Specification
D-12A09c/GV-S01-1.1
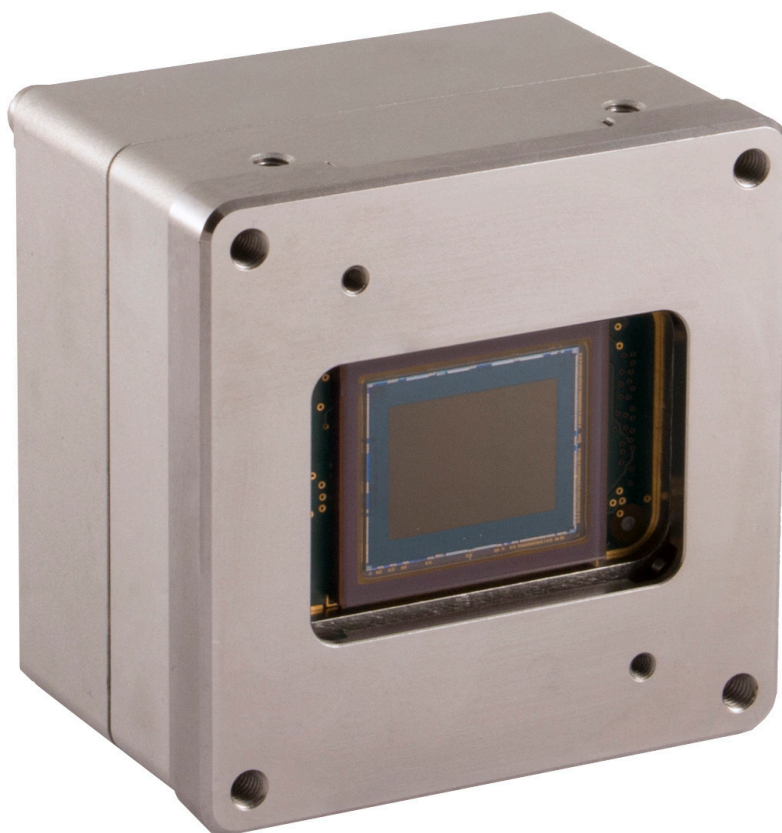
Key characteristics

12 Mpx 3.45 µm²	4096 3008	9+ FPS 8 bit
CMOS Global Shutter	1.1" Optical format	< 4 W
50x50x35 mm	200 g	68 dB DNR

- Sony Pregius IMX304LQR-C
- True Global Shutter CMOS
- Color
- Timed Trigger with software trigger
- Frame averaging for up to 16 frames
- Combine Multi-exposure and Frame averaging
- Binning: 2x2, 4x4
- GigE Vision
- Hirose 12pin power connector

Introduction

The Diamond D-12A09 GigE Vision camera delivers 4096 x 3008 pixel resolution at 9 fps with 3.45 micron square pixels. Adimec offers the Diamond 12 Mpx camera with optimized thermal management, low power and a compact design. With the focus on temperature stability of the high sensitivity image sensor, the Diamond series is designed for low light applications where long exposure times are required without active cooling.

Optical alignment is simplified via active alignment in 6 degrees of freedom between the sensor and the mechanical camera front. This creates a very accurate sensor alignment with high reproducibility. With an optional infrared cut-off filter at a sufficient distance from the image sensor, no particles will enter the sensor-to-glass optical path that could disturb the image uniformity.

Consistent tool matching is supported via repeatable optical alignment and performance monitoring for sensitivity, noise characteristics, dark current and uniformity at fixed temperature conditions. Additional special features of the 12 Mpx Diamond such as multi-exposure triggering, frame averaging and binning, further improve performance in low light uniformity measurement applications.
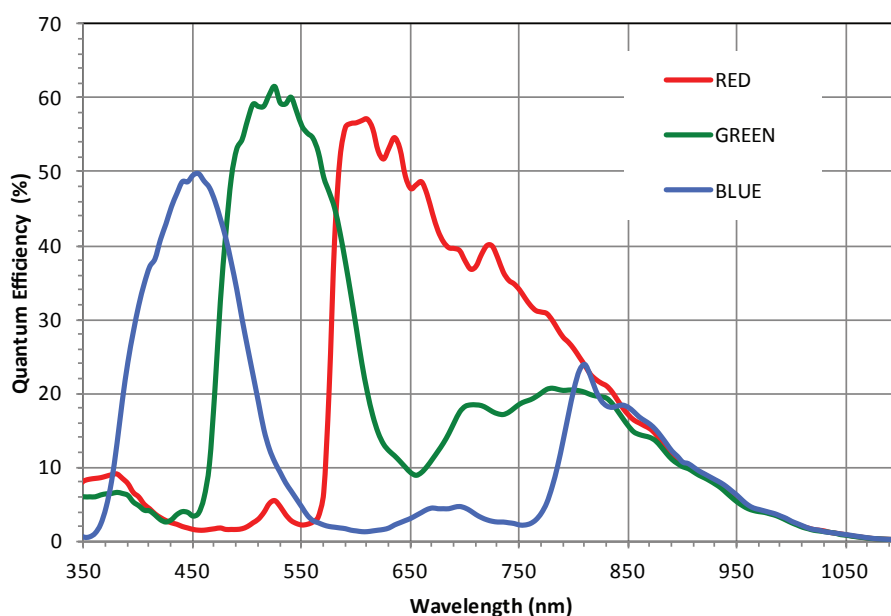
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Performance

Type	Sony Pregius IMX304LQR-C
Architecture	CMOS Global Shutter
Optical format	1.1"
Pixel size	3.45 µm x 3.45 µm
Active pixels	4096 (H) x 3008 (V)
Microlenses	Yes
Dynamic range	> 68 dB
Full well	10 ke
Max signal to noise	@3855 DN_{12}, 40±2.5 dB
Sensitivity* (DN_{12}/Lux·s) - R | G | B	13500±30% | 14450±30% | 4834±30%

*Conditions: Light source spectrum - tungsten lamp with CCT of 3200K + BG38 filter; N.A. of illumination > F8; including IR cut filter.

Quantum Efficiency

Measured without IR cut-off filter

Functionality

Image acquisition	Timed, TimedTrigger
Integration time control	Programmable between 25 µs and 60 s in steps of 1 µs
Gain	Programmable between 0 dB and 48 dB in steps of 0.1 dB
Video Processing	Automatic black level control - User programmable LUT - Manual white balance
Region of interest	Programmable ROI - Frame rate increases with smaller ROI - 2x2 mono, 2x2 bayer and 4x4 bayer binning
Defect pixel correction	On/Off switchable - Review of defect pixel map - Factory calibrated.
Test mode	Internal test pattern generator available for checking of the complete digital image chain
Mirroring	The output can be reversed in the horizontal and vertical direction
Frame Averaging & Multi-exposure	1 to 16 frames can be averaged and the camera can be configured for multi-exposure
Miscellaneous functions	1 factory set and 1 user set for storage of camera settings - Frame counter - Temperature readout - Camera type, issue, MAC address, firmware version, and serial number can be read via software - Built in test - Automatically determine maximum frame speed

Interfacing

Video

Video output	GigE Vision V1.2
External Sync	Software trigger
Output resolution	8 / 12 bit
Connector	RJ45 (Figure 1)

Camera Control Protocol

Interface	GenICam via GigE Vision
Protocol	GenTL

I/O

Output	None
Input	Software trigger
Connector	None

Power

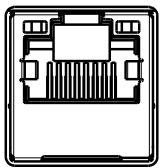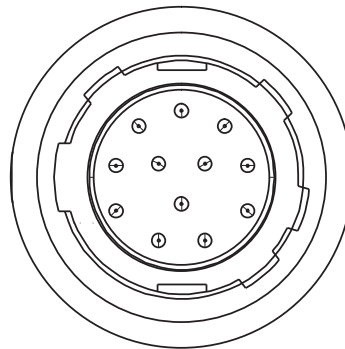|	
Input voltage	11.0 to 13.0 V
Power dissipation	< 4 W full 4096x3008 resolution, timed at maximum framespeed
Power connector	Hirose 12pin connector, HR10A-10R-12PC (Figure 2)

Figure 1: RJ45 GigE Vision interface connector

Figure 2: Hirose 12 pin connector HR10A-10R-12PC

Mechanical

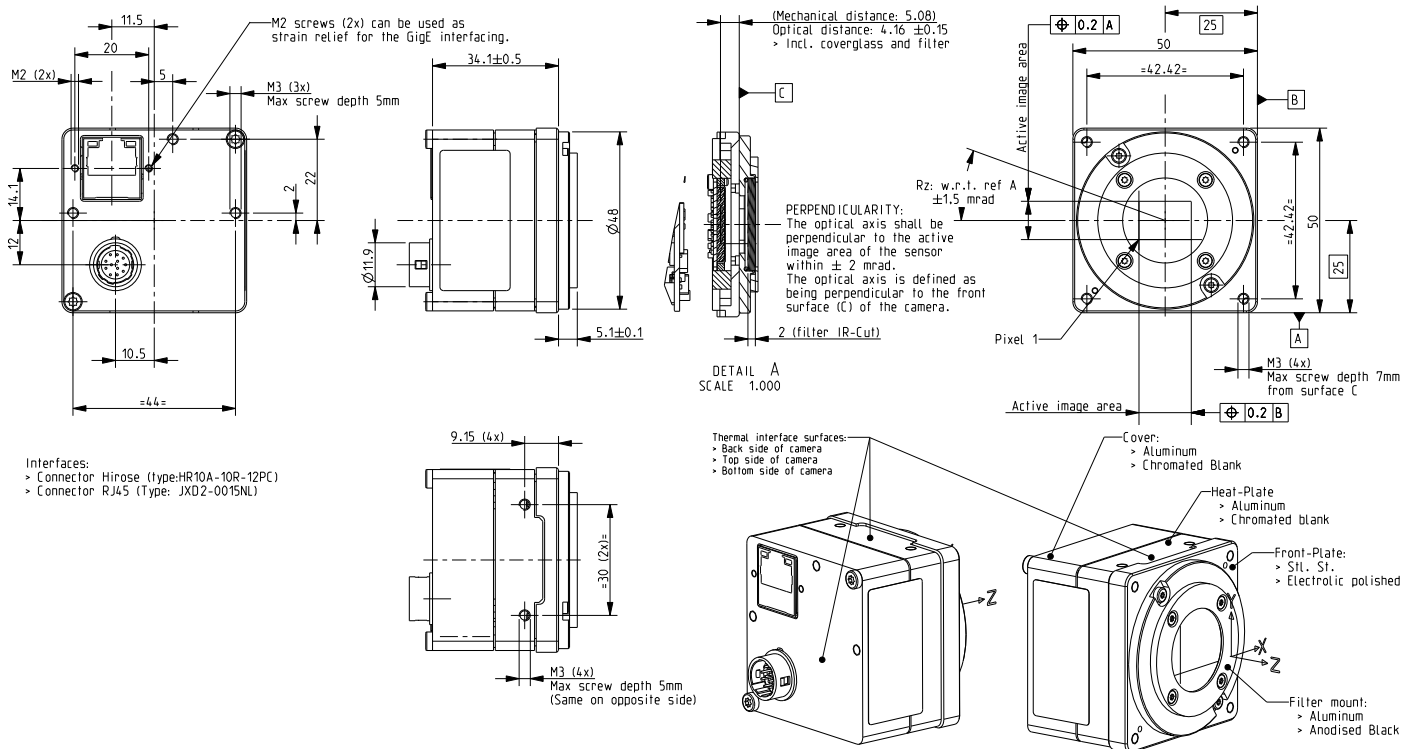|	
Mechanical mounting	4 x M3 at 42.42 mm pitch on camera front
Thermal mounting	2x M3 mounting holes on top and bottom side of the camera, 3x M3 on the back side of the camera
Filter	Optionally this camera is supplied with an IR cut filter.
Outline	See figure 3
Weight	approx 200 gram

Figure 3: Mechanical outline, including the optional IR cut filter.

Sensor Mounting Accuracy

XY-centering	± 0.1 mm
Rotation	± 1.5 mRad
Optical distance	4.16 ± 0.15 mm, with IR cut filter.
Perpendicularity	± 2 mRad

Compliance & Reliability

RoHS

Directive	2011/65/EU

CE-mark

Workmanship	In accordance with IPC-J-STD-001 class 2 and inspected according IPC-A-610 class 2

Reliability

MTBF	> 75,000h @ 30°C calculated according to the part stress analysis of MIL-HDBK-217F for ground fixed, uncontrolled environments

Environmental

Operating

Temperature	+10°C to +40°C
Humidity (relative)	20% - 80% non-condensing
Temperature shock	Continous operation with temperature changes up to 1°C/min

Storage

Temperature	-25°C to +65°C
Humidity (relative)	5% - 95% non-condensing
Shock	25 g, half sine shape, 6-10ms duration in ±X, ±Y and ±Z
Vibration	Sinusoidal linear vibration, 5 - 150 Hz, 10 g sweep rate 1 octave per minute in each axis

Camera Types

	Interface connector	Connector	Sensor	Type	Max. fps @ Full resolution
D-12A09c/GV-S01-1.1	RJ45	Hirose 12 pin	Sony Pregius IMX304LQR-C	Color	9+ fps

Adimec

Adimec is the leading supplier of high-end cameras for machine vision, medical and outdoor imaging applications. Our Adimec True Accurate Imaging® technology forms the foundation for a broad range of camera products, and brings new levels of precision and accuracy to vision systems.

Custom cameras

Adimec has the ability to offer additional camera functionality and create customer specific cameras even for small volume programs. Built from platforms, our standard line of cameras give us a flexible base that can be tailored to fit your specifications. Contact us to discuss these options in more detail. Visit: www.adimec.com for product details.

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North America
Phone: (+1) 781-279-0770
Fax: (+1) 781-279-0771
E-mail salesus@adimec.com

Europe
Phone: (+31) 40-2353900

E-mail: saleseu@adimec.com

Japan & Korea
Phone: (+81) 3-5968-8377
Fax: (+81) 3-5968-8388
E-mail: salesjp@adimec.com

Asia - Pacific
Phone: (+65) 6334-1236
Fax: (+65) 6334-1436
E-mail: salesap@adimec.com

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www.adimec.com