

Features & benefits

Ultra-low noise floor

Proprietary noise-reduction technique delivers an unprecedented $3e^-$ read noise @ 1MHz

Deep TE cooling to -45°C

Elimination of darkcurrent from noise floor

Excellent Thermal Management

Giving passive (fan-off) cooling to a stable -30°C for vibration free operation

UltraVac™*1

Critical for sustained vacuum integrity and to maintain unequalled cooling and QE performance, year after year.

Rapid Frame Rate

11 frames/sec @ 20 MHz readout speed

High Resolution

1.3 megapixel sensor format and $6.45\ \mu\text{m}$ pixels

High Dynamic Range

6000:1 standard dynamic range at 1MHz. Higher when binned

16-bit & 14-bit digitization

16-bit facilitating low noise / high dynamic range performance at slower speeds

Enhanced Baseline Clamp

Essential for quantitative accuracy of dynamic measurements

iCam

Unique innovation that empowers the Clara to operate with market-leading acquisition efficiency through live cell microscopy software

Visual Acquisition

Follow events in real time during data acquisition

USB 2.0 *2

Universal 'Plug and Play' connectivity

'OEM – friendly'

Compact and robust, vacuum longevity, easily accessible SDK, Andor integration support

Comprehensive and Flexible Inputs/Outputs

Synchronization within intricate experimental set-ups

Andor's expertise in scientific performance optimization has been harnessed once again. Clara has been designed to deliver the highest sensitivity performance achievable from a high-resolution interline CCD camera.

Based around the popular ICX285 sensor from Sony®, the Clara is ideally suited to high-resolution cell microscopy and OEM applications.

Andor's proven UltraVac™ process, alongside close attention to thermal management, has resulted in deep air cooling to -45°C for elimination of darkcurrent, complementing a unique read noise of $3e^-$ @ 1 MHz.

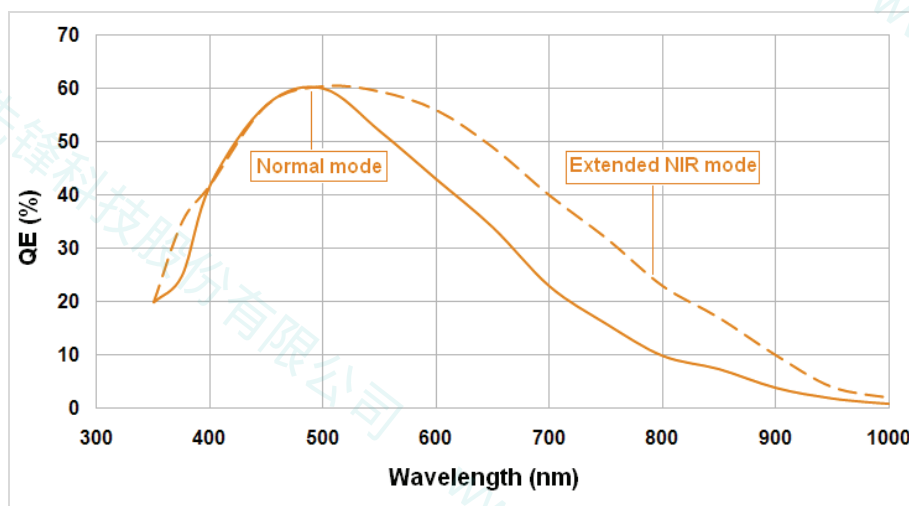
More dynamic events can be followed with outstanding quantitative stability via low noise 10 or 20 MHz readout modes, the data channeled through a trouble-free USB 2.0 interface. Andor's iCam technology enables market-leading acquisition efficiency through live cell microscopy softwares. The compact, robust design and accessible SDK, renders Clara ideally suited to OEM integration.



Camera overview

Active Pixels	1392 x 1040
Pixel Size (W x H; μm)	6.45 x 6.45
Image Area (W x H; mm)	8.98 x 6.71
Pixel Well Depth (e^- , typical)	18000; (30000 2 x 2 binned)
Readout speeds (MHz)	20, 10, 1
Read Noise (e^-)	3 @ 1 MHz (16-bit)
	5 @ 10 MHz (14-bit)
	6.5 @ 20 MHz (14-bit)
Cooling ($^{\circ}\text{C}$)	-45 fan on, -30 fan off
Max. Frame Rate	11 frames/sec

Quantum efficiency*3



QE curves under 'Normal' mode operation and 'Extended NIR' mode operation

Technical specifications

System characteristics

Pixel Readout Rate (MHz)	20, 10, 1
Digitization	16 bit @ 1 MHz 14-bit @ 10 MHz and 20 MHz
Frame Rate	11 frames/sec @ 20 MHz
Linearity (% , maximum) ^{*4}	1
Triggering	Arm, External Trigger, Frame Readout, Fire, Interline Shift, Shutter output

System readout noise^{*5}

Pixel Readout Rate (MHz)	Readout Noise (e ⁻ ; typical)
1	3
10	5
20	6.5

Minimum sensor temperatures (typical)

Air cooled with fan-on (ambient air at 20°C)	-45°C
Air cooled with fan-off (ambient air at 20°C)	-30°C

Dark current (typical)^{*6}

0.00001 e ⁻ /pixel/sec @ -45 °C
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Operating & storage conditions

Operating Temperature	0°C to 35°C ambient
Relative Humidity	< 70% (non-condensing)
Storage Temperature	-25°C to 55°C

Power requirements

• 0.6A @ +12V
• 0.3A @ -12V
• 3.0A @ +5V

Computer requirements

The following minimum specification is recommended:

- 2.4 GHz Pentium (or better) + 1Gbyte RAM
- 32 MB free hard disc to install software
- USB 2.0
- Windows 2000 or better

Need more information? Please contact us at:

International Office	US Office
Phone: +44 28 9023 7126	Phone: 800.296.1579
Fax: +44 28 9031 0792	Fax: 860.290.9566
Japanese Office	Chinese Office
Phone: +81 3 3511 0659	Phone: +86-10-5129-4977
Fax: +81 3 3239 8264	Fax: +86-10-6445-5401



Rear view showing connectors

Ordering & contact information and notes

To order the Clara you require, please quote one of the following model numbers:

DR - 385G - C0x - SIL

where:

x = Window option: **1** = one input window; **2** = two input windows (one additional at sensor)

The Clara also requires one of the following software options:

Andor Solis (i)	A ready-to-run Windows 2000 or XP-based package with rich functionality for data acquisition and processing.
Andor IQ	A comprehensive multi-dimensional imaging software package. Offers tight synchronization of EMCCD with a comprehensive range of microscopy hardware, along with comprehensive rendering and analysis functionality. Modular architecture for best price/performance package on the market.
Andor SDK	A ready-to-run Windows 2000 or XP-based package with rich functionality for data acquisition and processing. Available for Windows 2000 or XP and Linux.
Third party software compatibility	Drivers are available so that the iXon ^{EM+} range can be operated through a large variety of third party imaging packages.

Specifications are subject to change without notice

◆1	Assembled in a state-of-the-art Class 10,000 cleanroom facility, Andor's UltraVac™ vacuum process combines a permanent hermetic vacuum seal (no o-rings), with a stringent protocol to minimize outgassing, including use of proprietary materials. Outgassing is the release of trapped gases that would otherwise prove highly problematic for high-vacuum systems.
◆2	USB 2.0 is truly universal to all PCs, in contrast to a Firewire interface which often requires an internal interface card for PC compatibility.
◆3	In Extended NIR mode, the sensor cannot be clocked in 'Overlap Mode', reducing the achievable frame rate of the camera.
◆4	Linearity is measured from a plot of Signal vs. Exposure Time over the full dynamic range. Linearity is expressed as a percentage deviation from a straight line fit. This value is not measured on individual systems.
◆5	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 20°C and minimum exposure time under dark conditions
◆6	This value is obtained using the traditional method of measuring dark current, as for any CCD camera, i.e. taking a long integration time to get a dark signal that is well above the read noise. The dark current measurement is averaged over the CCD area excluding any regions of blemishes.

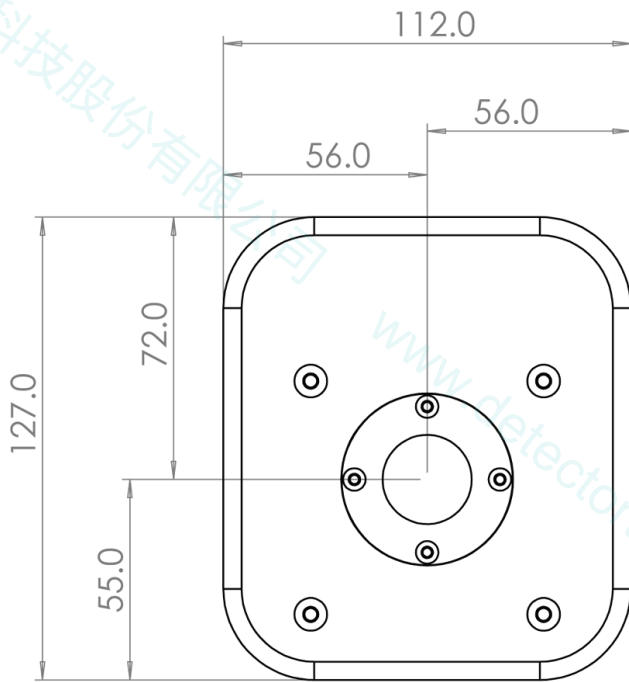
Clara

low-light imaging

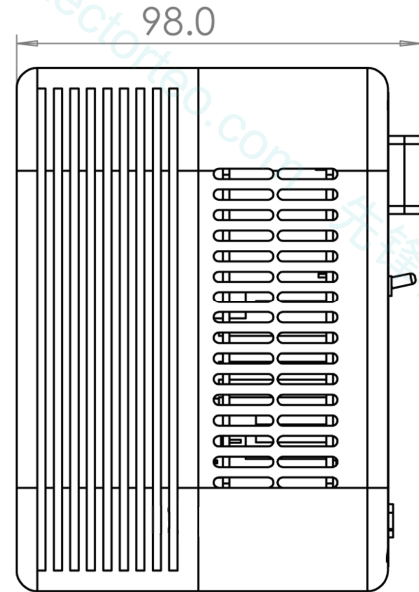
Dimensions

Weight: 1.8kg (3.97lb)

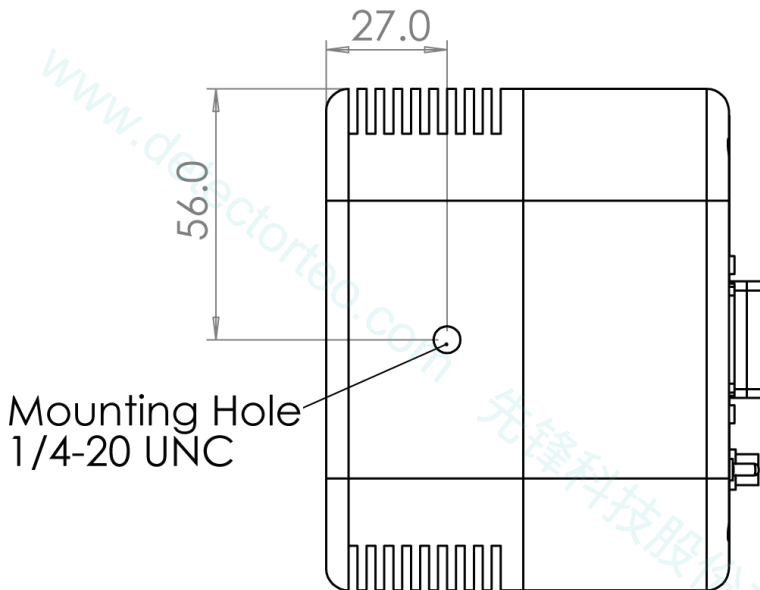
Front dimensions



Side dimensions



Mounting hole location



Focal Plane Distance

17.5 mm Focal plane
C-mount

