

DATASHEET

## Features

- Cmos Sensor 16384 Pixels, 5 x 5µm
- Interface : Medium/Full/Full+ CameraLink® :
- (4, 8 or 10 Channels), 85MHz each
- Line Rate : Up to 50000 l/s
- Data Rate : Up to 680 MB/s
- Bit Depth : 8 or 12bits
- Flat Field Correction
- Look Up Table
- Low Power Consumption : <13W
- Compliant with Standard Lenses of the Market



## Description

e2v's next generation of line scan cameras are setting new, high standards for line rate and image quality. Thanks to e2v's recently developed CMOS technology, the camera provides 50 000 lines/s in a 16k pixel format and combines high response with an extremely low noise level; this delivers high signal to noise ratio even when short integration times are required or when illumination is limited. The 5µm pixel size is arranged in one single active line, ensuring optimal spatial resolution in both scanning and sensor directions with off-the-shelf lenses.

## Application

- Flat Panel Display Inspection
- PCB Inspection
- Solar Cell Inspection
- Glass Inspection
- Print Inspection



## Standard Conformity

The UNIIQA+ cameras have been tested using the following equipment:

- A shielded power supply cable
- A Camera Link data transfer cable ref. 14B26-SZLB-500-OLC (3M)
- A linear AC-DC power supply

e2v recommends using the same configuration to ensure the compliance with the following standards.

## CE Conformity

The UNIIQA + cameras comply with the requirements of the EMC (European) directive 89/336/CEE (EN 50081-2, EN 61000-6-2).

## FCC Conformity

The UNIIQA + cameras further comply with Part 15 of the FCC rules, which states that: Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation
- This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
- This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
- Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

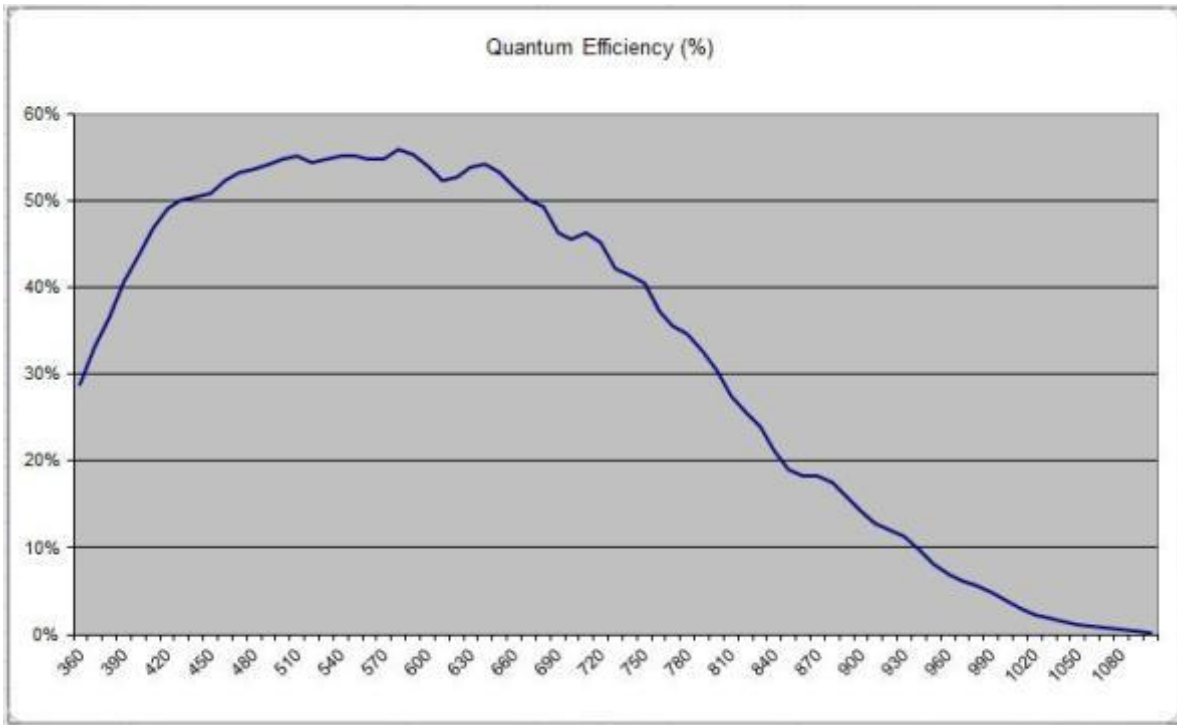
**Warning:** Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

## Key Specifications

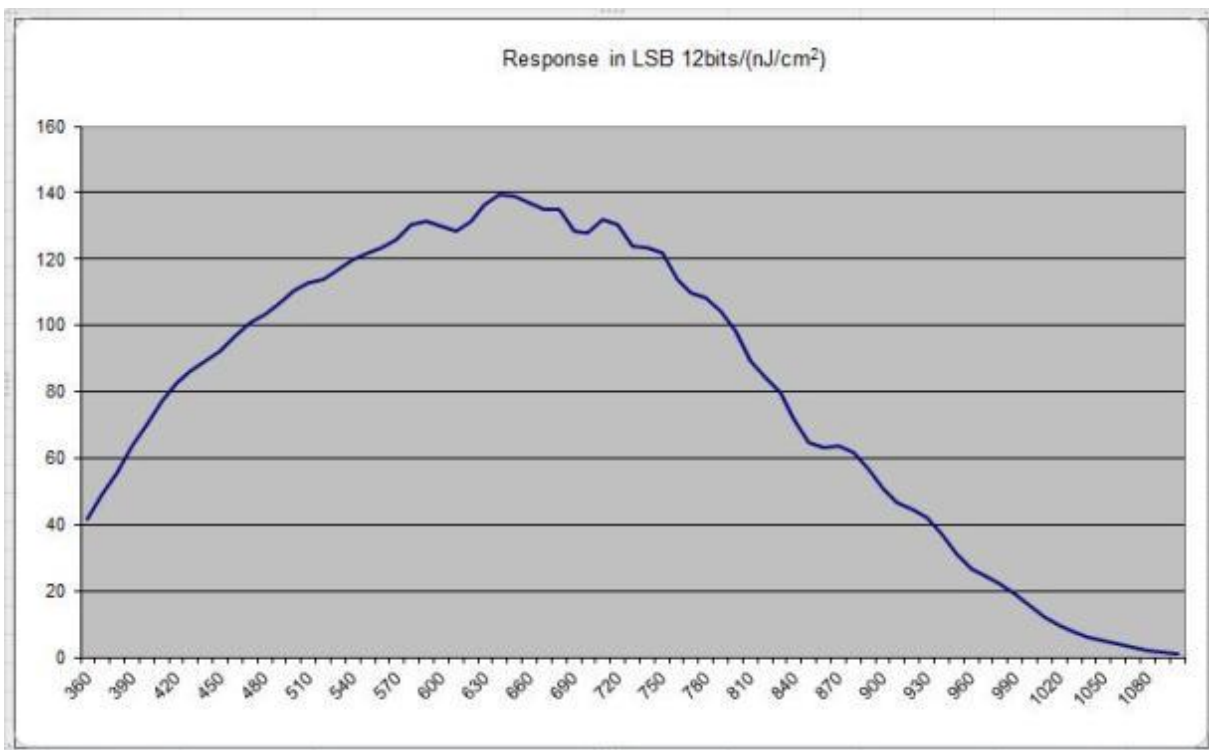
Characteristics	Value	Unit
<b>Sensor Characteristics</b>		
Resolution	16384	Pixels
Pixel Size (square)	5	µm
Max Line Rate		
CameraLink® 10xTaps Full+ mode (8 bits)	50	kHz
CameraLink® 8xTaps Full mode (8 bits)	40	kHz
CameraLink® 4xTaps Medium mode (8 or 12 bits)	20	kHz
<b>Radiometric Performances (at Maximum Pixel rate and Minimum Camera Gain)</b>		
Bit Depth	8 12	Bits Bits
Responsivity	137	LSB 12bits/(nJ/cm2)
Response non linearity ( between 5 – 95% saturation)	<1	%
Maximum PRNU	3	%
Dynamic Range	67	dB
<b>Functionalities (Programmable via Control Interface)</b>		
Gain (Analog : In the ADC converter)	Up to 12	dB
Offset	-4096 to +4095	LSB
Trigger Mode	Timed (Free run) and triggered (Ext Trig, Ext ITC) modes	
<b>Mechanical and Electrical Interface</b>		
Power Supply	Single 12 to 24	V <sub>DC</sub>
Power Consumption	<13	W
Lens Mount	M95	-
Sensor Alignment	±100	µm
Sensor Flatness	±35	µm
<b>General Features</b>		
Operating Temperature	0 to 55 Front Face	°C
Storage Temperature	-40 to 70	°C
Regulatory	CE, FCC and RoHs Compliant	-

## Response & QE curves

### Quantum Efficiency

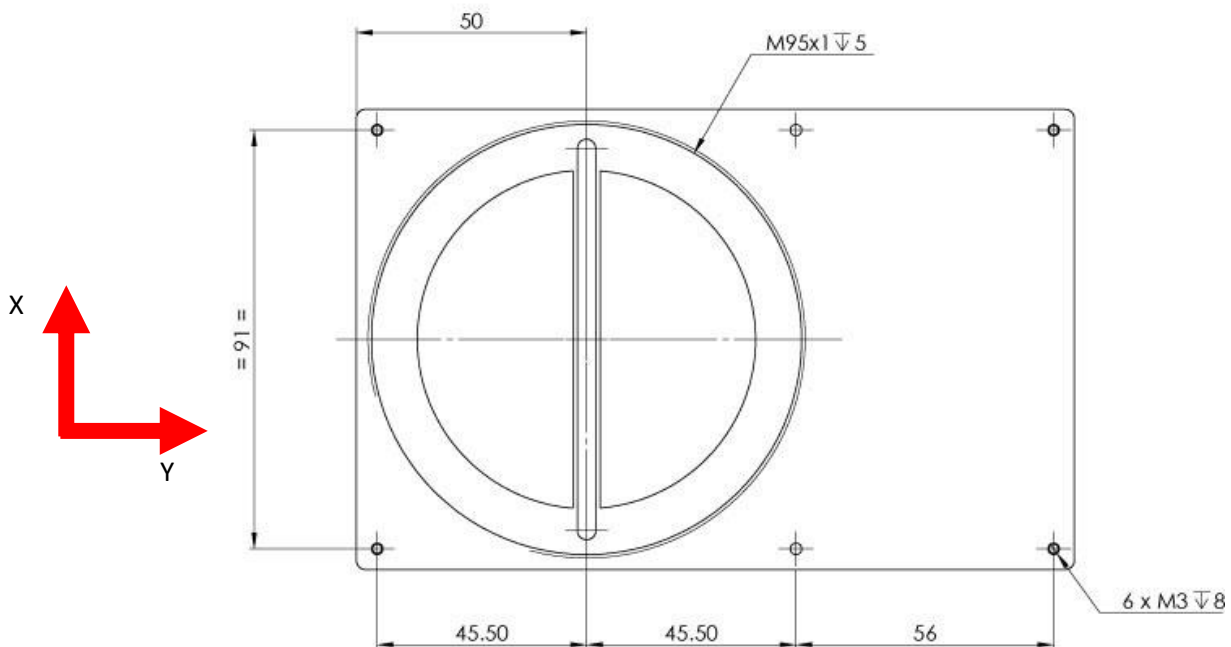
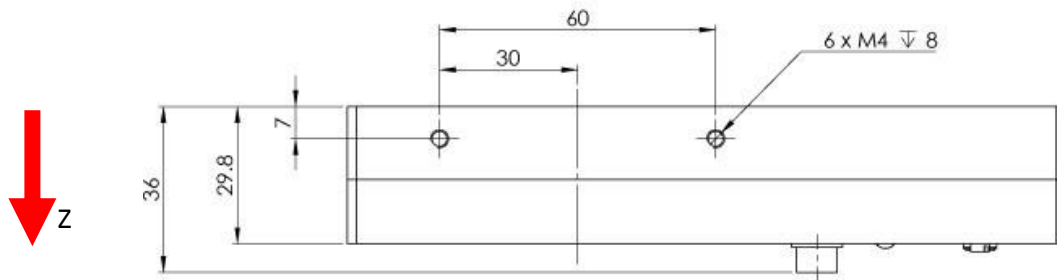
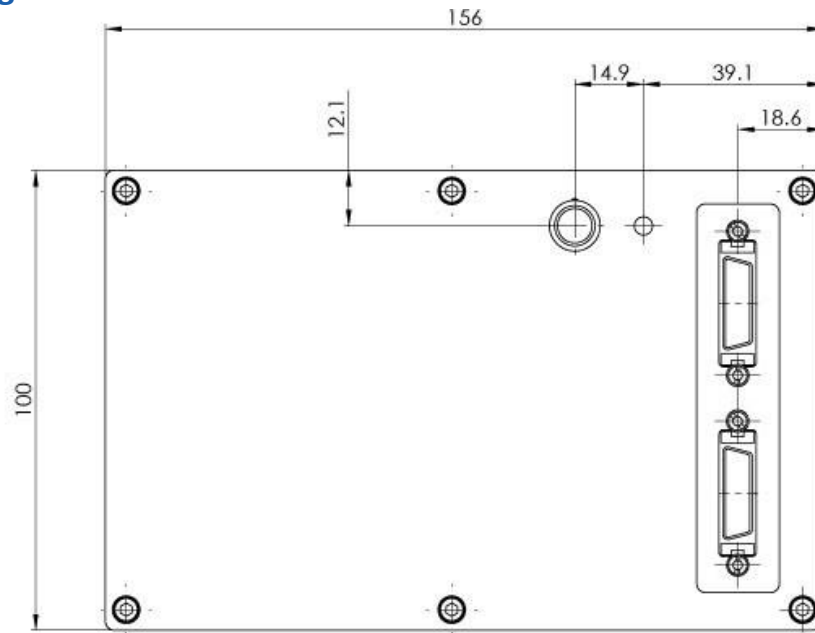


### Spectral Response



## Camera Interface

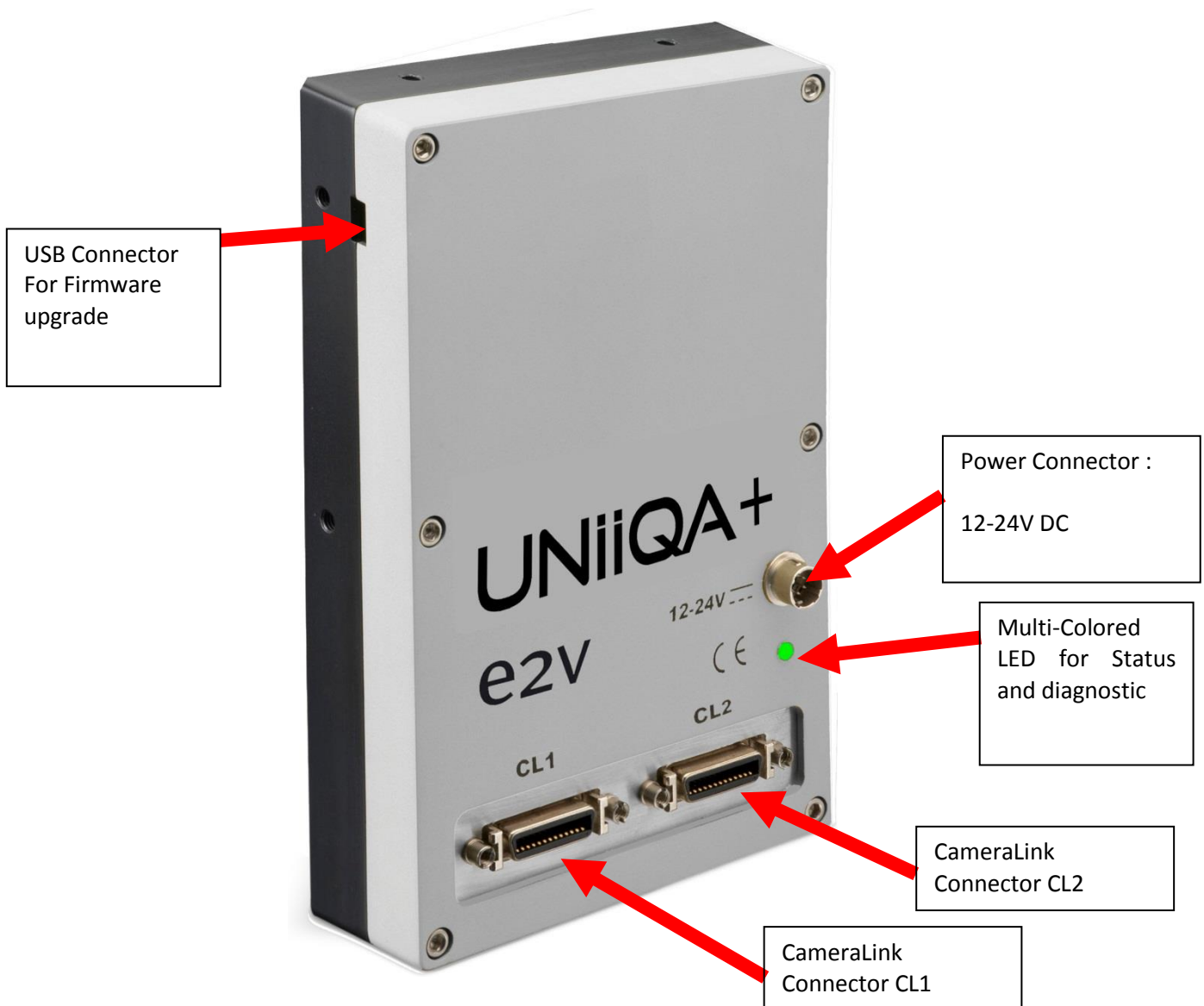
### Mechanical Drawings



## Sensor Positioning

Sensor alignment		
X	9 ±0,1	mm
Y	50 ±0,1	mm
Z	-9,4 ±0,15	mm
Planarity	±35	µm
Rotation (X,Y plan)	±0,2	°
Tilt (versus lens mounting plane)	±35	µm

## Input/Output Connectors and LED (CameraLink)



## Status LED Behaviour

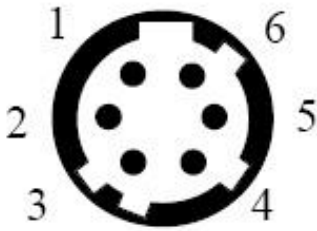
After less than 2 seconds of power establishment, the LED first lights up in ORANGE. Then after a Maximum of 30 seconds, the LED must turn in a following colour :

Colour and state	Meaning
Green and continuous	OK
Green and blinking slowly	Waiting for Ext Trig (Trig1 and/or Trig2)
Red and continuous	Camera out of order : Internal firmware error

## Power Connector

Camera connector type: Hirose HR10A-7R-6PB (male)

Cable connector type: Hirose HR10A-7P-6S (female)



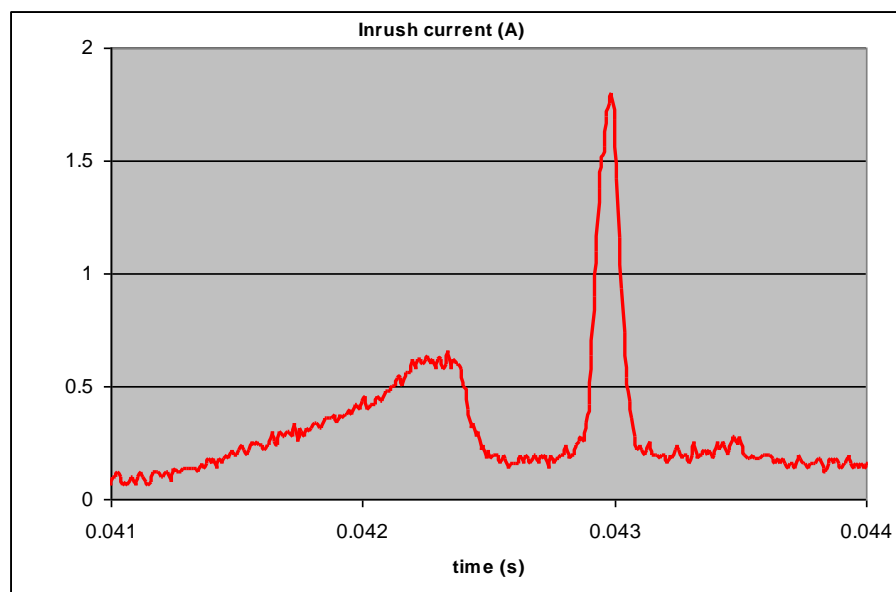
Camera side description

Signal	Pin	Signal	Pin
PWR	1	GND	4
PWR	2	GND	5
PWR	3	GND	6

Power supply from 12 to 24v  
Power 13W max with an typical inrush current peak of **1,8A** during power up

	Current consumption	
	12V	24V
Typical values		
ELIIXA+ CL (normal)	1,06A	0,54A
ELIIXA+ CL (Standby)	0,47A	0,25A

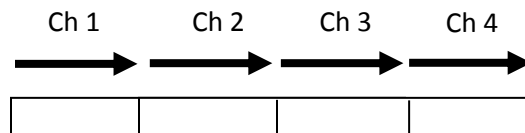
**Power up Time** : Around 43s (Green Light)



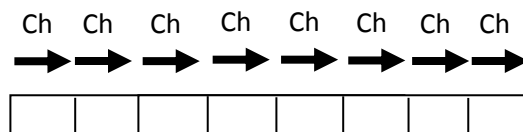
## Output Configuration

	Connector CL1 + CL2	Pixels per Channel
<b>Medium CameraLink Mode</b>		
4 Channels 8bits	4 x 85MHz	4 x 4096
4 Channels 12bits	4 x 85MHz	4 x 4096
<b>Full CameraLink Mode</b>		
8 Channels 8bits	8 x 85MHz	8 x 2048
<b>Full + CameraLink Mode</b>		
10 Channels 8bits	10 x 85MHz	10 x 1638

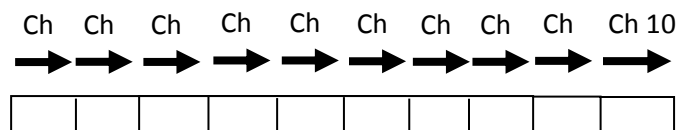
- Medium Mode 4x4096 Pixels at 85MHz each Channel (4x2048 pixels in Binning Mode 1SB or 2SB) : 4 Taps Separate, from Left to Right



- FULL Mode 8x2048 Pixels at 85MHz each Channel (8x1024 pixels in Binning Mode 1SB or 2SB) : 8 Taps Separate, from Left to Right



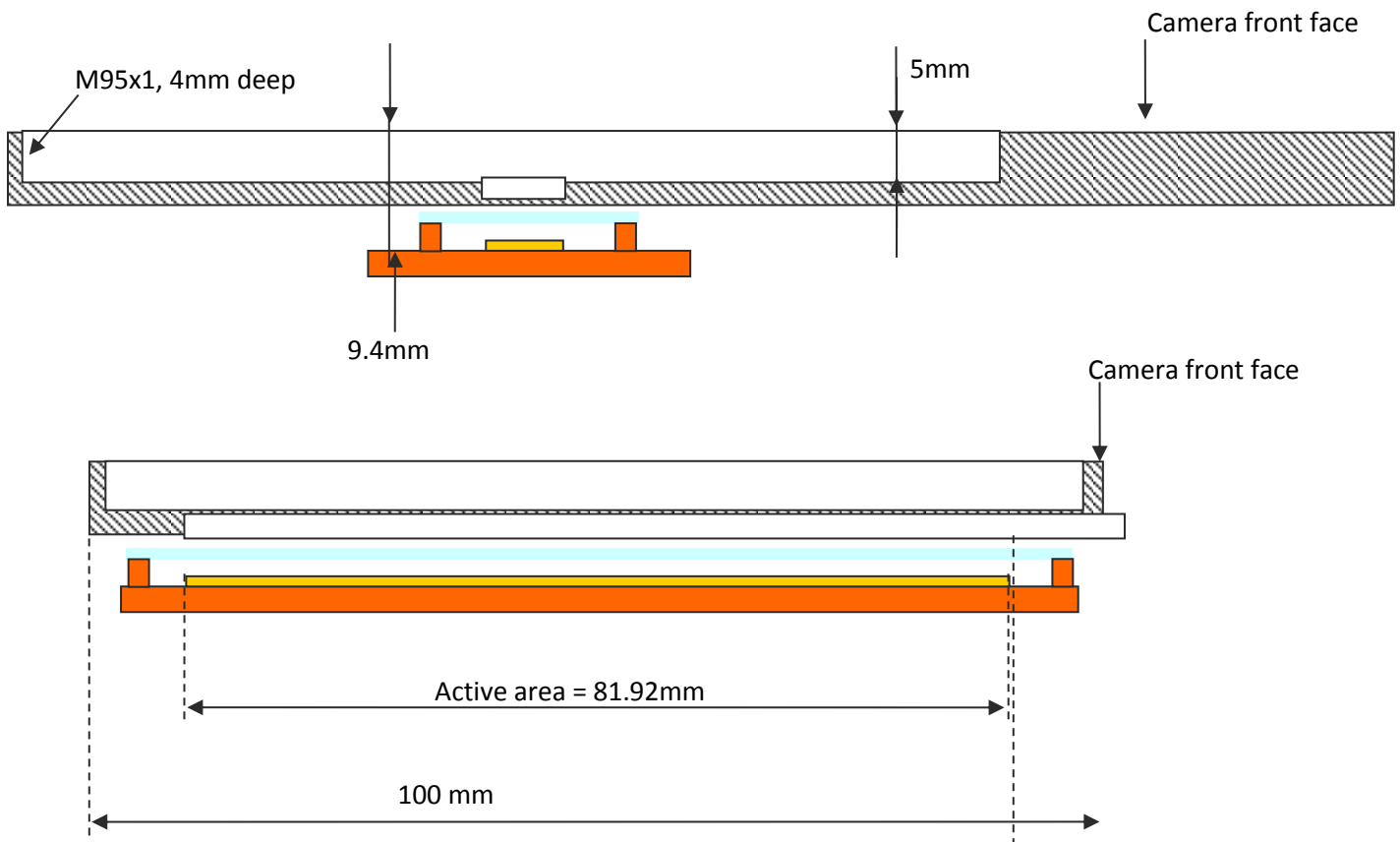
- FULL+ Mode 10x1638 Pixels at 85MHz each Channel (10x819 pixels in Binning Mode 1SB or 2SB) : 10 Taps Separate, from Left to Right :





## Optical Interface

## Mechanical Interface



## Lens Compliance

QIOPTICS (LINOS)				
	Nominal Magnification	Magnification Range	M95 Focus tube Reference	Lens Reference Part number
Inspec.x. L 5.6/105	0,33 X	0,25 – 0,45 X	2408-012-000-41	0703-085-000-20
Inspec.x. L 5.6/105	0,5 X	0,4 – 0,65 X	2408-012-000-41	0703-084-000-20
Inspec.x. L 5.6/105	0,87 X	0,6 – 0,9 X	2408-012-000-43	0703-083-000-20
Inspec.x. L 5.6/105	1 X	0,85 – 1,2 X	2408-012-000-43	0703-082-000-20
Inspec.x. L 4/105	3 X	2,8 – 3,3 X	2408-012-000-46	0703-104-000-20
Inspec.x. L 4/105	3,5 X	3,3 – 3,7 X	2408-012-000-44	0703-095-000-21
Inspec.x. L 3.5/105	5 X	4,8 – 5,2 X	2408-012-000-45	0703-102-000-20
SCHNEIDER KREUZNACH				
	Nominal Magnification	Magnification Range	Working Distance (at nom. Mag.)	Reference Part number
SR 5.6/120-0058	1 X	0,88 – 1,13 X	212 mm	1002647
SR 5.6/120-0059	0,75 X	0,63 – 0,88 X	252 mm	1002648
SR 5.6/120-0060	0,5 X	0,38 – 0,63 X	333 mm	1002650
SR 5.6/120-0061	0,33 X	0,26 – 0,38 X	453 mm	1004611
<b>Accessories</b>	V mount 25mm macro-extension tube		Necessary to combine the whole lens system	20179
	V mount to Leica adapter			20054
	Unifoc 76			13048
	Adapter M58x0.75 – M95x1			1062891
	Extension tube M95x1, 25mm		To be combined to reach the appropriate magnification	1062892
	Extension tube M95x1, 50mm			1062893
	Extension tube M95x1, 100mm			1062894
MYUTRON				
	Nominal Magnification	Working Distance	M95 Custom Mount available Aperture ( $\infty$ ) : 4.7	
XLS03-E	x0,3	477mm		
XLS53-E	x0,5	324mm		
XLS75-E	x0,75	246mm		
XLS010-E	x1	197mm		
XLS014-E	x1,4	170mm		
XLS203-E	x2	146mm		

EDMUND OPTICS			
	Nominal Magnification	Working Distance (at nom. Mag.)	Reference Part number
TechSpec F4	1 X	151 mm	NT68-222
TechSpec F4	1,33 X	158,5 mm	NT68-223
TechSpec F4	2,0 X	129 mm	NT68-224
TechSpec F4	3,0 X	110 mm	NT68-225
Accessories	Large Format Tip/Tilt Bolt Pattern Adapter, 2X		NT69-235
	Large Format Focusing Module		NT69-240
	Large Format Adapter Set		NT69-241
NAVITAR			
Raptar Pro 4/86	1 X	Extension Tubes on request	1 - 17494
NIKON			
Rayfact F4	0,05 X – 0,5 X	1820,4mm – 230,3mm	Rayfact ML90mm F4
NAVITAR			
Raptar Pro 4/86	Magnification : 1 X	Extension Tubes on request	1 - 17494

## Camera Models

Camera Part Number	Max Speed	Interface	Features
EV71YC1MCL1605-BA1	16k : 50kHz	CameraLink® 4, 8 or 10 Taps at 85MHz	-
EV71YC1MCL1605-BA2	16k : 50kHz	CameraLink® 4, 8 or 10 Taps at 85MHz	New Sensor and ROI