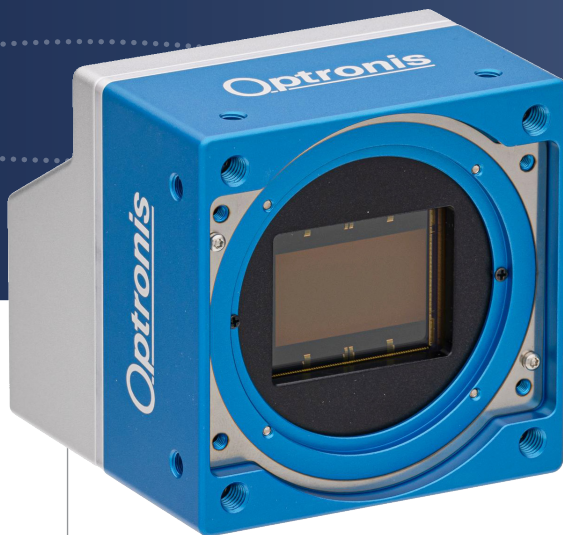


CYCLONEPLUS SERIES

# CyclonePlus-9

High-Speed Machine Vision Camera



- METROLOGY AND HIGH SPEED MACHINE VISION
- LASER LINE PROFIOMETRY
- AUTOMATED OPTICAL INSPECTION (AOI)

- 509 fps with 4 096 x 2 304 pixels
- >66 000 fps with 4 096 x 16 pixels
- Global shutter with low noise pixel
- CoaXPress V2.0 interface with 4 x 12.5 Gbit/s
- Features: Flat Field Correction, Dual ROI, Line Skipping, Binning, Mirroring

## DESCRIPTION

The CyclonePlus-9 is a high resolution camera with low noise pixels. It is part of Optronis CyclonePlus series for demanding machine vision applications. These cameras are streaming image data at up to 50 Gb/s to a CoaXPress frame grabber for real time processing.

- 4 096 x 2 304 pixel resolution with 509 fps
- Low noise pixel
- Short back focal (BF) distances
- Performant image processing features

## PERFORMANCE (EXAMPLES, TYP., 8 BIT, 4xCXP12)

Resolution (HxV)	Frame rate	Resolution (HxV)	Frame rate
4 096 x 2 304	509 fps	3 840 x 2 160	577 fps
4 096 x 128	8 936 fps	2 560 x 1 440	1 065 fps
4 096 x 4	122 399 fps	256 x 4	200 000 fps

EMVA1288 data (v3.1 typ.)	8 bit
Dynamic range	57 dB
Saturation capacity	10 600 e <sup>-</sup>
Temporal dark noise	19 e <sup>-</sup>
System gain	46 e <sup>-</sup> /DN
Signal-to-Noise Ratio	40 dB
Absolute Sensitivity Threshold	15 e <sup>-</sup>
Dark Signal Non-Uniformity	64 e <sup>-</sup>
Photo Response Non-Uniformity	2.4 %
Non-Linearity Error	1 %

## FEATURES

Exposure Mode	Timed
Trigger Activation	RisingEdge, FallingEdge, AnyEdge
Trigger Sources	External (Synch IN), CoaXPress, software
Trigger Filter and Trigger Hold-Off Time	Yes, for external trigger source
Trigger Delay	Adjustable
Flat Field Correction (FFC)	Block-based with up to 16 reference data in camera, auto calibration Column-based
Defect Pixel Correction	Yes, factory setting or customer configuration
Digital Binning Modes	Average, Sum
Digital Binning horizontal / vertical	x1, x2, x4 / x1, x2, x4
Dual ROI	Yes
Line Skipping (Vertical Decimation)	Yes
Image Mirroring	Horizontal and Vertical
User Global Adjustments	Offset analog and digital / Gain analog and digital
Programmable User Output	Yes
White Balance	Yes, with auto function ROI control, manual RGB gain
Counter and timer control	Yes
Image Stamp (Counter information in frame)	Yes
Save setup to flash and load on power-on	Yes
Over Temperature Monitoring	Yes
Firmware Update	via USB (CPH6-USB) and CXP
File Access Control	Yes, up to 3 MByte user data
Test Pattern Generation	Yes

## SPECIFICATIONS

Sensor type	LUX9506, Global Shutter
Resolution	4 096 pixel x 2 304 pixel
Frame rate (full resolution)	20 .. 509 fps
Exposure time	4 μs .. 1 / frame rate
Active area / Diagonal	26.62 mm x 14.98 mm / 30.55 mm
Pixel distance	6.5 μm x 6.5 μm
A/D conversion	8 bit
Quantum efficiency (sensor)	38 % @ 550 nm
Trigger	internal, external, CoaXPress
Trigger signals	Synch IN and Synch OUT, TTL level, electrically isolated
Interface	CoaXPress 2.0, Micro-BNC
Interface Configurations	4 x CXP12, 2 x CXP12, 1 x CXP12, 4 x CXP6, 2 x CXP6
Power	18 W, PoCXP, ext.
Operating Camera Temperatures	
Operating Case	0 .. +65°C / 32 .. 149°F
Operating Electronics	0 .. +90°C / 32 .. 194°F
Operating Ambient Temperatures without additional cooling	0 .. +15°C / 32 .. 59°F
with CYP-HIS	0 .. 20°C / 32 .. 68°F
with CYP-FAN	0 .. +40°C / 32 .. 104°F
Storage Temperature	-10 .. +40°C / 14 .. 104°F
Transport Temperature	-25 .. +65°C / -13 .. 149°F
Weight	370 g w/o mount, w/o cooling
Dimensions	65 mm x 65 mm x 65.5 mm (3D model data available)

# CyclonePlus-9 High-Speed Machine Vision Camera

**Optronis**

Make time visible

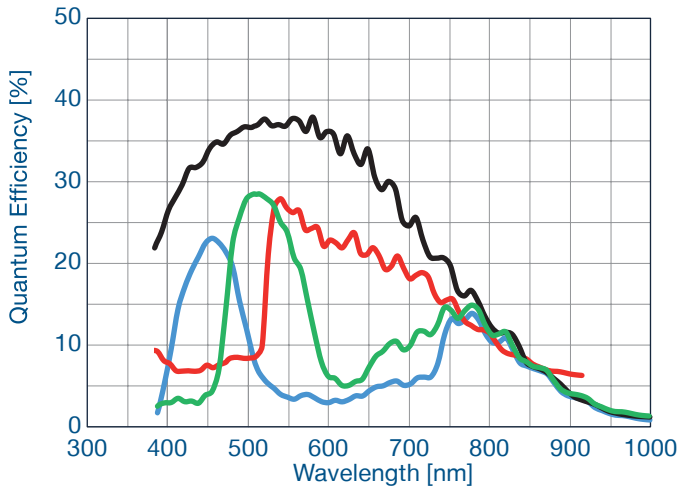
## MODELS

CyclonePlus-9-M	monochrome Camera
CyclonePlus-9-C	color Camera
Scope of delivery	Camera, brief introduction

## ACCESSORIES

CYP-CM	C-Mount lens adapter
CYP-FM	F-Mount lens adapter
CYP-M42-12	M42 Mount lens adapter, BF 12 mm
CYP-M58-11,58	M58 Mount lens adapter, BF 11.58 mm
CYP-HIS	Heat Sink
CYP-FAN	Cooling Fan
CPH6-PTC	Pig Tail Cable for synch
CPH6-USB	Programming Cable

## SPECTRAL SENSITIVITY



## COOLING CONCEPT

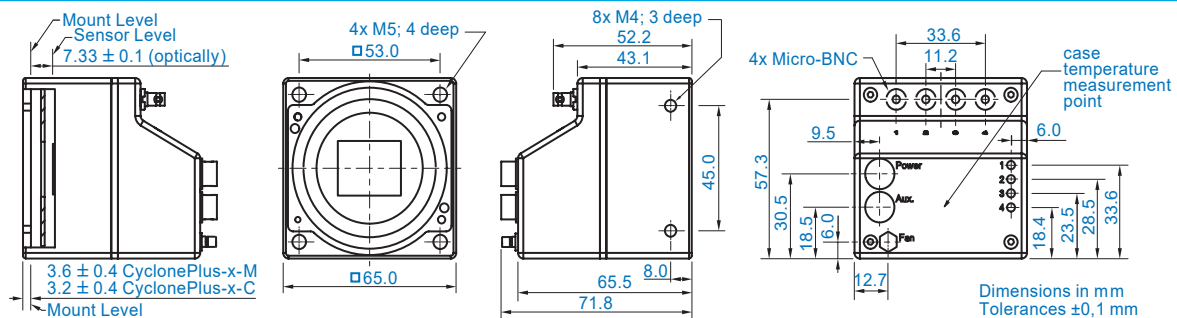
Passive heat sink or active fan can be installed by customer to adapt camera to operate at required temperatures. Alternatively, camera allows to be fixed onto a customer specific heat sink.

## FLAT FIELD CORRECTION (FFC)

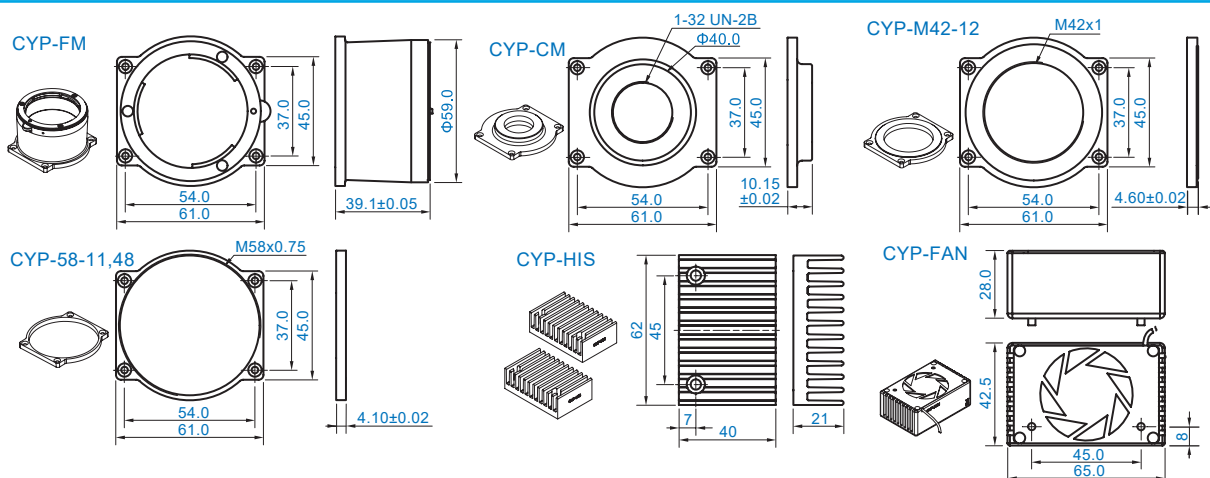
The camera allows FFC in real-time to correct non-homogeneous image intensity typically caused by non-homogeneous illumination or lens vignetting. Data of up to 16 reference images are saved in the camera.



## TECHNICAL DRAWING CAMERA



## TECHNICAL DRAWINGS ACCESSORIES



## CONTACT INFORMATION

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