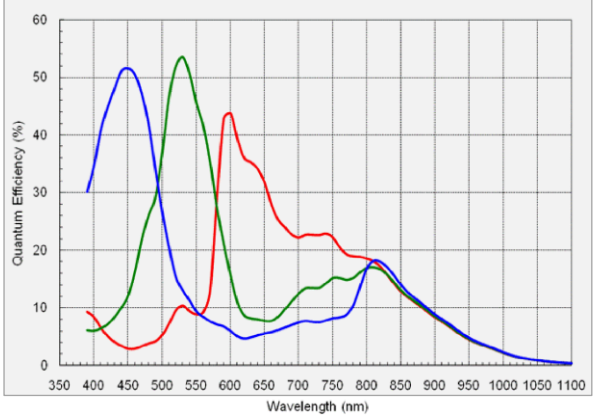
VFU-P031

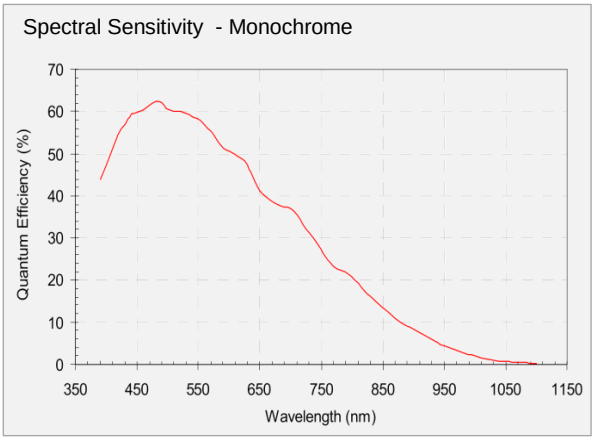
visiosens
Customized for High-Tech Industries

Camera Model	VFU-P031
Sensor Specifications	
Image sensor	Aptina MT9P031
Sensor type	CMOS
Optical size	1/2.5"
Chromatics	Mono / Color
Active pixels	2592(H) x 1944(V)
Pixel size	2.2µm x 2.2µm
Shutter type	Rolling shutter
Camera Specifications	
Partial scan	Yes
Binning	Yes
Subsampling	Yes
Integration time (min / max)	40µs - 3500ms
Supported bit depth	8- / 10-Bit
Full resolution frame rate (freerun)	4
Full resolution frame rate (triggered)	4
Dynamic range	>65dB
Interface	USB2.0
On-board image buffer	No
Power supply	5V DC via USB
Power consumption	<200mA

Spectral Sensitivity - Color



Spectral Sensitivity - Monochrome



Mechanical	
Packaging	Housed / Board-level
Available lens mount options	C / CS / M12
Dimensions (housed)	40mm x 40mm x 29mm
Dimensions (board-level M12)	34mm x 34mm x 17mm
Weight (housed)	75g
Weight (board-level)	11g

Environmental	
Storage temperature	-25°C to 85°C
Ambient operating temperature	-20°C to 70°C
Ambient humidity	20% to 95%, non condensing

System Requirements		
Hardware	CPU / RAM	1.8GHz / 1GB
	GPU	Supporting Pixel-Shader v2
	Camera interface	USB2.0 high-speed host
Software		.Net Framework 3.5 SP1
Supported operating systems (32 / 64 Bit)		Windows 2000 (SP3) Windows XP (SP3) Windows Vista Windows 7
Supported API languages		.Net (native) / C++-interface

Synchronization		
Inputs	Count / Internal circuit	2 / Opto-coupled
	High level / Maximum	1.8V / 24V
Outputs	Count / Internal circuit	2 / Opto-coupled
	Maximum voltage	24V

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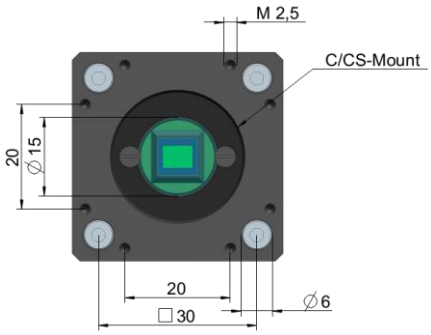
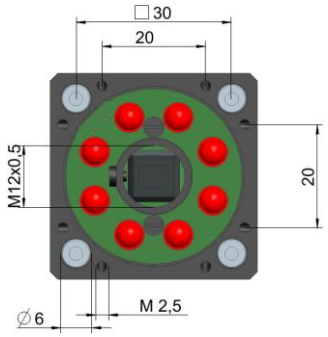
Mechanical Dimensions

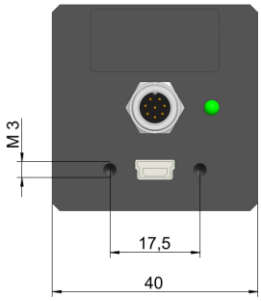
Housed

C-/CS-Mount | M12-Mount | Rear View (all Mounts)

Front View

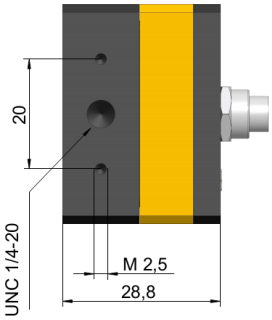


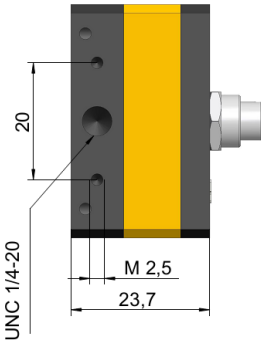




C-/M12-Mount | CS-Mount

Side View

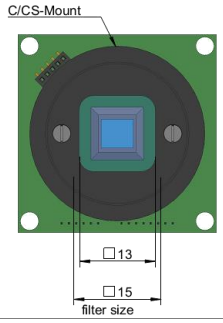


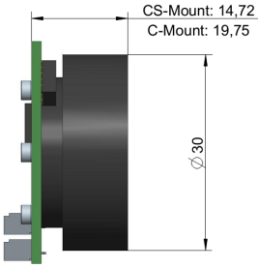


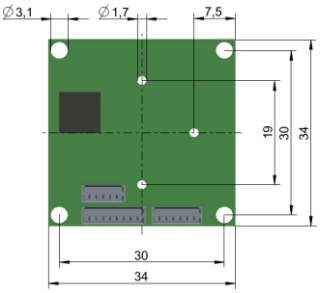
Board-Level B

Front View | Side View | Rear View (all Mounts)

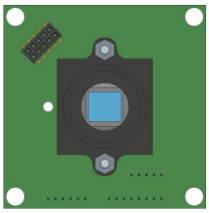
C-/CS-Mount

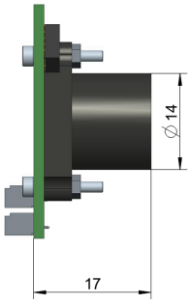


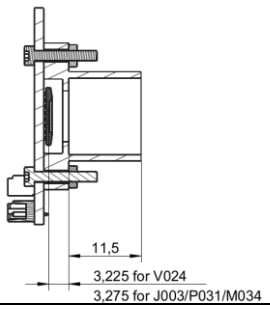




M12-Mount







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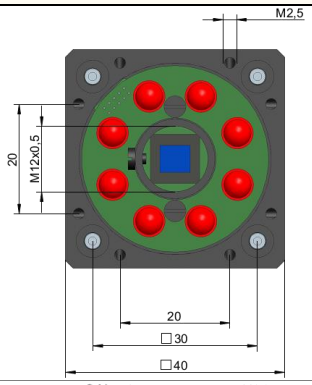
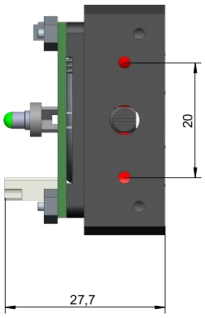
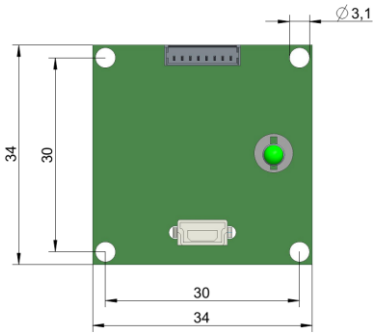
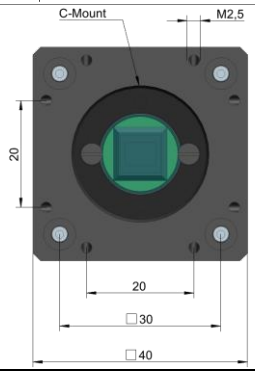
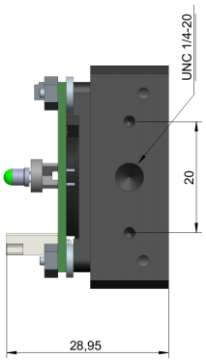
Mechanical Dimensions

Board-Level S

	Front View	Side View	Rear View (all Mounts)
M12a-Mount			
C-Mount (Square)			

Connectivity

Board-Level

USB-Connector (6 Pin; B-Version)
Type: Molex Picoblade 51021-0600

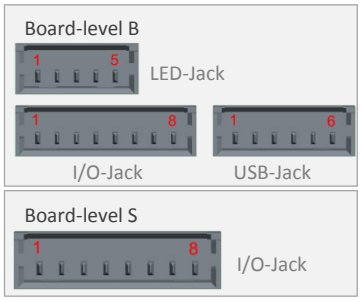
Pin	Standard	VFU-J003
1	SYS-/USB-GND	SYS-/USB-GND
2	D-	D-
3	D+	D+
4	USB Vcc	USB Vcc
5	SYS-/USB-GND	Cable shielding
6	Cable shielding	USB Vcc

LED-Connector (5 Pin, B-Version)
Type: Molex Picoblade 51021-0500

Pin	I_{LED}_max = 25mA per Channel!
1	VCC LED (5V)
2	LED_EXT OUT4
3	LED_EXT OUT3
4	LED_EXT OUT2
5	LED_EXT OUT1

I/O-Connector (8 Pin)
Type: Molex Picoblade 51021-0800

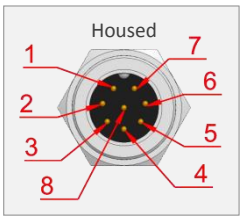
Pin	Board-Level B	Board-Level S
1	Trigger IN	IN2
2	IN1	IN1
3	IN2	Trigger IN
4	OUT1	GND for trig. / flash
5	GND INx / OUTx / Trig. IN	Flashlight OUT
6	OUT2	OUT2
7	Flashlight OUT	GND for INx / OUTx
8	GND for flashlight	OUT1



Housed

I/O-Connector (8-Pin)
Type: Binder 09 0481 65 08

Pin	Housed
1	GND for trigger / flashlight
2	Trigger IN
3	IN1
4	IN2
5	OUT1
6	GND INx / OUTx
7	OUT2
8	Flashlight OUT



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Ordering Information for Visiosens VFU Camera Platform

VFU - P031 - MH - C - IRC - LED470

Interface
U: USB2.0
U3: USB3.0

Sensor
V024
M034
P031
J003
X445
CMV2000

Chromatics
M : mono
C : color

Packaging
H: housing
S: board level with standard interface
B: board level with Molex jacks

Mount
Blank: without mount
C: C-mount for housing, round C-mount for packaging B, square C-mount (aluminum) for packaging S
CS: CS-mount for housing, round CS-mount for packaging B, square CS-mount (aluminum) for packaging S
M12: M12-mount for housing, round M12-mount for packaging B, square M12-mount (aluminum) for packaging S

Filter
Blank, in case of packaging S, B with mount C, CS, M12 or without mount: none
Blank, in case of chromatics M: clear glass window
Blank, in case of chromatics C: IR cut filter
IRC: IR cut
IRP: IR long pass
CLG: clear glass window

LED wavelength [nm]
Blank: none
LED470, LED525, LED590, LED630, LED670, LED850, LEDww (warm white)

Sensor Options

Order code	Sensor	Technology	Resolution	Frame rate [fps]		Sensor size	Pixel size	Exposure time	ADC depth
				USB2.0	USB3.0				
V024	Aptina MT9V024	CMOS, Global Shutter	752x480 0.4 MP	60	-	1/3“	6 µm	60µs – 500ms	8- / 10-Bit
M034	Aptina MT9M034	CMOS, Rolling Shutter	1280x960 1.2 MP	25	45*	1/3”	3.75 µm	40µs – 6000ms	8- / 10-Bit
P031	Aptina MT9P031	CMOS, Rolling Shutter	2592x1944 5.0 MP	4	14*	1/2.5”	2.2 µm	10µs – 3500ms	8- / 10-Bit
J003	Aptina MT9J003	CMOS, Rolling Shutter	3664x2748 10.1 MP	3.5	7.5*	1/2.3”	1.67 µm	60µs – 14000ms	8- / 10-Bit
X445*	Sony ICX445	CCD	1280x960 1.2 MP	22	-	1/3”	3.75 µm	50µs - 2500ms	8- / 10-Bit
CMV2000*	CMOSIS CMV2000	CMOS, Global Shutter	2048x1088 2.2 MP	-	85	2/3”	5.5µm	50µs - 4000ms	8-/ 10-Bit

* Available 2013

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Mount Options

Order code	Packaging / Description	Dependencies with other options
C	Housing: C-mount, aluminum Board-level B: C-mount, round, plastic Board-level S: C-mount, square, aluminum	not compatible to LED ring
CS	Housing: CS-mount, aluminum Board-level B: CS-mount, round, plastic Board-level S: CS-mount, square, aluminum	not compatible to LED ring
M12	Housing: S-mount, M12x0.5 thread, aluminum Board-level B: S-mount, M12x0.5 thread, round, plastic Board-level S: S-mount, M12x0.5 thread, square, aluminum	no filter option available Board-level B: Limited screw in depth

Filter Options

Order code	Description	Dependencies with other options
blank	for monochrome cameras: clear glass window for color cameras: IR cut filter (see option IRC) for mount M12: no filter, no clear glass	-
IRC	IR-cut filter, cuts IR radiation at wavelengths below 670nm	not available for Mount Option M12
IRP	IR-pass filter, lets IR radiation pass at a wavelength above 680nm	not available for Mount Option M12
CLG	clear glass window	not available for Mount Option M12

LED-Ring Options

Order code	Description	Dependencies with other options
LED470, LED525, LED590, LED630, LED670, LED850	LED Ring with 8 LEDs at corresponding wavelength, LED ring is either embedded in the housing or mounted on the board level camera	requires Mount Option M12
LEDww	LED Ring with 8 LEDs of warm white, LED ring is either embedded in the housing or mounted on the board level camera	requires Mount Option M12

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