pco.dimax® cs
high-speed camera series

» **pco.**dimax cs1
pco.dimax cs3
pco.dimax cs4

excellent
light sensitivity

12-bit
dynamic range

compact &
shock resistant

2128 fps
@ Full HD resolution

high performance for
car safety applications

pco.

the high-speed camera series for all demands

sled

onboard

offboard

The **pco.**dimax cs models are the company's latest addition to its high-speed camera family, which has been specifically designed for the demanding applications in car safety. With very high frame rates at a resolution of up to 4 Megapixels it provides magnificent light sensitivity, leading image quality and excellent color rendering.

The automotive testing sector will benefit from the variety of security features, making it ideally suited for harsh conditions appearing in applications such as crash tests or other industrial scenarios. Crashworthiness as well as compact design make the camera a true all-rounder for both, the onboard and off-board use. Individual demands can be met by a broad variety of optional but helpful accessories such

as electronic lens control for positions difficult to access, junction boxes for the use of multiple cameras or a lens cage for stabilizing the optical axis when using larger C-mount lenses.

In addition to these progressive technical specifications, the user can ease the flow of work by the automatic black referencing feature and an HD-SDI monitor connected to the associated video output for easily setting image section, aperture and focus of the lens. Last but not least, a software custom-made for controlling the camera rounds out the camera's great flexibility. This allows the user to put his focus on other things, while the camera is acting as an highly automated device in its daily routine.

pco.camware 4 is an application-oriented camera control software allowing for

• controlling multiple cameras
• clear arrangement and ease of use
• storable and reloadable camera and test settings
• burned-in time stamp with editable text
• low light preview function
• fluent live images of all cameras
• easy playback and video export
  of recorded sequences
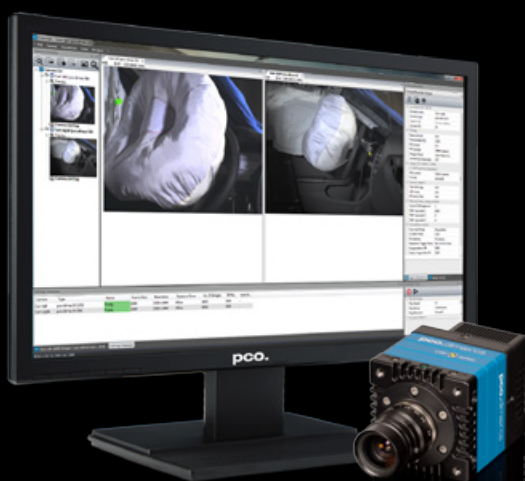
frame rate table

	resolution [pixels]	frame rate [fps]	recording time (9 GB)
cs4	2016 x 2016	1102	1.40 s
	2016 x 1536	1443	1.40 s
cs3	1920 x 1440	1603	1.41 s
	1920 x 1080	2128	1.42 s
	1440 x 1440	2032	1.49 s
cs1	1296 x 1024	3086	1.53 s
	1296 x 720	4346	1.54 s
	1008 x 952	4009	1.63 s
	864 x 848	5010	1.71 s
	528 x 528	10782	2.08 s

Performance examples. Regions of interest can be individually set by users.

pco.dimax cs1
resolution 1296 x 1024 pixels

pco.dimax cs3
resolution 1920 x 1440 pixels

pco.dimax cs4
resolution 2016 x 2016 pixels

technical specifications

image sensor

Image Sensor	Proprietary
Resolution	**cs4** 2016 x 2016 pixels
	cs3 1920 x 1440 pixels
	cs1 1296 x 1024 pixels
Sensor size / diagonal	**cs4** 22.18 x 22.18 mm² / 31.36 mm
	cs3 21.1 x 15.8 mm² / 26.4 mm
	cs1 14.26 x 11.26 mm² / 18.17 mm
Pixel size	11 x 11 µm²
Shutter mode	Global Shutter
Fullwell capacity	36 000 e⁻
Quantum efficiency	50% @ peak
Sensitivity (ISO[1])	ISO 1250 - 16000 (monochrome)
	ISO 160 - 6400 (color)
Spectral range	290 ... 1100 nm
Readout noise	22 e⁻ (typ.)
	18 e⁻ [2]
Dynamic range	1600 : 1 / 64 dB
	2000 : 1 / 66 dB [2]
Dark current	530 e⁻/pixel/s @ 20°C
Non-linearity	< 0.5% (diff.), < 0.2% (integr.)
DSNU (dark signal non-uniformity)	< 0.6 counts rms @ 90% center zone
PRNU (photo response non-uniformity)	< 1% @ 80% signal

camera values

Exposure time	1.5 µs ... 40 ms
Dynamic range A/D	12 bit
Region of interest	24 x 4 pixel steps (centered)
Camera memory	9 Gigabytes
Signal types	RS-485, TTL, contact [3]
Output signals	Status exposure / Status busy
Multi-camera sync	Sync In/Out (Master/Slave), PLL
Data interface	Gigabit Ethernet
Time stamp	in image (accuracy of 1 µs)
Time code input	IRIG-B unmodulated (optional)
Interframing time	3.58 µs (optional)
Shock	150g > 11ms (in all axes)
Operating temperature	0° - 40°C
Housing	self-contained housing
Power supply	15 - 48 V DC
Power consumption	27 W
Camera connector	LEMO (18-pin)
Available lens mounts	C-mount / F-mount, EF-mount (optional)
Weight	0.985 kg
Dimensions	85 x 85 x 102.5 mm³

[1] Determination of ISO speed according to ISO 12232.

[2] In correlated double image mode (CDI) the readout noise is reduced and therefore the intrascene dynamic is improved.

[3] Contact signal type in combination with **pco.**extension box.

pco.

qualities

fast frame rates at high resolution
1102 fps | 2016 x 2016 pixels **pco.**dimax cs4
1603 fps | 1920 x 1440 pixels **pco.**dimax cs3
3086 fps | 1296 x 1024 pixels **pco.**dimax cs1

excellent light sensitivity at true 12 bit dynamic range
outstanding low light performance requires less light and allows for reduced shutter time
in order to avoid motion blur

ruggedized camera body
camera withstands 150g for more than 11 milliseconds in all axes
self-contained & dust tight housing

compact & lightweight
very compact and lightweight body allowing for quick and easy setup even in tight spaces

secure and smart operation
employable pulse length filter reduces risk of false triggering by interfering EM signals
secure synchronization mode (phase-lock PLL) even if sync signal fails

high data security
optional battery secures image memory for 45 minutes in case of power failure

electronic lens control for Canon EF lenses
allows for remote control camera lens (focus and aperture) for use in positions that are hard to
access (film pit, hall ceiling, crash block)

ALL IN ONE

one camera for every application
due to size, weight and changeable lens mounts, the camera can be quickly swapped
between onboard and off-board positions delivering high-quality images

wide variety of helpful accessories
camera-lens cage for perfect stabilization of the optical axis for onboard applications
ruggedized junction box with integrated battery and sync generator for multiple cameras

use-oriented camera control software
pco.camware 4 allows for fast repeatability of different test scenarios
integration in several major third-party camera control software packages

high-quality product made in Germany
robust and reliable camera system combines German engineering
with outstanding color quality and crisp images

accessories

HD-SDI video output

The camera's video output provides fluent live video in Full HD quality which allows to easily set camera view, focus and aperture.

lens cage

The supportive lens cage perfectly stabilizes the optical axis when working with larger C-mount lenses in high-G applications where strong cross acceleration forces occur.

lens remote controller

The optional Canon lens controller enables the user to connect electronic EF- and EF-S Canon lenses allowing to remote control focus and aperture of those lenses.

camera junction box

The camera junction box is the perfect source for up to six off-board cameras providing power, Ethernet, trigger and sync signals via one solid LEMO cable.
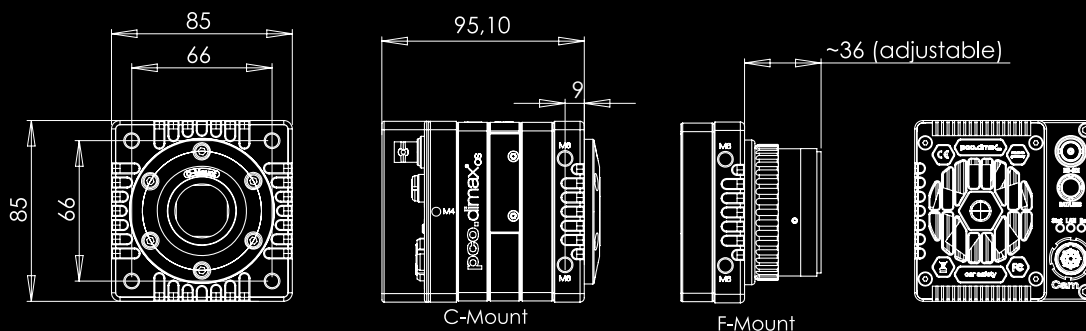
onboard controllers

Different ruggedized onboard controllers supply up to ten cameras with power, Ethernet, trigger and sync signals. An integrated battery provides an ideal back-up power source.

dimensions

85

66

85

66

95,10

9

C-Mount

~36 (adjustable)

F-Mount

pco.dimax® cs

high-speed camera series

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