SCIENTIFIC FULL-FRAME CCD CAMERAS

for UV, VIS, NIR Imaging and Spectroscopy

DATA SHEET:

GE 1024 1024 series

GE 1024 128 series

GE 1024 256 series

GE 2048 512 series

SPECTRAL RANGES:

Ultraviolet (UV)

Visible (VIS)

Near-infrared (NIR)

GE 1024 1024 series	GE 1024 128 series GE 1024 256 series	GE 2048 512 series
1024 ×1024 pixels	1024 × 128 pixels 1024 × 256 pixels	2048 × 512 pixels
13.3 mm × 13.3 mm image area	26.6 mm × 3.3 mm image area 26.6 mm × 6.7 mm image area	27.6 mm × 6.9 mm image area
13 µm × 13 µm pixel size	26 µm × 26 µm pixel size	13.5 µm × 13.5 µm pixel size

Based on a unique platform concept, greateyes offers a portfolio of about 20 scientific cameras for imaging and spectroscopy in the UV, VIS and NIR range. These deep-cooled, high-performance CCD detectors have the most compact design available. They combine highly sensitive sensors with ultra-low noise electronics for optimal detection of weak signals. Select among different pixel formats, several sensor technologies and various coatings to find the best solution for your imaging or spectroscopic application.

The full-frame CCD sensors are integrated in hermetically sealed vacuum chambers with single optical windows. Deep cooling of the sensor is achieved by means of multi-stage thermoelectric Peltier elements. The cameras are equipped with a rich set of functionalities including flexible binning operation, various trigger and synchronisation modes, software adjustable gain settings as well as temperature monitoring of the sensor and heat radiation system.

Key features

Compact size	Flexible binning modes	Quantum efficiency up to 98%
Full well capacity up to 700 ke$^-$	Software adjustable gain setting	Deep cooling down to -60°C
Scientific low-noise CCD sensors	Temperature monitoring	max. 18-bit dynamic range
Portfolio of about 20 different models	Patented single window design	greateyes Vision software included
SDK & LabVIEW and EPICS drivers	Ext. trigger, shutter, sync signals	Liquid and forced air cooling

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SPECIFICATIONS

Model specifications

	GE 1024 1024 series	GE 1024 128 series GE 1024 256 series			GE 2048 512 series
Nominal pixel format	1024 × 1024	1024 × 128 1024 × 256			2048 × 512
Image area	13.3 mm × 13.3 mm	26.6 mm × 3.3 mm 26.6 mm × 6.7 mm			27.6 mm × 6.9 mm
Pixel size	13 µm × 13 µm	26 µm × 26 µm			13.5 µm × 13.5 µm
Full well capacity	100 ke⁻ / 120 ke⁻ (DD)	500 ke⁻ / 700 ke⁻ (DD)			100 ke⁻
Register well capacity	400 ke⁻	1 000 ke⁻ / 1 400 ke⁻ (DD)			400 ke⁻
Typ. read noise (e⁻) @ 500 kHz @ 1 MHz @ 3 MHz	FI / BI / DD 5.2 6.6 9.7	FI 7.5 10.7 17.3	BI 9.7 12.1 19.2	DD 9.0 11.6 18.0	FI / BI 5.7 6.9 10.3
Dark current @ -80°C	0.0003 e⁻/pixel/s 0.017 e⁻/pixel/s (for DD)	0.0005 e⁻/pixel/s 0.08 e⁻/pixel/s (for DD)			0.0003 e⁻/pixel/s
Gain	1 counts/e⁻ (high) 0.4 counts/e⁻ (low)	1 counts/e⁻ (high) 0.2 counts/e⁻ (low)			1 counts/e⁻ (high) 0.4 counts/e⁻ (low)
CCD sensor type	Front-illuminated (FI), back-illuminated (BI), deep depletion fringe suppression (DD), open-electrode (OE)				
Sensor coating	Antireflective UV (UV2, UV3), broadband (BR), midband (MID), multiband (MU2) or near-infrared (NIR) coating				
Blemish specifications	Grade 0 or grade 1 (standard) as specified by sensor manufacturer				

Common specifications

Pixel readout frequency	500 kHz, 1 MHz, 3 MHz
AD converter resolution	16-bit, 18-bit (optional)
Linearity	Better than 99%
Window material	MgF_2 or UVFS for UV sensitive models, otherwise BK7
Distance flange - focal plane	10.0 mm
CCD sensor cooling	min. -60°C to 20°C, forced air or liquid cooling
Temperature monitoring	CCD sensor and thermoelectric cooler (hot side)
Data link	USB 2.0, Gigabit Ethernet (optional)
Software	greateyes Vision software for Windows 7 / 10
SDK and drivers	DLL for Windows; LabVIEW, EPICS, Linux driver (optional)
TTL interface signals	Sync out, shutter out, external trigger in
Operating conditions	Temperature: 0°C to 35°C ambient, relative humidity <80% (non-condensing)
Power supply	110-240 VAC, 50-60 Hz, max. 1 A
Certification	CE
Dimensions	6.2 cm (2.44″) × 10.0 cm (3.94″) × 13.0 cm (5.12″) (W × H × L)
Weight	1 300 g

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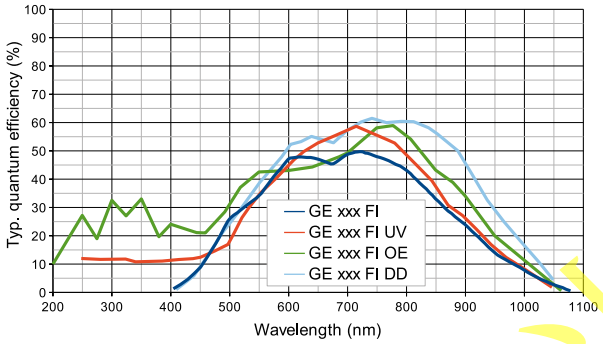
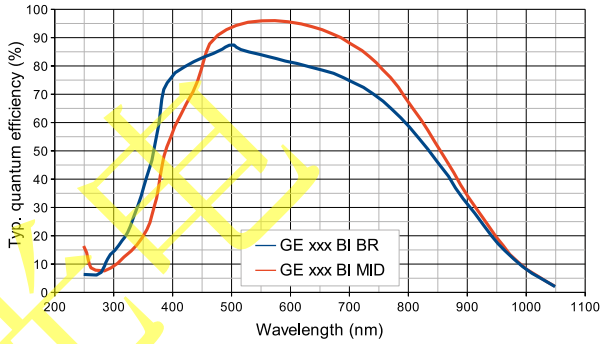
STEP 1: Choose camera model by order code

	GE 1024 1024 series	GE 1024 128 series GE 1024 256 series	GE 2048 512 series
Enhanced UV sensitivity	GE 1024 1024 BI UV3	GE 1024 256 OE UV GE 1024 256 BI UV2 GE 1024 256 BI UV3	GE 2048 512 FI UV GE 2048 512 BI UV2 GE 2048 512 BI UV3
Enhanced VIS sensitivity	GE 1024 1024 FI GE 1024 1024 BI BR GE 1024 1024 BI MID	GE 1024 128 FI GE 1024 128 BI MID GE 1024 256 FI GE 1024 256 BI MID	GE 2048 512 FI GE 2048 512 BI MID
Enhanced NIR sensitivity	GE 1024 1024 DD NIR GE 1024 1024 DD MU2	GE 1024 128 DD NIR GE 1024 256 DD NIR GE 1024 256 DD MU2 GE 1024 256 FI DD	

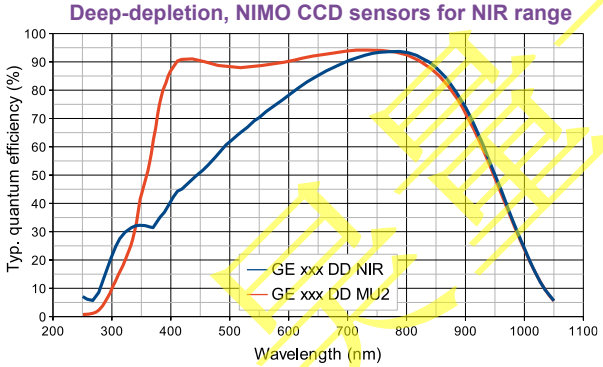
Basic front-illuminated CCD sensors



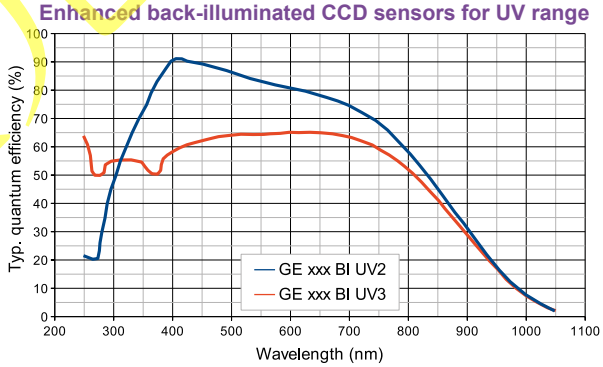
Back-illuminated CCD sensors optimised for VIS range



Deep-depletion, NIMO CCD sensors for NIR range



Enhanced back-illuminated CCD sensors for UV range



STEP 2: Select accessories and software by order code

Order code	Description
A) Subpixel resolution enhancement	
New GE-S xxx xxx series	Increased spatial resolution (See scientific superresolution camera data sheet for details)
B) Accessories for imaging purposes	
GE-CM01	C-Mount lens adapter
GE-M42 / GE-FA	M42/F-mount lens adapter with integrated filter and electronic shutter holder (optional)
GE-DR01	Electronic shutter driver
C) Accessories for enhanced cooling performance	
GE-CR01	Compact recirculator operating at room temperature for deep camera cooling
GE-CR02	Recirculating water chiller, temperature range -5°C to 30°C for ultra-deep camera cooling
D) Software development kit (SDK) and drivers	
GE-SDK01	SDK for Windows (based on C/C++)
GE-LAB01	LabVIEW driver
GE-EP	EPICS driver
GE-LX01	Linux driver

STEP 3: For customisation of the camera, please let us know your requirements.

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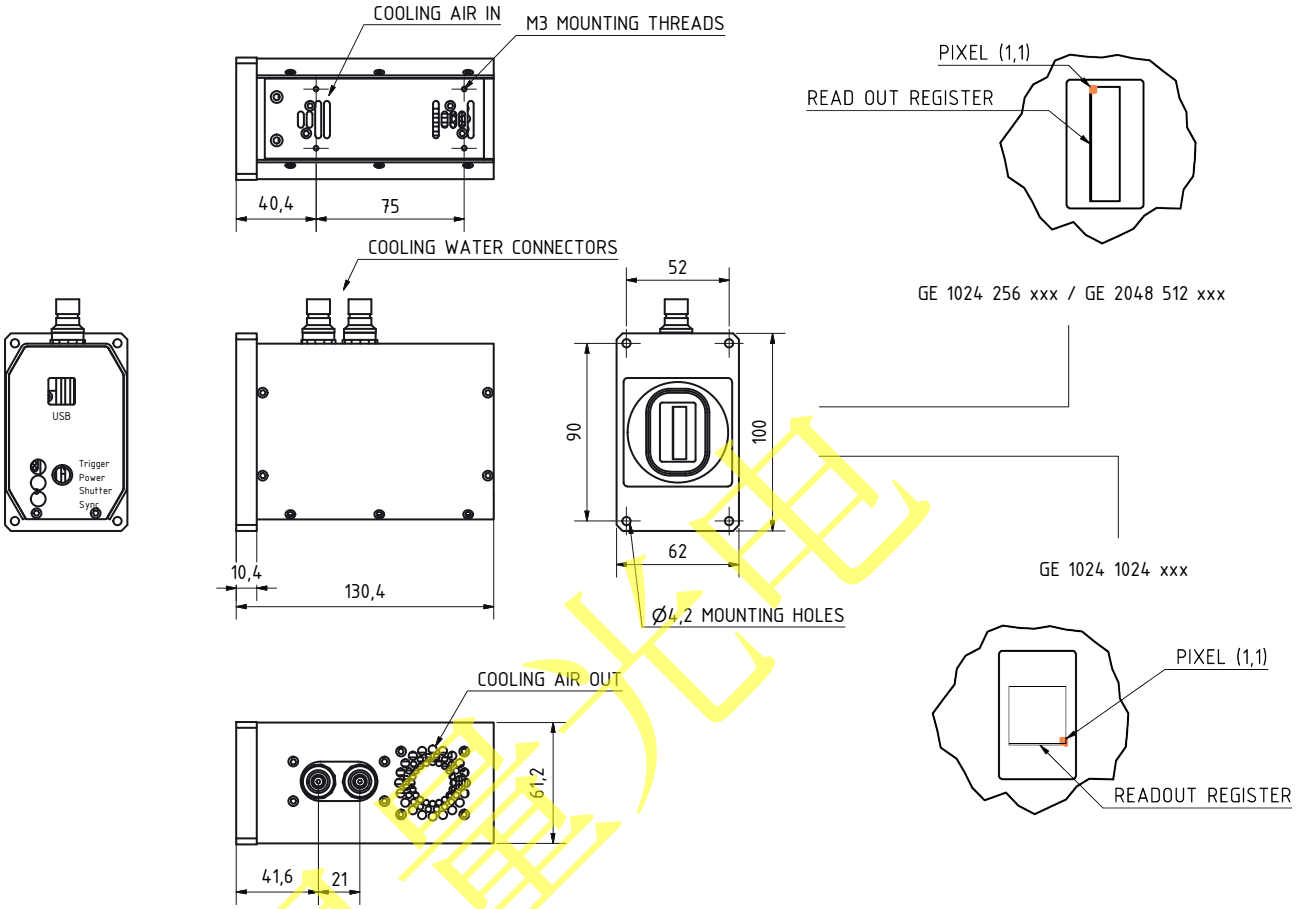
TECHNICAL DRAWINGS



Items delivered together with each camera

GE-VI01	greateyes Vision software suite for Windows
GE-USB5m	5m USB 2.0 cable type A to type B
GE-POW01	Camera power supply with cabling
GE-ManCam	Camera instruction manual on storage device

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