ORCA® Ⅱ

Digital CCD camera C11090-22B

The ORCAⅡ has a specialty feature of low noise and high-sensitivity. Cooling down 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.

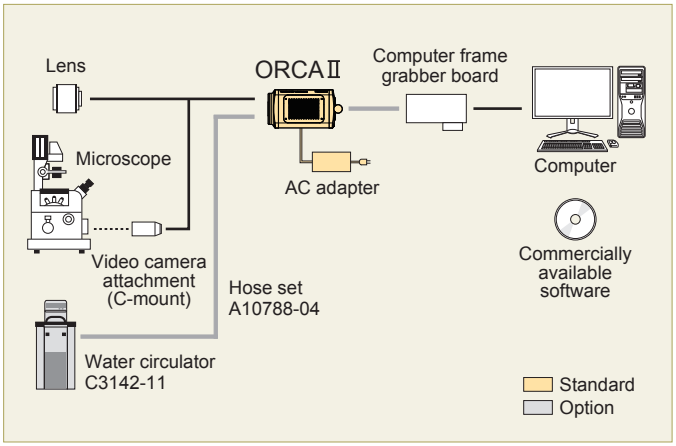
FEATURES

- **High resolution format**
  (1024 × 1024 pixels)
- **High quantum efficiency from UV to NIR**
- **Long exposure time**
  (Max. 2 hours)
- **Low readout noise**
  (6 electrons rms. typ.)

APPLICATIONS

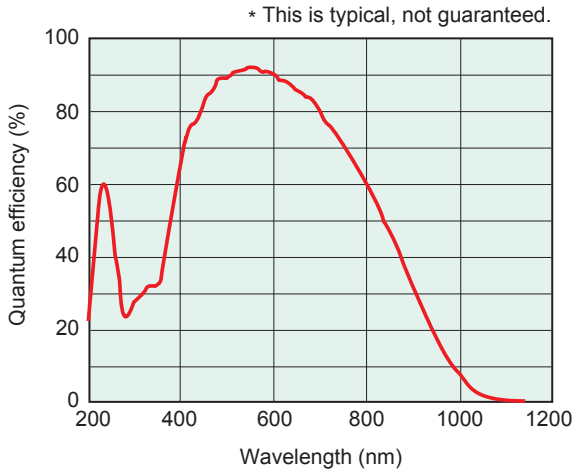
- **Luminescence and fluorescence imaging**
- **X-ray scintillator readout**
- **X-ray diffraction image readout**
- **Neutron radiography**
- **Photovoltage inspection**
- **Astronomy**

SYSTEM CONFIGURATION



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

SPECTRAL RESPONSE



HAMAMATSU
PHOTON IS OUR BUSINESS

SPECIFICATIONS

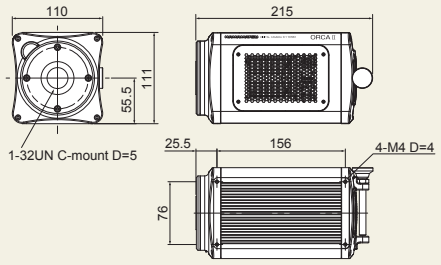
Type number			C11090-22B
Camera head type			Hermetic vacuum-sealed head *1
Imaging device			Frame transfer CCD
Effective number of pixels			1024 (H) × 1024 (V)
Pixel size			13 µm (H) × 13 µm (V)
Effective area			13.3 mm (H) × 13.3 mm (V)
Pixel clock rate	High-precision readout mode		0.3125 MHz/pixel
	High speed readout mode		5 MHz/pixel
Cooling method/	Forced-air cooled		- 65 ˚C (Ambient temperature : 0 ˚C to +30 ˚C)
Cooling temperature* 2	Water cooled* 3		- 75 ˚C (Water temperature : +20 ˚C)
Readout noise* 4 (typ.)			6 electrons rms
Full well capacity (typ.)			80 000 electrons
Dark current (typ.)	Air cooled (cooling temperature: - 65 ˚C)		0.0065 electrons/pixel/s
	Water cooled (cooling temperature: - 75 ˚C)		0.0012 electrons/pixel/s
Dynamic range* 5			13 333 : 1
Digital output			16 bit
Exposure time* 6	Internal synchronous mode	High-precision readout mode* 7	3.53 s to 7200 s
		High speed readout mode	306.58 ms to 7200 s
	External synchronous mode	High-precision readout mode	400 ms to 7200 s
		High speed readout mode	20 ms to 7200 s
External trigger input mode* 8			Edge trigger, Level trigger, Start trigger, Synchronous readout trigger
Trigger output* 8			3 programmable timing outputs, Exposure timing output, Trigger ready output
Binning			2 × 2, 4 × 4, 8 × 8
Sub array			Yes
Interface			IEEE 1394b-2002
Lens mount			C-mount
Power supply			AC 100 V to 240 V, 50 Hz / 60 Hz
Power consumption			Approx. 120 VA
Ambient operating temperature			0 ˚C to + 40 ˚C
Ambient operating humidity			30 % to 70 % Forced-air cooled (with no condensation)
Performance guaranteed temperature			0 ˚C to + 30 ˚C
Ambient storage temperature			-10 ˚C to + 50 ˚C

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 vacuum-sealed head maintains a high degree of vacuum, 10^{-8} Torr, without re-evacuation.
*2: Thermal electric cooling 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 readout 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 7200 s.
*8: C-MOS 3.3 V with reversible polarity.

DIMENSIONAL OUTLINES (Unit : mm)

● **Camera** (Approx. 3.5 kg)



OPTIONS

- Water circulator : C3142-11
- 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

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)53-433-8031, E-mail: export@sys.hpk.co.jp

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 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)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it
China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R.China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

Cat. No. SCAS0103E03
FEB/2019 HPK
Created in Japan