

PRIME BSI EXPRESS CMOS CAMERA

KEY FEATURES

- Backside sensor illumination
- 95% quantum efficiency
- 95 frames per second
- 6.5 μm pixels
- 1.0 e^- read noise
- Compact form factor, ideal for integration
- High dynamic range
- Programmable scan mode to control camera readout

TYPICAL APPLICATIONS

- Light-sheet microscopy
- Super-resolution microscopy
- Spinning disk confocal imaging
- Live cell imaging
- Calcium imaging
- Fluorescence imaging

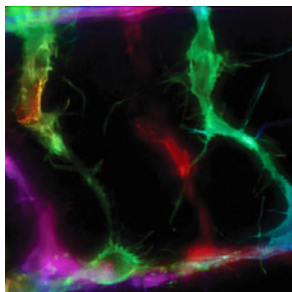
RELIABILITY

- Three-year warranty
- Extended warranty available

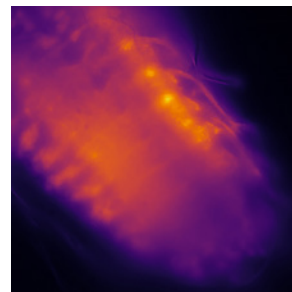
High-Sensitivity, High Speed CMOS

The Prime BSI Express CMOS camera is a compact and powerful imaging solution, offering high-resolution and high sensitivity at speeds up to 95 fps over USB. The compact design is optimized for easy integration without causing limitations on camera performance.

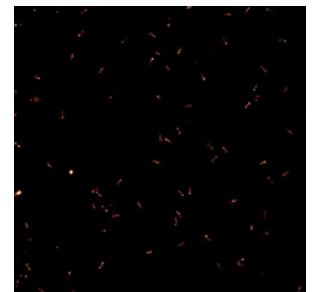
This perfect balance in performance makes the Prime BSI Express a highly versatile CMOS camera that is easy to integrate into imaging systems, acquiring data at high speeds, with no event undetected.



Axially-swept light sheet
Prof. Reto Fiolka



Calcium imaging
Prof. Mathias Wernet



DNA-PAINT super resolution
Prof. David Klenerman

PRIME BSI EXPRESS SPECIFICATIONS

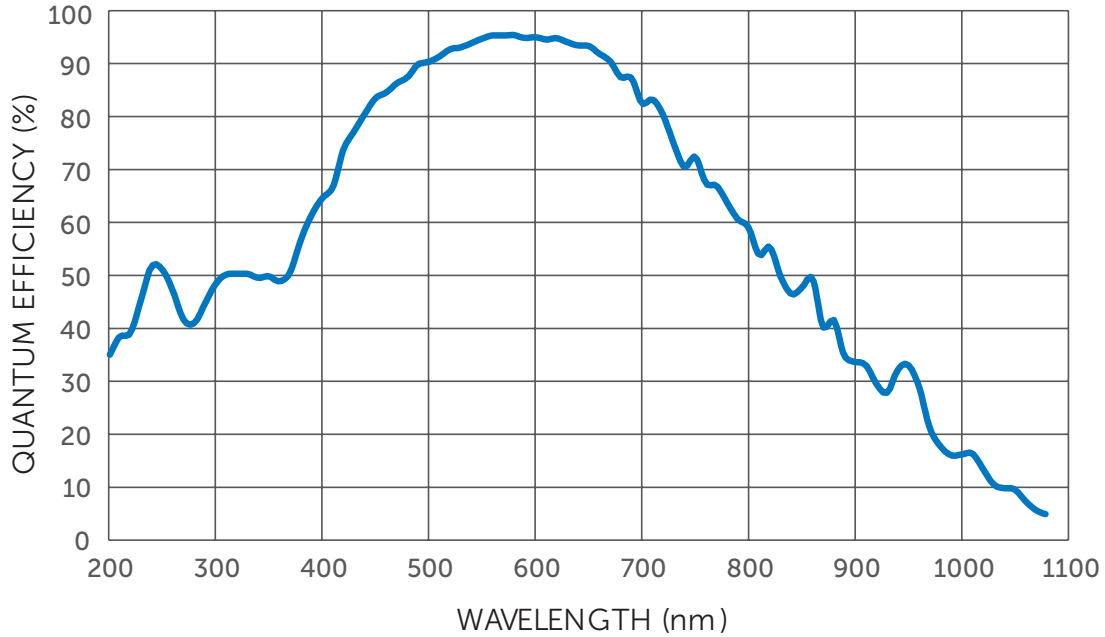
SPECIFICATIONS	Camera Performance
Sensor	GPixel GSENSE2020BSI scientific CMOS sensor
Active Array Size	2048 x 2048 (4.2 megapixel)
Pixel Area	6.5 x 6.5 μm (42.25 μm^2)
Sensor Area	13.2 mm x 13.2 mm (18.7 mm diagonal)
Peak QE%	95%
Readout Modes	Rolling shutter
	Effective global shutter
	Programmable scan mode
Digital Binning	2 x 2
Linearity	> 99.5%
Cooling Options	Air cooled (-20 °C @ 30 °C ambient, 0.5 e ⁻ /pixel/second dark current)
Digital Interfaces	USB 3.2gen2 10Gbps
Lens Interfaces	C-mount
Mounting Points	4 x ¼" -20 UNC mounting points
Camera Weight	0.76 kg, 1.67 lbs

CAMERA MODES

SPECIFICATIONS	Speed (200 MHz)	HDR (100 MHz)	CMS (100 MHz)
Bit Depth	11-bit	16-bit	12-bit
Frame Rate (Full Frame)	95 fps	43 fps	43fps
Read Noise	1.6 e ⁻	1.6 e ⁻	1.0 e ⁻
Cooling (Air)	0 °C	0 °C	0 °C
Line Time	5.14 $\mu\text{sec}/\text{line}$	11.4 $\mu\text{sec}/\text{line}$	11.4 $\mu\text{sec}/\text{line}$
Dark Current (Air)	1.5 e ⁻ /p/sec	1.5 e ⁻ /p/sec	1.5 e ⁻ /p/sec
Full Well Capacity	10,000 e ⁻	45,000 e ⁻	1,000 e ⁻

TRIGGERING MODE	Function
INPUT TRIGGER MODES	
Trigger First	Sequence triggered on first rising edge
Edge Trigger	Each frame in sequence triggered by rising edge
SMART Streaming	Fast iteration through multiple exposure times, works with the four trigger out cables to control multiple light sources at multiple exposure times
OUTPUT TRIGGER MODES	
Any Row	Expose signal is high while any row is acquiring data
First Row	Expose signal is high while first row is acquiring data
Line Output	Expose signal provides rising edge for each row advanced by the rolling shutter readout
EFFECTIVE GLOBAL SHUTTER TRIGGER MODES	
All Row	Expose out signal high for exposure time, maintains exposure time but drops frame rate
Rolling Shutter	Expose out signal high for exposure time – readout time. Keeps frame rate but drops exposure time.
OUTPUT TRIGGER SIGNALS	
Expose Out (up to four signals), Read Out, Trigger Ready	

PRIME BSI EXPRESS QE CURVE



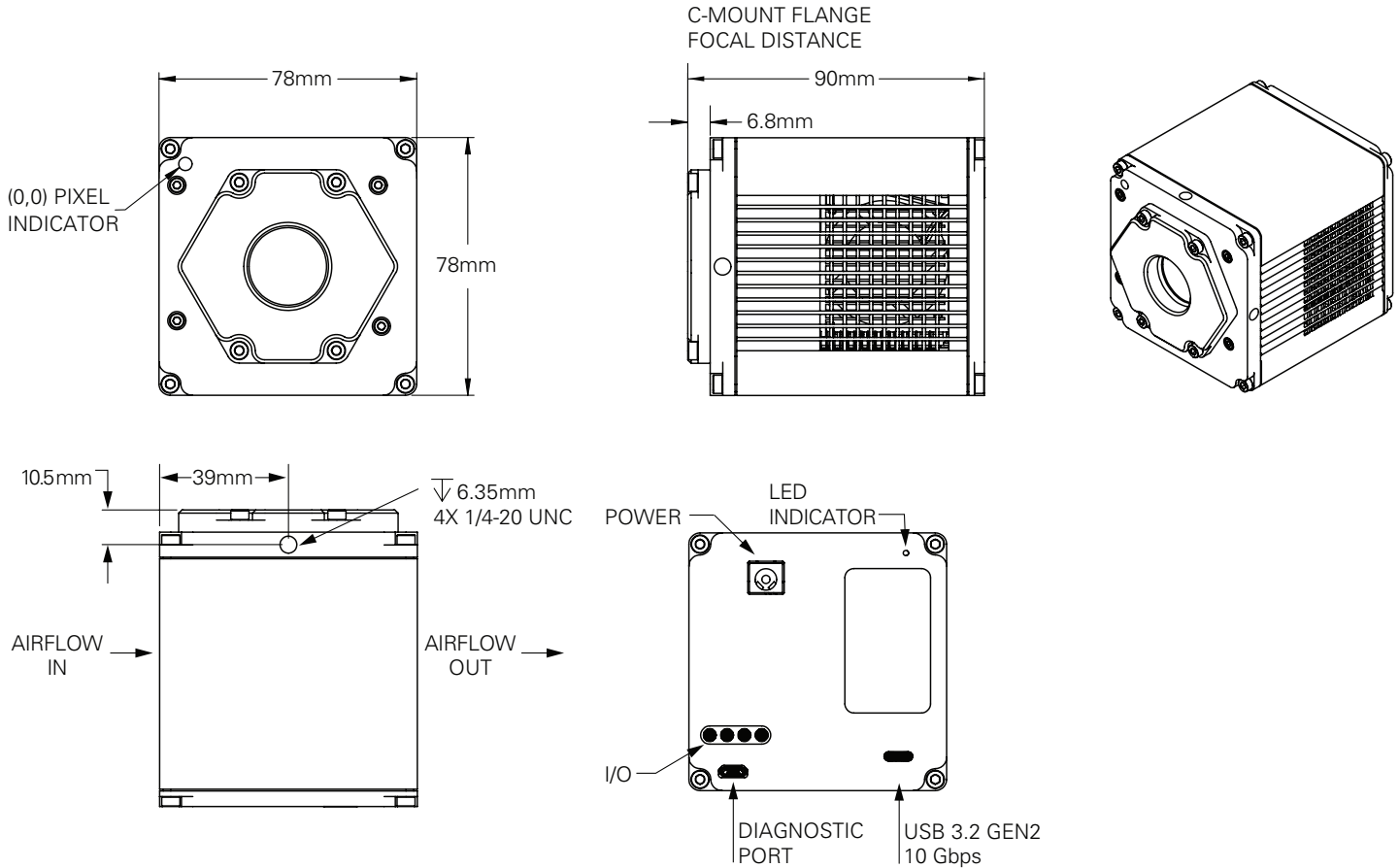
PRIME BSI EXPRESS SPEED TABLE

FRAME RATES (HZ)		
ARRAY SIZE	SPEED (11-bit)	HDR (16-bit) and CMS (12-bit)
2048 x 2048	95	43
2048 x 1024	188	87
2048 x 512	375	174
2048 x 256	745	347
2048 x 128	1468	690

PRIME BSI EXPRESS PROGRAMMABLE SCAN MODE

PROGRAMMABLE SCAN MODE	Function
SCAN MODES	
Auto	Normal camera operation
Line Delay	Control rolling shutter propagation rate by adding delays to the line time
Scan Width	Control number of rows between reset and readout signal in the rolling shutter
SCAN DIRECTION	
Down	Rolling shutter readout begins at the top of the sensor
Up	Rolling shutter readout begins at the bottom of the sensor
Down/Up Alternate	Rolling shutter readout alternates direction after starting at the top of the sensor

PRIME BSI EXPRESS DIMENSIONAL OUTLINES (UNIT: MM)



PRIME BSI EXPRESS ACCESSORIES

ACCESSORIES (INCLUDED)	
USB 3.2gen2 10Gbs interface card	Power supply (12V/10A DC)
USB 3.2gen2 10Gbs A-C 0.9 m	PVCAM drivers/software
USB 3.2gen2 10Gbs C 3 m	Quick installation guide
BNC trigger cable	Performance and gain test data



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