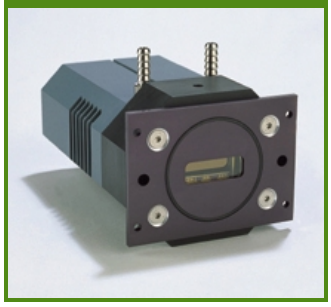
SPECTROSCOPY

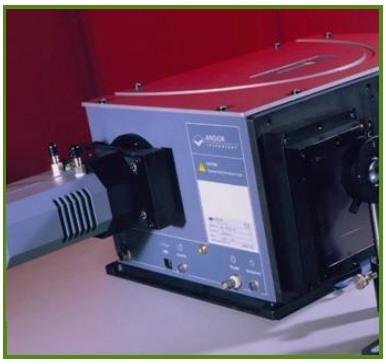


Andor's DV420 CCD cameras offer the best price/performance for a wide range of spectroscopy applications. The 1024 x 256 array with 26μm² pixels offers the best dynamic range versus resolution. The system also benefits from negligible dark current with thermoelectric cooling down to –80˚C.

- Peak QE of 95% .... High detector sensitivity
- Min operating temp of –80ºC with TE cooling .... Negligible dark current without the aggravation or safety concerns associated with LN_2
- Guaranteed hermetic vacuum seal .... Ultimate reliability and sustained lifetime performance characteristics
- Front- or back-illuminated design .... Offers the best price/performance options
- 26 x 26μm pixel size .... Optimised pixel size for high dynamic range and resolution
- Andor-MCD software .... Friendly Windows user interface offers system integration, automation and advanced data manipulation facilities

- **Camera Overview**

Active Pixels	1024 x 255
Pixel Size (WxH; μm)	26x26
Image Area (mm)	26.6 x 6.7
Pixel Well Depth (e^-, minimum) [OE] **(typical) [OE]**	300,000 [200,000] 465,000 [395,000]
Register Well Depth (e^-, typical) ♦[1]	1,000,000
Max spectra per sec (FVB)	166
Read Noise (e^-, typical)	4 @ 31 kHz



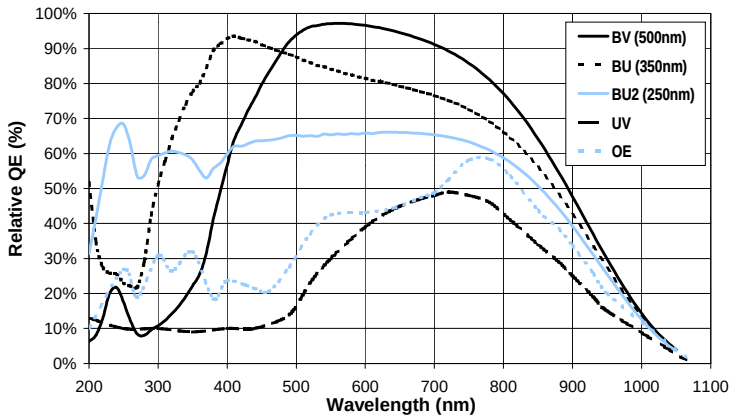
System Characteristics

Dummy Pixels [2]	8, 8, 0, 0
Linearity (%, maximum) [3]	1
Vertical Clock Speed (µs)	16
Sensitivity (e-/count) @ 1&2, 16, 32 µs	10, 7, 3.5
Camera window type	Single quartz window, AR coating available

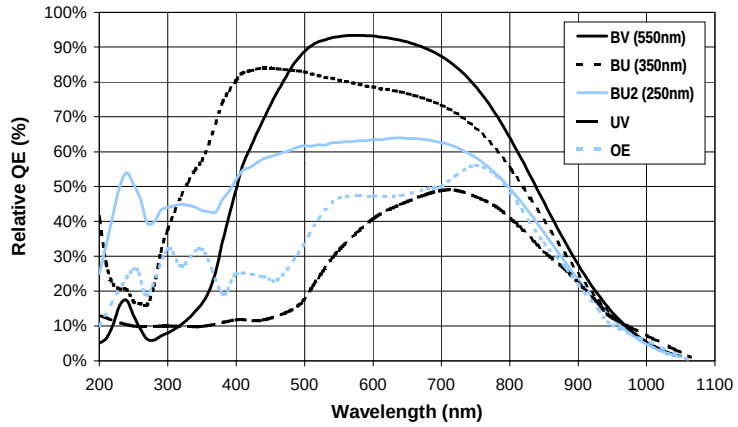
Noise

System Readout Noise (typical; e-) [4]	***Typical***	***Maximum***
31 kHz pixel readout rate	4	8
1 MHz pixel readout rate	18	25

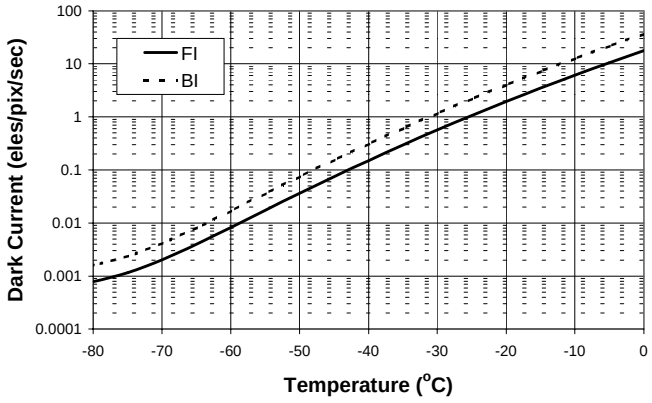
Quantum Efficiency at Room Temp [5]



Quantum Efficiency at –100°C



Dark Current [6]



Minimum Temperature (°C)

	Auxiliary Cooling Connector	External PSU PS150
Air-cooled ***(ambient air @ 20°C)***	-55	-65
Re-circulator (RC180) ***(ambient air @ 20°C)***	-65	-75
Water-cooled ***(@ 10°C, 0.75 l / min)***	-70	-80

- **Max Spectra per sec** [7]

Full Vertical Binning	166 spectra/s
50 row sub-image	500 spectra/s

- **Power Requirements** [8]

(for kHz [MHz] operation)		No Auxiliary Cooling Connector		Auxiliary Cooling Connector	
No cooling	slot	2.4A	[3A]	2.4A	[3A]
	connector	-	-	-	-
TE cooler on	slot	1.5A	[1.5A]	0A	[0A]
	connector	-	-	2.2A	[2.2A]
Total		3.9A	[4.5A]	4.6 A	[5.2A]

(Power drawn from +5V power supply; Optional external power supply (PS150) plugs into the mains)

- **Computer Requirements**

Minimum:	**Also:**
800MHz Pentium + 256Mbytes RAM	• PCI-compatible computer
	• PCI slot must have bus master capability
Recommended:	• Available auxiliary internal power connector
2.4GHz Pentium (or better) + 512 Mbytes RAM	• Minimum of 25MB free hard disc to install software

- **Operating & Storage Conditions**

Operating Temperature	0°C to 30°C ambient
Relative Humidity	< 70% (non-condensing)
Storage Temperature	-25°C to 55°C

- **For complete system use with...**

The DV420 requires one of the following controller card options:

CCI-001 PCI Controller card with 16-bit 62KHz & 31KHz pixel readout rate options
CCI-010 PCI Controller card with 16-bit 1MHz, 500KHz, 62KHz & 31KHz pixel readout rate options

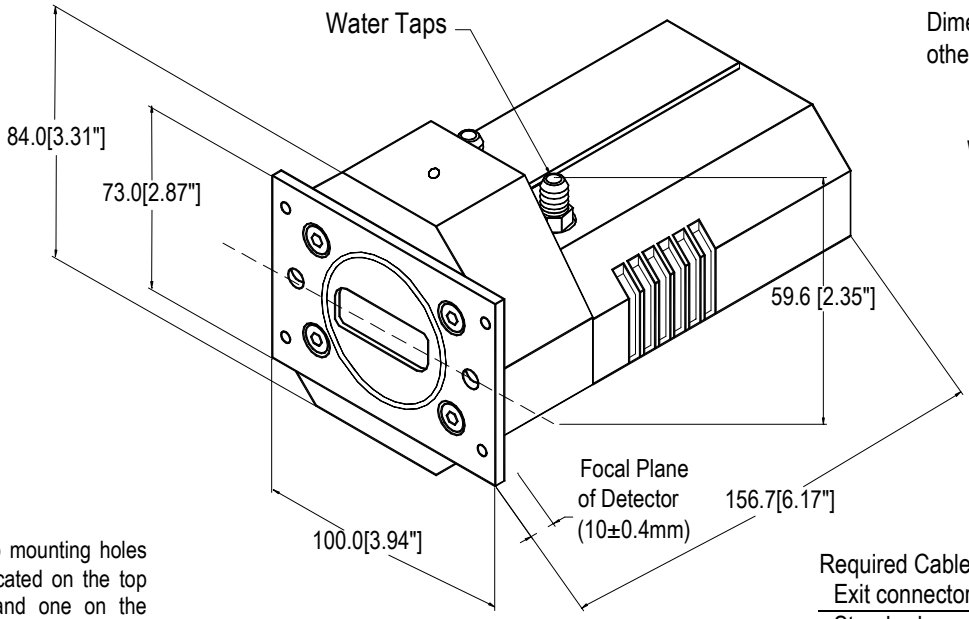
The DV420 also requires one of the following software options:

Andor MCD Software – a ready-to-run Windows 95, 98, 2000, ME, NT or XP -based package with rich functionality for data acquisition and processing
Andor-SDK-CCD – a DLL driver and software development kit that let you create your own applications for the Andor camera.

The DV420 may be used with the following accessories:

PS150 Power Supply Module for achieving the lowest temperatures
IO160 Breakout box for interface signals
IO165 Breakout box for additional interface signals
LM-NIKON-F Nikon F-mount lens adaptor
LMS-NIKON-F Nikon F-mount lens adaptor with shutter
RC180 200W Re-circulator for enhanced cooling performance

Contact Andor for details of spectrographs and adapters that can be used with the DV420. (Contact details on back page)



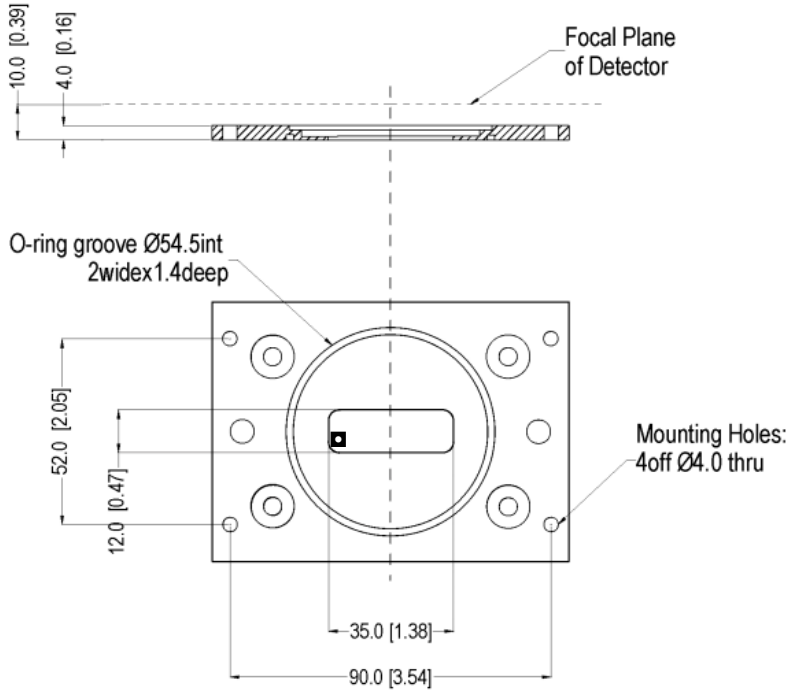
Dimensions in mm unless otherwise indicated.

Weight: 2 Kg [4 lb 8 oz]

Note: There are two mounting holes (1/4-20UNC), one located on the top of the CCD head and one on the bottom. They are positioned centrally at a distance of 22mm from the front of the front face.

Required Cable Clearance at back:

Exit connector type	Clearance
Standard	140 mm
45° angle	50 mm
90° angle	40 mm



◘ = position of pixel (1,1)

NOTE - Specifications are subject to change without notice.

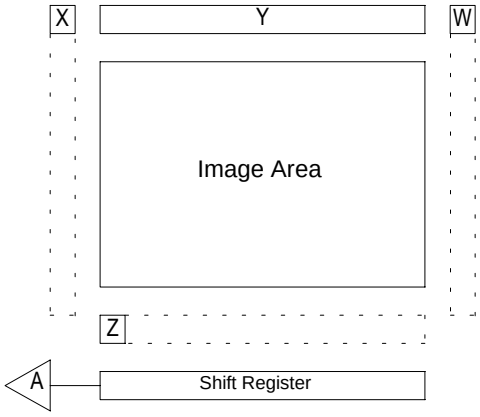
♦1 The register well depth that is actually accessible by the CCD system is dependant on the gain setting.

♦2 Chip manufacturers may include a number of pixels or elements that are neither active nor part of the shift register. Andor refers to these pixels as dummy pixels and represents them in a 4-part notation (*W,X,Y,Z*), where:

W = dummy pixels to the right of the shift register (non-amplifier end)
X = dummy pixels to the left of the shift register (amplifier end)
Y = dummy pixels at the top of the image area
Z = dummy pixels between the shift register and the image area.

A = position of output amplifier

It should be noted that the elements can be made up of either pixels, rows or columns.
The diagram shows what is seen when looking at the front of the CCD.



♦3 Linearity is measured from a plot of Counts vs. Signal over the 16 bit dynamic range. Linearity is expressed as a percentage deviation from a straight line fit. This value is not measured on individual systems.

♦4 System Readout noise is for the entire system. It is a combination of CCD readout noise and A/D noise. Measurement is for Single Pixel readout with the CCD at a temperature of -50°C and minimum exposure time under dark conditions.

♦5 Quantum efficiency of the CCD sensor is measured by the CCD Manufacturer.

♦6 The graph shows typical dark current level as a function of temperature for front illuminated (FI) and back illuminated (BI) CCDs. Systems are specified in terms of minimum dark current achievable rather than absolute temperature. The dark current measurement is averaged over the CCD area excluding any regions of blemishes.

♦7 The max spectra/sec for spectroscopy CCDs is the maximum speed at which the device can acquire spectra in a standard system. It assumes a 1MHz digitization rate, internal trigger mode and full vertical binning. Also given is the rate for a 50 row high sub-image (crop mode) on a CCD in a standard system. Note that faster rates may be achieved by operating the CCD in Fast Kinetics mode.

♦8 These power requirements are the maximum load that will be drawn from the computer for the camera head and controller card combined.

Ordering Information:

To order this camera,
quote model number **DV420-**

BV: back illuminated – AR coated for optimal performance in the visible region
BU: back illuminated – AR coated for optimal performance in the 350nm region
BU2: back illuminated – AR Coated for optimal performance in the 250nm region
UV: front illuminated device with UV coating
OE: open electrode device

Need more information? Contact us at:

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