NEW

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ORCA®-Flash4.0 LT3

Digital CMOS camera C11440-42U40

The ORCA®-Flash4.0 LT3 is a new scientific CMOS camera for fluorescence imaging, which has been improved from the ORCA®-Flash 4.0 released in 2011.
It is equipped with a high level of performance required for fluorescence imaging such as life science applications, and can be used not only for basic research applications but also for integration into various types of equipment.

Features

- Low readout noise (Standard scan):
  1.5 electrons rms, 0.9 electrons median
- High speed readout (Rapid rolling, Full resolution):
  40 frames/s
- Large field of view:
  13.312 mm (H)×13.312 mm (V)
- High resolution: 2048 (H)×2048 (V)
- High quantum efficiency: 82 % (Peak QE)

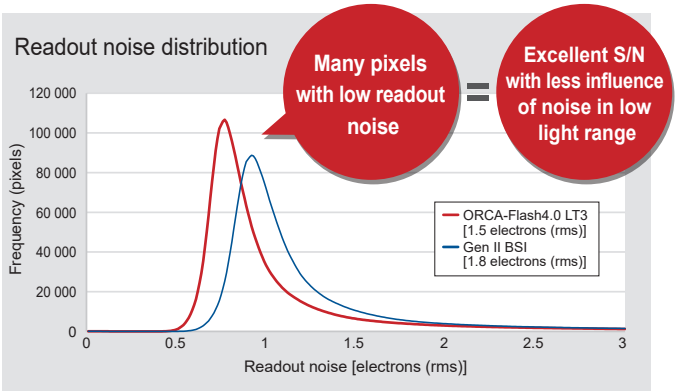
Applications

- Time-lapse imaging
- Multidimensional imaging
- Ca^{2+} imaging
- DNA chip reading

High S/N equivalent or better than BSI camera

The graph below compares the readout noise distribution with the Gen II BSI camera* and shows that the ORCA®-Flash4.0 LT3 has more pixels with smaller readout noise.
With a low readout noise of 1.5 electrons rms, the ORCA®-Flash4.0 LT3 delivers high S/N comparable to or better than a BSI camera, especially in the low light range.
This performance can be demonstrated in high quality multidimensional imaging, as typified by long time-lapse imaging with low excitation light with low phototoxicity and photobleaching.

* BSI camera: Back-side illuminated camera

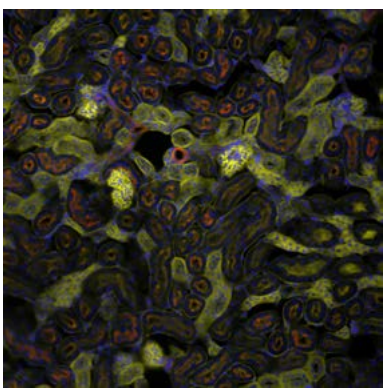


High speed readout

The ORCA®-Flash4.0 LT3 is capable of 40 frames/second readout, which is even faster than the conventional ORCA®-Flash4.0 LT+ (30 frames/second).
This is useful for applications which requires real time measurement with high temporal resolution.

Large field of view

The wide field of view of 13.312 mm (H) × 13.312 mm (V) allows more information to be obtained in a single shot.
This contributes to higher throughput in experiments such as DNA chip reading.



Sample:
FluoCells™ Prepared slide #3 mouse kidney section
Fluorescence probes:
DAPI, AF488 WGA, AF568 phalloidin
Objective lens:
Plan Apo 20×/0.75

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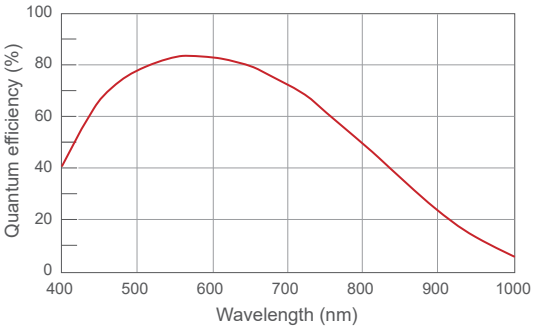
Specifications

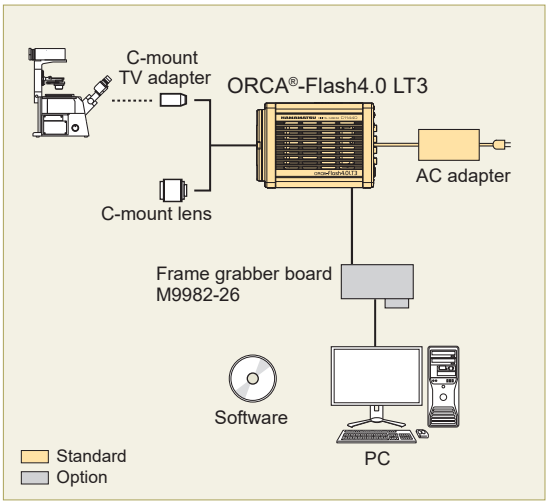
Product number			C11440-42U40
Imaging device			Scientific CMOS image sensor
Effective number of pixels			2048 (H) × 2048 (V)
Pixel size			6.5 µm (H) × 6.5 µm (V)
Effective area			13.312 mm (H) × 13.312 mm (V)
Full well capacity (typ.)			30 000 electrons
Dynamic range (typ.)			33 000: 1 *1 20 000: 1 *2
Cooling method			Forced-air cooled, peltier cooling
Cooling temperature	Forced-air cooled (FAN speed: Fast ambient temperature: +10 °C to +30 °C)		+10 °C
Frame rate at full resolution	Rapid rolling		40 frames/s
	Standard scan		30 frames/s
Readout noise (typ.)	Rapid rolling		1.9 electrons rms / 1.3 electrons median
	Standard scan		1.5 electrons rms / 0.9 electrons median
Dark current (typ.)	Cooling temperature: +10 °C		0.6 electrons/pixel/s
Digital output			16 bit
Exposure time	Internal trigger mode *3	Rapid rolling	1 ms to 10 s
		Standard scan	3 ms to 10 s
	Internal trigger mode with sub-array readout	Rapid rolling	40 µs to 10 s
		Standard scan	129.99 µs to 10 s
External trigger input mode			Edge trigger, Global reset edge trigger, Level trigger, Global reset level trigger, Synchronous readout trigger, Start trigger
Trigger delay function			0 s to 10 s in 1 µs steps
Trigger input connector			SMA
Trigger output			3 programmable timing outputs, Trigger ready output, Global exposure timing output, Low output, High output
Trigger output connector			SMA
Binning			2×2, 4×4
Sub-array			Yes
Interface			USB 3.1 Gen 1
Lens mount			C-mount
Power supply			AC 100 V to AC 240 V, 50 Hz / 60 Hz
Power consumption			Approx. 75 VA
Ambient operating temperature	FAN speed: Fast		0 °C to +40 °C
Ambient operating humidity			30 % to 80 % (With no condensation)
Ambient storage temperature			−10 °C to +50 °C
Ambient storage humidity			90 % Max. (With no condensation)

*1 Calculated from the ratio of the full well capacity and the readout noise (median) in standard scan
*2 Calculated from the ratio of the full well capacity and the readout noise (rms) in standard scan
*3 Minimum exposure time in internal trigger mode varies depending on sub-array size and position.

Spectral response



System configuration

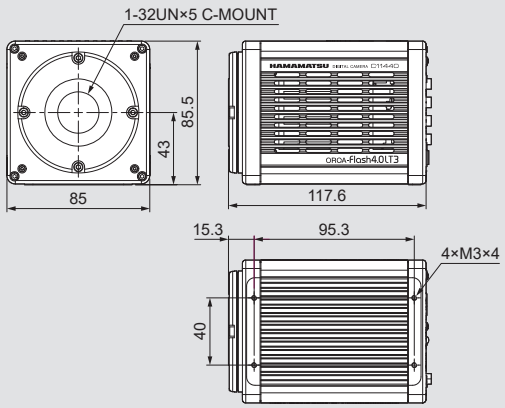


Options

Product number	Product name
M9982-26	Frame grabber board with USB 3.0 A-MicroB 3m Cable
A12046-03	USB 3.0 cable A-MicroB 3 m
A12106-05	External trigger cable SMA-BNC 5 m
A12107-05	External trigger cable SMA-SMA 5 m
A11186-01	Base plate common for Flash4.0 chassis

Dimensional outlines (Unit: mm)

■ Camera (Approx. 1.1 kg)



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