

High-performance Vision Sensor

F250

Advanced algorithm enables ultra high speed and maximum flexibility



F250

Features

Inspection and positioning that was difficult with previous vision sensors is now surprisingly easy!

ED defect inspection



High-precision detection of minute defects that could not be detected previously.



Certain detection of rubber packing deformities.

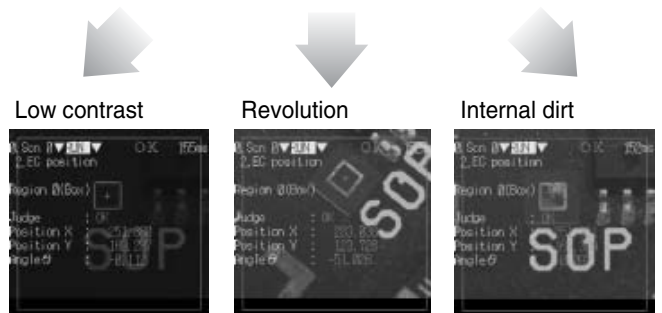


Detection of low-contrast defects on metal surfaces

EC positioning

High-precision position measurement even if the inside of the work changes or the view changes.

- Positioning of PWB fiducial marks



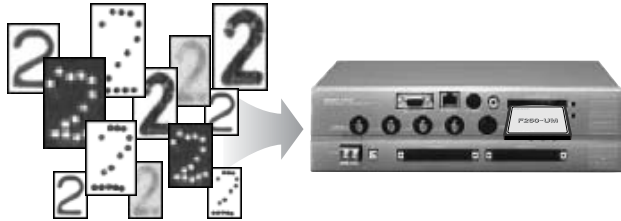
Features

QUEST character checking

Even if the shape or size of a character varies, "QUEST Logic" finds printed characters with certainty. The built-in dictionary makes "simple settings" possible.

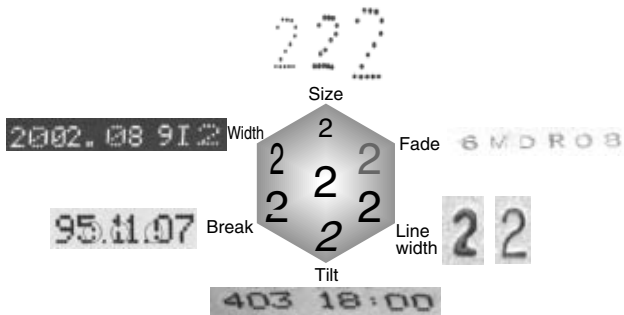
● No need to store a character dictionary

Various character fonts for factory automation have been pre-stored. This eliminates the need to store a dictionary or model names, and allows a dramatic reduction in man-hours for initial setup.



● The "six character variations" can also be recognized with certitude.

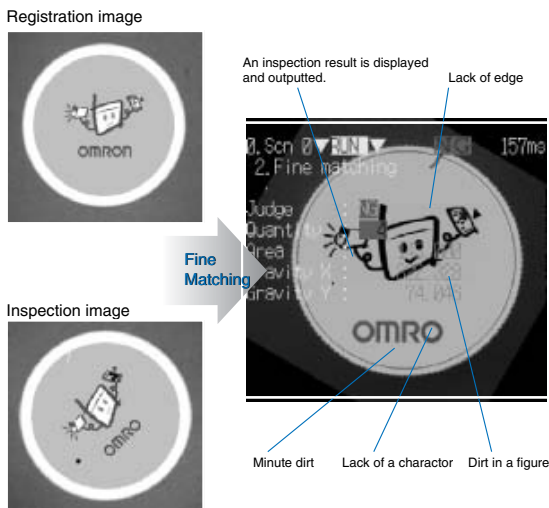
Checks characters printed on the production line such as "Best before" dates and lot numbers. Even if there are deviations in shape, size, or line width, the characters are accurately checked.



Fine matching

Detects differences from the stored "good" image quickly and with high accuracy. Dramatic improvement in ability to inspect characters and patterns with minute border defects.

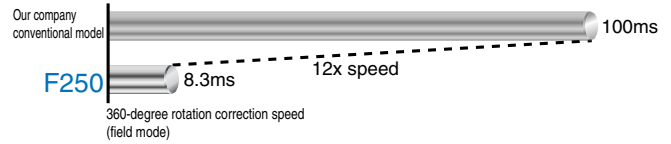
● Example of application to soft drink cap inspection



For fast increasing line speeds and ever stricter quality demands.

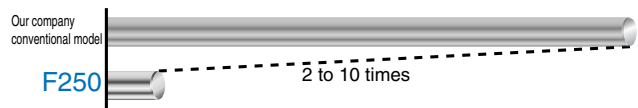
● Real time Revolution Search is amazing

Executes a real time search of 72 models. Even with works that rotate 360°, positioning corrections are completed at the same time as image read-in.



● Fast image processing

Inspection functions following camera image read-in are also up to 10 times faster thanks to a newly developed parallel processing technology.

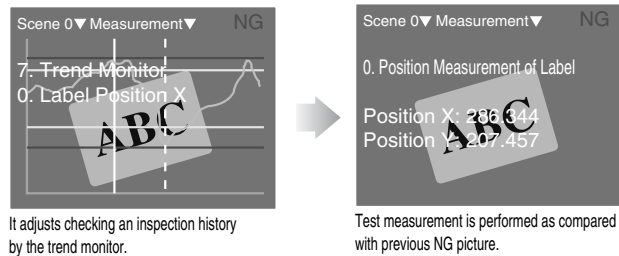


● Fast image read-in

The F160-S1 double-speed camera achieves a maximum image read-in speed of 8.3 ms.

"Non-stop" adjustment without stopping the line

All settings can be adjusted and reset while inspection continues. There is no need to stop the line for adjustments, subsequently, no capacity drops.

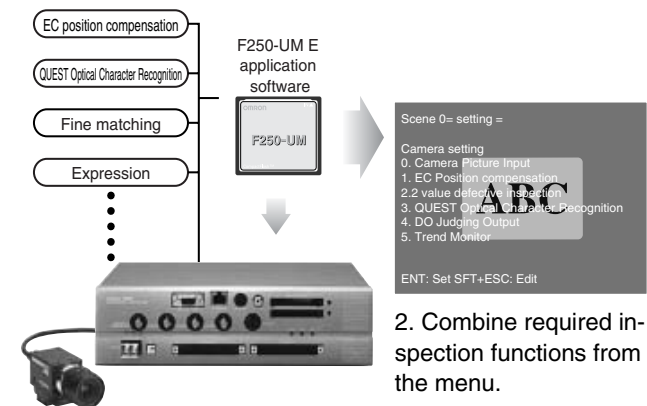


It adjusts checking an inspection history by the trend monitor.

Test measurement is performed as compared with previous NG picture.

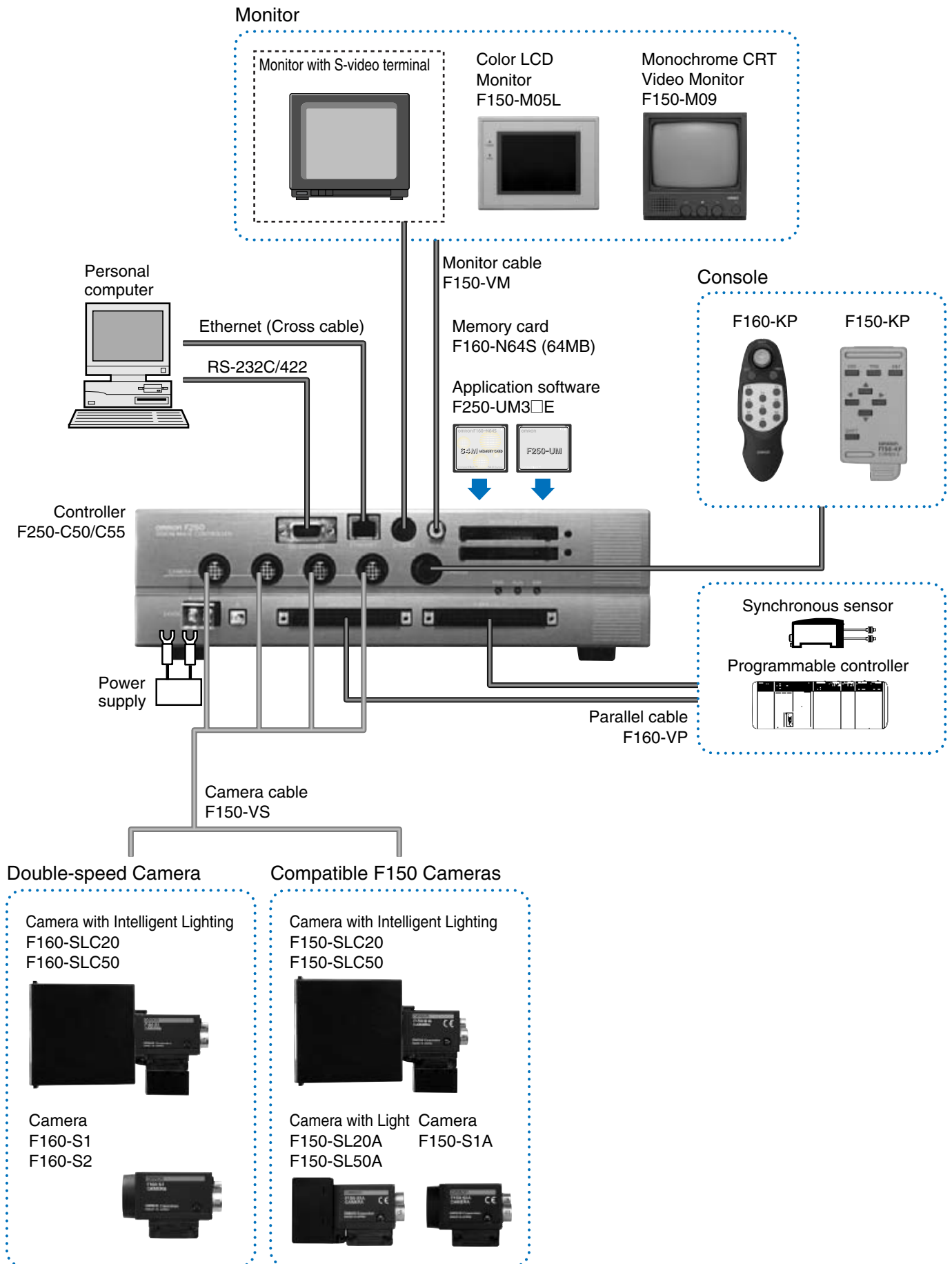
● Easy and flexible settings by means of software application

1. Functions needed for inspection are selected and installed from the software application.



2. Combine required inspection functions from the menu.

System configuration



F250

Ordering Information

| Name | | Model | Remarks |
|-------------------------|----------------------------------|--------------|---|
| Controller | | F250-C50 | NPN Input/Output |
| | | F250-C55 | PNP Input/Output |
| Double-speed camera | Camera with intelligent lighting | F160-SLC20 | |
| | | F160-SLC50 | |
| | Camera only | F160-S1 | |
| | | F160-S2 | Includes Partial Scan functionality |
| F150 Compatible cameras | Camera with intelligent lighting | F150-SLC20 | |
| | | F150-SLC50 | |
| | Camera with lighting | F150-SL20A | |
| | | F150-SL50A | |
| | Camera only | F150-S1A | |
| Console | | F160-KP | |
| | | F150-KP | |
| LCD monitor | | F150-M05L | |
| Video monitor | | F150-M09 | |
| Memory card | | F160-N64S(S) | Memory capacity 64 MB |
| Application software | | F250-UM3ME | with Macro function |
| | | F250-UM3FE | without Macro function |
| Camera cable | | F150-VS | Length of cable for double-speed camera and F150 common camera: 3 m |
| Monitor cable | | F150-VM | Cable length: 2 m |
| Parallel cable | | F160-VP | Length of pigtail cable for parallel input/output connector: 2 m |

Rating/Performance

Controller: F250-C50/C55

| | |
|----------------------------------|--|
| Connected camera | F150-S1A/SL20A/SL50A/SLC20/SLC50, F160-S1/S2/SLC20/SLC50 |
| Number of connectable cameras | 4 |
| Processing resolution | 512(H) x 484(V) |
| Number of scenes | 32 scenes (expansion possible using memory card) |
| Image storage function | Maximum 35 images |
| Image pre-processing | Smoothing (strong/weak), edge enhancement, edge extraction (horizontal, vertical, both), erosion, dilation, median, background deletion |
| Operation and Settings | Install measurement routines from a software application, combine and establish settings for measurement routines from menus. |
| Menu language | Japanese/English (changeable) |
| Operation customization function | Password function, short-cut key function |
| Screen customization function | Display items: Character strings (measured values, decisions, time, any character string, measurement area names), graphics (straight lines, rectangles, circles, cross-hair cursors) Parameters specified: display color, position, size |
| Non-stop adjustment function | Yes |
| Trend monitor function | Yes |
| Memory card slot | 2 slots |
| Monitor | Composite video output: 1 CH, S-video output: 1 CH |
| Ethernet | 10Base-T 1CH |
| Serial communication | RS-232C/422A 1CH |
| Parallel input/output | Inputs: 21 points, outputs: 46 points |
| Strobe | 4 CH (included in parallel outputs) |
| Power supply voltage | 20.4 to 26.4 VDC |
| Current consumption | Approximately 3.7 A (when four F160-SLC50 units are connected) |
| Ambient temperature | Operating: 0 to +50°C, storage: -25 to +65°C (no ice formation or condensation) |
| Ambient humidity | Operating/storage: 35 to 85% RH (with no condensation) |
| Dimensions | 270(W) x 81(H) x 197(D) |
| Weight | Approximately 3.1kg (unit only) |

Double-speed camera: F160-S1/S2

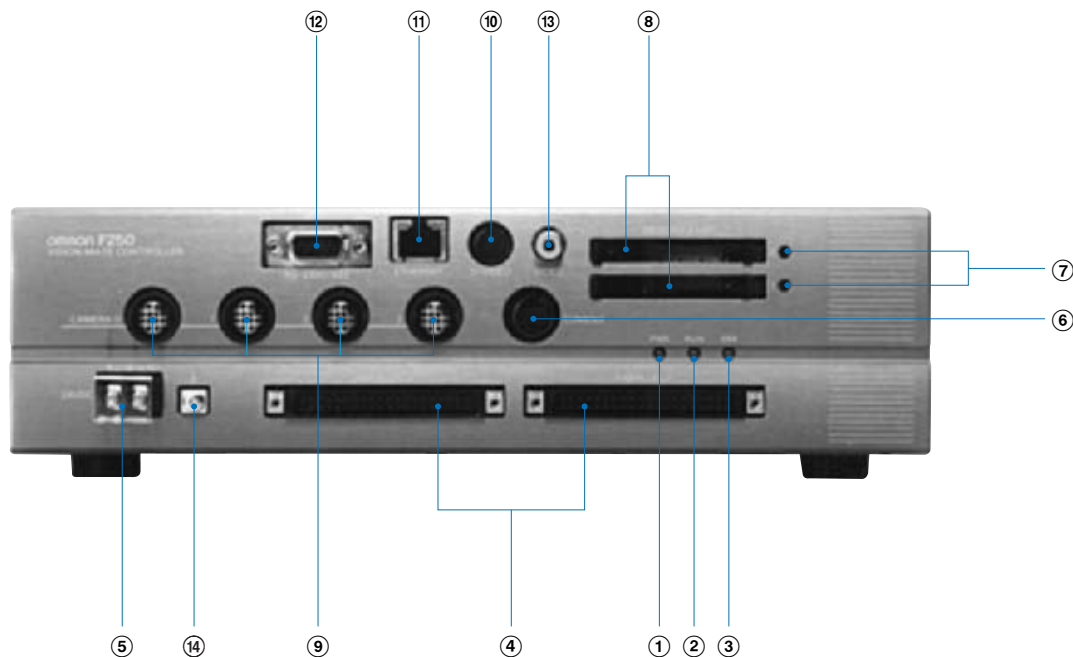
| | |
|----------------------------------|---|
| Picture element | 1/3" Interline CCD |
| Effective pixels | 659 x 44 (H x V) |
| Scanning method | 1/60-s non-interlace (frame) mode, 1/120-s 2:1 interlace (field) mode |
| Shutter | Electronic shutter; select from 8 shutter-speed settings (1/120 to 1/20,000 s) using menu |
| Camera with Intelligent Lighting | F160-SLC20 (field of vision: 20 mm), F160-SLC50 (field of vision: 50 mm) |
| Ambient temperature | Operating: 0 to +50°C Storage: -25 to +60°C (with no icing or condensation) |
| Ambient humidity | Operating and Storage: 35 to 85% RH (with no condensation) |
| External Dimensions | 31 x 40 x 54.5 (W x H x D) mm (not including connectors and other protruding parts) |
| Weight | Approx. 85 g (Camera only) |

Monitor

| Item | Model number Name | F150-M05L Color LCD monitor | F150-M09 Monochrome CRT Video Monitor |
|-----------------------|-------------------|---|---|
| Size | | 5.5 inches | 9 inches |
| Type | | Liquid crystal color TFT | CRT monochrome |
| Resolution | | 320 x 240 dots | 800TV or min. (at center) |
| Input signal | | NTSC composite video (1.0 V / 75 Ω) | |
| Power supply voltage | | 20.4 to 26.4 VDC | 100 to 240 VAC (-15%, +10%) |
| Current consumption | | Approx. 700 mA | Approx. 400 mA |
| Ambient temperature | | Operating: 0 to +50°C Storage: -25 to +65°C (with no icing or condensation) | Operating: -10 to +50°C Storage: -20 to +65°C (with no icing or condensation) |
| Ambient humidity | | Operating or storage: 35% to 85% (with no condensation) | Operating or Storage: 10% to 90% (with no condensation) |
| Weight (Monitor only) | | Approx. 610 g | Approx. 4.5 kg |
| Accessories | | Instruction manual and 4 mounting brackets | Instruction manual |

Name and function of each part

Controller: F250-C50/C55



- | | |
|---|---|
| <p>① POWER LED (green) Illuminates while the power is on.</p> <p>② RUN LED (orange) Illuminates while the system is in measurement mode.</p> <p>③ ERROR LED (red) Illuminates when a problem occurs.</p> <p>④ Input connectors 0, 1 Connects to a synchronous sensor or programmable controller.</p> <p>⑤ Power terminal Connects to a DC power supply.</p> <p>⑥ Console connector Connects to the console.</p> <p>⑦ Memory card LEDs 0, 1 Illuminates while power is supplied to the memory card.</p> | <p>⑧ Memory card slots 0, 1 A memory card or software application is inserted here.</p> <p>⑨ CAMERA 0 - 3 connectors Connects to a camera.</p> <p>⑩ Monitor connector (S-Video output) Connects to a monitor with an S-Video input</p> <p>⑪ Ethernet connector Connects to a computer.</p> <p>⑫ RS-232C/422 connector Connects to a computer or programmable controller.</p> <p>⑬ Monitor connector (composite video output) Connects to a monitor.</p> <p>⑭ Ground terminal Connect the ground wire to this terminal.</p> |
|---|---|

Function menu

Processing routine list

The F250-UME application software contains approximately 50 processing routines.

Image input related

- Camera image input
- Camera switch
- Pre-processing change
- Repeat preprocessing

Position compensation related

- Binary position correction
- Model position correction
- Circular work position correction
- Edge position correction
- EC position correction
- Scroll return
- Scroll

General measurement related

| | |
|------------------------------------|---------------------------|
| QUEST character checking | Dark-light edge position |
| Binary defect inspection | ECM search |
| Density defect inspection | EC positioning |
| Fine matching | Lot number checking 1 |
| Pattern inspection | Dark-light edge number |
| Sorting | Density average/deviation |
| EC defect inspection | Labeling |
| EC circular piece count inspection | Label data |
| Rotation positioning | |

Measurement supplement related

- Computing
- Acquire processing unit data
- Set processing unit data
- Wait
- Elapsed time
- Trend monitor

Branch control related

- Condition branch
- DI branch
- End

Result output related

- Memory card data output
- DO data output
- Significant link data output
- Non-protocol data output
- DO decision output

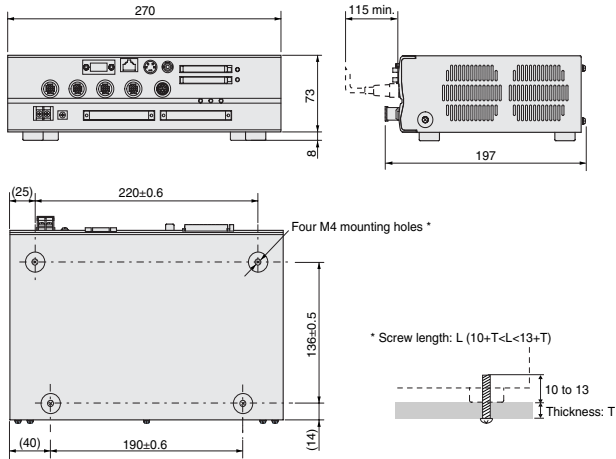
Result display related

- Any character display
- Measured value display
- Decision character display
- Processing task name display
- Measurement time display
- Fixed graphic display
- Straight line result display
- Rectangle result display
- Circle result display
- Cross-hair cursor result display

Dimensions (Unit: mm)

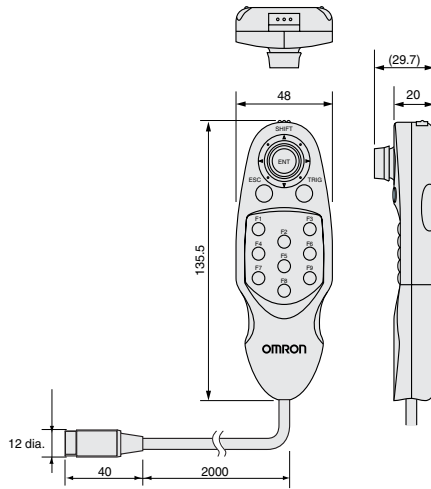
Controller

F250-C50/C55



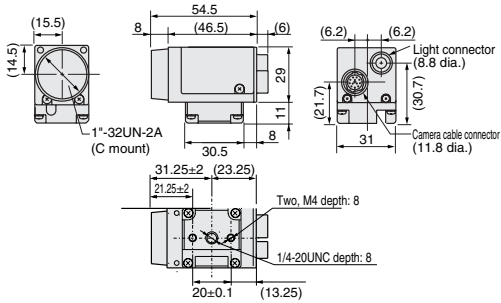
Console

F160-KP

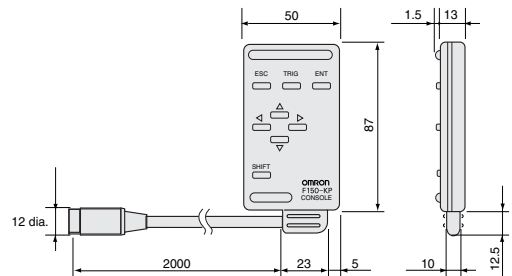


Double-speed camera

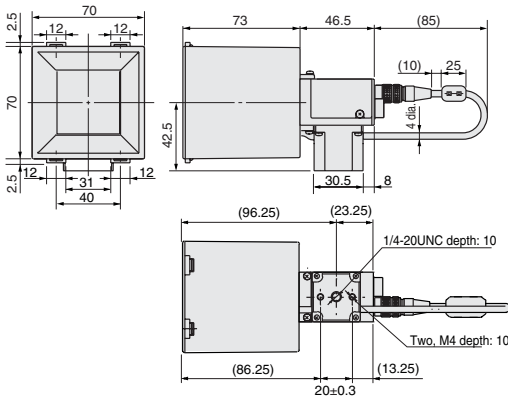
F160-S1/S2



F150-KP

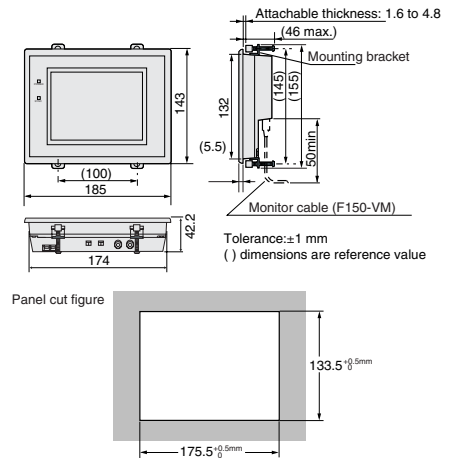


F160-SLC20 (with F150-LTC20 intelligent lighting)

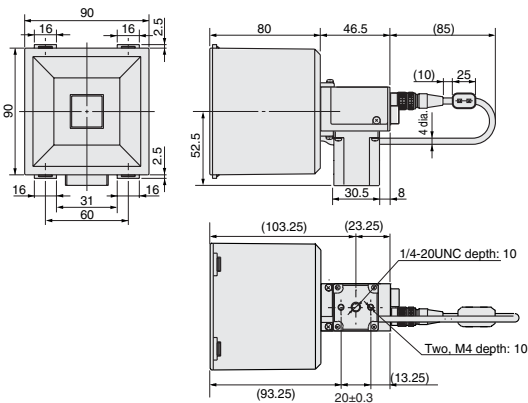


LCD monitor

F150-M05L



F160-SLC50 (with F150-LTC50 intelligent lighting)



Video monitor

F150-M09

