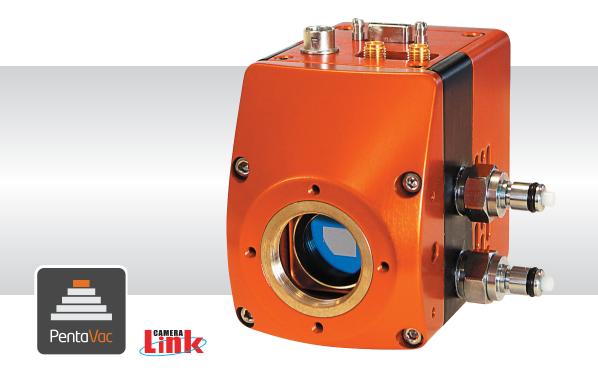
Ninox 640 II

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-

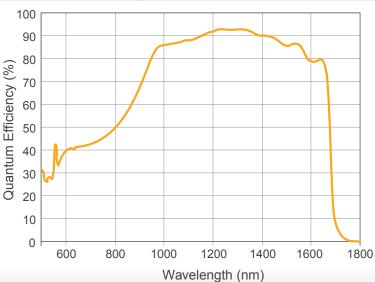


Specification for Ninox 640 II

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	

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Quantum Efficiency



^{*}Data supplied by sensor manufacturer



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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

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Art Inspection

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