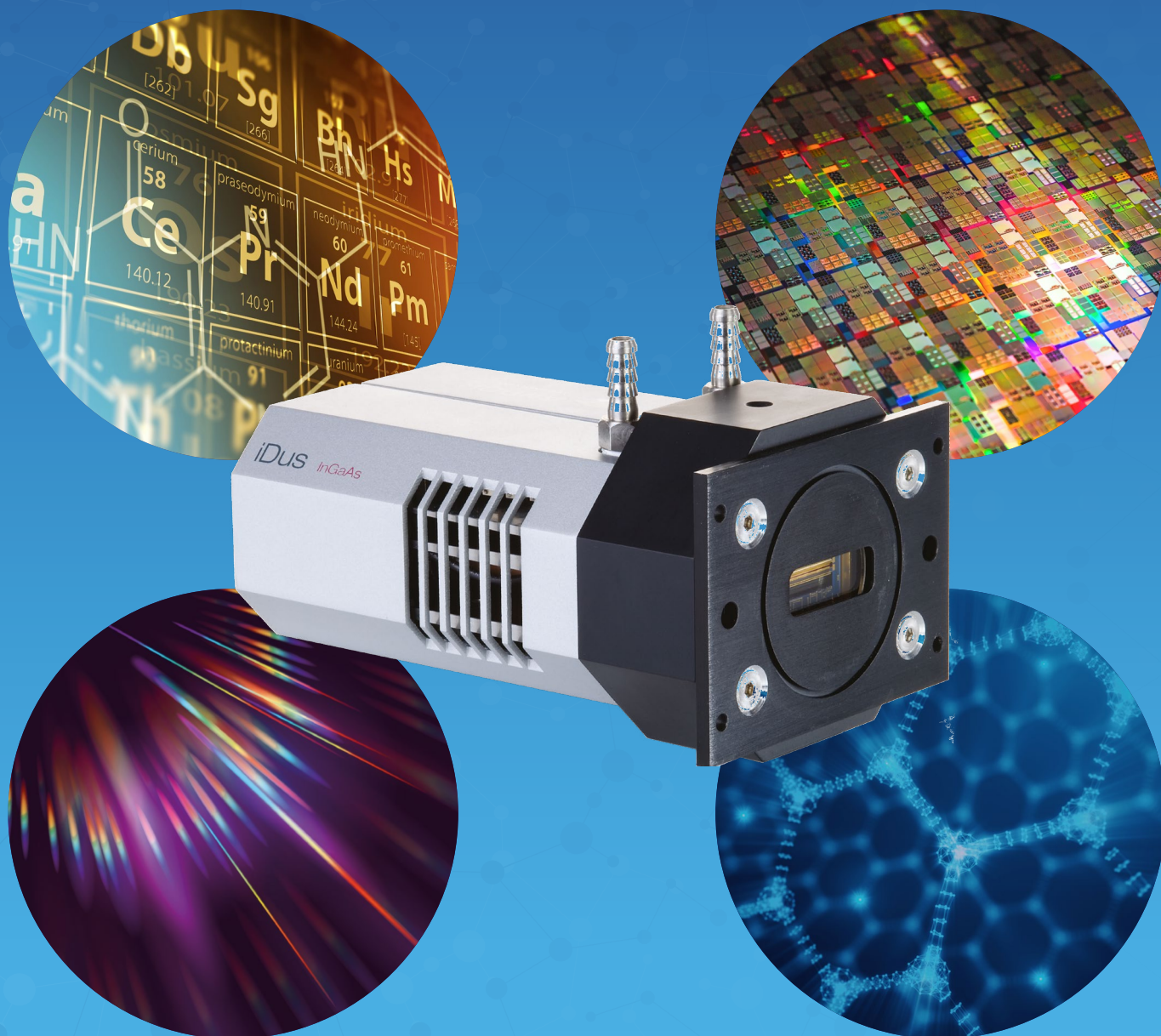


Andor **iDus InGaAs** Detector array for Spectroscopy

Low-dimensional materials | Semiconductors | Chemistry
Photoluminescence & Fluorescence | Raman (1064 nm)



Introducing the iDus InGaAs series

The iDus InGaAs range is a perfect complement to Andor's UV-VIS-NIR CCD camera family, extending spectral detection capabilities beyond 1.1 μm and up to 2.2 μm . The thermo-electrically cooled, in-vacuum sensors reach cooling temperatures of -90°C where the best signal-to-noise ratio can be achieved for the majority of applications in this spectral region. Beyond this cooling point blackbody radiation from any elements facing the sensor will dominate the dark signal, and since quantum efficiency will be impacted with decreasing cooling temperature, TE cooling will allow access to optimum SNR performance.



- 1.7** Andor's iDus InGaAs 1.7 detector series provides best detection capabilities in the 600 nm to 1.7 μm spectral range.
- 2.2** Andor's iDus InGaAs 1.7 detector series provides best detection capabilities in the 1.7 μm to 2.2 μm spectral range.

Features	Benefit
TE cooling to -90°C •1	Greatly minimised dark current from sensor without the inconvenience of LN_2
UltraVac™ •2	Permanent vacuum integrity, critical for deep cooling and sensor performance
Single window design	Delivers maximum photon throughput
25 μm pixel width option	Ideal for high-resolution NIR spectroscopy
Software selectable output amplifiers	Allows user to optimise operation with choice of High Dynamic Range (HDR) or High Sensitivity (HS) modes of operation
Minimum exposure time of 1.4 μs	Enables higher time-resolution and minimization of dark current contribution for applications with reasonable signal level
Simple USB 2.0 connection	USB plug and play – no controller box. Inputs & Outputs: External Trigger, Fire and Shutter TTL readily accessible. I ² C for the more adventurous user
Integrated in EPICS	Platform is fully integrated into the EPICS control software

APPLICATION FOCUS

Spectral signatures in the SWIR region can provide unique optical, structural or electronic information for certain classes of material & chemical species. Relevant analytical techniques inc. Fluorescence, Photoluminescence, Cathodoluminescence, Raman and Reflectance/Transmittance spectroscopies.

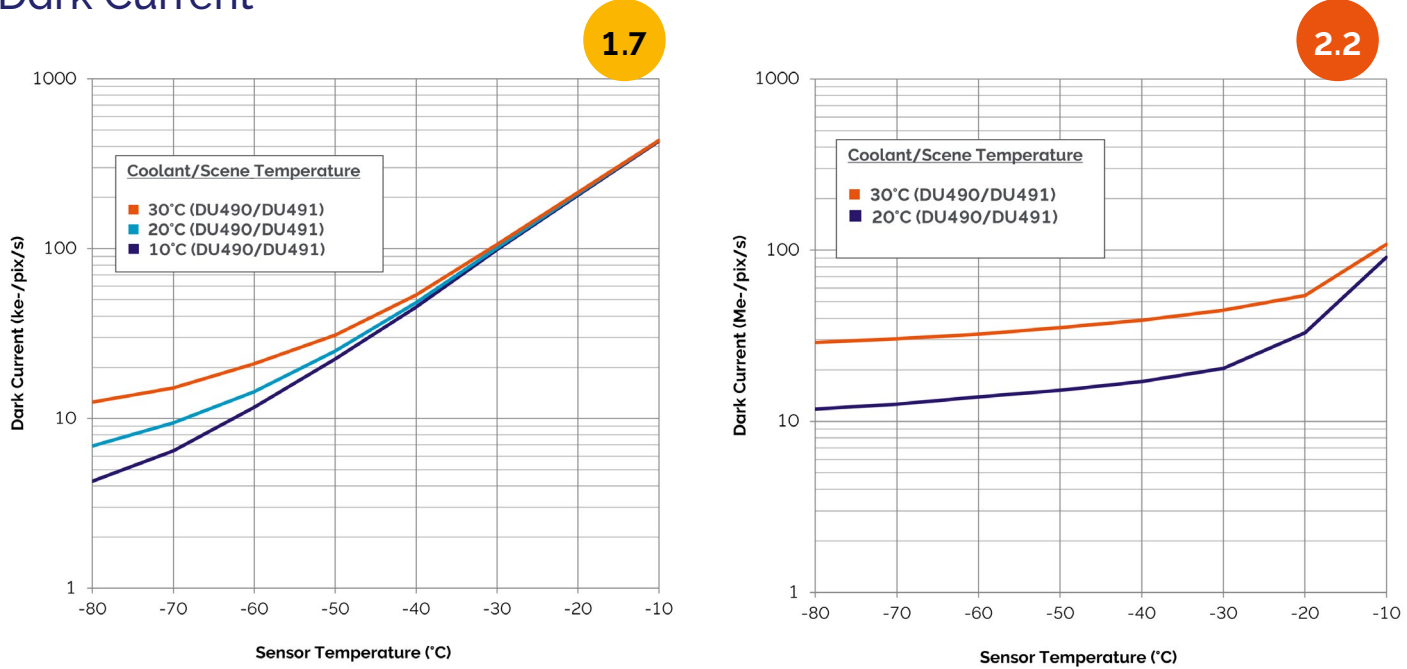


- Biophysics**
Development and characterisation of biomarkers, biosensors and functionalised molecules for bio-imaging in the NIR II region, medical diagnostics, targeted therapy, surgical procedure assistance
- Material Science**
Development and characterisation of integrated quantum sources in telecom bands (Quantum dots, crystal vacancy centers, functionalised carbon nanotubes, nano-lasers, diodes), high-efficiency photovoltaic structures & photodetectors (perovskites, Transition Metal Dichalcogenides (TMDs), GaAs semiconductors, van-der-Walls structures). Quality control for the semiconductor industry.
- Chemistry**
Catalysis and reactions mechanism study/real-time monitoring. 1064 nm Raman - minimise unwanted fluorescence of species of interest or species environment. Study of singlet oxygen generation mechanism, reactivity for photodynamic therapy.

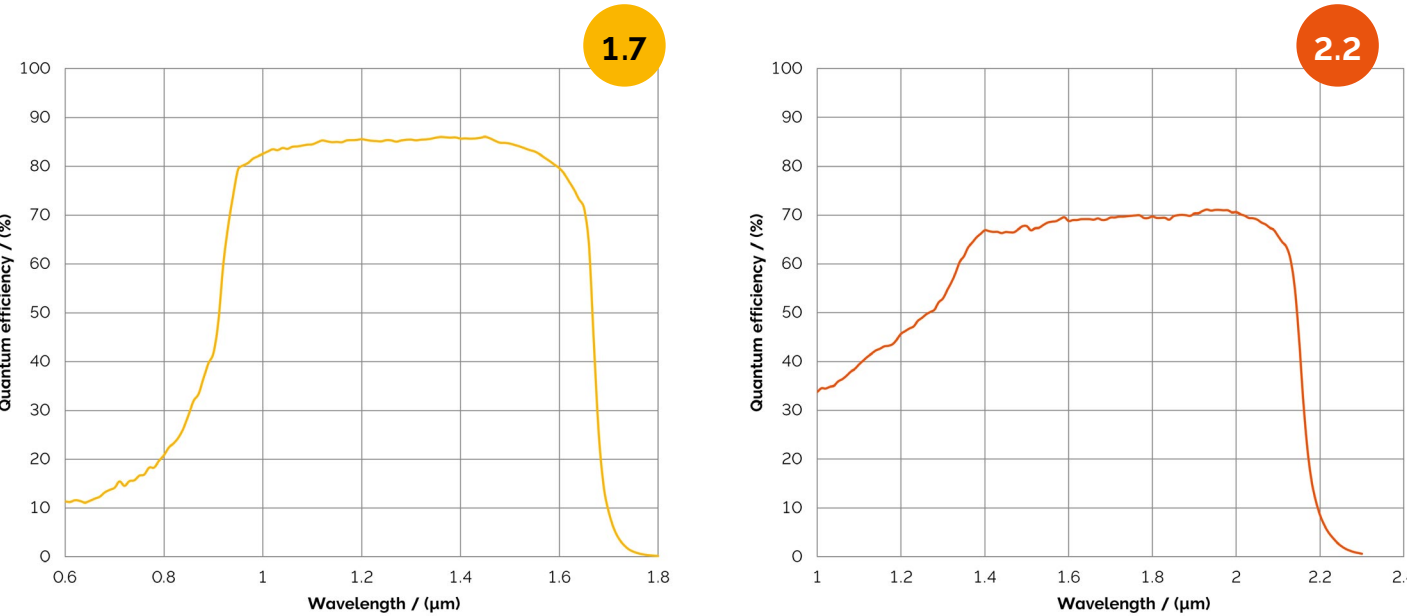
Specifications^{•2}

	iDus InGaAs 1.7 μm			iDus InGaAs 2.2 μm	
	490A	491A	492A	490A	491A
Sensor options	512 pixels, 25 μm pitch	1024 pixels, 25 μm pitch	512 pixels, 50 μm pitch	512 pixels, 25 μm pitch	1024 pixels, 25 μm pitch
Active pixels	512	1024	512	512	1024
Pixel size	25 x 500	25 x 500	50 x 500	25 x 250	25 x 250
Wavelength range	600 nm - 1.7 μm			800 nm - 2.2 μm	
Minimum exposure time •4	1.4 μs				
Minimum temperatures •5 Air cooled Coolant chiller, coolant @ 16°C , 0.75 l/min Coolant chiller, coolant @ 10°C, 0.75 l/min	-70°C -85°C -90°C				
Max spectra per second (100 kHz readout)	193	97	193	193	97
Window type'	Broadband VUV-SWIR, unwedged				
Dark current ke ⁻ /pixel/sec @ max cooling •6	10.7	12.0	21.1	5,000	5,000
Pixel well depth (Me ⁻) •7					
High Dynamic Range mode	170				
High Sensitivity mode	5				
Read noise (e ⁻) •8					
High Sensitivity mode	580				
High Dynamic Range mode	8150				
Sensitivity (e ⁻ /count)					
High Dynamic Range mode	2800				
High Sensitivity mode	90				
Blemishes •9	0	≤ 10	≤ 5	≤10	≤ 20
Linearity	Better than 99%				
Insertion delay from external trigger	2.95 μs ± 0.1 μs				
Digitisation	16 bit				

Dark Current^{•9}



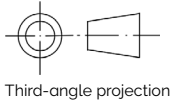
Quantum Efficiency Curves^{•10}



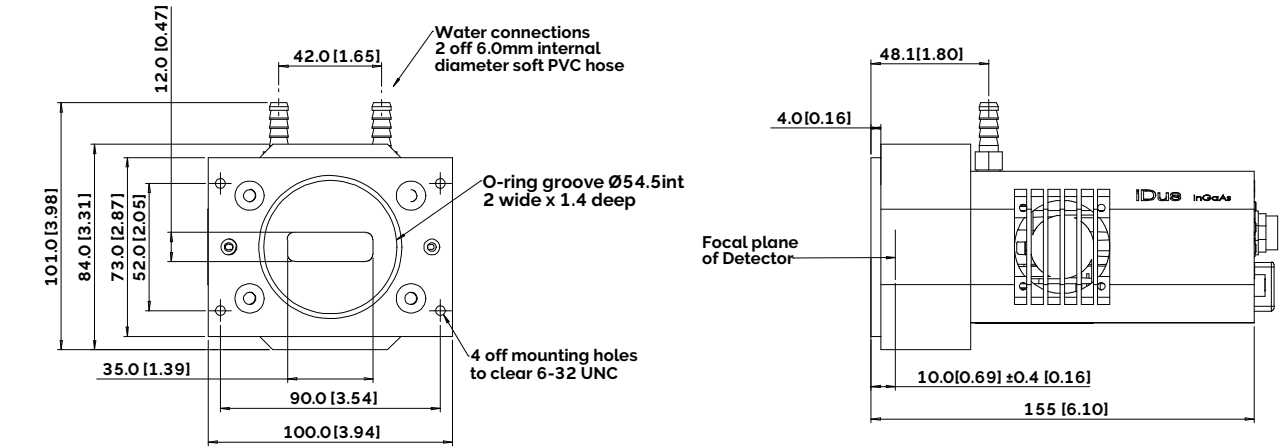
Applications guide	DU490-1.7	DU491-1.7	DU492-1.7	DU490-2.2	DU491-2.2
Absorption/Transmission/Reflection	○	○	●	○	●
Photoluminescence & Fluorescence	●	○	○	○	●
1064 nm Raman Spectroscopy	○	●	○		
● - Optimum ○ - Suitable					

Product drawings 1.7 and 2.2 models

Dimensions in mm [inches]

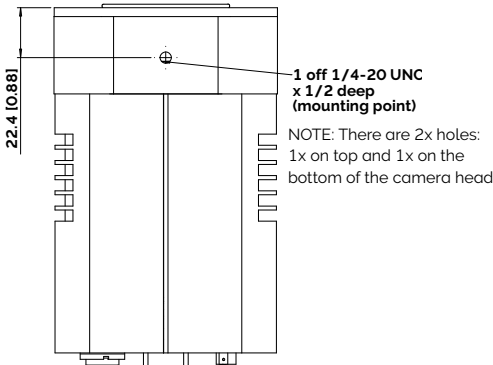
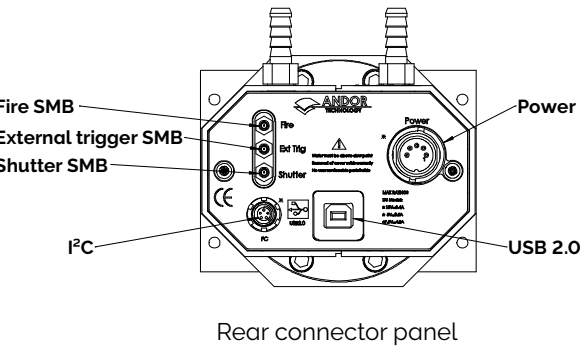


Third-angle projection



= position of pixel 1,1

Weight: 2 kg [4 lb 8 oz]



Items shipped with your camera:
1x 2 m BNC - SMB connection cable
1x 3 m USB 2.0 cable Type A to Type B
1x Set of hex keys (7/64" & 3/32")
1x Power supply (PS-25) with mains cable
1x Individual system performance booklet
Electronic copy of user guide and software (if ordered)

Recommended computer requirements:
3.0 GHz single core or 2.4 GHz multi core processor
2 GB RAM
100 MB free hard disc to install software (at least 1 GB recommended for data spooling)
USB 2.0 High Speed Host Controller capable of sustained rate of 40 MB/s
Windows 10, 11 or Linux

Operating and storage conditions
● Operating (air cooling): 0°C to 20°C ambient
● Operating (deep cooling): 0°C to 30°C ambient
● Relative Humidity: < 70% (non-condensing)
● Storage Temperature: -25°C to 50°C
Power requirements
● 100 - 240 VAC, 50 - 60 Hz

Footnotes

- Typically obtainable at ambient temperature of 20°C, coolant chillers operating with 10°C coolant @0.75 l/min.
- Assembled in a state-of-the-art facility, Andor's UltraVac™ vacuum process combines a permanent hermetic vacuum seal (no o-rings), with a stringent protocol and proprietary materials to minimise outgassing. Outgassing is the release of trapped gases that would otherwise degrade cooling performance and potentially cause sensor failure.
- Figures are typical unless otherwise stated.
- The InGaAs sensor starts to 'open' to light up to approximately 1 µs before the rising edge of the Fire pulse. It then starts to 'close' to light up to 1 µs before the falling edge of Fire. This ensures that the camera is 100% responsive by the time the Fire pulse has risen and closed by the falling edge. These figures only need to be taken into account for extremely short exposures.
- The standard PS-25 power supply is suitable for air cooling and deep cooling. Measured at ambient temperature of 20°C.
- Measured using 16°C water and 16°C target/scene.
- At exposures below 20 µs, well depth will be reduced by approximately 1/3 of typical value stated.
- Noise is measured on a single pixel.
- Grade 1 sensor from supplier. For further information on blemish specifications refer to: andor.oxinst.com/learning/view/article/ccd-blemishes-and-non-uniformities
- The coolant temperature is also representative of the scene temperature that the camera is exposed to during these measurements.
- Quantum efficiency of the sensor at 20°C as supplied by the sensor manufacturer.

Creating the optimum product for you

Step 1. Select the camera type



Camera type

All models: deep-TE cooling (-70°C air-cooled, -90°C with coolant chiller and +10°C coolant)

	Description	Order code
1.7	25 µm x 500 µm, 512 pixel array	DU490A-1.7
	25 µm x 500 µm, 1024 pixel array	DU491A-1.7
	50 µm x 500 µm, 512 pixel array	DU492A-1.7
2.2	25 µm x 250 µm, 512 pixel array	DU490A-2.2
	25 µm x 250 µm, 1024 pixel array	DU491A-2.2

Step 2. Select an alternative camera window



Camera window

The standard window has been selected to satisfy most applications. However, other options are available and the alternative camera window code must be specified at time of ordering.

To view and select other window options please refer to the [Camera Windows Selector Tool](#). Further detailed information on windows can be found in the technical note – [How to Select a Window for your Camera](#).

Step 3. Select the required accessories



Accessories

Accessories description	Order code
Coolant re-circulator for deeper-cooling performance	XC-RECR-AL
Ultra Compact Chiller Unit, Thermo-Electric based cooling technology	XC-CHILLER-AL
Chiller and recirculator hose kit, 100 cm clear hose with fitted valved male/female connectors (chiller or recirculator side), spare male/female un-valved connectors (for hose extension ACC-6MM-**** black hose options)	XC-COOL-HOSE_BARB-06
2.5 and 5 m black hose options to chiller/recirculator	ACC-6MM-TUBING-2X2.5/ ACC-6MM-TUBING-2X5M
700 mL Propylene Glycol with corrosion and biological inhibitors	XC-COOLANT_702-070L
Shutter Driver for NS25B Bistable Shutter (not needed for Kymera/Shamrock spectrographs)	ACC-SD-VED24
Bistable Shutter, Standalone (not needed for Kymera/Shamrock spectrographs)	ACC-SHT-NS25B

Spectrograph Compatibility

The iDus InGaAs series is fully compatible with Andor's Kymera and Shamrock spectrographs (193 - 750 mm focal lengths). Spectrograph mounting flanges and software control are available for a wide variety of third party spectrographs including McPherson (including 1 m and greater focal length option), JY/Horiba (excluding USB models), PI/Acton, Chromex/Bruker, Oriel/Newport, Photon Design, Dongwoo, Bentham, Solar TII and others.

Step 4. Software



Software

The iDus InGaAs requires at least one of the following software options:

Solis for Spectroscopy A 64-bit enabled application for Windows (10 and 11) offering rich functionality for data acquisition and processing. AndorBasic provides macro language control of data acquisition, processing, display and export. Control of Andor Kymera and Shamrock spectrographs and a very wide range of third party spectrographs is also available, see list in step 3 above.

Andor SDK A software development kit that allows you to control the Andor range of cameras and spectrographs from your own application. Available as a 64-bit library for Windows (10 and 11) and Linux. Compatible with C/C++, C#, Delphi, VB.NET, LabVIEW, MATLAB and Python.

Third party software compatibility Drivers are available for a variety of third party imaging packages. See Andor website for detail: andor.oxinst.com/third-party-software-matrix

Order Today

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