

System Performance Booklet





Returns Report



Reported Fault

Returning iKon-M camera for widow changes. Camera parallel window to be replaced with WN35FS Broadband VUV-NIR Wedged windows, code- (BB-VV-NR)W.

Diagnosis

Confirmed requested wedged window replacement required.

Work Carried Out

Camera rebuilt (allocated s/n CCD-22932). Wedged window installed. Full system QC & new performance sheets completed: - Passed.

	Receipt Date	Work Complete	Passed For Shipping	Shipped
Date	22/08/2018	16/01/19	16/01/19	
Initials	РМС	PJ	MB	

* In the case of Products which are upgraded, the old Model No / Serial No are bracketed first, followed by the new Nos: ** Returns must be passed for shipping by the manufacturing manager and / or Sales Support



System Overview

Description	Model	nbaa		Se	erial Number	
CCD Head V	D U 9	34P	- BR-DD	C	CD-22932	and d
TE Cooler performance (~)	0.01	6.5.040	High	Ultra-high	S2-84)
Accessories	Power Su	oply Un	it (PS -24)	*	PS -25	
1162	10.1.01		S ME		✓ IX	5
8853	SO-	LM-		MFL-	SX	8
Serial/Batch Number			5.81		La la	2
Other		1.1.1			TX.	1
Concertures and	1.C	1 4		11	a dal Marshan	

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

CCD Details

Manufac	turer / Model No.	Pixels	Serial Number
E2V	CCD47-10	1024x1024, 13µm x 13µm	10041-11-19
E2V	CCD57-10	512x512, (FT), 13μm x 13μm	0.05 xt
E2V	CCD77-00	512x512, 24μm x 24μm	0.05 0.05 x2
			0.05 × 1

Special Feature	(*)		(*)
NIMO	~	Custom Mounting Flange	
Fringe Suppression		Custom Cables	
Shielded Anti-Blooming			

Window Variant	(*)		(~)
VUV-UV Parallel		NUV-Enhanced Parallel	
Broadband VUV-NIR Wedged	~	Broadband VUV-NIR Parallel	
Broadband VIS-NIR Wedged		Broadband VIS-NIR Parallel	
VIS-NIR Enhanced Wedged		Bose-Einstein 780nm Wedged	
None		Other	



Summary of System Test Data

Readout Noise +1 and Base Mean Level

A/D Rate (MHz All 16 bit)	Preamp setting	CCD Sensitivity +3 eles per A/D count	Single Pixel Noise electrons	Full Vert Bin Noise electrons	Base Level ♦2 (Counts)
5	x1	6.7	34.9	33.1	1162
5	x2	3.0	17.2	17.0	2089
5	x4	1.5	13.2	12.6	3231
3	x1	5.9	19.9	19.6	1289
3	x2	3.0	12.8	12.8	2397
3	x4	1.3	9.7	9.7	4144
1	x1	5.2	11.3	11.2	984
1	x2	2.6	8.1	8.1	1995
1	x4	1.2	6.6	6.7	4095
0.05	x1	5.2	5.3	5.5	542
0.05	x2	2.6	4.5	4.7	1541
0.05	x4	1.2	4.0	4.1	3620
Satura	tion Signal p	er pixel	151072	Electror	ns/pixel



Minimum Dark Current Achievable +4	0.00099	electro	ons/pixel/s	ec
@ Sensor Temperature of +5	-95.472	°C	16	°C cooling Water
		With PS	-25	
CCD Dark Current Uniformity better than +6	0.2978	electro	ons/pixel/s	ес

CCD Dark Current



Linearity and Uniformity

Linearity better than •7	1	% over 16 bits	
Response Uniformity better than +8	2.22	%	

Response Defects

Centrola	Number of Pixels	Centroid		Number of Pixels		
X , X ,	X	(, (, (, (,)))))			
White/Black Columns ♦10	Column num	bers indicated	x	x		

Dark Current Defects

Cent	roid	Number of Pixels	Centroid	Number of Pixels
X,	X) X	(,])
Х,	X) X	(,)
,)	()
)	(,)
)	(,)
,			(,)



Test Conditions

Readout Noise tested at	-80	°C with	16	°C water
Base Mean Level measured at	-80	°C with	16	°C water
Dark Current Uniformity tested at	-65	°C with	[.] 16	°C water
Blemishes tested at	-65	°C with	16	°C water

Custom Testing

Signed

System Passed for Shipping

PATRICK MCCANN

10TH DECEMBER 2018

Hardware	HEADBOARD	FPGA		
Version #	AG	20.24		
Shipping				
Software	SOLIS	SDK		
Version #				
Testing				
Software	SOLIS	SDK		
Version #	4.31.30022.0	2.103.33022.0		

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

Sensor Options			
OE	Open electrode	BU2	Back Illuminated (BI) + 250nm UV optimised
FI	Front illuminated (FI)	BU	BI + UV (350nm) optimised
UV	FI+UV coating	BV	BI + VIS (550nm) optimised)
FO	FI + Fibre optic	BR-DD	BI + NIR +deepdepletion
FI-DD	FI + deep depletion	BN	BI with no AR coating



Performance Notes

- Readout Noise is measured for both single pixel (SP) and fully vertically binned (FVB)
 with the CCD in darkness at temperature indicated and minimum exposure time.
 Noise values will change with pre-amplifier gain selection [PAG].
- Average electronic DC offset for CCD in darkness at temperature indicated and minimum exposure time under dark conditions measured by single pixel (SP) for imaging systems and by (FVB) for spectroscopic systems.
- 3 Sensitivity is calculated in photoelectrons per A/D count from measurements of the Photon Transfer Curve.
- 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.
- ♦5 Minimum temperature achieved for thermoelectric (TE) cooler set to maximum value with water cooling
- ♦6 RMS (root mean square) deviation of dark current for fully binned operation for spectroscopic cameras, or full resolution image for imaging cameras, under dark conditions at temperature indicated (pixel/column defects not included). This variation is mainly cosmetic since it is fully subtractable without significant loss of performance.
- 7 Linearity is measured from a plot of Counts vs. Signal over the 16 bit dynamic range. Linearity is expressed as a %age deviation from a straight line fit. This quantity is not measured on individual systems.
- RMS (root mean square) deviation from the average response of the CCD in full resolution image for imaging cameras, illuminated with uniform white light (defects not included).
- ♦ 9 White/black pixels have signals >25% above/below the average (25% contrast) with uniform illumination across the sensor.
- \bullet 10 A black column is defined as having ≥ 10 black pixels for imaging cameras.
- It 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 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.