

Work Inspection Camera

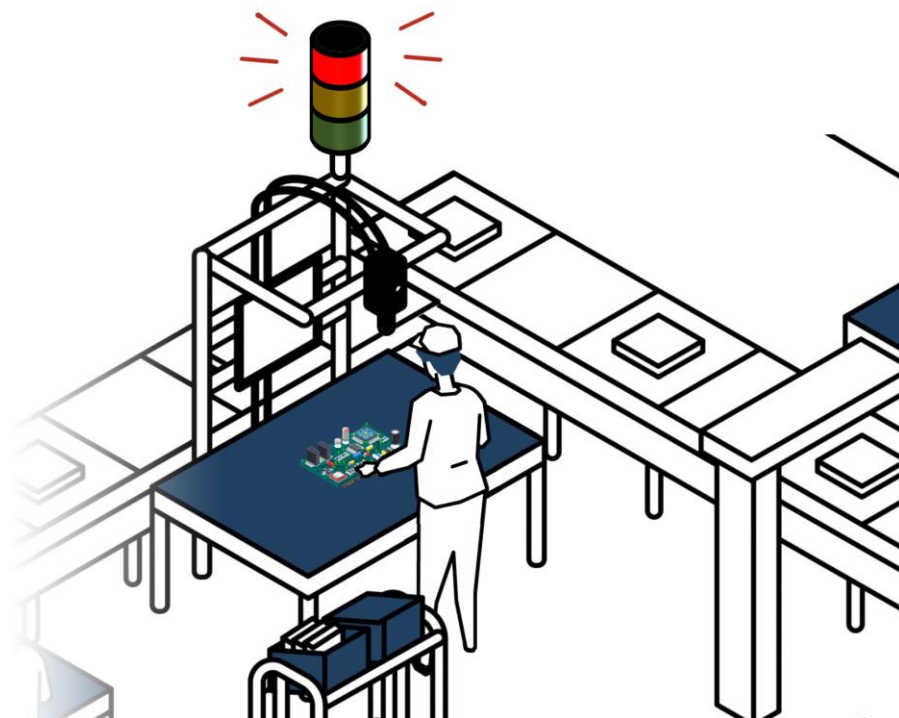
RICOH SC-20

## External I/O Settings

- Switch
- Signal light

Example of utilization

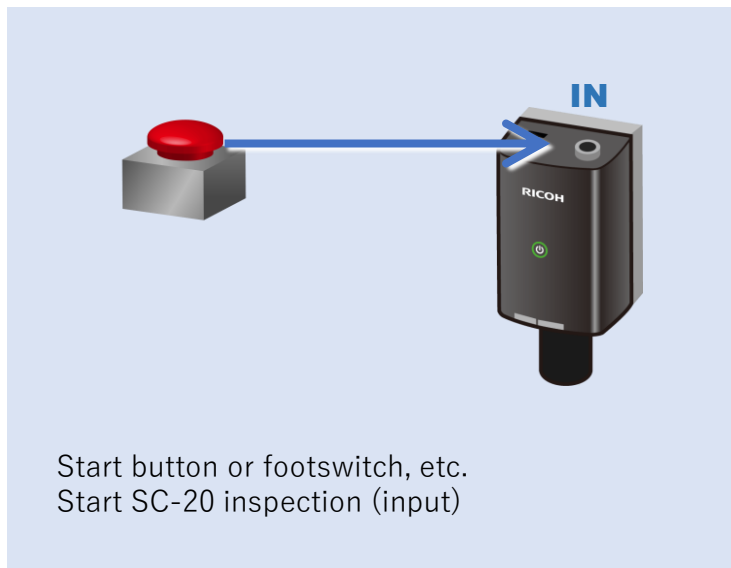
**RICOH**  
imagine. change.



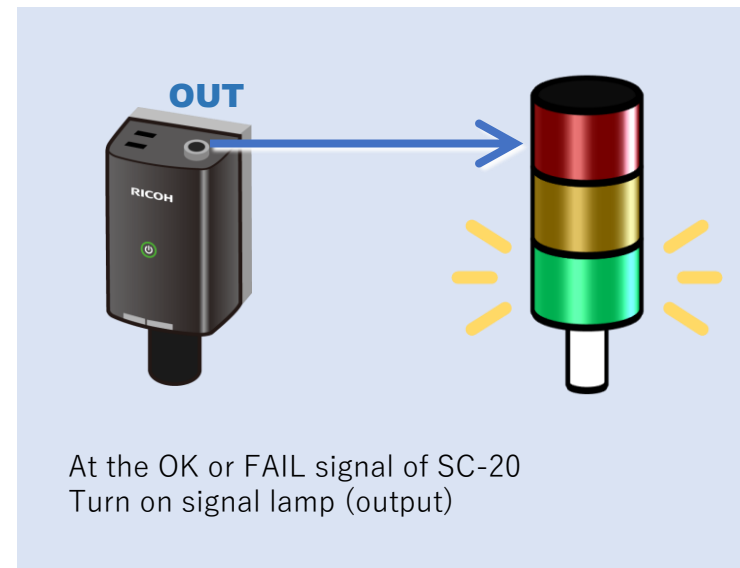
This document presents an example of linking RICOH SC-20 with external devices, including a button to start an inspection and a signal lamp to inform inspection results.

\* In this example, in addition to the external devices and I/O cables to be connected, a DC power supply and SSR are used together in the configuration.

## Starting SC-20 from an external device

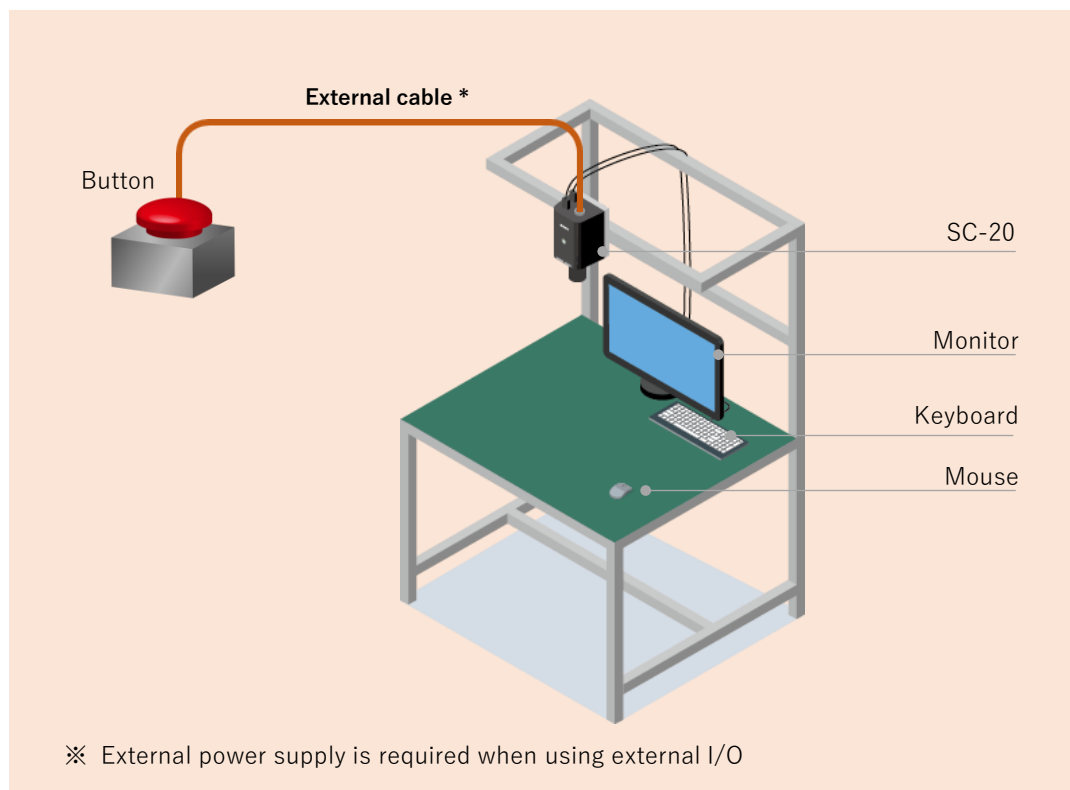


## Lamps inform you of SC-20 OK/FAIL results

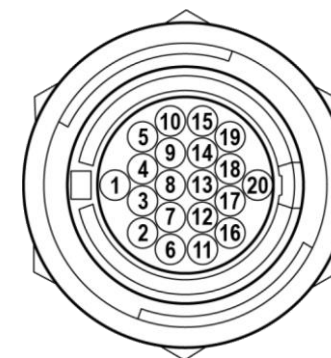


# 1. Start SC-20 from an external device

## Device Configuration



Camera-side connector shape

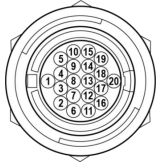


### \*External cable

Please use the following genuine options. Click [here](#) for details.

- External I/O cable (5m) IOC-2005
- External I/O cable (10m) IOC-2010

# 1. Start SC-20 from an external device



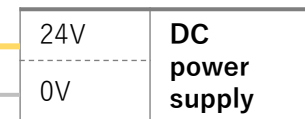
SC-20 side Connector

Wire connection image

| Pin No. | Signal Name | Specifications   | For electric screwdriver linkage       |
|---------|-------------|--|--|
| 1       | VPSU        | Power for the unit<br>12/24 V ± 10%                              | Not connected when using AC adapter    |
| 2       | IN 0        | Input (Insulated)  | Used for start button                  |
| 3       | GPSU        | GND for the unit   | Not connected when using AC adapter    |
| 4       | IN 1        | Input (Insulated)  | Not used in this example               |
| 5       | IN 2        | Input (Insulated)  |  |
| 6       | IN 3        | Input (Insulated)  |  |
| 7       | IN 4        | Input (Insulated)  |  |
| 8       | IN 5        | Input (Insulated)  |  |
| 9       | IN 6        | Input (Insulated)  |  |
| 10      | IN 7        | Input (Insulated)  |  |
| 11      | IN 8        | Input (Insulated)  |  |
| 12      | IN 9        | Input (Insulated)  | Use as needed                          |
| 13      | OUT 0       | Output (Insulated)   |  |
| 14      | OUT 1       | Output (Insulated)   |  |
| 15      | OUT 2       | Output (Insulated)   |  |
| 16      | OUT 3       | Output (Insulated)   |  |
| 17      | OUT 4       | Output (Insulated)   |  |
| 18      | OUT 5       | Output (Insulated)   | Used for power supply for external I/O |
| 19      | VCC_IO      | External I/O (insulated input/output)<br>power 5 V to 24 V ± 10% |  |
| 20      | GND_IO      | External I/O (insulated input/output)<br>GND                     | Used for GND for external I/O          |



※ External power supply is required when using external I/O.

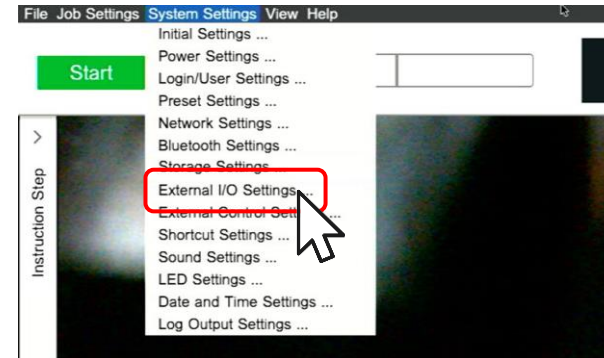


# 1. Start SC-20 from an external device

Sets the function of the signal connected to the wiring.

1

Select "External I/O Settings..." from the "System Settings" menu bar.

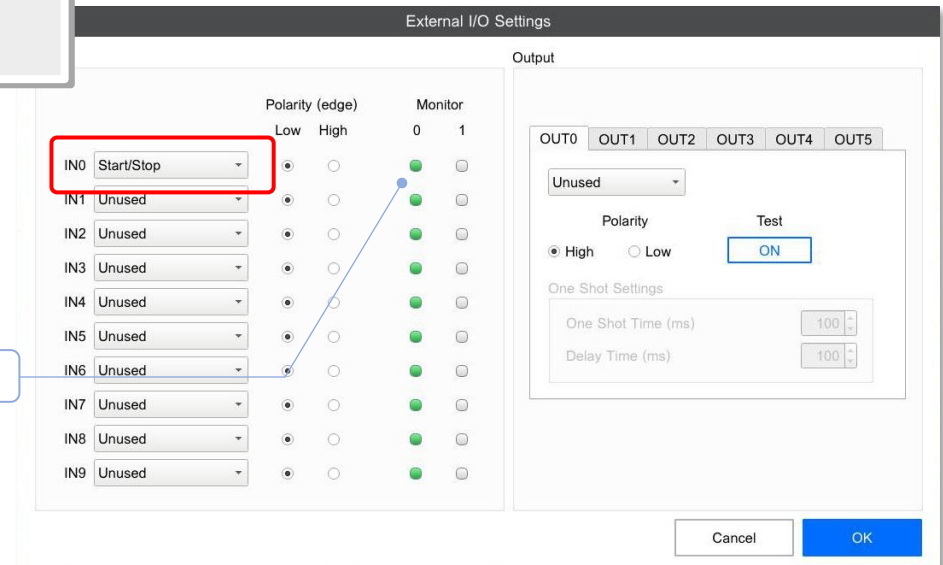


2

Set the following functions in the "Input" section of the "External I/O Settings" dialog box.

- IN0 : Start/Stop

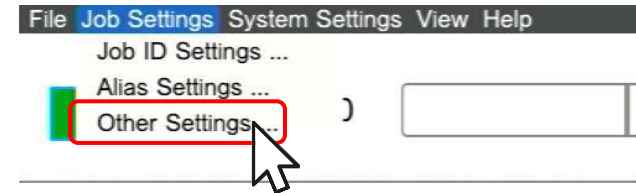
When connected normally, the display of "0" ← → "1" in "Monitor" will change.



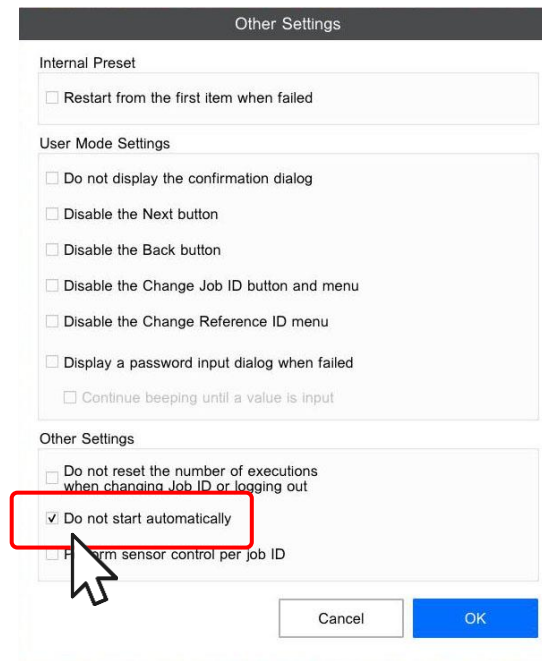
# 1. Start SC-20 from an external device

Change the setting so that the work inspection does not start automatically.

3 Select "Other Settings..." from the "Job Settings" menu bar.



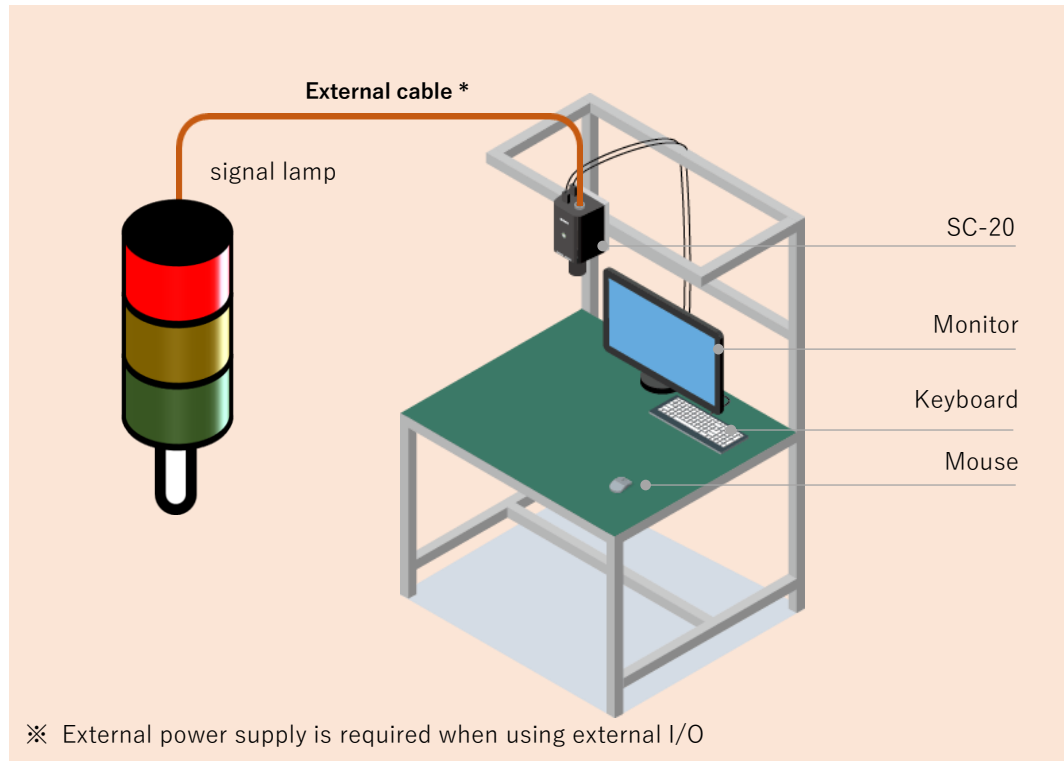
4 In the "Other Settings" dialog box, check the "Do not start automatically" checkbox.



The setup is now complete.

## 2. Indicates OK/FAIL results for SC-20 with a lamp

### Device Configuration



※ The output side has an output current of 3 mA, so please pay attention to the specifications of the support equipment. Use a solid-state relay if necessary.

#### ■ Operation verified solid-state relay

Terminal SSR "G3S4-D1 DC24V" manufactured by OMRON

#### ■ SC-20 External output (isolated output) specifications

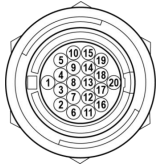
|                                  |                                  |
|----------------------------------|----------------------------------|
| Rated power voltage              | : 5V to 24V ±10%                 |
| Output current                   | : 3mA (Max)                      |
| Output voltage (source)          | : VCC_IO-0.3V @ 3mA              |
| Output voltage (sink)            | : 0.3V @ -3mA                    |
| Output method                    | : Push-pull                      |
| ON/OFF response time             | : 0.5us or less / 0.25us or less |
| Insulation system                | : Photocoupler                   |
| Electrostatic protection element | : Present                        |

#### \*External cable

Please use the following genuine options. Click [here](#) for details.

- External I/O cable (5m) IOC-2005
- External I/O cable (10m) IOC-2010

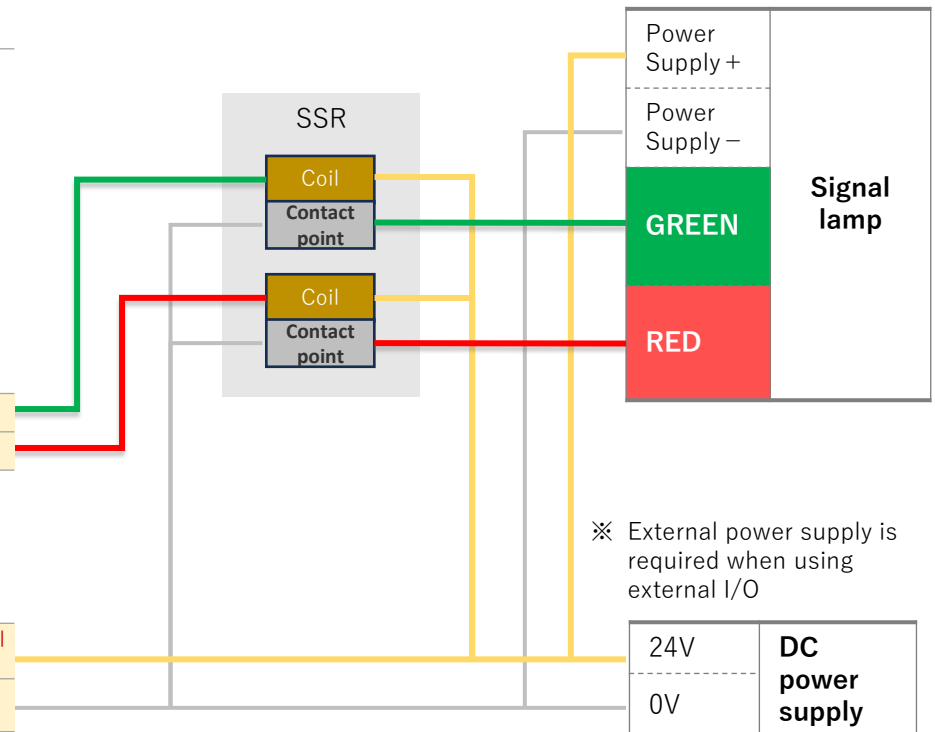
## 2. Indicates OK/FAIL results for SC-20 with a lamp



Camera-side connector

| Pin No. | Signal Name | Specifications   | For electric screwdriver linkage       |
|---------|-------------|--|--|
| 1       | VPSU        | Power for the unit<br>12/24 V ± 10%                              | Not connected when using AC adapter    |
| 2       | IN 0        | Input (Insulated)  | Not used in this example               |
| 3       | GPSU        | GND for the unit   | Not connected when using AC adapter    |
| 4       | IN 1        | Input (Insulated)  | Use as needed                          |
| 5       | IN 2        | Input (Insulated)  |  |
| 6       | IN 3        | Input (Insulated)  |  |
| 7       | IN 4        | Input (Insulated)  |  |
| 8       | IN 5        | Input (Insulated)  |  |
| 9       | IN 6        | Input (Insulated)  |  |
| 10      | IN 7        | Input (Insulated)  |  |
| 11      | IN 8        | Input (Insulated)  |  |
| 12      | IN 9        | Input (Insulated)  |  |
| 13      | OUT 0       | Output (Insulated)   | Used to light the GREEN lamp           |
| 14      | OUT 1       | Output (Insulated)   | Used to light the RED lamp             |
| 15      | OUT 2       | Output (Insulated)   | Not used in this example               |
| 16      | OUT 3       | Output (Insulated)   |  |
| 17      | OUT 4       | Output (Insulated)   |  |
| 18      | OUT 5       | Output (Insulated)   |  |
| 19      | VCC_IO      | External I/O (insulated input/output)<br>power 5 V to 24 V ± 10% | Used for power supply for external I/O |
| 20      | GND_IO      | External I/O (insulated input/output)<br>GND                     | Used for GND for external I/O          |

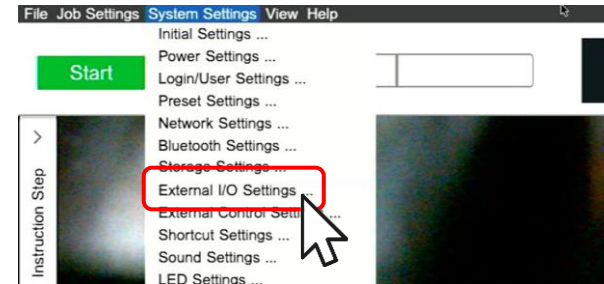
Wire connection image



## 2. Indicates OK/FAIL results for SC-20 with a lamp

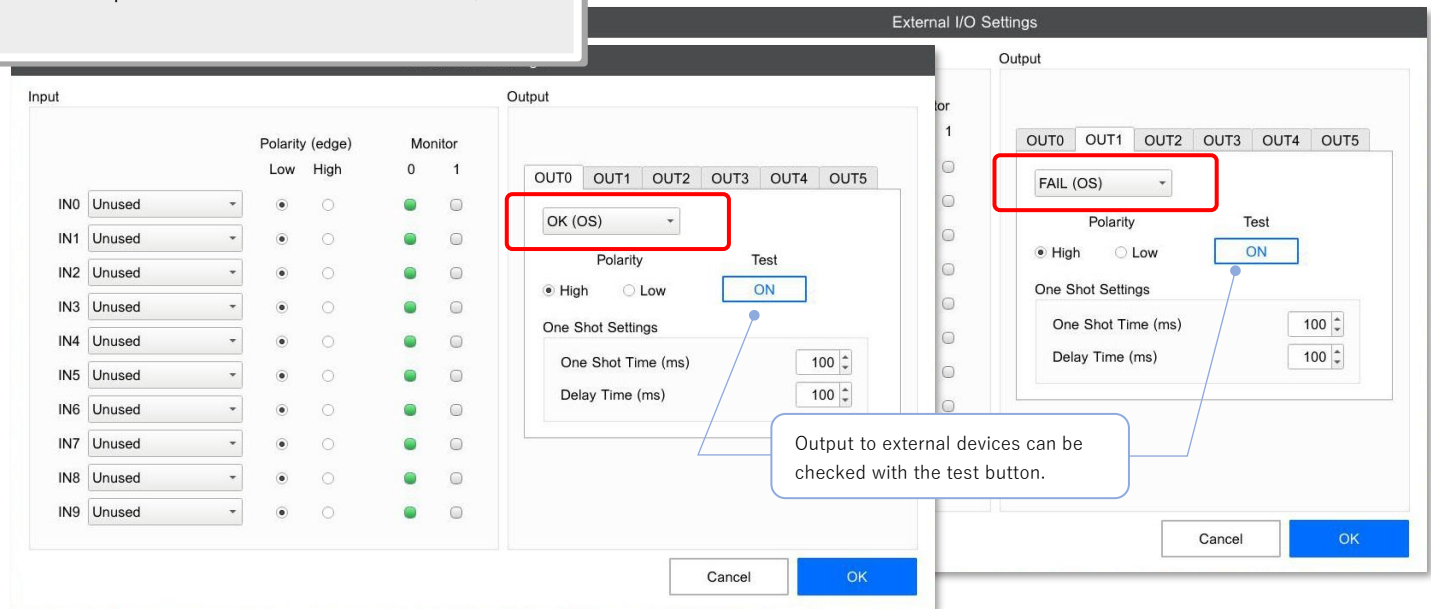
Sets the function of the signal connected to the wiring.

1 Select "External I/O Settings..." from the "System Settings" menu bar.



2 Set the following functions in the "Output" section of the "External I/O Settings" dialog box.

- OUT0 : OK (OS)
- OUT1 : NG (OS)

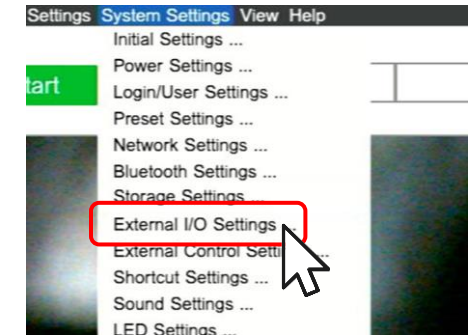


With the above settings, the GREEN lamp lights up for OK judgments and the RED lamp lights up for FAIL judgments.

# 3. Output cycle completion signal to external devices

To output a signal to an external device when one cycle of a series of work items is completed, make the following settings.

**1** Select "External I/O Settings..." from the "System Settings" menu bar.

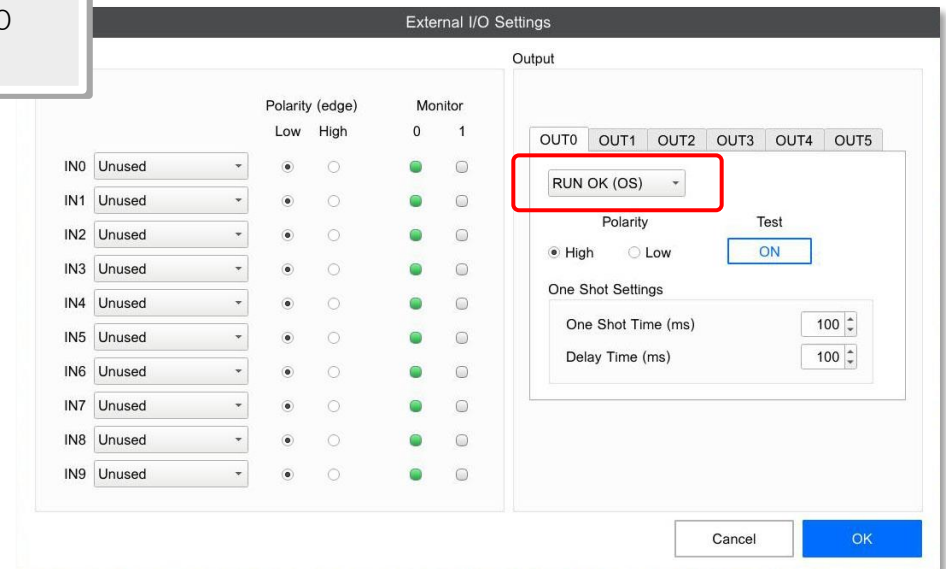
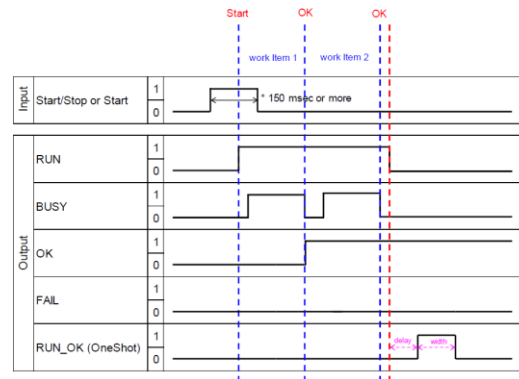


**2** Set the following functions in the "Output" section of the "External I/O Settings" dialog box.

■ OUT0 : RUN OK (OS)

When the work ID is successfully completed, the signal is generated for a certain period of time.

The delay time and one-shot time are equivalent to other one-shot settings.



# [Supplementary information] External I/O Settings

## Input

Set the input functions of the external connector pins.

## Output

Set the output functions of the external connector pins.

### IN0 ~ IN9

Set the input function for the corresponding signal name.

Unused  
EXTIN0  
Start/Stop  
Start  
Stop  
CHG JOB ID  
ENTER  
Next  
Back

### Polarity (edge)

Set the polarity of the signal that acts as a trigger at the input side.

### Monitor

Displays the current status of the input signal.

If the setting of [Polarity (edge)] and the status of the input signal (High/Low) is matching, the value is "1", and if these are different, the value is "0".

| Input | Function | Polarity (edge)                  |                       | Monitor                             |                          |
|-------|----------|----------------------------------|-----------------------|-------------------------------------|--------------------------|
|       |          | Low                              | High                  | 0                                   | 1                        |
| IN0   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN1   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN2   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN3   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN4   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN5   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN6   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN7   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN8   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| IN9   | Unused   | <input checked="" type="radio"/> | <input type="radio"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### OUT0 ~ OUT5

Set the output function for the corresponding signal name.

Unused  
EXTOUT0  
EXTOUT0 (OS)  
RUN  
BUSY  
OK  
OK (OS)  
FAIL  
FAIL (OS)  
RUN OK (OS)

※ See next page for RUN, BUSY, OK, FAIL

### Test

Test the output switch settings.

### One Shot Time

Set the time for output in one shot (10 to 2000 (ms)).

### Delay Time

Set the delay time up to output in one shot (0 to 2000 (ms)).

### Polarity

Configure the output switch settings.

## IN0 ~ IN9

Set the input function for the corresponding signal name.

Unused  
EXTIN  
Start/Stop  
Start  
Stop  
CHG JOB ID  
ENTER  
Next  
Back

### EXTIN 0~9

Used as an OK or FAIL input in the check mode of the inspection step.

### Start/Stop

Starts the workflow when the workflow can be started.  
Stops the workflow while it is being executed.

## OUT0 ~ OUT5

Set the output function for the corresponding signal name.

Unused  
EXTOUT  
EXTOUT (OS)  
RUN  
BUSY  
OK  
OK (OS)  
FAIL  
FAIL (OS)  
RUN OK (OS)

### EXOUT 0~5 (OS)

Turns ON for a certain period of time when an arbitrary inspection step ends.

### RUN

Turns ON during the workflow and OFF when the flow is complete.

### BUSY

Turns ON during the execution of an inspection step, and turns OFF when the judgment is complete.

### OK(OS)

Turns ON for a certain period of time during an OK judgment of each inspection step. The ON timing and the output time are set in [One Shot Time (ms)] and [Delay Time (ms)].

### FAIL(OS)

Turns ON for a certain period of time during a FAIL judgment of each inspection step. The ON timing and the output time are set in [One Shot Time (ms)] and [Delay Time (ms)].

### RUN OK(OS)

Turns ON for a certain period of time when the workflow is complete. The ON timing and the output time are set in [One Shot Time (ms)] and [Delay Time (ms)].

※ For details on external I/O, see [RICOH SC-20 Operating Instructions](#) [12.Settings - External I/O Settings]