Ninox 640 II

Ultra low noise, cooled, digital VIS-SWIR camera 640 x 512 • 15 μ m x 15 μ m Pixel Pitch • 18 electrons (HG) • Air Cooled to -15°C •



Key Features and Benefits

The best performing VIS-SWIR camera in the World!

 Air Cooled VIS-SWIR technology Air Cooled to -15°C. Enables low dark current for longer exposures 	Resolution	640 x 512
 15µm x 15µm Pixel Pitch Enables highest resolution VIS-SWIR image 	Frame Rate	up to 120Hz
Ultra Low Noise Sensor: 18e- in High Gain Enables ultimate low light Vis-SWIR image	Readout Noise	18e- (typical)
Ultra High Intra-scene Dynamic range - 73dB (Typical) Enables similtaneous capture of bright & dark portions of a scene	Spectral Response 0.4µm - 1.7µm	
	Typical Dark Cur	rent < 750e-

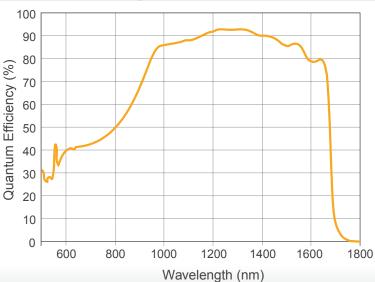


Specification for Ninox 640 II

Sensor TypeInGaAs PIN-PhotodiodeActive Pixel640 x 512Pixel Pitch15µm x 15µmActive Area9.6mm x 7.68mmSpectral Respones ¹ 0.4µm to 17µmReadout Noise (RMS) ² E = Low Gain HG = High Gain16: <175c (150c + typical) HG: <22c (18c + typical)Peak Quantum Efficiency>90% e0 13µmPixel Operability0Pixel Operability16: <100ceDark Current (e/p/s)14bit Camera Link (Base Configuration)Digital Output Format16: Global shutterSpoure Time ³ 16: Cinus to 26.8s HG: 100µs to 26.8sShutter ModeGlobal shutterOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger Interface17igger IN and OUT - TTL compatiblePower Supply3 point NUC (offset, Gain & Dark Current) + pixel correctionTinge Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionCamera Power Consumption ⁴ -20°C to +55°CStorage Temperature-20°C to +55°CDianenson (LWH) ⁵ 87.30mm x 78.86mm x 79.30mm			
Pixel PitchInterventionPixel Pitch15µm x 15µmActive Area9.6mm x 7.68mmSpectral Response10.4µm to 17µmReadout Noise (RMS)2LG: <175e: (150e: typical)LG = Low Gain HG = High GainHG: <22e: (18e: typical)Peak Quantum Efficiency>90% @ 1.3µmFull Well CapacityI.G: 650ke- HG: 10ke-Pixel Operability>99.5%Dark Current (e/p/s)<3,000 @15°C (1.500 typical)Digital Output Format14bit Camera Link (Base Configuration)Exposure Time3I.G: 10µs to 26.8sShutter ModeGlobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationSposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<100W with TEC ON, NUC ON)Operating Case Temperature-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L'W'H)4\$7.30mm x 78.86mm x 79.30mm	Sensor Type	InGaAs PIN-Photodiode	
Active Area9.6mm x 7.68mmSpectral Response'0.4µm to 1.7µmReadout Noise (RMS)² LG : Cl Sc (150e typical) HG: c22e (18e typical) HG: 22e (18e typical) HG: 22e (18e typical)Peak Quantum Efficiency>90% @ 1.3µmPull Vell CapacityLG: 650ke- HG: 10ke-Pixel Operability>99.5%Dark Current (e/p/s)C3.000 @15°C (1,500 typical)Digital Output Format14bit Camera Link (Base Configuration)Exposure Time³CGiobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower SupplySposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ A, TEC, ROITingger CorrectionSposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ A, TEC, ROICornear Power Consumptio4-20°C to 455°CStorage Temperature-20°C to 450°CVieightS7.30m x 78.86mm x 79.30mm	Active Pixel	640 x 512	
Spectral Response'0.4µm to 1.7µmSpectral Response'0.4µm to 1.7µmReadout Noise (RMS)² LG = Low Gain HG = High GainHG: <22e- (18c + typical) HG: <22e- (18c + typical)Peak Quantum Efficiency>90% @ 1.3µmPeak Quantum EfficiencyS90% @ 1.3µmFull Well CapacityLG: 650ke- HG: 10ke-Pixel Operability>99.5%Dark Current (e/p/s)C.3.000 @15°C (1.500 typical)Digital Output Format14bit Camera Link (Base Configuration)Exposure Time³C.Giobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)Cooled to -15°C, AT = 35°CTigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial CommunicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ AX, TEC, ROIOpterating Case Temperature-20°C to +55°CStorage TemperatureS7.30m x 78.86mm x 79.30mmWeightS50g	Pixel Pitch	15μm x 15μm	
Readout Noise (RMS)² LG = Low Gain HG = High GainLG: <175e- (150e- typical) HG: <22e- (18e- typical)	Active Area	9.6mm x 7.68mm	
LG = Low Gain HG = High GainHG: <22e' (18e' typical)	Spectral Response ¹	0.4µm to 1.7µm	
Full Well CapacityLG: 650ke- HG: 10ke-Pixel Operability>99.5%Dark Current (e/p/s)<3,000 @15°C (1,500 typical)Digital Output Format14bit Camera Link (Base Configuration)Exposure Time³C.G. 10µs to 26.8sShutter ModeGlobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingSpoint NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<100W with TEC ON, NUC ON)Operating Case Temperature-20°C to +55°CStorage TemperatureS7.30m x 78.86mm x 79.30mmWeightStorage			
Full Well CapacityHG: 10ke-Pixel Operability>99.5%Dark Current (e/p/s)Digital Output Format14bit Camera Link (Base Configuration)Exposure Time³LG: 10µs to 26.8sShutter ModeGlobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceOTrigger IN and OUT - TTL compatiblePower Supply3 point NUC (offset, Gain & Dark Current) + pixel correctionImage CorrectionSposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICharge Temperatures-20°C to +55°CStorage TemperaturesS7.30mm x 78.86mm x 79.30mmWeightStorage Temperatures	Peak Quantum Efficiency	>90% @ 1.3µm	
Dark Current (e/p/s)<3,000 @15°C (1,500 typical)	Full Well Capacity		
Digital Output Format14bit Camera Link (Base Configuration)Exposure Time³LG: 10μs to 26.8sShutter ModeGlobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)Operating Case Temperature5-20°C to +55°CStorage Temperature87.30mm x 78.86mm x 79.30mmWeight550g	Pixel Operability	>99.5%	
Exposure Time³LG: 10μs to 26.8s HG: 100μs to 26.8sShutter ModeGlobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROIOperating Case Temperature5-20°C to +55°CStorage Temperature87.30mm x 78.86mm x 79.30mmWeight550g	Dark Current (e/p/s)	<3,000 @15°C (1,500 typical)	
Exposure TimesHG: 100µs to 26.8sShutter ModeGlobal shutterFrame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROIOperating Case Temperature5-20°C to +55°CStorage Temperature687.30mm x 78.86mm x 79.30mmWeight550g	Digital Output Format	14bit Camera Link (Base Configuration)	
Frame RateUp to 120HzOptical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceOTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROIOperating Case Temperatures-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L*W*H)*87.30mm x 78.86mm x 79.30mmWeight550g	Exposure Time ³	·	
Optical InterfaceC-mount (selection of SWIR lens available)Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROIOperating Case Temperatures-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L*W*H) ⁶ 87.30mm x 78.86mm x 79.30mm	Shutter Mode	Global shutter	
Dynamic Range (Typical)LG: 73dB HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)Operating Case Temperature5-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L*W*H)687.30mm x 78.86mm x 79.30mmWeight550g	Frame Rate	Up to 120Hz	
HG: 55dBTrigger InterfaceTrigger IN and OUT - TTL compatiblePower Supply12V DC ±5%TE CoolingCooled to -15°C, AT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)	Optical Interface	C-mount (selection of SWIR lens available)	
Power Supply12V DC ±5%TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)	Dynamic Range (Typical)		
TE CoolingCooled to -15°C, ΔT = 35°CImage Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)	Trigger Interface	Trigger IN and OUT - TTL compatible	
Image Correction3 point NUC (offset, Gain & Dark Current) + pixel correctionFunctions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)	Power Supply	12V DC ±5%	
Functions controlled by serial communicationExposure, intelligent AGC, Non Uniformity Correction, Gamma, Pk/ Av, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)Operating Case Temperature5-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L*W*H)687.30mm x 78.86mm x 79.30mmWeight550g	TE Cooling	Cooled to -15°C, $\Delta T = 35^{\circ}C$	
communicationAv, TEC, ROICamera Power Consumption4<10W with TEC ON, NUC ON)Operating Case Temperature5-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L*W*H)687.30mm x 78.86mm x 79.30mmWeight550g	Image Correction	3 point NUC (offset, Gain & Dark Current) + pixel correction	
Operating Case Temperature5-20°C to +55°CStorage Temperature-30°C to +60°CDimensions (L*W*H)687.30mm x 78.86mm x 79.30mmWeight550g			
Storage Temperature -30°C to +60°C Dimensions (L*W*H) ⁶ 87.30mm x 78.86mm x 79.30mm Weight 550g	Camera Power Consumption⁴	<10W with TEC ON, NUC ON)	
Dimensions (L*W*H) ⁶ 87.30mm x 78.86mm x 79.30mm Weight 550g	Operating Case Temperature⁵	-20°C to +55°C	
Weight 550g	Storage Temperature	-30°C to +60°C	
	Dimensions (L*W*H)6	87.30mm x 78.86mm x 79.30mm	
Raptor Photonics Limited reserves the right to change this document at any time without notice and	Weight	550g	

Raptor Photonics Limited reserves the right to change this document at any time without notice and disclaims liability for editorial, pictorial or typographical errors.

Quantum Efficiency



^{*}Data supplied by sensor manufacturer



Willowbank Business Park Larne, Co Antrim BT40 2SF, Northern Ireland Raptor Photonics Ltd. (UK) T: +44(0)2828 270 141 E: sales@raptorphotonics.com www.raptorphotonics.com **Ordering Information**

Camera

Ninox 640 II Digital Camera	NN1.7-VS-CL-640	
Power Supply Cable	RPL-HR4-K	
Optional Accessories		
Mini PC with XCAP Std and frame grabber	RPL-PC-EL1	
EPIX® EB1 frame grabber	RPL-EPIX-EB1	
EPIX® XCAP Std software	RPL-XCAP-STD	
Camera Link Cable (2m) ⁷	RPL-MCL-CBL-2M	
Thermoelectric Water Chiller Unit ⁸	RPL-CHILLER	
Chiller Tubing ⁹	RPL-WTUBE-NINOX	
Optical Lenses ¹⁰	RPL-xx-xxxx	
 Note 1: Optional filters available: low, high or bandpass. Note 2: Typical readout noise is calculated from an average of the last 20 cameras shipped Note 3: In practice, the maximum exposure time will be dark current limited. Note 4: Measured in an ambient of 25°C with adequate heat sinking. For more detailed power consumption values, please refer to the user manual. Note 5: Extended Operating Temperature range available on request. Note 6: Dimensions include all connector parts on the camera interface. Note 7: Longer Camera Link cable available. Note 8: This includes the chiller and the liquid. Recommended coolant flow rate >0.51/min & cooling capacity >100W @ 20°C. Note 9: This includes the tubing & connectors. Note 10: Please consult us to check our range of lenses. 		

Demo is available on request. Pricing AOR subject to volumes.

Detailed technical drawings can be downloaded at www.raptorphotonics.com

Applications

Scientific

- Astronomy
- Beam Profiling
- Hyperspectral Imaging
- Semiconductor Inspection
- Solar Cell Inspection
- Thermography
- Microscopy

Raptor Photonics Inc. (USA)

www.raptorphotonics.com

E: sales@raptorphotonics.com

T: +1 (877) 230-4836

Art Inspection

Document #: USNN1.7-VS-CL-640 0320

