouse or keyboard.
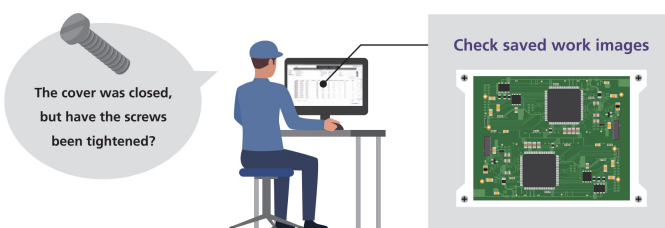
* The RICOH SC-20 main unit is not provided with a lens. A genuine RICOH C-mount lens compatible with the RICOH SC-20 must be purchased separately.

**Easy setup with a monitor and camera only**



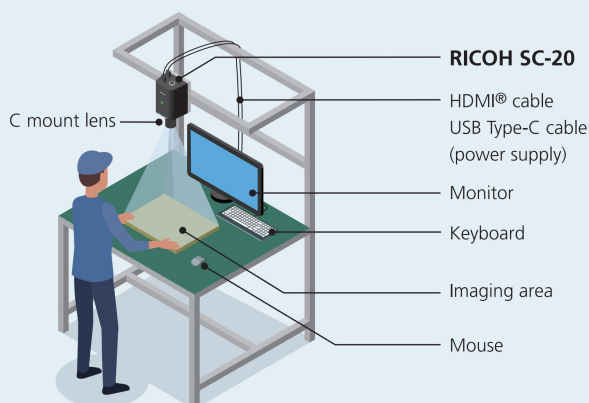Touch panel monitor          Camera

## Ensure traceability
*point* **03**

Part serial numbers, work times, etc., and inspection results such as OK/FAIL can be saved as image logs for use in work analysis and traceability.

### Logs can be viewed for work tracing

The cover was closed, but have the screws been tightened?

**Check saved work images**



## System Configuration



C mount lens

**RICOH SC-20**
HDMI® cable
USB Type-C cable (power supply)
Monitor
Keyboard
Imaging area
Mouse

**Easily connect to external devices using the external connector, LAN port, wireless LAN*¹, or Bluetooth®*¹**

Sensor

Foot switch

PLC*², controller

Indicator lamp

Electric screwdriver
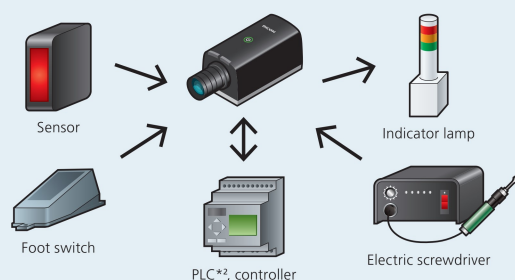
**A genuine optional external I/O cable (5m/10m) is available for connection to external devices.**

*1 Wireless LAN and Bluetooth are supported only on the models with a wireless communication system.
*2 Programmable Logic Controller

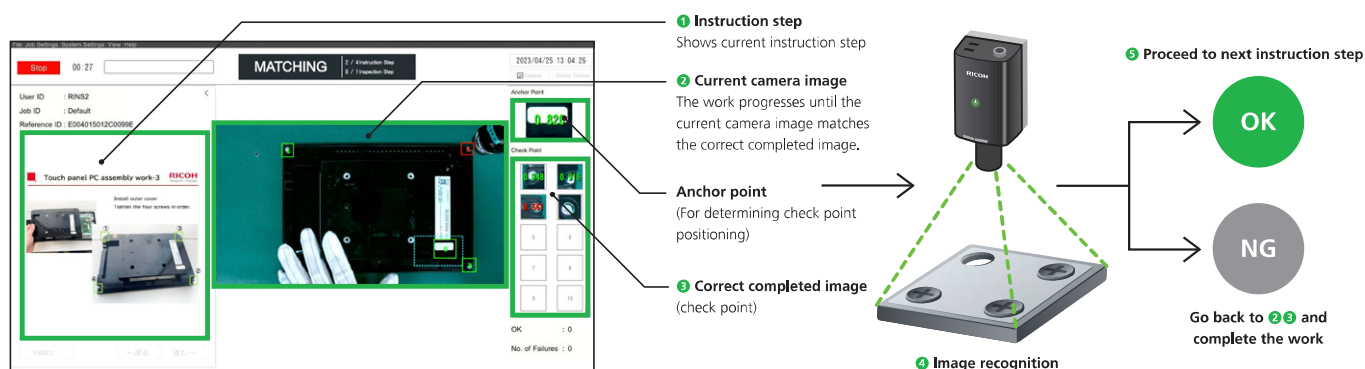* A mouse and keyboard are not necessary when using a touch panel monitor.

## Compatible with C-mount FA lenses and a wide variety of workpiece sizes and working distances

The camera uses an interchangeable C mount lens. 5 high-resolution, RICOH FA lenses that offer minimal distortion are available.
Select from 5 focal lengths to match the size of your workpiece.

## Real-time inspections during a job

Instruction steps are linked with image recognition. The worker follows the instruction steps displayed on the left side of the screen and the system uses image recognition to automatically check that the work has been carried out in the correct order, including screw tightening, etc. The system prevents the worker from proceeding to the next step in the process until the camera image matches the completed image, helping prevent mistakes and improve quality. The system helps workers learn proper work procedures.



❶ **Instruction step**
Shows current instruction step

❷ **Current camera image**
The work progresses until the current camera image matches the correct completed image.

**Anchor point**
(For determining check point positioning)

❸ **Correct completed image**
(check point)

❹ **Image recognition**

❺ **Proceed to next instruction step**

OK

NG

Go back to ❷❸ and complete the work

## Prevent mistakes with image recognition (matching)

Pattern matching checks product numbers and similar parts with slightly different shapes, and checks for missing parts. Color recognition can detect differences in color among similar parts to ensure that they are assembled in the correct orientation Image recognition can also differentiate between smooth and uneven surface materials such as non-woven fabric, sponge, ensuring that they are attached to the product. 1D/2D code reading and character reading by OCR are also available with the addition of optional functions (paid option).

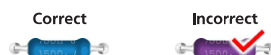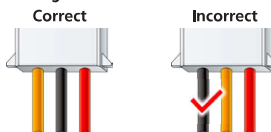### Checking for similar or missing parts

■ **Checking for wrong parts**
Correct — Incorrect
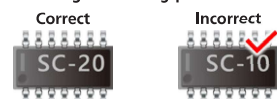
■ **Checking for missing parts**
Correct — Incorrect
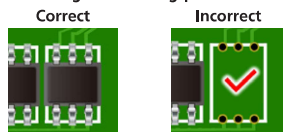
### Checking color / color order

■ **Checking for differences in colors**
Correct — Incorrect

■ **Checking for differences in color order**
Correct — Incorrect

### Checking specific parts by AI

■ **Checking the absence/presence of screws**
Correct — Incorrect
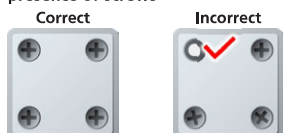
■ **Checking the polarity direction of electrolytic capacitors**
Correct — Incorrect
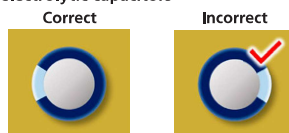
### Easily read barcodes and text (option)

The camera body can recognize barcode and QR code information. Also, text information that was previously checked visually can be read with OCR, making it possible to save product names and serial numbers in the work log. User ID input during login can be handled by the camera body using image input.
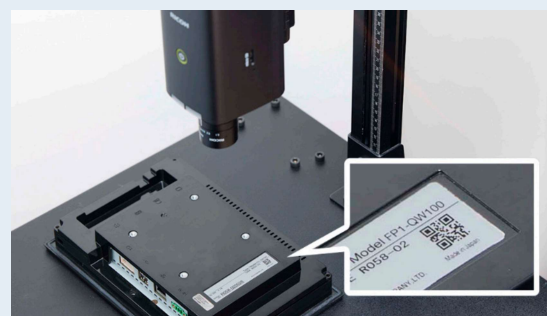
## RICOH SC-20 Main Specifications

| Item | | | | Specifications |
|---|---|---|---|---|
| Lens mount | | | | C-mount (The RICOH SC-20 main unit is not provided with a lens. A genuine RICOH C-mount lens compatible with the RICOH SC-20 must be purchased separately.) |
| Image sensor | | | | 1/1.8 inch 4K (QFHD) progressive color CMOS |
| | Number of pixels | | | 3840 (H) x 2160 (V) |
| | Cell size | | | 2.0 (H) x 2.0 (V) μm |
| Instruction step | Instruction step file | | | JPG format (610 (H) x 680 (V)) |
| Matching | Method | | | Shape, color, texture, AI(Capacitor), AI(Screw) |
| | Area setting (ROI) | | | Specify area with absolute position |
| | Position correction | | | Relative position correction from reference position |
| | Position rotation correction | | | ±180° (shape only) |
| | Character string check | | | Maximum 20 places |
| Check | | | | Button, External inputs |
| Data input | Output method | | | Check whether matches set number of characters |
| | Character string check | | | Check whether matches set character string on left |
| Color Order Judgment | | | | Matching the set color order |
| Result logging | Output method | | | Saved in CSV format to the specified path |
| | Log information | | | Work ID, reference ID, user ID, instruction step, inspection step, date/time, standard time, elapsed time, process item, judgment result, final judgment result, image log file name, process data |
| Image logging | Output method | | | Saved in JPG format to the specified path |
| | Setting method | | | Image logging can be enabled or disabled for each inspection step. |
| External interfaces | HDMI | | | 1920 (H) x 1080 (V)/60 Hz   * Voice output is not supported. |
| | USB | | | Type-A x 1 : USB 5Gbps (Host)<br>Type-C x 1 : USB 5Gbps (Host) USB PD supported, USB DP Alt Mode not supported<br>* Supported class: USB-HID, USB-Mass Storage, USB-Audio |
| | Ethernet | | | RJ-45 x1 100Base-TX / 1000Base-T |
| | microSD card | | | microSD / SDHC / SDXC x1 High Speed / UHS-I supported |
| | External GPIO | | | OUT (insulated): 6 pieces   IN (insulated): 10 pieces   OUT/IN (insulated) power: 5 V to 24 V ±10% |
| | Wireless LAN (Models with a wireless communication system only) | | | IEEE802.11a/b/g/n/ac (2.4 GHz/5 GHz) compliant |
| | Bluetooth (Models with a wireless communication system only) | | | Bluetooth 5.0 BR/EDR Class 2   * Supported profile: SDP, L2CAP, GAP, A2DP, HID |
| I/O | Buzzer | | | Electromagnetic (Volume: high, low, mute) |
| | LED indicator lamps | | | Power, OK, FAIL |
| | Switch | | | Power |
| Ratings | Power voltage | | | 12 V DC ±10% 3A or more (USB PD)   12/24 V DC ±10% (external connector)   * Power must not be supplied from both connectors at the same time. |
| | Power consumption | | | 8.6 W or less |
| Storage area | Area accessible by user | | | 25 GB |
| Environmental resistance | Operating temperature range | | | 0 to 40°C |
| | Storage temperature range | | | -20 to +60°C |
| | Ambient humidity range | | | 30 to 80% RH   * No condensation |
| External dimensions | | | | 78 (W) x 73.5 (H) x 117.9 (D) mm (excluding attached lens and connectors) |
| Weight | | | | Approx. 460 g |
| Mounting holes | | | | Tripod screw hole (ISO 1222 compliant), M4 screw hole x 2 |
| AC adapter (models including an AC adapter only) | Product name | | | D-AC166-SC |
| | Manufacturer | | | Adapter Technology Co., Ltd. |
| | Ratings | Input voltage | | 100 to 240 V AC / 50 to 60 Hz |
| | | Output voltage | | +12 V ±5% |
| | | Output current | | 3 A max. |
| | External dimensions | | | 33 (W) x 50 (H) x 99 (D) mm (excluding cable) |
| | Weight | | | Approx. 210 g |

● **RICOH SC-20 Work Instructions Editor (PC software) recommended operating conditions**
This PC software is used to create instruction step files optimized for the RICOH SC-20.
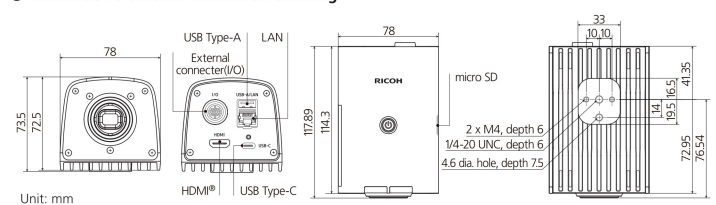[Supported OS] Windows® 10 (32-bit/64-bit) Ver. 1607 and later, Windows® 11 (64-bit)

● **RICOH SC-20 Compatible Lenses**
FL-CC0820-5MX  (f=8mm,F2.0)
FL-CC1218-5MX  (f=12mm,F1.8)
FL-CC1618-5MX  (f=16mm,F1.8)
FL-CC2518-5MX  (f=25mm,F1.8)
FL-CC3524-5MX  (f=35mm,F2.4)

● **RICOH SC-20 Genuine External I/O cable**
IOC-2005 [5m]   IOC-2010 [10m]

● **RICOH SC-20 exterior dimension drawing**

Unit: mm

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