

HAMAMATSU

DATA SHEET

Fast Scan Multi Format Cooled CCD Camera C4880-80



▲ Naturally air-cooled head

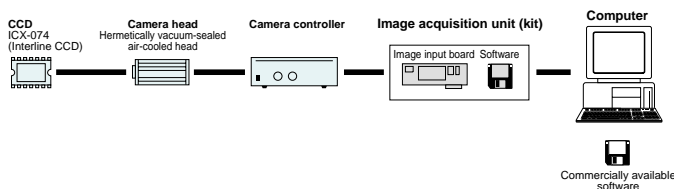
These low noise/high frame rate camera systems maintain the superb noise characteristic of the conventional cooled CCD camera, while at the same time adding high speed.

In order to achieve both high speed and a low noise characteristic, a progressive scan interline CCD is used, which eliminates the need for a mechanical shutter. This means that problems such as vibration caused by the mechanical shutter at high frame rates, and the lifetime of the mechanical shutter, have been completely eliminated. In addition, taking advantage of the low dark current characteristic of the CCD used in these models, cooling can be suppressed to the minimum necessary level, and by switching from a conventional forced cooling system to a system which discharges heat by natural means, operation is significantly improved.

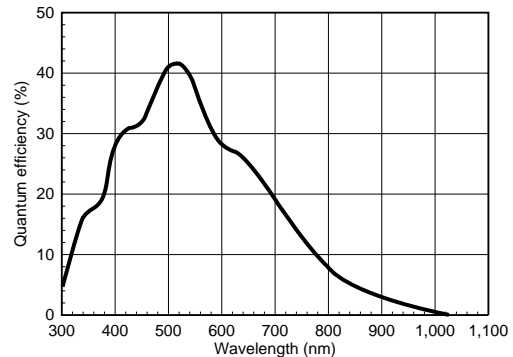
APPLICATIONS

- Faint light observation under a microscope
- Continuous imaging of high-speed moving objects
- Kinetic changes in light intensity

SYSTEM CONFIGURATION



SPECTRAL RESPONSE CHARACTERISTICS



* This is typical, not guaranteed.

FEATURES

- Progressive scan interline CCD used with no mechanical shutter
- Two scan modes as well as sub-array and binning functions available
- Maximum frame rate of up to approximately 500 frames/sec
- Fast scan readout with low noise
- Full computer control

TYPE NO.

C4880-80- A

Bit number on A/D converter

- 12: Fast scan mode 10-bit
High precision scan mode 12-bit
- 14: Fast scan mode 10-bit
High precision scan mode 14-bit
- 22: Fast scan mode 12-bit
High precision scan mode 12-bit
- 24: Fast scan mode 12-bit
High precision scan mode 14-bit

SPECIFICATIONS

Model name	C4880-80-□□-A	
Camera head type	Naturally air-cooled head	
Circulating water cooler (sold separately)	-	
Vacuum pump (sold separately)	-	
Imaging device	ICX-074 Model 1/2 full-pixel scanning interline CCD	
Effective no. of pixels	656 (H) × 494 (V)	
Cell size	9.9 (H) × 9.9 (V) μm	
Effective area	6.49 (H) × 4.89 (V) mm	
Readout noise	Min. Typ.	5 electrons r.m.s. 7 electrons r.m.s.
Full well capacity	30,000 to 50,000 electrons	
Dynamic range	Typ. Max.	4,300 : 1 10,000 : 1
Frame rate	High-precision scan mode Fast scan mode	1Hz (1 × 1 binning), 310Hz (32 × 32 binning) 28Hz (1 × 1 binning), 529Hz (32 × 32 binning)
Cooling method	Peltier cooling / natural air cooling	
Cooling temperature	0 °C (Cools the CCD element to 20 °C less than the ambient temperature)	
CCD cooling control	Normally ON	
Dark current	3 electrons/pixel/sec	
Exposure time	1/8,000 sec to 10 sec	
A/D converter	12 / 14 bits	
Lens mount	C-mount	
Mechanical shutter	-	
Variable analog gain	Front panel dial / software-controlled switching, 1 - 10 times (high-speed scan)	
Variable offset	Front panel dial / software-controlled switching (fast scan)	
Amp gain	2 steps (fast scan), 3 steps (precision scan)	
Binning scan	Yes	
Sub-array scan	1/1, 1/2, 1/4, 1/8 (H) × any desired number (V)	
Super-pixel scan	2 × 2, 4 × 4, 8 × 8, 16 × 16, 32 × 32	
External trigger input	Yes	
Output signal (digital output)	Parallel digital output (conforms to RS-422)	
External control	RS-232C	
Ambient storage temperature	-10 to +50 °C	
Ambient operating temperature	0 °C to +40 °C	
Ambient operating/storage humidity	70% max. (with no condensation)	
Line voltage	100 / 117 / 220 / 240 VAC, 50/60 Hz	
Power consumption	Approx. 115 VA	

High-precision scan mode

Full frame readout

Binning number	1 × 1	2 × 2	4 × 4	8 × 8	16 × 16	32 × 32
No. of pixels (H × V)	656 × 494	328 × 247	164 × 123	82 × 61	41 × 30	20 × 15
Frame rate (Hz)	1	4	14	45	133	310

Sub-array scan (100 × 100 area)

Binning number	1 × 1	4 × 4
No. of pixels (H × V)	100 × 100	25 × 25
Frame rate (Hz)	25	127

Fast scan mode

Full frame readout

Binning number	1 × 1	2 × 2	4 × 4	8 × 8	16 × 16	32 × 32
No. of pixels (H × V)	656 × 494	328 × 247	164 × 123	82 × 61	41 × 30	20 × 15
Frame rate (Hz)	28	53	102	189	328	529

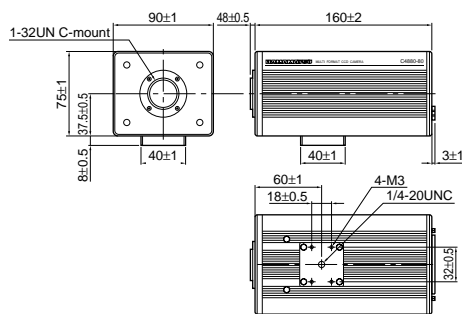
Sub-array scan (100 × 100 area)

Binning number	1 × 1	4 × 4
No. of pixels (H × V)	100 × 100	25 × 25
Frame rate (Hz)	90	170

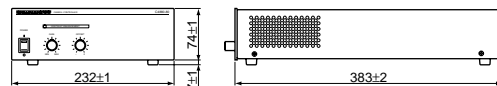
Note: Values for scan speeds are typical values. Please consult with HAMAMATSU for further information.

DIMENSIONAL OUTLINES

Camera head (approx. 1.3 kg)



Camera controller (approx. 6.3 kg)



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HAMAMATSU

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