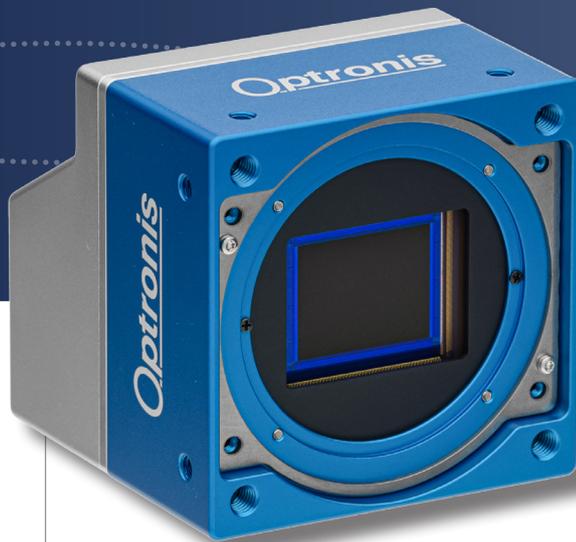# Optronis

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CYCLONEPLUS SERIES

CyclonePlus-21

High-Speed Machine Vision Camera

☑ AUTOMATED OPTICAL INSPECTION (AOI)

☑ HIGH SPEED MEASUREMENTS

☑ SEMICONDUCTOR QUALITY CONTROL

- 230 fps with 5 120 x 4 096 pixel

- Global shutter with low noise pixel

- Short Back-Focal design

- Flat Field Correction (FFC)

- Power and trigger via CoaXPress

- CoaXPress V2.0 interface with 4 x 12.5 Gbit/s

www.optronis.com

CyclonePlus-21 High-Speed Machine Vision Camera

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DESCRIPTION

At 21 MPixel resolution the Cyclone-21 provides high frame rate of 230 fps. for dmanding machine vision applications. Combined with a CoaXPress frame grabber all CyclonePlus cameras are streaming image data for real time processing. The cameras allow flexible cooling solutions.

- 230 fps @ 5 120 x 4 096 pixel resolution
- Low noise pixel
- Short back-focal distance

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

Resolution (HxV)	Frame rate	Resolution (HxV)	Frame rate
5 120 x 4 096	230 fps	5 120 x 2 048	456 fps
1 920 x 1 088	871 fps	5 120 x 512	1 735 fps
640 x 480	1 898 fps	5 120 x 32	14 055 fps

EMVA1288 data (v4.0 typ.)	8 bit	10 bit
Dynamic range	54 dB	59 dB
Saturation capacity	31 000 e⁻	31 000 e⁻
Temporal dark noise	48 e⁻	36 e⁻
System gain	130 e⁻/DN	32 e⁻/DN
Signal-to-Noise Ratio	45 dB	45 dB
Dark Signal Non-Uniformity	23 e⁻	18 e⁻
Photo Response Non-Uniformity	1.5 %	1.5 %
Non-Linearity Error (V3.0)	0.5 %	0.5 %

SPECIFICATIONS

Sensor type	GSPRINT4521, Gl. Shutter, Grade 1
Resolution	5 120 pixel x 4 096 pixel
Frame rate (full resolution)	1 .. 230 fps
Exposure time	4 µs .. 1 / frame rate
Active area / Diagonal	23.04 mm x 18.43 mm / 29.50 mm
Pixel distance	4.5 µm x 4.5 µm
A/D conversion	8/10 Bit
Device Tap Geometry	1X-2YE
Quantum efficiency (sensor, typ.)	63 % @ 500 nm
Trigger signals	Synch IN and Synch OUT, TTL level, electrically isolated
Interface	CoaXPress 2.0 Micro-BNC (HD-BNC) connectors
Interface Configurations	4 x CXP12, 2 x CXP12 4 x CXP6, 2 x CXP6
Power Consumption	16 W (typ.)
Power Supply	PoCXP, ext.
Temperature Ranges (to limit case temeratur to 65°C)	
- operation, amb., with CYP-HIS	0 .. +25°C / 32 .. 77°F
- operation, amb., with CYP-FAN	0 .. +45°C / 32 .. 113°F
- operation, case temperature	0 .. +65°C / 32 .. 149°F
Weight (typ.)	370 g w/o mount, w/o cooling
Dimensions	65 mm x 65 mm x 66.6 mm (3D model data available)

FEATURES

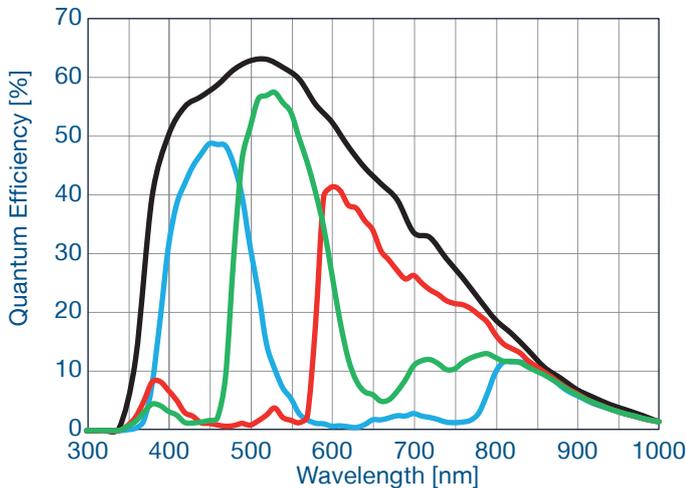|	
Exposure Modes	Timed, TriggerWidth, TriggerControlled
Trigger Activation	RisingEdge, FallingEdge, AnyEdge
Trigger Sources	External (Synch IN), CoaXPress, software
Trigger Filter and Trigger Hold-Off Time	Yes, for external trigger source
Trigger Delay	Adjustable
Flat Field Correction (FFC)	Block-based 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 (x4 mono only) / x1, x2, x4 (x4 mono only)
Reverse X	Yes
Reverse Y	Yes
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

CyclonePlus-21 High-Speed Machine Vision Camera

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MODELS

CyclonePlus-21-M	monochrome Camera
CyclonePlus-21-C	color Camera
Scope of delivery	Camera, brief introduction

SPECTRAL SENSITIVITY

ACCESSORIES

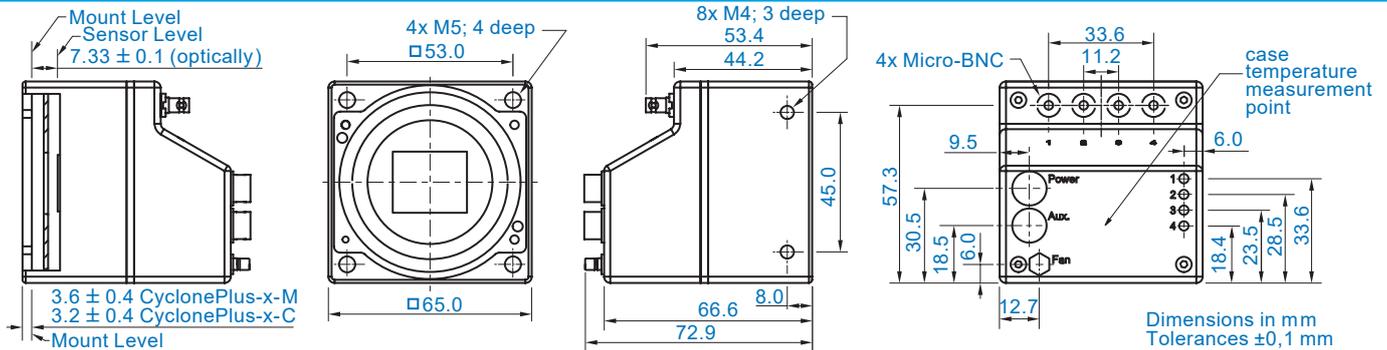|	
CYP-CM	C-Mount lens adapter
CYP-FM	F-Mount lens adapter
CYP-M42-12	M42 Mount lens adapter, BF 12 mm
CYP-M58-11,58	M58 Mount lens adapter, BF 11.58 mm
CYP-HIS	Heat Sink
CYP-FAN	Cooling Fan
CPH6-PTC	Pig Tail Cable for synch
CPH6-USB	Programming Cable

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.
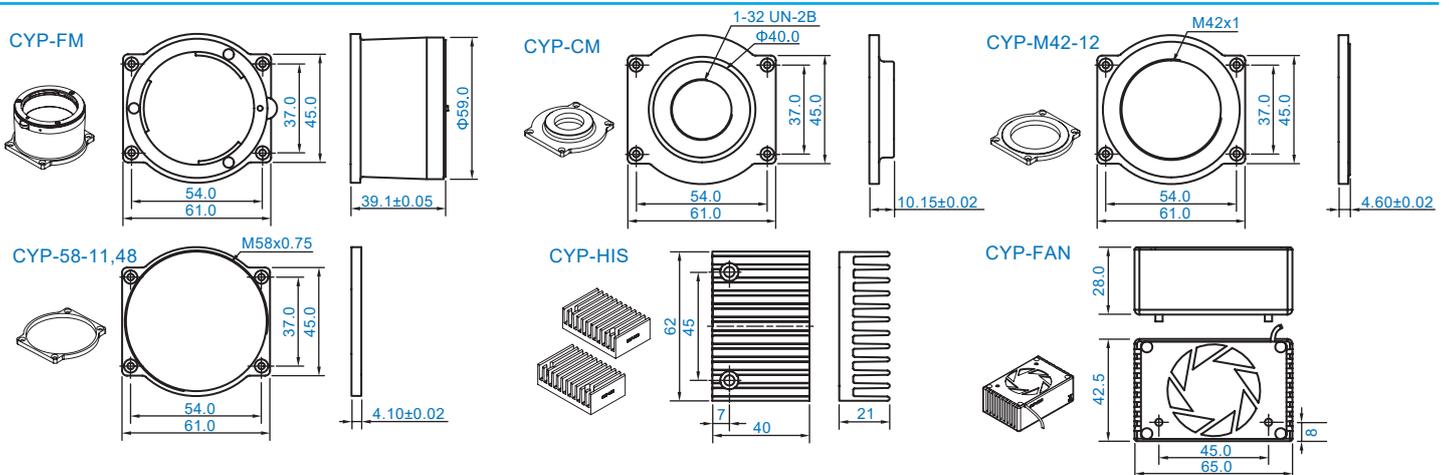
COOLING CONCEPT

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.

TECHNICAL DRAWINGS CAMERA

Dimensions in mm
Tolerances ±0,1 mm

TECHNICAL DRAWINGS ACCESSORIES

CONTACT INFORMATION