F400 Color Vision Sensor

Detects All Specified Colors

F400

U O V K W Q E Z
P F H X Q E
S Z 4 N 6 A M
Colorgray Filter

Ideal for Detecting Fine Differences in Color

Example: Inspection of Surface Defects on Bottle Caps

- Original image
- Colorgray image: The scratches not detected in the original image are now clearly visible.
- Monochrome image: The scratches are almost invisible.

Ideal for Handling Light Fluctuations

Example: Inspection of Arrangement of Color Pencils (color set to red)

- Original image
- Colorgray image
- Original image
- Colorgray image: Stable colorgray images can be obtained even if the lighting is reduced.
A Color Vision Sensor able to distinguish even finer difference in color, taking the field of inspection to new heights.

The F400 Color Vision Sensor features not only the conventional color pickup function but also color-gray filtering - a first in the industry. A completely new type of vision sensor, the F400 Color Vision Sensor provides easy and stable detection of fine color processing or conventional color pickup methods.

The compact F400 Color Vision Sensor incorporates additional features for improved inspection.

- RGB filters
- Color pickup function
- A variety of measurement modes
A variety of different inspections are possible with one F400 Color Vision Sensor.

**RGB Filters**

In addition to the color gray filter, RGB (red, green, and blue) filters are available.
- Select a filter in accordance with the color of the inspected object and the purpose of inspection.

![Color image (original image)](image1)

![Red filter image](image2)
![Green filter image](image3)
![Blue filter image](image4)

**Color Pickup**

Detects up to eight colors simultaneously and measures area, center of gravity, and position displacement with high speed and precision.
- Ideal for distinguishing colors, checking different objects, and checking color arrangement.

![Original image](image5)
![Color pickup image](image6)

**A Variety of Measurement Modes**

Incorporates the same variety of measurement algorithms available with the F150-2.
- Binary measurement/gray measurement algorithms
- Surface defect measurement/edge position measurement algorithms
- Storing of NG (unacceptable) images (monochrome images after filtering)
Application Examples

- Colorgray Processing

  Inspection of Surface Defects on Bottle Caps

  Original image
  The contrast between the cap color and dirt is emphasized.

  Image after filtering

- Inspection of Amount of Adhesive

  Original image
  The edge enhancement function is used for the detection of the glue on copper plates. Fine color differences are distinctly visible, which is not possible from monochromatic images.

  Image after filtering

Color Pickup Processing

- Color Discrimination of Paper Cups

  Original image

  Color pickup image

- Miswiring Check of Wire Harnesses

  Original image

  Color pickup image
System Configuration

Recommended Power Supply: S82K-01524 by OMRON
Use the power supply at the specified supply voltage

F400 Vision Mate Controller: F400-C10E/F400-C15E

F150-VM Monitor Cable (2 m)

Programmable Controller

F150-KP Console (Cable length: 2 m)

Power Supply

Synchronous Sensor

F150-VM Monitor Cable (2 m)

BNC connector (provided)

Video Monitor
Use a video monitor conforming to NTSC standards and incorporating external video input terminals

F400-S1 Camera

F150-VC Camera Cable (3 m)
### Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F400 Vision Mate Controller: F400-C10E/F400-C15E</strong></td>
<td></td>
</tr>
<tr>
<td>Number of connected cameras</td>
<td>1</td>
</tr>
<tr>
<td>Number of pixels</td>
<td>512 x 484 (H x V)</td>
</tr>
<tr>
<td>Number of scenes</td>
<td>16</td>
</tr>
<tr>
<td>Image memory function</td>
<td>Maximum of 16 images (filtered monochrome images) stored</td>
</tr>
<tr>
<td>Operation method</td>
<td>Color pickup or color filtering (selectable)</td>
</tr>
<tr>
<td>Processing method</td>
<td>Extraction of 8 colors max.</td>
</tr>
<tr>
<td>Filtering</td>
<td>Images at 256 gradations</td>
</tr>
<tr>
<td></td>
<td>Gray, red, green, blue, color/grey filters (selectable)</td>
</tr>
<tr>
<td></td>
<td>Smoothing, enhance edges, all edges, and background suppression</td>
</tr>
<tr>
<td></td>
<td>256 levels per region</td>
</tr>
<tr>
<td>Position compensation</td>
<td>Compensating directions: X, Y, and if directions</td>
</tr>
<tr>
<td></td>
<td>Detection mode: Binary gravity/Axis angle, search (1 mode, 2 modes), and edge position (1 region, 2 regions)</td>
</tr>
<tr>
<td>Number of regions</td>
<td>16 per scene</td>
</tr>
<tr>
<td>Measurement data</td>
<td>Binary area, center of gravity, axis angle, correlation, search position, and edge position</td>
</tr>
<tr>
<td>Operation function</td>
<td>Arithmetic operation, distance, angle, square root, maximum value, and minimum value</td>
</tr>
<tr>
<td>Criteria result output</td>
<td>Overall judgment, judgment of operation results per region, and measurement and operation data</td>
</tr>
<tr>
<td>Monitor interface</td>
<td>1 channel (pin-jack over-scan monitoring compatible)</td>
</tr>
<tr>
<td>RS-232C interface</td>
<td>1 channel (D-sub 9-pin female)</td>
</tr>
<tr>
<td>Parallel I/O</td>
<td>11 inputs and 21 outputs including control I/O points</td>
</tr>
<tr>
<td>Output Type</td>
<td>F400-C10E: NPN, F400-C15E: PNP</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>24 VDC ±10%±15%</td>
</tr>
<tr>
<td>Current consumption</td>
<td>0.6 A max.</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>0°C to 50°C (with no condensation) 35% to 85% (with no condensation)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 400 g</td>
</tr>
</tbody>
</table>

### Camera: F400-S1

<table>
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<tr>
<th>Item</th>
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<tbody>
<tr>
<td>Picture element</td>
<td>1/3&quot; color CCD</td>
</tr>
<tr>
<td>Effective pixels</td>
<td>659 x 494 (H x V)</td>
</tr>
<tr>
<td>Shutter speed</td>
<td>Electronic shutter, 1/100, 1/500, 1/2000, or 1/10000 s (selectable with menu)</td>
</tr>
<tr>
<td>Lens mounting</td>
<td>C mount</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>0°C to 50°C (with no condensation) 35% to 85% (with no condensation)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 70 g (without mounting base)</td>
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### Dimensions

**Unit: mm**

**F400 Vision Mate Controller: F400-C10E/F400-C15E**

**Camera: F400-S1**
Export Precautions
These products are Controlled Products subject to Japanese Law.
They should not be sold, transferred, re-exported or otherwise used, disposed, and other than original usage declared to the exporter without prior notification and approval to the exporter.

General Precautions
The user must operate the product according to the performance specifications described in the brochure.
Before using the product under conditions which are not described in the brochure or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems, machines, and equipment that may have a serious influence on lives and property if used improperly, consult your OMRON representative.
Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.

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