

datasheet

# pc<sub>o</sub>.horizon 9.1 bi TDI CLHS

state-of-the-art in line scan imaging

**TDI** time delay integration

**UV** ultraviolet\*

resolution  
**9K**

pixel size  
**5.0  $\mu\text{m}$  x 5.0  $\mu\text{m}$**

interface  
**CLHS FOL**



2 photosensitive bands  
p1: 9072 pixels x 256 stages  
p2: 9072 pixels x 32 stages

temperature-stabilized  
image sensor

max. line frequency  
608 kHz

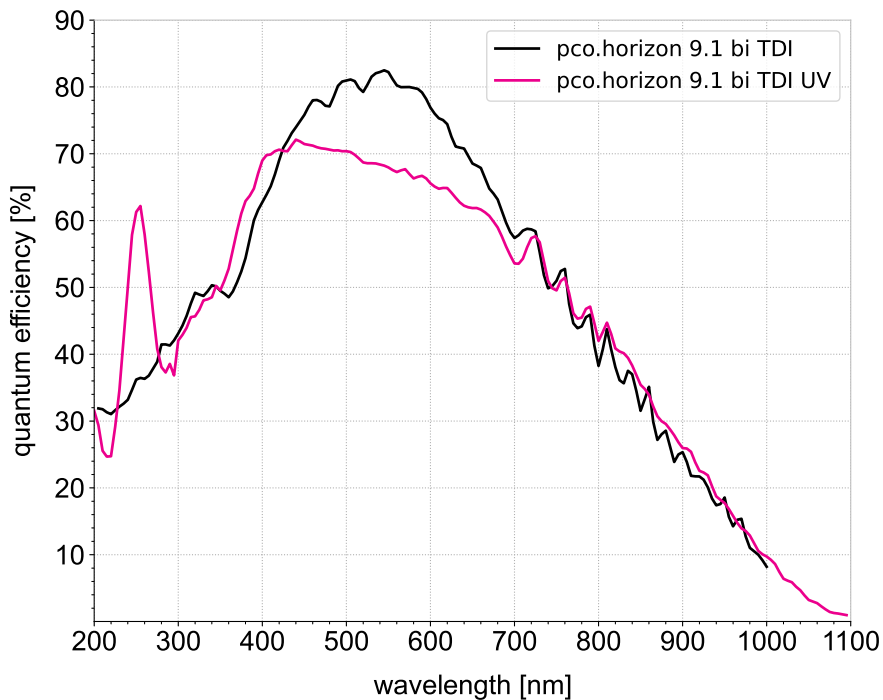
ultraviolet variant  
available\*

back illuminated CMOS

# technical data

image sensor		
	40G variant	100G variant
sensor technology	back illuminated CMOS time delay integration (bi CMOS TDI)	
color type	monochrome	
resolution (horizontal × vertical)	1 photosensitive band 9072 px × 256 stages	2 photosensitive bands p1: 9072 px × 256 stages p2: 9072 px × 32 stages
sensor size (horizontal × vertical)	45.36 mm × 1.28 mm	p1: 45.36 mm × 1.28 mm p2: 45.36 mm × 0.16 mm
sensor diagonal	45.38 mm	p1: 45.38 mm p2: 45.36 mm
pixel size (horizontal × vertical)	5.0 μm × 5.0 μm	
shutter mode	global shutter (GS)	
peak quantum efficiency	82 % @ 550 nm 72 % @ 440 nm (UV variant)	
spectral range	200 nm - 1100 nm	
dark current (typ.)	8000 e <sup>-</sup> /pixel/s @ +30 °C sensor temperature	
fullwell capacity	15 000 e <sup>-</sup>	
readout noise (typ.) @ 10 bit single band @ 12 bit single band	11 e <sup>-</sup> 6 e <sup>-</sup>	
dynamic range (intra-scene) @ 10 bit single band @ 12 bit single band	62.7 dB 68.0 dB	

## quantum efficiency



<b>camera</b>		
	<b>40G variant</b>	<b>100G variant</b>
<b>max. line frequency</b>		
<b>@ 8 bit single band</b>	540 kHz	608 kHz
<b>@ 10 bit single band</b>	432 kHz	608 kHz
<b>@ 12 bit single band</b>	300 kHz	300 kHz
<b>dynamic range A/D</b>		8 bit 10 bit 12 bit
<b>max. data rate</b>	40 Gbps	75 Gbps
<b>photo response non-uniformity (PRNU)</b>		< 1 %
<b>cooling method</b>		forced air liquid cooling system integration via defined thermal interface
<b>trigger input signals</b>		line trigger
<b>status output signals</b>		exposure, busy
<b>input / output signal connector</b>		Hirose 12-pin circular
<b>meta data</b>		available
<b>data interface</b>		Camera Link HS FOL

## special features

The pco.horizon 9.1 bi TDI CLHS is a line scan camera. It incorporates a back illuminated, charge-domain CMOS image sensor with built-in Time Delay Integration (TDI).

The sensor features a pixel size of 5  $\mu\text{m}$ , an effective resolution of 9072 pixels, and is equipped with two photosensitive bands, 256 stages and 32 stages respectively. By maximizing the sensitivity from ultraviolet to near infrared, it is designed to meet the needs of high-speed and low-light applications.

The camera is available in two spectral variants—a standard model with a broad spectral response and a UV model dedicated to DUV applications. In addition, both variants offer selectable options for frame rate, cooling method, and interface speed, allowing the configuration to be adapted to a wide range of applications.

The camera's data output impresses with its reliability, speed and high bandwidth due to utilizing the standard protocol of Camera Link HS with a FOL cable connection.

## general

<b>power supply</b>	24 VDC ( $\pm 10\%$ ) (tbd) (Hirose 12-pin circular)
<b>power consumption</b>	max. 55 W (tbd)
<b>weight</b>	0.8 kg (tbd)
<b>dimensions (height x width x length<sup>1</sup>)</b>	115.5 mm x 79.5 mm x 61.1 mm
<b>operating temperature range</b>	+10 °C to +40 °C
<b>storage temperature range</b>	-10 °C to +60 °C
<b>humidity range (non-condensing)</b>	10 % to 80 % (recommended < 65 %)
<b>certifications</b>	CE, FCC, UKCA

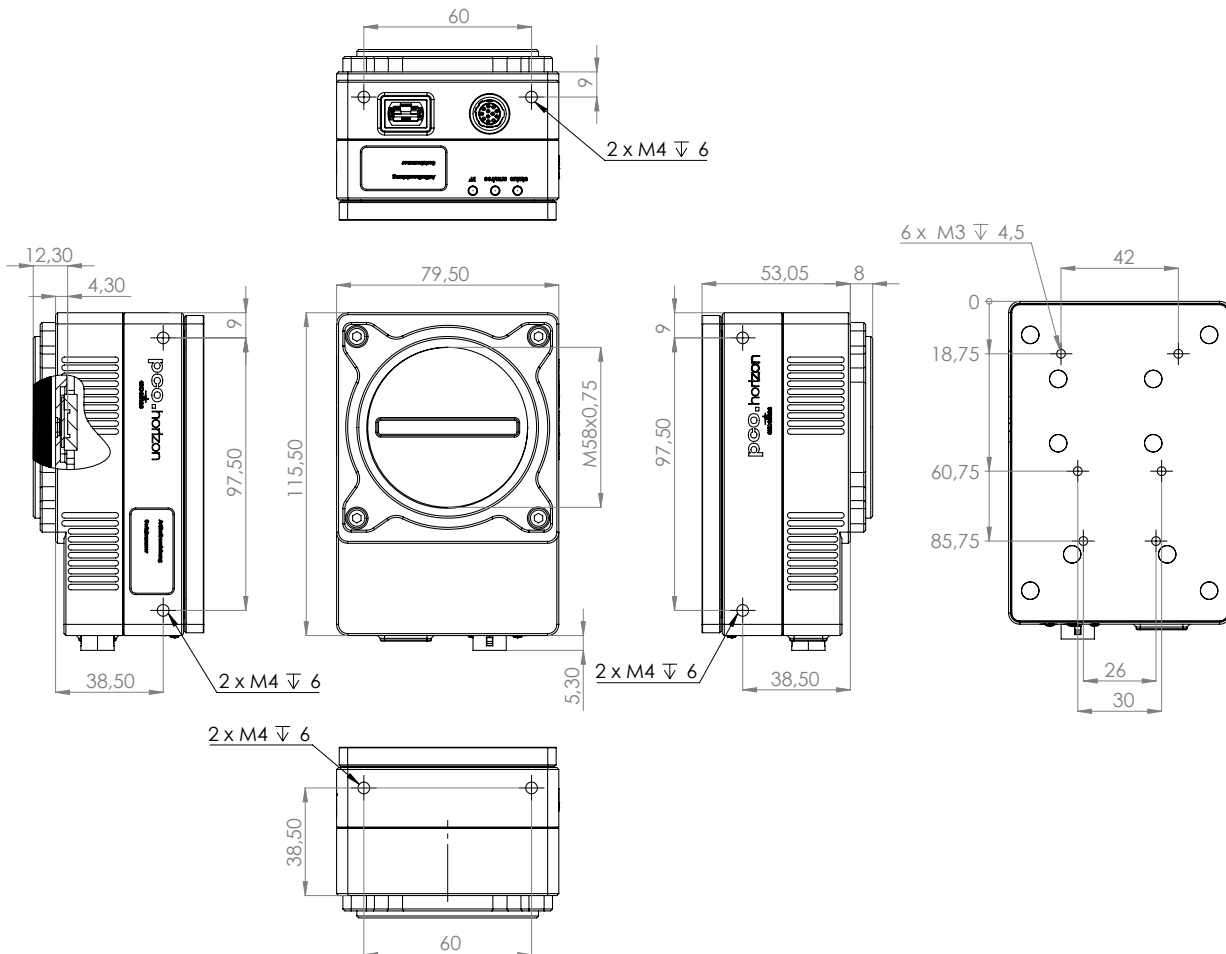
<sup>1</sup> This value refers to the length including the camera flange. The length depends on the selected cooling method.

## optical interface

<b>direct mounting distance (no camera flange)</b>	4.3 mm $\pm 10\%$
<b>lens mounting</b>	M58 x 0.75 (flange focal distance 12.3 mm)

Configure your optical setup with our **MachVis Lens Selector** online tool.

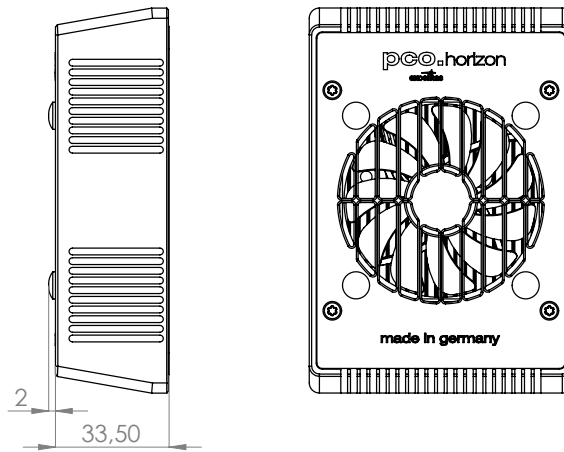
## dimensions



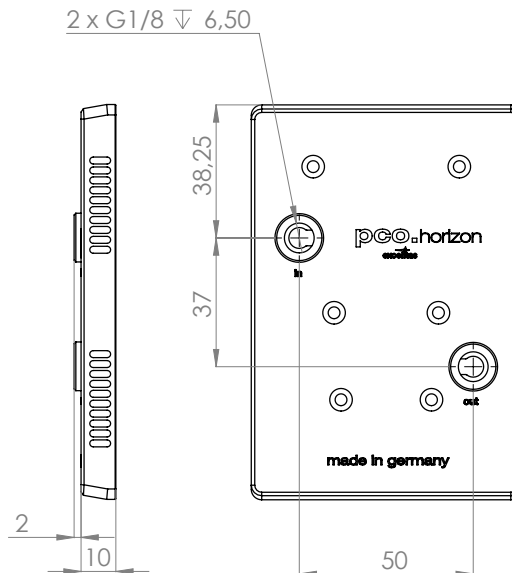
outlines of pco.horizon 9.1 bi TDI CLHS with camera flange (all dimensions given in mm)

### thermal design options

The pco.horizon 9.1 bi TDI CLHS features sophisticated thermal management, based on a heatpipe design. It is engineered to offer several options for cooling, such as forced air, liquid cooling, or individual system integration. All while having a compact form and space-saving dimensions.



air cooling module for pco.horizon 9.1 bi TDI CLHS (all dimensions given in mm)



liquid cooling module for pco.horizon 9.1 bi TDI CLHS (all dimensions given in mm)

## software

### Your first choice is pco.camware:

Our main camera control software enables control of most camera settings and facilitates image acquisition and storage.

You can customize it exactly to your needs using different layouts, styles and features.

### You prefer to use a different software:

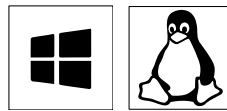
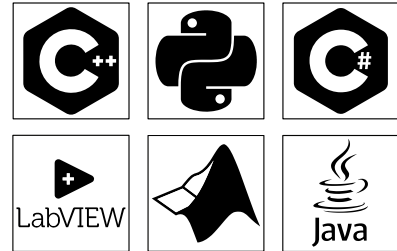
Our cameras integrate with a range of third-party software applications.

In microscopy we offer dedicated support for  $\mu$ Manager, while ensuring compatibility with other software maintained by their providers.

### You want to create your own application:

We feature a wide range of software development kits (SDK) for various programming languages, such as C++, Python, C#, LabVIEW, Matlab, and Java.

If you are looking for more general SDKs, we present pco.sdk and pco.recorder, our low-level SDKs with C interface.



Our software is available for Windows and Linux platforms.

Visit our **website** for detailed information, installation guidance, and Github projects.

## areas of application

digital pathology | flat panel inspection | fluorescence imaging | gene sequencing | industrial quality inspection | machine vision | material testing | optical inspection | PCB and electronics inspection | wafer inspection

### ordering information

<b>pco.horizon 9.1 bi TDI CLHS 40G</b>	85108000900	camera system, 9072 pixels, 1 photosensitive band, monochrome, time delay integration, global shutter, CLHS interface, air/liquid/no/passive cooling
<b>pco.horizon 9.1 bi TDI UV CLHS 40G</b>	85108000901	camera system, 9072 pixels, 1 photosensitive band, monochrome, time delay integration, global shutter, UV-enhanced sensor, CLHS interface, air/liquid/no/passive cooling
<b>pco.horizon 9.1 bi TDI CLHS 100G</b>	85108000902	camera system, 9072 pixels, 2 photosensitive bands, monochrome, time delay integration, global shutter, CLHS interface, air/liquid/no/passive cooling
<b>pco.horizon 9.1 bi TDI UV CLHS 100G</b>	85108000903	camera system, 9072 pixels, 2 photosensitive bands, monochrome, time delay integration, global shutter, UV-enhanced sensor, CLHS interface, air/liquid/no/passive cooling

**pco.**<sup>®</sup>

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