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1024 x 1024 pixels BT(back-thinned) CCD

HAMAMATSU

DATA SHEET

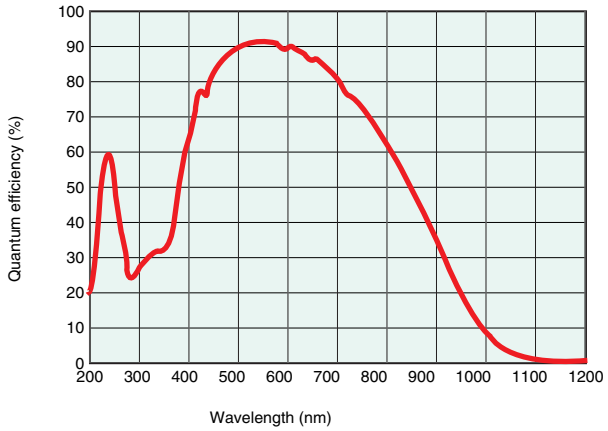
High resolution BT(Back-thinned)-CCD Cooled Digital Camera

ORCA Ⅱ-BT-1024G



The ORCA Ⅱ-BT-1024G features the well known Marconi CCD47-10 chip packaged in a proprietary permanently sealed vacuum chamber evacuated to 10^{-7} Torr. This very high resolution, back thinned, back illuminated, million pixel CCD offers very high quantum efficiency over the spectrum from 350 nm to 900 nm. With a large full well capacity, low read noise and MPP (Multi-Pinned Phase) technology in the drive circuits to reduce dark current, this camera will produce rapid exposures and high dynamic range images. Dual mode digitization offers a software selectable choice of speed or very low noise readout methods with 12 bit to 16 bit precision. Special analog contrast enhancement circuits increase versatility for even the most difficult imaging conditions. A high performance serial bus IEEE 1394 is used as a computer interface.

SPECTRAL RESPONSE CHARACTERISTIC



* This is typical, not guaranteed.

FEATURES

- **Very high resolution format (1024 × 1024 pixels)**
- **High quantum efficiency from UV to NIR**
- **Very large full well capacity (80000 electrons typ.)**
- **Low readout noise design (4 electrons r.m.s. typ.)**
- **Software selectable dual digitizers**
- **Analog contrast enhancement**
- **Compatible with IIDC 1394-based digital camera specifications**
- **Full remote controle from PC via IEEE 1394 Bus**

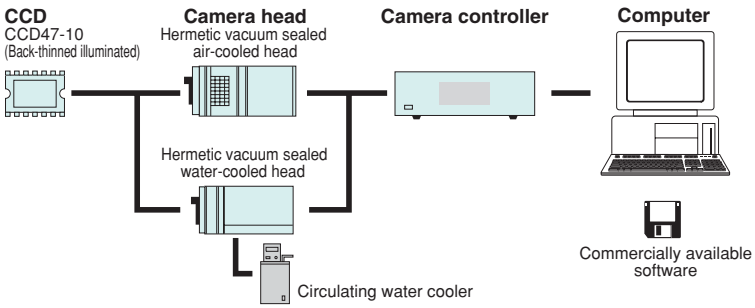
TYPE NUMBER

□ G

Cooling method
A: Air-cooling
W: Water-cooling

APPLICATIONS

- **Luminescence and Fluorescence**
- **High resolution video microscopy**
- **Semiconductor imaging**
- **X-ray applications**
- **Neutron radiography**
- **Scintillator readout**



1394 TRADE ASSOCIATION
THE MULTIMEDIA CONNECTION

Hamamatsu is a member of 1394 Trade Association

SPECIFICATIONS

Type number	C4742-98-26KAG	C4742-98-26KWG
Camera head type	Hermetic vacuum sealed air-cooled head	Hermetic vacuum sealed water-cooled head
Circulating water cooler (sold separately)	–	Required
Mechanical shutter	Built-in (Control: OPEN / CLOSE / AUTO)	
Imaging device	CCD47-10 full-frame transfer CCD	
Effective no. of pixels	1024 (H) × 1024 (V)	
Cell size	13 μm (H) × 13 μm (V)	
Effective area	13.3 mm (H) × 13.3 mm (V)	
Pixel clock rate	312.5 kHz/pixel (High-precision readout) / 5 MHz/pixel (High-speed readout)	
Frame rate	0.28 frame/ s (High-precision readout) / 3.05 frame/s (High-speed readout)	
Readout noise (r.m.s.) (High-precision readout) typ.	6 electrons	
Full well capacity typ.	80 000 electrons	
Dynamic range* (High-precision readout) typ.	13333 : 1	
Cooling method	Forced air peltier cooling, with hermetic sealing	Water-cooling and peltier cooling, with hermetic sealing
Cooling temperature	- 55 ˚C	- 60 ˚C
Dark current	0.03 electrons/pixel/s	0.01 electrons/pixel/s
A/D converter (High-precision readout)	16 bit	16 bit
Interface / Output signal (digital output)	IEEE 1394-1995/ Non-compressed data (Mono 16)	
Exposure time	20 ms to 7 200 s	
External control	IIDC 1394-Based Digital Camera Specification Ver. 1.30	
Sub-array	Yes	
External trigger	Yes	
Contrast enhancement	1, 4, 18 times (High-precision readout) / 1 to 6 times (High-speed readout)	
Lens mount	C-mount	
Line voltage	AC 100 V / AC 117 V / AC 220 V / AC 240 V, 50 Hz/60 Hz	
Power consumption	approx. 220 V·A	
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)	

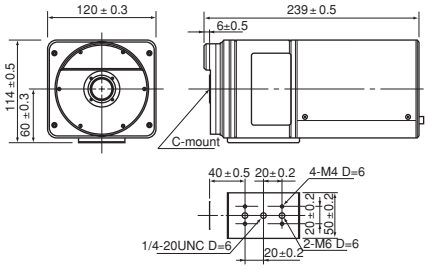
Binning		1 × 1	2 × 2	4 × 4	8 × 8
Frame rate	High-speed readout	3.05 frame/s	4.58 frame/s	6.12 frame/s	7.36 frame/s
	High-precision readout	0.28 frame/s	0.54 frame/s	1.01 frame/s	1.83 frame/s

Subarray		256 × 256	128 × 128
Frame rate	High-precision readout	4.58 frame/s	6.12 frame/s
	High-speed readout	0.93 frame/s	2.52 frame/s

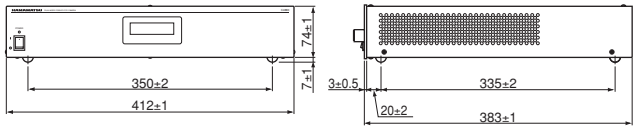
* Calculated from the ratio of the full well capacity and the readout noise.

DIMENSIONAL OUTLINES (Unit: mm)

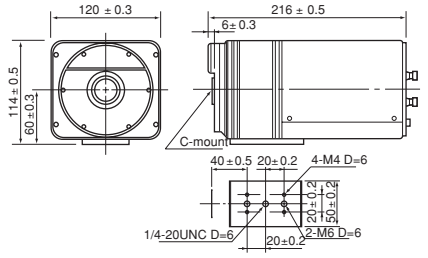
- **Hermetic vacuum sealed air-cooled head (approx. 2.5 kg)**



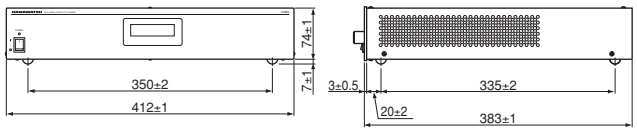
- **Camera controller (approx. 8.5 kg)**



- **Hermetic vacuum sealed water-cooled head (approx. 2.5kg)**



- **Camera controller (approx. 8.5 kg)**



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