



SYSTEM Performance



***International Headquarters
Andor Technology Limited
Springvale Business Park
Belfast***

Congratulations.

You have selected one of the finest multichannel detectors available anywhere in the world today !

This high performance instrument has been individually built for you and tested in accordance with Andor's ISO 9001:2000 quality régime.

The documents in this folder are your individual assurance that your new multichannel detector has been rigorously tested and its performance recorded in detail. You can be confident that your detector meets Andor's exacting standards.

We hope you find use of our detector rewarding and we look forward to working with you again in the future !

Yours sincerely,

Andor Technology

PS Don't forget to fill in and return your Warranty Registration today. It helps us.... to help you!

Product Registration Form

fax to **+44 (0)28 9031 0792** or complete on-line at **www.andor.com/warranty**

Thank you for choosing ANDOR. Product Registration helps us respond to your future needs. Fax or e-mail a completed Product Registration Form within **30 days** of receipt of goods and enjoy a **Free 1-Year Warranty Extension** plus advance information about future product developments. Tick ✓ those check-boxes that apply.

Prof Dr Mr Ms

First: _____ Last: _____

Organization:

Address:

City:

Country: _____ Zip: _____

Tel: _____

@

Day/Month/Year: / /

Model No: _____ Serial No: _____

USB interface

Model No: _____ Serial No: _____

Model No: _____ Serial No: _____

Solis SDK iQ Komet

Version: _____

XP NT 2000 Linux Other

Processor: _____ Speed: _____
 Memory: _____ Hard Drive: _____

Physics Chemistry Biology Other

Brief outline: _____

Imaging Spectroscopy

Brief outline: _____

Why did you purchase from ANDOR? Tick all that apply

Specification Quality Reputation

Price Service Other

Comments: _____

Are you happy with the buying experience?

Happy Neutral Unhappy

discover new ways of seeing™

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 if you have any queries then e-mail marketing@andor.com

www.andor.com

Camera Overview

Description	Model						Serial Number
Head ▽	DV8	85	K	CS	-	VP	X-2335
Controller Card	CCI-23						C-2885
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	28nS per pixel	35MHz
14 bit	37nS per pixel	27MHz
14 bit	77nS per pixel	13MHz

CCD Details

Manufacturer / Model No.	Pixels	Serial Number
Texas Inst. Tx285SPD	1004x1002, 8x8μm ²	\

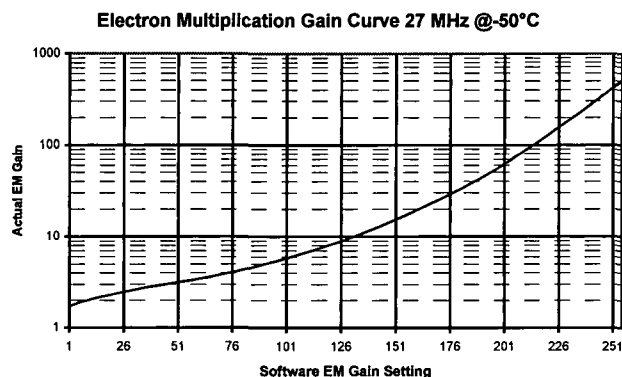
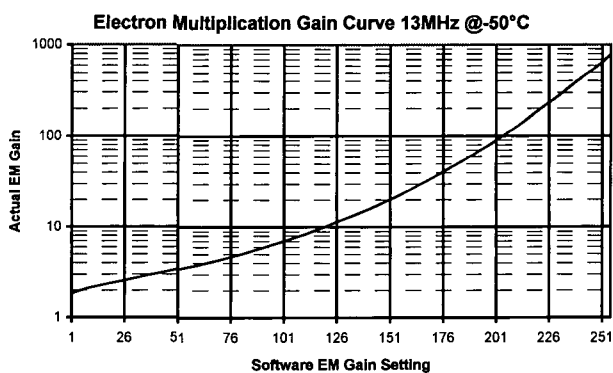
▼ Table 1; Key code to define the meanings of the last letters in the Model Number

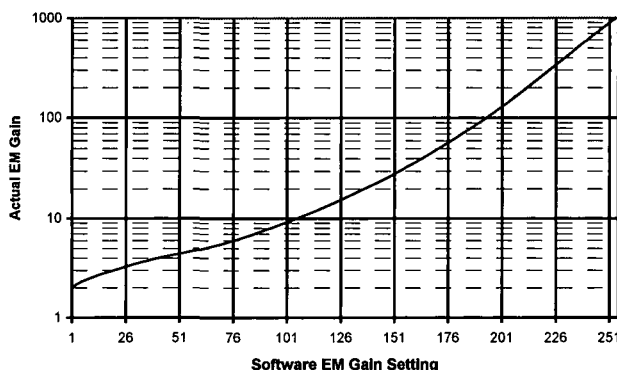
Options		
Letters	Sensor	Window
FI	Front illuminated sensor	Standard AR coated fused silica window
BV	Back illuminated sensor with 550nm AR coating	Standard AR coated fused silica window
UV	Front illuminated sensor with UV phosphor	Uncoated fused silica window
UVB	Back illuminated sensor with UV phosphor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

Summary of System Test Data Readout Noise ♦1 and Base Mean Level

A/D Rate	EM = electron multiplication Con = conventional	Options (✓)	CCD Sensitivity ♦3 eles per A/D count	Single Pixel Noise electrons	Base Level ♦2 (Counts)
35 MHz 14 bit EM amplifier		✓	1	1.51	853
27 MHz 14 bit EM amplifier		✓	1	0.79	1004
13 MHz 14 bit EM amplifier		✓	1	1.1	1001
Saturation Signal per pixel (35MHz 14 bit EM amplifier)			30,500	Electrons/pixel	

EMCCD Gain Characteristics ♦4



Electron Multiplication Gain Curve 35MHz @-50°C


Note: Maximum Electron Multiplication Gain will reduce by approximately a factor of two for every 10°C rise in temperature. Software EM gain setting of zero equates to an actual gain of unity.

CCD Dark Current

Minimum Dark Current Achievable ♦5	0.00234	electrons/pixel/sec		
@ Sensor Temperature of ♦6	-100.5	°C	16	°C water cooling
		With PSU		

Linearity and Uniformity

Linearity better than ♦7	1	% over 14 bits
Response Uniformity better than ♦8	1.41	%

Response Defects

White/Black Spots ♦9		(X, Y)	
(X , X)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)
White/Black		X	X
Columns ♦10	Column numbers indicated.	X	X
Traps ♦11	Column numbers indicated.	X	X

Dark Current Defects

Hot Spots ♦12		(X, Y)			
(X , X)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)
(,)	(,)	(,)	(,)	(,)	(,)

Hot Columns ♦13	Column numbers indicated.	X	X

Test Conditions

Readout Noise tested at	-50	°C with	16	°C water cooling
Base Mean Level measured at	-50	°C with	16	°C water cooling
Blemishes tested at	-20	°C with	16	°C water cooling

System Passed for Shipping

Signed

Date

Philip McIlwrath

28TH August 2006

Version control information

Hardware	POLO BOARD	CONNECTOR	PROCESS	POWER	27V BOARD	EEPROM VERSION
Version #	C	D	C	C	E	11
Shipping Software	MCD	COF	RBF			
Version #	4.3	256	38			
Testing Software	MCD	COF	RBF			
Version #	4.3.0.0	256	38			

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.
- ◆2 Average electronic DC offset for CCD in darkness at temperature indicated and minimum exposure time under dark conditions and single pixel readout.
- ◆3 Sensitivity is measured in photoelectrons per A/D count from a plot of Total Noise against Signal. This quantity is not measured on individual systems.
- ◆4 The Electron multiplication gain characteristics on the sensor. Note that the gain achieved varies with operating temperature and may reduce slowly over time.
- ◆5 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.
- ◆6 Minimum temperature achieved for thermoelectric (TE) cooler set to maximum value with water cooling.
- ◆7 Linearity is measured from a plot of Counts vs. Signal over the 14 bit dynamic range. Linearity is expressed as a %age deviation from a straight line fit. This quantity is not measured on individual systems
- ◆8 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).
- ◆9 A 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.
- ◆10 Columns which have ≥ 10 blackspots with uniform illumination across the sensor.
- ◆11 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.
- ◆12 A 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.
- ◆13 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.