ANDOR™ TECHNOLOGY | iXon EM + PERFORMANCE SHEET

Camera Overview

Camera Details

Description	Model Number										Serial Number	
Head ▽	DU	-	897E	-	CS0	-	#BV				X -	2171
Controller Card	CCI	-	22								C -	2141
Other:												
Other:												

▽ Sensor types are defined in Table 1 using the last letters in box Model Number.

Special Feature	(✔)
Special AR coated Window	
MgF_2 Input	
Other (specify)	

A/D Feature		
A/D resolution	**Readout Time**	**Readout Speed**
14 bit	100nS per pixel	10MHz
14 bit	200nS per pixel	5 MHz
14 bit	333nS per pixel	3MHz
14 bit (D only)	1000nS per pixel	1MHz
16 bit (E only)	1000nS per pixel	1MHz

CCD Details

Manufacturer / Model No.	Pixels	Serial Number
E2V TECH CCD65	576x288, 20x30μm^2	
E2V TECH CCD87	512x512, 16μm^2	
E2V TECH CCD97	512x512, 16μm^2	05124-03-23
E2V TECH CCD60	128x128, 24μm^2	

▽Table 1; Key code to define the meanings of the last letters in the Model Number

Options			
Letters	**Sensor**		**Window**
FI	Front illuminated sensor		Standard AR coated fused silica window
BV	Back illuminated sensor with 550nm AR coating		Standard AR coated fused silica window
UV	Front illuminated sensor with UV phosphor		Uncoated fused silica window
UVB	Back illuminated sensor with UV phosphor		Uncoated fused silica window

Summary of System Test Data

Sensitivity, Readout Noise ♦1 and Base Mean Level

A/D Rate — EM = electron multiplication, Con = conventional	Options (✔)	Preamp setting	CCD Sensitivity ♦2 (electrons per A/D count)	Single Pixel Noise (electrons)	Base Level ♦3 (Counts)
10 MHz 14 bit EM amplifier	✔	1x	64.84	99.2	412
	✔	2.4x	26.45	61.7	411
	✔	4.7x	12.04	50.8	413
5 MHz 14 bit EM amplifier	✔	1x	58.64	82.8	408
	✔	2.4x	23.81	54.3	405
	✔	4.7x	10.57	41.5	417
3 MHz 14 bit EM amplifier	✔	1x	58.67	65.5	420
	✔	2.4x	23.7	39.1	425
	✔	4.7x	10.49	32.3	417
1 MHz 16 bit EM amplifier	✔	1x	23.44	42.6	400
	✔	2.4x	9.52	26.7	400
	✔	4.7x	4.28	22.3	402
3 MHz 14 bit CON amplifier	✔	1x	11.02	15.4	413
	✔	2.4x	4.15	10.8	410
	✔	4.7x	1.83	9.6	413
1 MHz 16 bit CON amplifier	✔	1x	4.19	9.3	399
	✔	2.4x	1.56	6.6	400
	✔	4.7x	0.67	5.8	401
Saturation Signal per pixel (10MHz 14 bit EM amplifier)		154954		electrons / pixel	

Linearity and Uniformity

Linearity better than ♦4	1	% over 14 bits
Response Uniformity better than ♦5	0.53	%

Dark Current

Minimum Dark Current Achievable ♦6	0.001374	electrons/pixel/sec		
@ Sensor Temperature of ♦7	-103.26	°C and	16	°C water cooling

Dark Current Defects

Hot Spots ♦8 (X,Y)

(X, X)	(,)	(,)	(,)
(X, X)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)

Hot Columns ♦9	Column numbers indicated.	X	X

Response Defects

White/Black Spots ♦10 (X,Y)

(X, X)	(,)	(,)	(,)
(X, X)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)

White/Black Columns ♦11	Column numbers indicated .	X X	X X
Traps ♦12	Column numbers indicated.	X	X

Test Conditions

Readout Noise tested at	-75	°C with	16	°C water cooling
Base Mean Level measured at	-75	°C with	16	°C water cooling
Blemishes tested at	-20	°C with	16	°C water cooling

Version Control Information

Hardware Version #	POLO	CONNECTOR	DIGITAL	ANALOGUE	POWER
	C	D	F	E	E
Firmware Version #	ENGINE	EEPROM			
	3.3	14			
Shipping Software Version #	MCD	COF	RBF	DRIVER	
	4.2	162	174	4.26	
Testing Software Version #	MCD	COF	RBF	DRIVER	
	4.2.0.3	162	174	4.26	

System Passed for Shipping

Signed	**Date**
PHILIP STEEN	12TH MAY 2006

Notes

All tests are carried out with standard test card
Actual performance may differ slightly with supplied card, but will remain within specification

♦1 Readout Noise is measured for single pixel readout with the CCD in darkness at temperature indicated and minimum exposure time. Noise values will change with pre-amplifier gain selection [PAG].

♦2 Sensitivity is measured in photoelectrons per A/D count from a plot of Variance [Noise squared] against Signal.

♦3 Average electronic DC offset for CCD in darkness at temperature indicated and minimum exposure time under dark conditions and single pixel readout.

♦4 Linearity is measured from a plot of counts vs. signal up to the saturation point of the system. Linearity is expressed as a percentage deviation from a straight line fit. This quantity is not measured on individual systems.

♦5 RMS (root mean square) deviation from the average response of the CCD in full resolution image operation illuminated with uniform white light (defects not included).

♦6 Dark current falls exponentially with temperature. However, for a given temperature the actual dark current can vary by more than an order of magnitude from device to device. The devices are specified in terms of minimum dark current achievable rather than minimum temperature.

♦7 Minimum temperature achieved for thermoelectric (TE) cooler set to maximum value with water cooling.

♦8 A hot spot can be up to 3 pixels in size. For Grade A devices, hot spots are counted if they exhibit >50 times the maximum specified dark current at the test temperature indicated.

♦9 A column is considered defective if >10 pixels are affected, or if the column exhibits >2 times the maximum specified dark current at the test temperature indicated.

♦10 A white/black spot can be up to 3 pixels in size. White/black spots have signals >25% above/below the average (25% contrast) with uniform illumination across the sensor.

♦11 White/black columns have = 10 white/black spots with uniform illumination across the sensor.

♦12 Traps are pixels which absorb charge as it is clocked through the defective area. When the light source is switched off, the signal from the trap appears to drop off more slowly than the signal from the surrounding pixels.