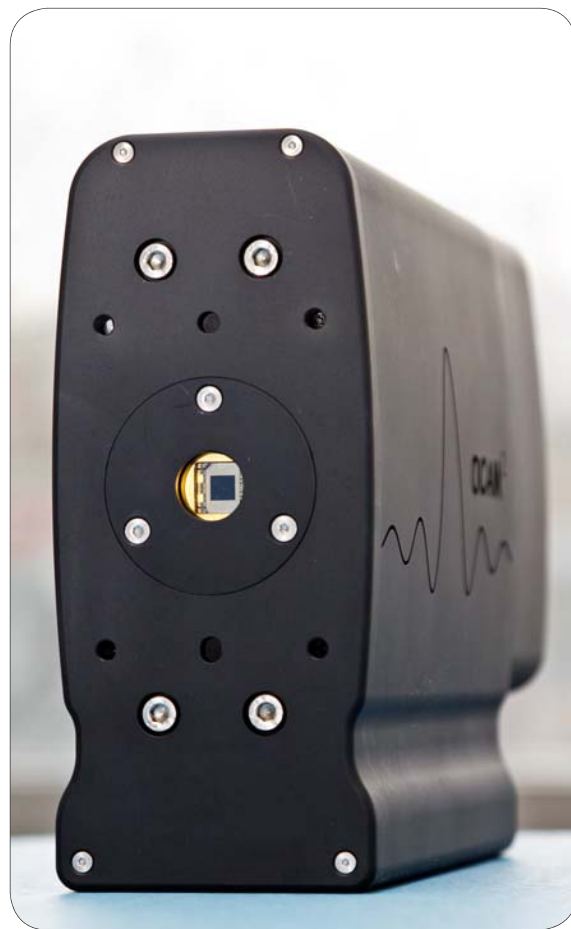


MAIN FEATURES :

- 240x240 pixels state of the art EMCCD
- Wide 24 μm pixels
- 1500 FPS
- 95% peak QE typical (DD Silicon)
- Deep depletion silicon option
- 14 bits precision A/D converter
- Cooled operation for low dark current
- Integrated temperature controller
- Fully sealed resistant aluminium body
- Ultra-low latency cameralink full interface
- Optional fiber interface
- Clock & trigger input / output for synchronous operation
- Custom design available upon request



OCAM² WITH CCD220 TYPICAL PERFORMANCES :

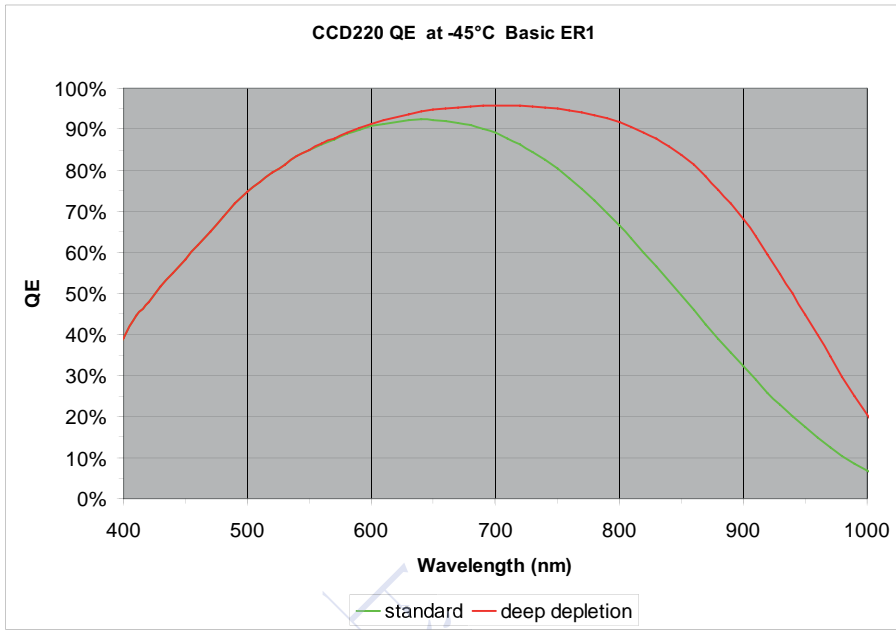
Test measurement	Result	Unit
Mean readout noise at 1500 fps and multiplication gain ~ 500	0.3	e^-
Quantization	14	bits
Dark signal at 1500 fps at -45°C	<0.01	$e^- \text{ pixel}^{-1} \text{ frame}^{-1}$
Dark signal at 25 fps at -45°C	<0.05	$e^- \text{ pixel}^{-1} \text{ frame}^{-1}$
Detector Operating Temperature	-45	$^\circ\text{C}$
Peak Quantum Efficiency at 650nm, STD Silicon	92	%
Peak Quantum Efficiency at 650nm, Deep Depletion Silicon	95	%
Peak Quantum Efficiency at 750nm, Deep Depletion Silicon	95	%
Linearity at gain x1000 from $10 e^-$ to $150 e^-$	<3	%
Linearity at gain x1 from $15,000 e^-$ to $150,000 e^-$	<3	%
Image Full Well capacity at gain x1, 1500 fps	270,000	e^-
Parallel CTE at gain x1, 1500 fps	>0.99995	N/A
Serial CTE at gain x1, 1500 fps	>0.99994	N/A
Maximum deviation from peak to valley over the light sensitive area	0.7	μm
Optical distance from CCD Image Plane to front of Window	3.33	mm
Angle between CCD Image Plane and front of Window	<0.2	$^\circ$

NOMINAL SUPPLY RATINGS

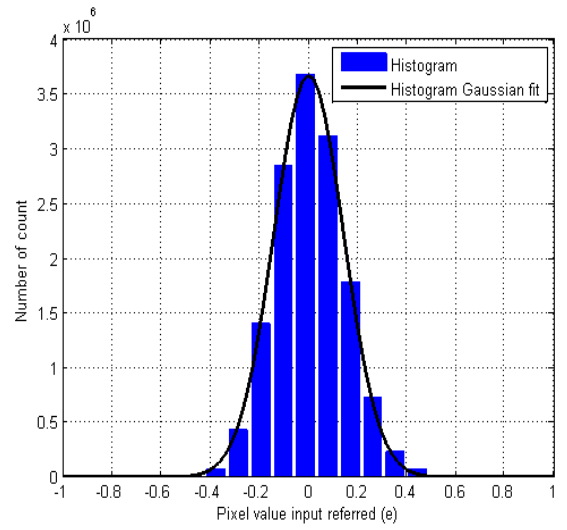
Supply voltage	24 to 25V
Supply current	6 amp*
Supply cooling water flow	1.5 to 3 l/min
Supply cooling water temperature	5 to 35°C

* The current at input depends on the water cooling temperature and on the operating current. When water temperature decreases and water flow increases, the required current decreases for a given detector temperature. Decreasing the detector temperature requires to increase current supply. Values given here are specified in the worst conditions.

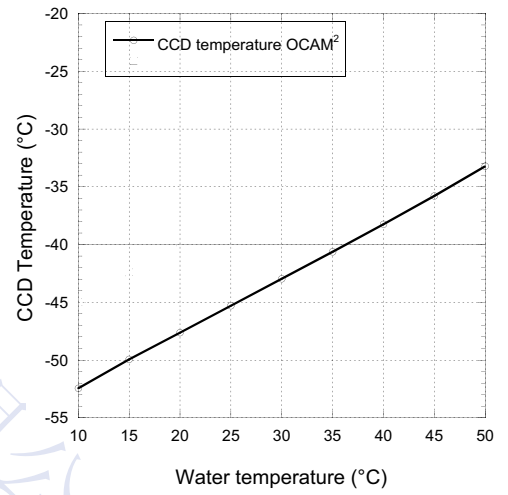
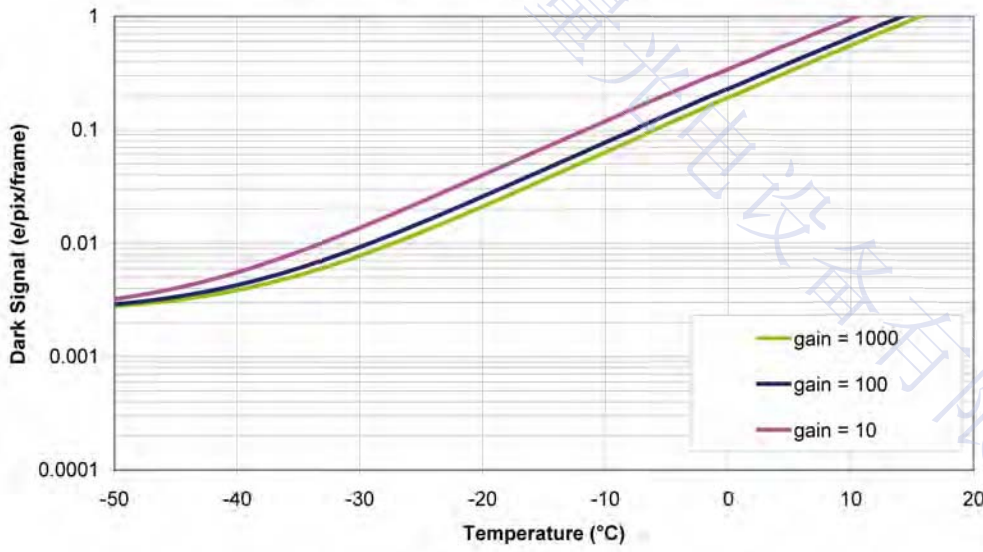
TYPICAL QUANTUM EFFICIENCY, NO WINDOW, AT 228°K



NOISE HISTOGRAM FOR GAIN x1000



Typical dark signal for operation at 1500fps.



THEORY OF OPERATION :

OCAM² is a high speed low noise camera able to run at 1500 fps with sub-electron readout noise. To achieve this performance, OCAM² uses an EMCCD, the CCD220 fabricated by e2v technologies, which is a 8 output split frame transfer CCD. To minimize smearing, the CCD220 high speed metal buttressed clock lines are driven by OCAM² at a speed as high as 7 Mlines/s transferring each frame in the store section in only 18 microseconds.

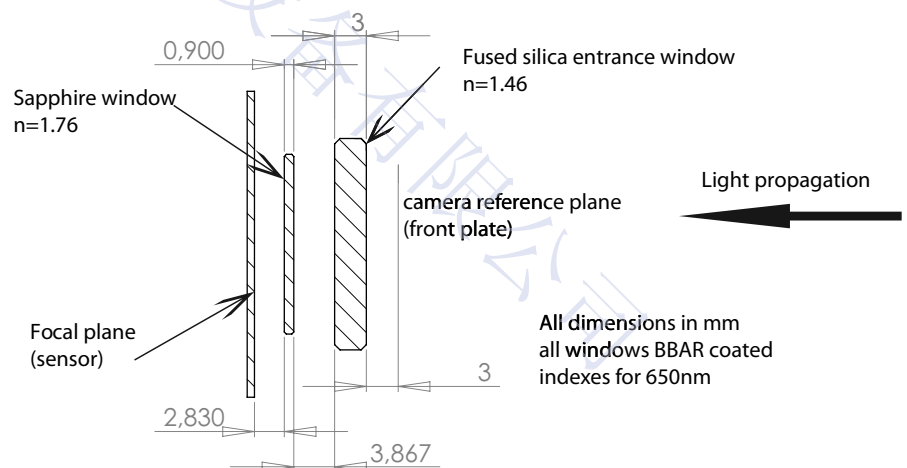
OCAM² offers an extremely low latency: 58μs between exposure and first pixel availability.

The CCD220 is cooled down to lower the dark signal at a level of 0.01 e⁻/pixel/frame at 1500 fps. A water-cooled thermoelectric module is used for detector cooling allowing to operate OCAM² with water supply temperatures as high as 35°C. The camera needs a single 24 to 25V power supply and is interfaced with a Cameralink Full digital interface. Fiber connection is available as an option, and specific or proprietary datalinks can be implemented upon request. The camera head can be adapted to your needs, microlens arrays can also be mounted in the camera and aligned. Contact us for more details.

MATING CABLES AND CONNECTORS :

Power : Lemo FGG.1B.304 series
Ethernet : RJ45
Cameralink : 3M cable 1MD26-X560-00C-XXX
Synchronization : Lemo FFA.00.250 series
Water : Parker/Legris X25 male series

STANDARD OPTICAL PATH :



ORDERING INFORMATION :

OCAM² part number : OCAM-2-AAAA-BBB-C-D-EEE

AAAA : speed grade 0500,1000,1500,2000*

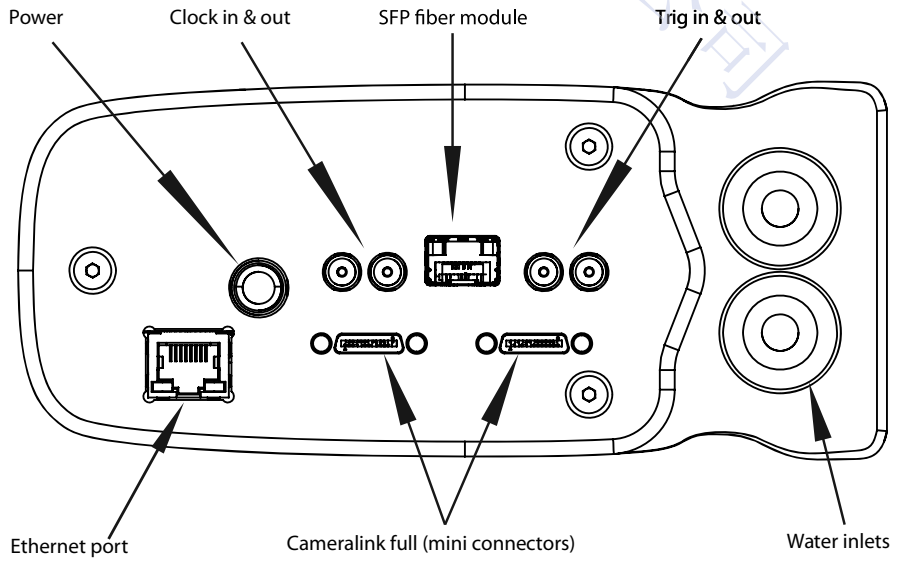
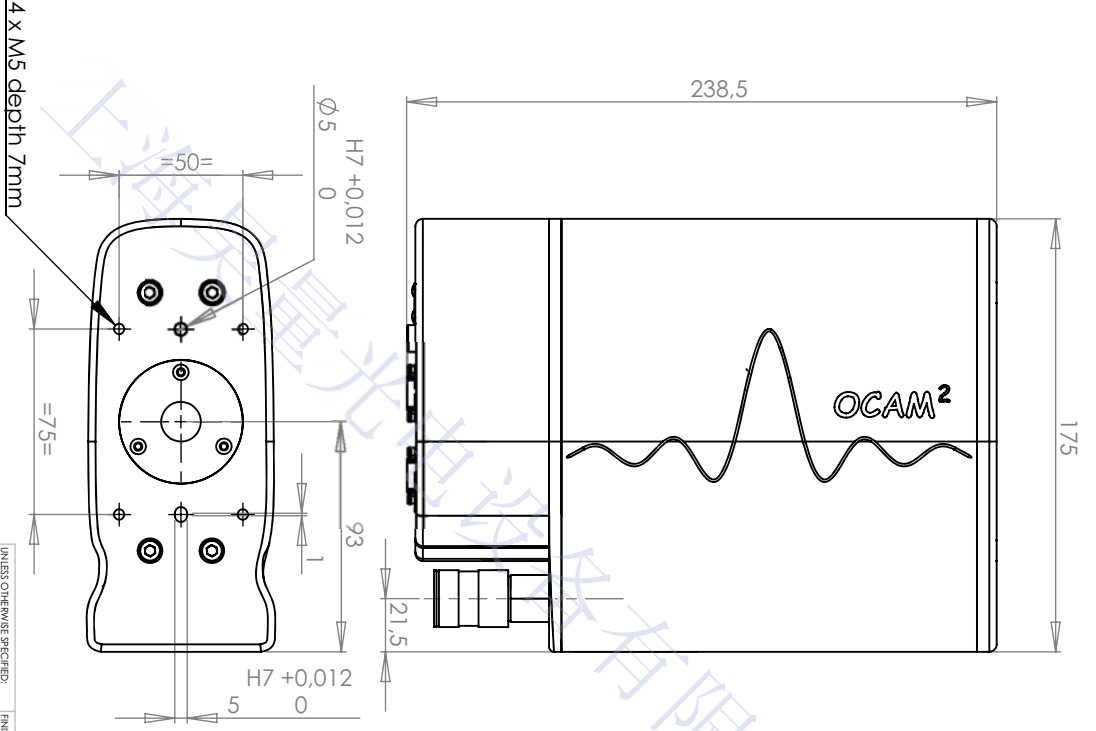
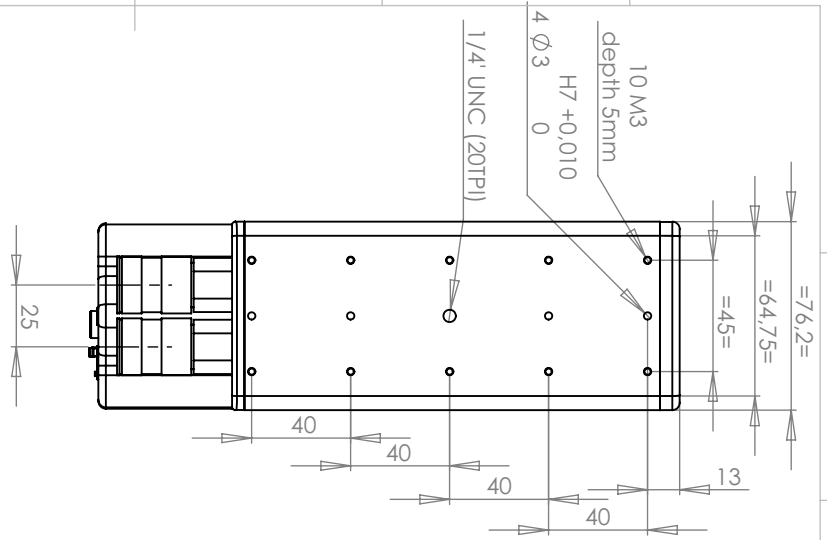
BBB : Silicon option STD = standard, DDS = Deep Depletion Silicon

C : synchronisation option : S=synchronous option, N= none

D : Optical transceiver module : O = optical module, N= none

EEE : special request = SPE, standard product = blank

* Availability Q1 2013. OCAM²-1500fps units are upgradable to OCAM²-2K 2000fps.



OCAM²

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN MILLIMETERS TOLERANCES: LINEAR: ANGULAR:	FINISH: SURFACE: EDGES:
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DO NOT SCALE DRAWING	REVISION
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DRAWN	NAME	SIGNATURE	TITLE:
CHKD			OCAM ²
APPRD			Interface drawing
MFG			
QA			

FIRST LIGHT
ADVANCED IMAGERY

DWG NO.	SCALE: 1:2	SHEET: 01-1
A3		