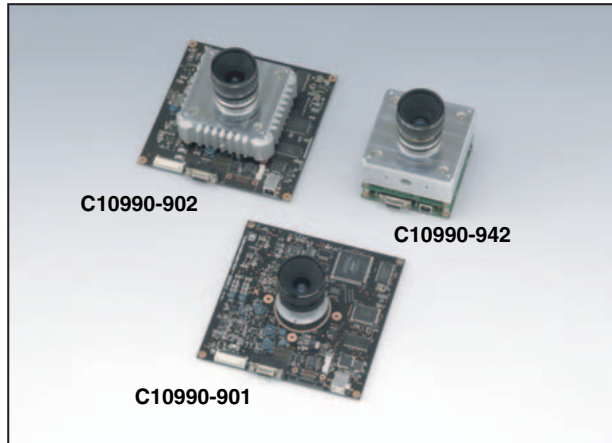


Board-Level CCD Camera C10990 Series



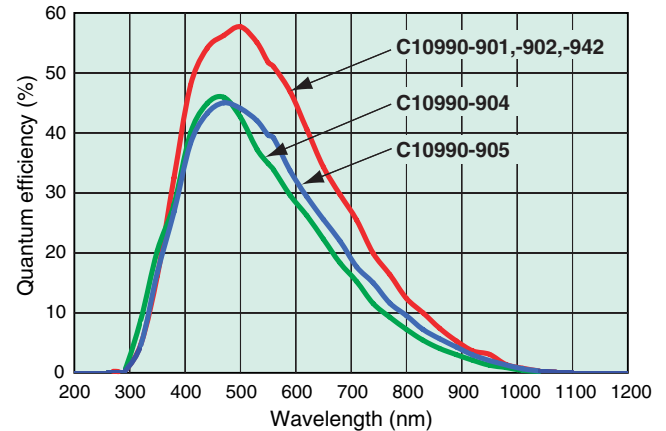
▲ Shown with optional lens.

The Board-Level CCD Camera C10990 Series are the high sensitivity and a high resolution digital CCD cameras corresponding to the OEM requirements with dedicated 1.3 million pixel 2/3 type progressive scan interline CCD, a circuit, lens mount, etc. on one board. Hamamatsu can provide various cameras according to demands based on the long experiences with the camera technology.

APPLICATIONS

- Routine fluorescence microscopy
- Green fluorescent protein applications
- DNA and ploidy analysis
- Red and near infrared fluorescent applications
- Fluorescence In situ hybridization studies
- Motility and motion analysis
- Combined DIC/Phase and fluorescence
- Histology, pathology and cytology
- Metallurgical microscopy
- Failure analysis
- Semiconductor inspection
- X-ray scintillator readout

SPECTRAL RESPONSE

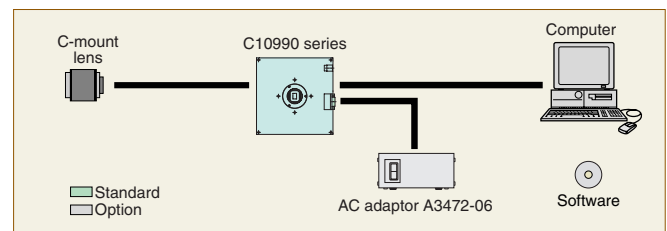


* This is typical, not guaranteed.

FEATURES

- Progressive scan interline CCD
- Low readout noise
- Antiblooming
- Cooling by 1 stage peltier (C10990-902, -942)
- Digital 12 bits output
- Pixel clock rate : 12.5 MHz
- Frame integration : 5 ms to 20 s
- Bining : 2×2, 4×4
- Sub array (ROI) possible
- Data transfer I/F USB 2.0 (equivalent)

SYSTEM CONFIGURATION



SPECIFICATIONS

Type number	C10990-901	C10990-902	C10990-942	C10990-904	C10990-905
Camera head type	PC board type				
Imaging device	Progressive scan interline CCD				
CCD size	2/3 inch	2/3 inch	2/3 inch	1/2 inch	1/2 inch
Effective number of pixels	1344 (H) × 1024 (V)	1344 (H) × 1024 (V)	1344 (H) × 1024 (V)	1344 (H) × 1024 (V)	640 (H) × 480 (V)
Cell size	6.45 μm (H) × 6.45 μm (V)	6.45 μm (H) × 6.45 μm (V)	6.45 μm (H) × 6.45 μm (V)	4.65 μm (H) × 4.65 μm (V)	9.9 μm (H) × 9.9 μm (V)
Effective area	8.67 mm (H) × 6.60 mm (V)	8.67 mm (H) × 6.60 mm (V)	8.67 mm (H) × 6.60 mm (V)	6.25 mm (H) × 4.76 mm (V)	6.34 mm (H) × 4.75 mm (V)
Pixel clock rate	12.5 MHz/pixel				
Frame rate	1 × 1	4 frame/s	4 frame/s	4 frame/s	20 frame/s
	2 × 2	9 frame/s	9 frame/s	9 frame/s	38 frame/s
	4 × 4	18 frame/s	18 frame/s	18 frame/s	65 frame/s
Readout noise at 20 °C room ambient temperature (r.m.s.) (typ.)	13 electrons	13 electrons	13 electrons	13 electrons	18 electrons
Full well capacity (typ.)	18 000 electrons	18 000 electrons	18 000 electrons	10 000 electrons	23 000 electrons
Full well capacity at binning (typ.)	23 000 electrons	23 000 electrons	23 000 electrons	12 000 electrons	40 000 electrons
Dynamic range* (typ.)	1380 : 1	1380 : 1	1380 : 1	760 : 1	1270 : 1
Cooling method	-	One stage peltier	One stage peltier	-	-
Cooling temperature at 20 °C room ambient temperature	-	+10 °C	+10 °C	-	-
Dark current at 20 °C room ambient temperature	8 electrons/pixels/s	3.5 electrons/pixels/s	3.5 electrons/pixels/s	5 electrons/pixels/s	10 electrons/pixels/s
A/D converter	12 bit				
Exposure time	5 ms to 20 s				
Lens mount	C-mount				
Anti-blooming	Yes				
Binning	2 × 2, 4 × 4				
Sub-array(ROI)	Yes				
Board camera weight	approx. 170 g	approx. 800 g	approx. 800 g	approx. 170 g	approx. 170 g
Data transfer I/F	USB2.0 High speed mode (equivalent)				
Input voltage	DC + 12 V				
Supply current (typ.)	300 mA				
Supply current (for peltier cooling)(typ.)	-	300 mA	300 mA	-	-
Voltage ripple	± 50 mV				
Ambient storage temperature	-10 °C to +50 °C				
Ambient operating temperature	0 °C to +40 °C				
Ambient operating/storage humidity	70 % max. (with no condensation)				

*Calculated from the ratio of the full well capacity and the readout noise

- 1) At the external condition, CCD is driven by the sequential readout mode.
- 2) At the long exposure condition, some shading caused by the CCD AMP heat is observed.
- 3) At the long exposure condition, some white spots are observed.

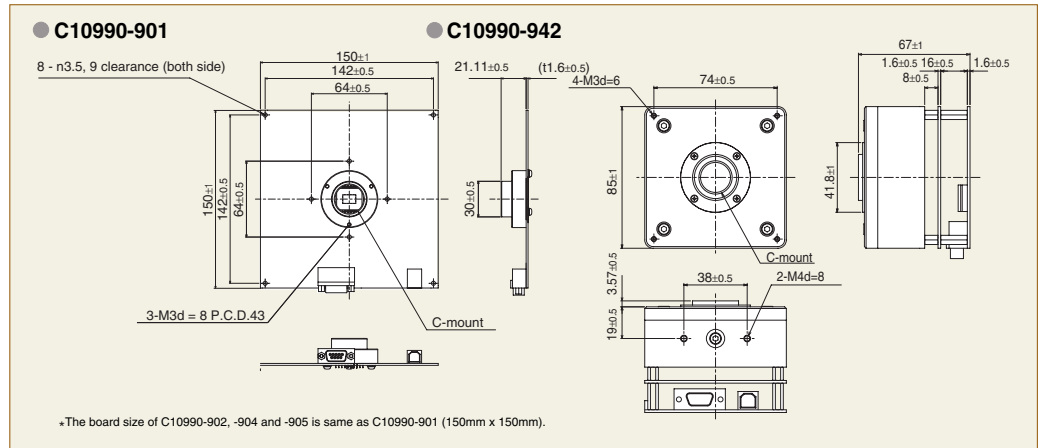
● 9 pin D-sub FEMALE connector

1	NC
2	NC
3	Trigger In (TTL input)
4	NC
5	NC
6	+ 12V DC
7	+ 12V DC
8	GND
9	GND

● Software support

DCAM-API support

DIMENSIONAL OUTLINES (Unit:mm)



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