ORCA® Ⅱ

Digital CCD camera C11090-22B

The ORCA Ⅱ has a specialty feature of low noise and high-sensitivity. Maximum cooling down to -90 ˚C enables dark current as low as 0.0012 electrons/pixel/second and the 1024 × 1024 pixels BT-CCD (Back-thinned CCD) provides 1M pixel resolution and high quantum efficiency of over 90 % peak and broad sensitivity from UV to NIR. This camera is especially suitable for applications which require to detect faint light with long exposure time and low noise.

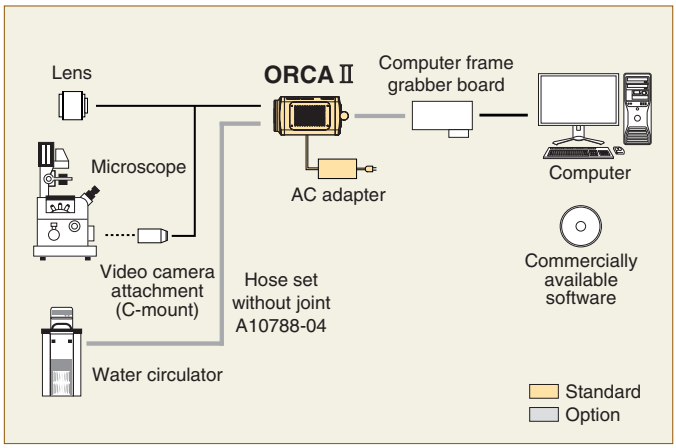
FEATURES

- **High resolution format**
  (1024 × 1024 pixels)
- **High quantum efficiency from UV to NIR**
- **Low readout noise**
  (6 electrons rms. typ.)
- **Dual readout mode**
  (high-resolution and high-speed readout mode)
- **Programmable trigger signal output**
- **Sub-array and binning readout mode**
- **IEEE1394b interface**

APPLICATIONS

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

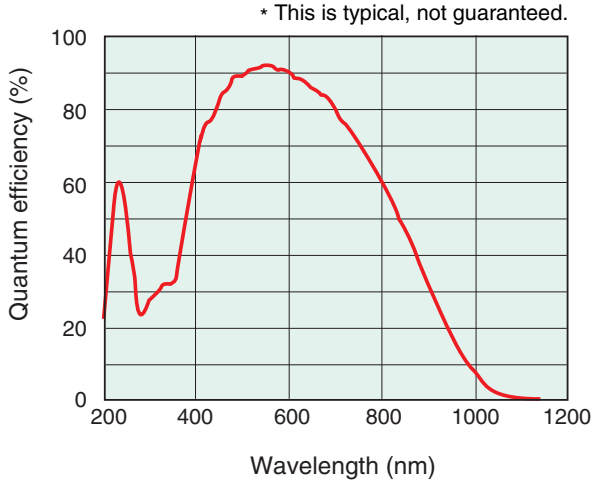
SYSTEM CONFIGURATION



* Please contact your local Hamamatsu representative or distributor regarding actual configuration.

SPECTRAL RESPONSE

* This is typical, not guaranteed.



HAMAMATSU

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SPECIFICATIONS

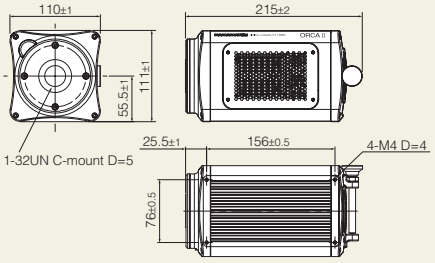
Type number			C11090-22B
Camera head type			Hermetic vacuum-sealed air/water-cooled head *1
Imaging device			Back-thinned frame transfer CCD
Effective number of pixels			1024 (H) × 1024 (V)
Cell size			13 µm (H) × 13 µm (V)
Effective area			13.3 mm (H) × 13.3 mm (V)
Pixel clock rate	High-precision readout		312.5 kHz
	High speed readout		5 MHz
Cooling method/ temperature*2	Forced-air cooled	at temperature control	- 65 ˚C stabilized (0 ˚C to +30 ˚C)
	Water cooled *3	at temperature control	- 75 ˚C (Water temperature : +20 ˚C)
		at maximum cooling typ.	- 90 ˚C (Water temperature: lower than +10 ˚C)
Readout noise*4 (typ.)			6 electrons rms
Full well capacity (1×1)			80 000 electrons
Dark current (typ.)	Forced-air cooled (- 65 ˚C)		0.0065 electron/pixel/s
	Water cooled (- 75 ˚C)		0.0012 electron/pixel/s
Dynamic range*5			13 333:1
A/D converter			16 bit
Analog gain	High-precision readout		×1, ×4, ×18
	High speed readout		×1 to × 6
Exposure time*6	Internal synchronous mode	High-precision readout*7	3.53 s to 120 min (312.5 kHz)
		High speed readout	307 ms to 120 min (5 MHz)
	External synchronous mode	High-precision readout	400 ms to 120 min
		High speed readout	20 ms to 120 min
Binning			2 × 2, 4 × 4, 8 × 8
Sub array readout			Every 8 lines (horizontal, vertical) size and position can be set
External trigger mode*8			Edge trigger, Level trigger, Start trigger, Synchronous readout trigger
External synchronization function			Trigger readout delay, Thin out of encoder pulses
Trigger output*8			Exposure timing output, Programmable timing output (Delay and pulse length are variable.), Trigger ready output
Interface			IEEE1394b
Lens mount			C-mount
Input power supply			AC 100 V to 240 V, 50 Hz / 60 Hz
Power consumption			Approx. 120 VA
Ambient storage temperature			-10 ˚C to + 50 ˚C
Ambient operating temperature			0 ˚C to + 40 ˚C
Performance guaranteed temperature			0 ˚C to + 30 ˚C
Ambient operating humidity			70 % max. (with no condensation)

Binning		1×1	2×2	4×4	8×8
Frame rate (frames/s)	High-precision readout	0.28	0.55	1.04	1.88
	High speed readout	3.15	4.85	6.64	8.13

*1: The hermetic sealed head maintains a high degree of vacuum, 10^{-8} Torr, without re-evacuation.
*2: Thermal electric cooling +air or water cooling (Change with DIP SW). The cooling temperature may not reach to this temperature; it depends on the operation condition.
*3: Water volume 0.5 liter/min.
*4: High precision mode
*5: Calculated from the ratio of the full well capacity and the readout noise.
*6: Image smearing may appear when the exposure time is short.
*7: Using DCAM-API, the value is 400 ms to 6.45 s.
*8: C-MOS 3.3 V with reversible polarity.

DIMENSIONAL OUTLINES (Unit : mm)

● **Camera** (Approx. 3.5 kg)



OPTIONS

- **IEEE1394b cable 9P-9P 4.5 m : A12344-05**
- **Hose set without joint : A10788-04**
- **External trigger cable SMA-BNC 5 m : A12106-05**
- **External trigger cable SMA-SMA 5 m : A12107-05**
- **Base plate common for ImagEM© X2 chassis : A12263-01**

- Subject to local technical requirements and regulations, availability of products included in this promotional material may vary. Please consult your local sales representative.
- Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions. Specifications and external appearance are subject to change without notice.

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Systems Division
812 Joko-cho, Higashi-ku, Hamamatsu City, 431-3196, Japan, Telephone: (81)53-431-0124, Fax: (81)53-435-1574, E-mail: export@sys.hpk.co.jp

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com
Germany: Hamamatsu Photonics Deutschland GmbH.: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de
France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509-031-00, Fax: (46)8-509-031-01 E-mail: info@hamamatsu.se
Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6 20020 Arese (Milano), Italy, Telephone: (39)02-93581733, Fax: (39)02-93581741 E-mail: info@hamamatsu.it
China: Hamamatsu Photonics (China) Co., Ltd.: B1201 Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn

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