

# Cheetah 640 Series

## Areascan SWIR Camera

- SWIR cooled camera with 640 x 512 resolution
- In-house developed InGaAs sensor



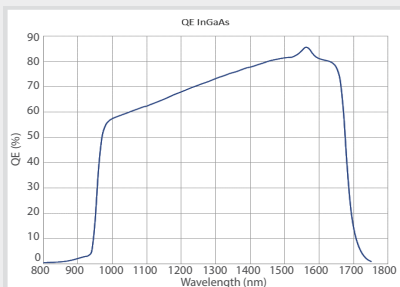
### World's fastest InGaAs areascan camera with high image resolution

The Cheetah 640 series is based on a cooled, in-house developed InGaAs detector with a 640 x 512 pixel resolution.

The Cheetah 640 camera with single-stage TE-cooled detector offers high frame rates of either 400 Hz, 800 Hz or 1700 Hz while the version with three-stage TE-cooled detector offers a frame rate of up to 110 Hz.

The camera comes with a CameraLink interface.

A visible short-wave infrared (vSWIR) option is available for extension into the visible wavelength band.



### Designed for use in

- Safety & Security
- Scientific & Advanced research
- Medical

### Advantages

- World's fastest SWIR areascan imaging up to 1700 Hz
- vSWIR optional
- Low dark current
- Reliable data transfer via CameraLink



• Semiconductor analysis



• Semiconductor inspection



• Art inspection

## ► Camera Specifications

| Camera Specifications  | Cheetah 640 TE1 400<br>Cheetah 640 TE1 400 vSWIR   | Cheetah 640 TE1 800<br>Cheetah 640 TE1 800 vSWIR                     | Cheetah 640 TE1 1700<br>Cheetah 640 TE1 1700 vSWIR                               | Cheetah 640 TE3                                     |
|--|--|--|--|---|
| <b>Mechanical specifications</b>                                       |  |  |  |   |
| Approximate dimensions - excluding lens [width x height x length] [mm] | 143 x 137 x 95   |  |  |   |
| Weight [gr] - excluding lens   | 2000   |  |  |   |
| Camera cooling   | Forced convection [fan]  | Forced convection [fan]  | Forced convection [fan]  | Water cooling                                       |
| Optical interface  | C-mount  |  |  |   |
| Connector CameraLink   | Standard SDR connectors  |  |  |   |
| Connector power  | LEMO ECG 1B-1K302  |  |  |   |
| Connector trigger  | LEMO ECG 1B-1K302  |  |  |   |
| Water connector  | -  | -  | -  | Push-in fitting for 6 mm diameter tube              |
| <b>Environmental &amp; power specifications</b>                        |  |  |  |   |
| Ambient operating temperature range [°C]                               | From 0 to +50  |  |  |   |
| Storage temperature [°C]   | From -45 to +60  |  |  |   |
| Power consumption [W]  | Up to 25   | Up to 25   | Up to 25   | Up to 60  |
| Power supply voltage   | DC 12 V  |  |  |   |
| Shock  | MIL-STD810G method 516.6; half sine; 40 g [11 ms]  |  |  |   |
| Vibration  | Random: MIL-STD810G method 514.6; 4.01 g [15 - 2000 Hz]. Sine: MIL-STD883J method 2007; 5 g [20 - 2000 Hz] |  |  |   |
| Regulatory compliance  | CE, RoHS   |  |  |   |
| <b>Electro-optical specifications</b>                                  |  |  |  |   |
| Image format [pixels]  | 640 x 512  |  |  |   |
| Pixel pitch [µm]   | 20   |  |  |   |
| Detector type  | InGaAs photodiode array with CTIA ROIC   |  |  |   |
| Sensor cooling   | TE cooler  | TE cooler  | TE cooler  | 3-stage TE cooler                                   |
| Integration type   | Snapshot - global shutter  |  |  |   |
| Active area and diagonal [mm]  | 12.8 x 10.24 [diagonal 16.4]   |  |  |   |
| Optical fill factor  | 100%   |  |  |   |
| Spectral range [nm]  | 900 - 1700 [SWIR],<br>500 - 1700 [vSWIR]   | 900 - 1700 [SWIR],<br>500 - 1700 [vSWIR]                             | 900 - 1700 [SWIR],<br>500 - 1700 [vSWIR]   | 900 - 1700 [SWIR]                                   |
| Quantum efficiency   | ~80% [typical peak value]  |  |  |   |
| Gain modes   | High Gain [HG] & High Dynamic Range [HDR]  |  |  |   |
| Full well capacities [electrons]                                       | 45k [HG] & 500k [HDR]  |  |  |   |
| Read noise [electrons]   | 120 [HG] & 500 [HDR]   |  |  |   |
| Dark current [electrons/second]  | <100k [at 288K sensor temp and 150 mV reverse bias]; <200k for vSWIR                                       | <100k [at 288K sensor temp and 150 mV reverse bias]; <200k for vSWIR | <100k [at 288K sensor temp and 150 mV reverse bias]; <200k for vSWIR             | <1000 [at 233K sensor temp and 150 mV reverse bias] |
| Read out mode  | ITR & IWR  |  |  |   |
| Pixel operability  | >99%   |  |  |   |
| Preconfigured exposure time range [ms]                                 | 0.1 to 40 in HG, 0.1 to 20 in HDR  | 0.1 to 40 in HG, 0.1 to 20 in HDR                                    | 0.1 to 40 in HG, 0.1 to 20 in HDR  | Maximum exposure time is up to 20s in HG            |
| Max frame rate [Hz] [full frame]                                       | 444  | 865  | 1730   | 111   |
| Region of interest   | Yes  |  |  |   |
| Min region size [pixels]   | 32 x 4 [step 16 x 4]   |  |  |   |
| Max frame rate [Hz] [min region size]                                  | >100000  |  |  |   |
| Analog-to-Digital [ADC] [bits]   | 14   |  |  |   |
| Command and control  | CameraLink   |  |  |   |
| Digital output format  | CameraLink [12 bit base] - 1 cable   | CameraLink [12 bit medium] - 2 cables                                | CameraLink [12 bit dual medium] - 4 cables<br>CameraLink [8 bit full] - 2 cables | CameraLink [14 bit base] - 1 cable                  |
| Trigger  | In or out via trigger connector [configurable]   |  |  |   |
| <b>Product selector guide</b>  |  |  |  |   |
| Part number  | XEN-000175 [SWIR]  | XEN-000577 [SWIR]  | XEN-000176 [SWIR]  | XEN-000271 [SWIR]                                   |
|  | XEN-000045 [vSWIR]   | XEN-000578 [vSWIR]   | XEN-000046 [vSWIR]   | -   |

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