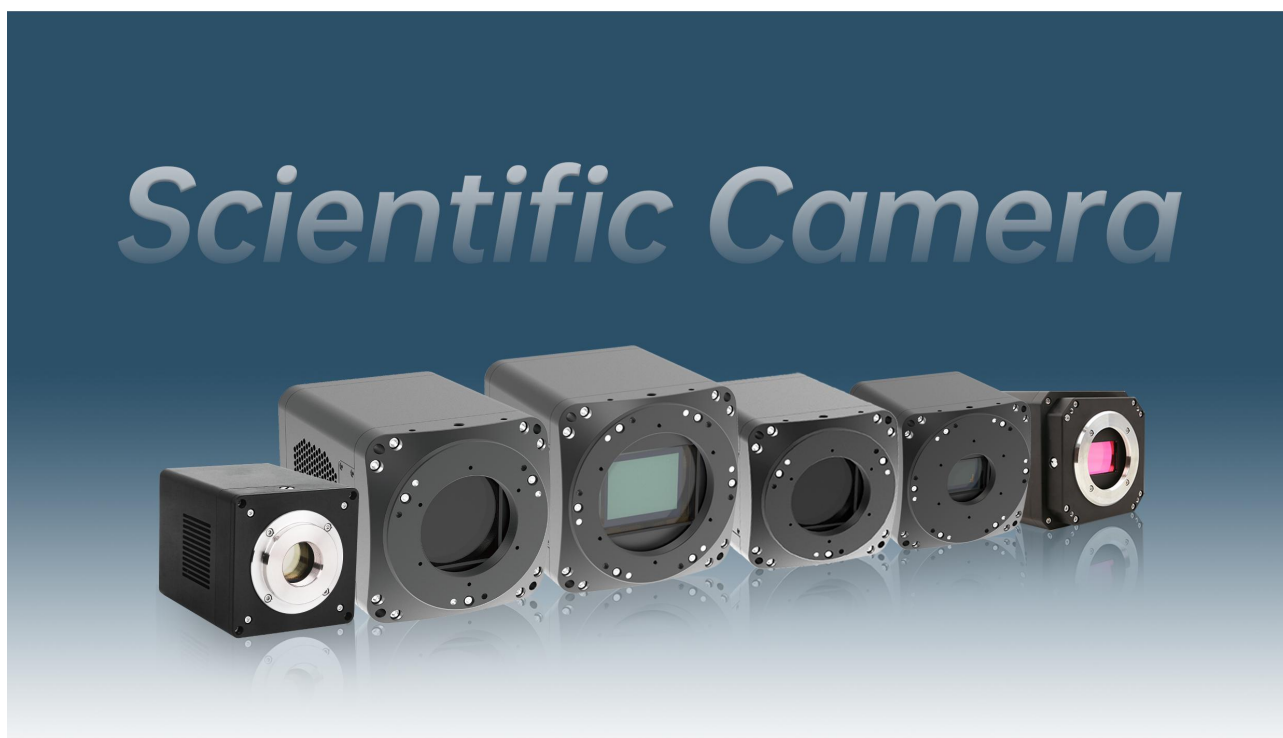


User Manual for Scientific Cameras



20241202

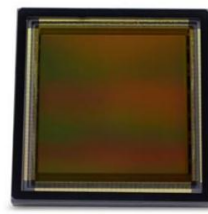
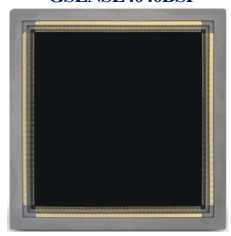
Contents

USER MANUAL FOR SCIENTIFIC CAMERAS.....	1
1 PRODUCT LIST.....	3
1.1 SCIENTIFIC HIGH SENSITIVITY CAMERA SPECIFICATIONS(9).....	3
1.1.1 sMAX Series(7).....	3
1.1.2 sCCD Series(1).....	4
1.1.3 sNIRII Series(1).....	5
1.2 SCIENTIFIC HIGH SPEED CAMERA SPECIFICATIONS(6).....	6
1.3 SCIENTIFIC HIGH RESOLUTION CAMERA SPECIFICATIONS(1).....	7
2 HIGH SENSITIVITY CAMERA SPECIFICATION(9).....	8
2.1 sMAX04BM.....	8
2.2 sMAX16AM.....	10
2.3 sMAX16BM.....	12
2.4 sCCD01AM.....	14
2.5 sNIRII640A-U3-10G.....	15
3 HIGH SPEED CAMERA SPECIFICATION(6).....	16
3.1 SS21MPA-U3-CXP.....	16
3.2 SS21MMA-U3-CXP.....	17
3.3 SS10MPA-U3-CXP.....	18
3.4 SS10MMA-U3-CXP.....	20
3.5 SS02MPA-U3-CXP.....	22
3.6 SS02MMA-U3-CXP.....	23
4 HIGH RESOLUTION CAMERA SPECIFICATION(1).....	25
4.1 SR600MMA.....	25
5 CAMERA DIMENSION AND INTERFACE.....	26
5.1 sMAX04BM.....	26
5.1.1 Mechanical Housing Dimensions.....	26
5.1.2 Interface Description.....	26
5.1.3 Power Supply and I/O Connector.....	27
5.1.4 Packing Information.....	27
5.2 sMAX04BM-CL100.....	28
5.2.1 Mechanical Housing Dimensions.....	28
5.2.2 Interface Description.....	28
5.2.3 Power Supply and I/O Connector.....	29
5.2.4 Packing Information.....	29
5.3 sMAX16AM & sMAX16BM.....	30
5.3.1 Mechanical Housing Dimensions.....	30
5.3.2 Interface Description.....	30
5.3.3 Power Supply and I/O Connector.....	31
5.3.4 Packing Information.....	31
5.4 sCCD01AM.....	32
5.4.1 Mechanical Housing Dimensions.....	32
5.4.2 Interface Description.....	32
5.4.3 Power Supply and I/O Connector.....	33
5.4.4 Packing Information.....	33

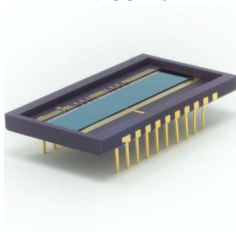
1 Product List

1.1 Scientific High Sensitivity Camera Specifications(9)

1.1.1 sMAX Series(7)

Sensor	GSENSE2020BSI 	GSENSE4040 	GSENSE4040BSI 
Camera model	sMAX04BM sMAX04BM-U100 sMAX04BM-CL100	sMAX16AM-U3-CL sMAX16AM-U3-CL-GPS	sMAX16BM-U3-CL sMAX16BM-U3-CL-GPS
Pixel size	6.5μm x 6.5μm	9μm x 9μm	9μm x 9μm
Sensor size	1.2"	3.2"	3.2"
Resolution	2048 x 2048 1024 x 1024(bin 2x2)	4096 x 4096 2048 x 2048 (bin 2x2)	4096 x 4096 2048 x 2048 (bin 2x2)
Spectral range	200nm-1100nm	300nm-1000nm	200nm-1100nm
QE	95%@560nm	74%@600nm	90%@550nm
Data Format	8bit / 11bit / 12bit / 16bit	8bit / 12bit / 16bit	8bit / 12bit / 16bit
Target application	Fluorescence imaging Spectral analysis Gene sequencing Semiconductor inspection	Fluorescence imaging Spectral analysis Astro observation	Fluorescence imaging Spectral analysis Astro observation Semiconductor inspection

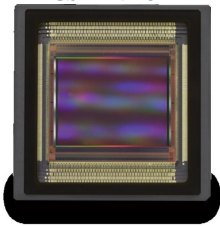
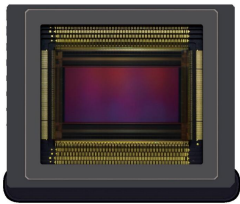
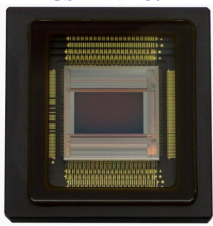
1.1.2 sCCD Series(1)

Sensor	E2V CCD261 
Camera model	sCCD01AM Coming soon
Pixel size	15μm x 15μm
Sensor size	30.7mm x 4.0mm
Resolution	2048 x 264
Spectral range	250nm-1050nm
QE	95%@800nm
Data Format	8bit / 16bit
Target application	Raman spectra detection Photoluminescence / Fluorescence Hyperspectral imaging

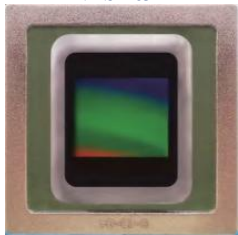
1.1.3 sNIRII Series(1)

Sensor	Nationally produced InGaAs Image sensor
Camera model	sNIRII640A-U3-10G Coming soon
Pixel size	15μm x 15μm
Sensor size	3/4"
Resolution	640 x 512
Spectral range	900nm-1700nm
QE	TBD
Data Format	8bit / 16bit
Target application	Near-infrared II-region in vivo microscopy imaging

1.2 Scientific High Speed Camera Specifications(6)

Sensor	GSPRINT4521 	GSPRINT4510 	GSPRINT4502 
Camera model	SS21MPA-U3-CXP SS21MMA-U3-CXP Coming soon	SS10MPA-U3-CXP SS10MMA-U3-CXP Coming soon	SS02MPA-U3-CXP SS02MMA-U3-CXP Coming soon
Pixel size	4.5μm x 4.5μm	4.5μm x 4.5μm	4.5μm x 4.5μm
Sensor size	1.86"	1.44"	0.67"
Resolution	5120 x 4096 2560 x 2048(bin 2x2)	4608 x 2176 2304 x 1088 (bin 2x2)	2048 x 1216 1024 x 608 (bin 2x2)
Spectral range	300nm-1100nm	300nm-1100nm	300nm-1100nm
QE	62.8%@520nm (Mono)	63%@550nm (Mono)	65.7%@550nm (Mono)
Data Format	8bit / 10bit / 12bit	8bit / 10bit / 12bit	8bit / 10bit / 12bit
Target application	High speed industrial inspection High-end photography industry	High speed industrial inspection High-end photography industry	High speed industrial inspection High-end photography industry

1.3 Scientific High Resolution Camera Specifications(1)

Sensor	VPS2163A 
Camera model	SR600MMA Coming soon
Pixel size	0.5μm x 0.5μm
Sensor size	1.08"
Resolution	20480 x 27200
Spectral range	TBD
QE	TBD
Data Format	8bit / 10bit
Target application	Microscopic observation of cells or organisms

2 High Sensitivity Camera Specification(9)

2.1 sMAX04BM

Table 2- 1 sMAX04BM camera specifications

Model		sMAX04BM	sMAX04BM-U100	sMAX04BM-CL100
Parameter		Camera		
Sensor model		GSENSE2020BSI		
Sensor type		CMOS		
Spectral range		200nm - 1100nm		
pixel size		6.5 μm x 6.5 μm		
Target size		1.2"		
Resolution		2048 x 2048 1024 x 1024(bin 2x2)		
Frame Rate		72.5fps@2048x2048 72.5fps@1024x1024	89fps@2048x2048 100fps@1024x1024	108fps@2048x2048 108fps@1024x1024
Memory		512MB (4Gb)		
Conversion gain	11bit	1.03		
	12bit	0.42(HCG) 13.33(LCG)		
	12bit CMS	0.43		
	12bit Global reset	0.44(HCG) 1.92(LCG)		
	HDR 11HL	0.58		
	HDR 12HL	0.54		
Dynamic Range	11bit	61.38dB		
	12bit	59.73dB(HCG) 67.17dB(LCG)		
	12bit CMS	64.12dB		
	12bit Global reset	58.63dB(HCG) 61.27dB(LCG)		
	HDR 11HL	91.83dB		
	HDR 12HL	86.02dB		
Read noise	11bit	1.69e-		
	12bit	1.72e-(HCG) 23.25e-(LCG)		
	12bit CMS	1.07e-		
	12bit Global reset	2.08e-(HCG) 6.62e-(LCG)		
	HDR 11HL	0.97e-		
	HDR 12HL	1.78e-		
Full well charge	11bit	1.98ke-		
	12bit	1.67ke-(HCG) 53.07ke-(LCG)		
	12bit CMS	1.71ke-		
	12bit Global reset	1.78ke-(HCG) 7.66ke-(LCG)		
	HDR 11HL	37.85ke-		
	HDR 12HL	35.56ke-		
SNR	11bit	32.97dB		
	12bit	32.22dB(HCG) 47.25dB(LCG)		
	12bit CMS	32.34dB		
	12bit Global reset	32.49dB(HCG) 38.85dB(LCG)		
	HDR 11HL	45.78dB		
	HDR 12HL	45.51dB		
Sensitivity		1.1x10 ⁸ e-/((W/m ²).s)@550nm		
Dark current		Typical: 0.45e-/s/pix@ -30°C die temp		
QE		95%@560nm		
Exposure time range		12us-300s	12us-10s	12us-10s
Gain Range		1x – 21x	1x	1x – 21x
Shutter mode		Rolling shutter / Global reset		
Binning mode		Software 2x2, 3x3, 4x4, Hardware FPGA 2x2		
Data interface		USB3.0	USB3.0	CameraLink
Digital I/O		One optical-coupling isolated input, one optical-coupling isolated output, tow non-isolated input and output		
Data Format		8bit / 11bit / 12bit / 16bit		
Cooling temperature difference		Below room temperature 40 degrees Celsius		

General parameters	
Power supply	DC12V power supply
Power consumption	<25W
Temperature	Working temperature -30 ~ 60 °C , storage temperature - 40 ~ 85 °C
Humidity	20%-80% , non-condensing
Size	80*80*101.5
Weight	860g
Lens mount	C-mount interface
Software	Provide Complete SDK (software development kit) / ToupView / SDK development kit and CL View software based on Delsa acquisition card

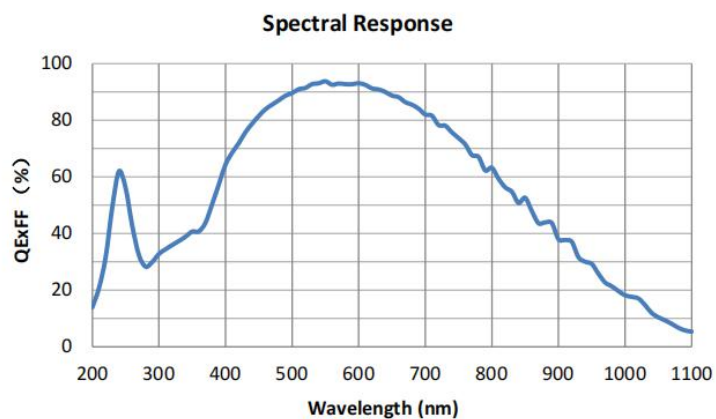


Figure 1 The spectral QE of GSENSE2020BSI

2.2 sMAX16AM

Table 2- 2 sMAX16AM camera specifications

Parameter		Model	sMAX16AM-U3-CL sMAX16AM-U3-CL-GPS
Camera			
Sensor model		GSENSE4040	
Sensor type		CMOS	
Spectral range		300nm - 1000nm	
pixel size		9 μm x 9 μm	
Target size		3.2"	
Resolution		4096 x 4096 2048 x 2048 (bin 2x2)	
Frame Rate	USB3	20fps@4096x4096, 80fps@2048x2048	
	CameraLink	23fps@4096x4096, 90fps@2048x2048	
Memory		1024MB (8Gb)	
Conversion gain	12bit	0.86e-/DN(HCG 16.5x) 20.94e-/DN (LCG 2.8x)	
	12bit Global reset	TBD	
	HDR16	0.94e-/DN	
Dynamic Range	12bit	58.5dB(HCG 16.5x) 67.5dB(LCG 2.8x)	
	12bit Global reset	TBD	
	HDR16	82.5dB	
Read noise	12bit	4.06e-(HCG 16.5x) 35.61e-(LCG 2.8x)	
	12bit Global reset	TBD	
	HDR16	4.59e-	
Full well charge	12bit	3.45ke-(HCG 16.5x) 84.33ke-(LCG 2.8x)	
	12bit Global reset	TBD	
	HDR16	61.49ke-	
SNR	12bit	35.4dB(HCG 16.5x) 49.3dB(LCG 2.8x)	
	12bit Global reset	TBD	
	HDR16	47.9dB	
Sensitivity		23.82 V/(lux-s)@600nm	
Dark current		0.15e-/s/pix	
QE		74% @ 600nm	
Dark signal inhomogeneity		0.5e-	
Optical signal inhomogeneity		0.2%	
Exposure time range		12us-3600s	
Gain Range		1x – 16.5x	
Shutter mode		Rolling shutter / Global reset	
Binning mode		Software 2x2, 3x3, 4x4, Hardware 2x2	
Data interface		USB3.0 / CameraLink	
Digital I/O		One optical-coupling isolated input, one optical-coupling isolated output, tow non-isolated input and output	
Data Format		8bit / 12bit / 16bit	
Cooling temperature difference		Below room temperature 40 degrees Celsius	
General parameters			
Power supply		DC19V 4.74A power supply	
Power consumption		TEC ON: 58.7W; TEC OFF: 16.2W; TEC OFF + CameraLink Only: 8.2W	
Temperature		Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C	
Humidity		0-95%	
Size		100*100*127.7	
Weight		1317g	
Lens mount		M54 x 0.75	
Software		ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc	
SDK		C, C++, C#, Python	
Operating system		Windows, Linux	

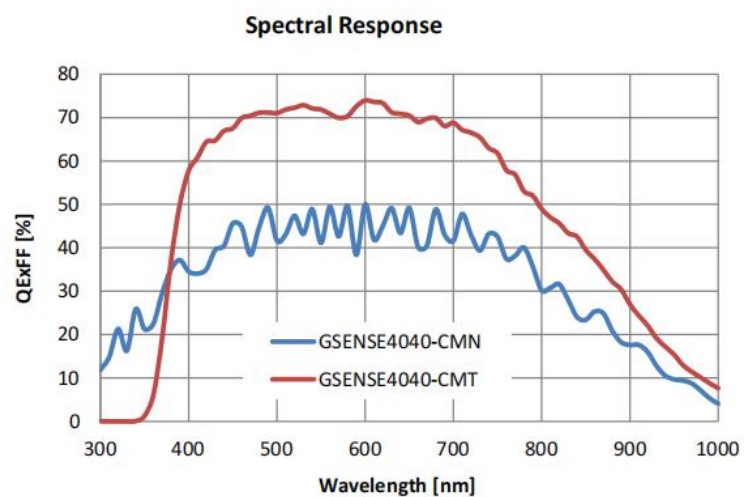


Figure 2 The spectral QE of GSENSE4040

2.3 sMAX16BM

Table 2- 3 sMAX16BM camera specifications

Parameter		Model	sMAX16BM-U3-CL sMAX16BM-U3-CL-GPS
Camera			
Sensor model		GSENSE4040BSI	
Sensor type		CMOS	
Spectral range		200nm - 1100nm	
pixel size		9 μm x 9 μm	
Target size		3.2"	
Resolution		4096 x 4096 2048 x 2048 (bin 2x2)	
Frame Rate	USB3	20fps@4096x4096	
	CameraLink	23fps@4096x4096	
Memory		1024MB (8Gb)	
Conversion gain	12bit	0.35e-/DN(HCG 12x) 10.42e-/DN(LCG 3x)	
	12bit Global reset	TBD	
	HDR16	TBD	
Dynamic Range	12bit	55.0dB(HCG 12x) 62.4dB(LCG 3x)	
	12bit Global reset	TBD	
	HDR16	TBD	
Read noise	12bit	4.06e-(HCG 12x) 35.61e-(LCG 3x)	
	12bit Global reset	TBD	
	HDR16	TBD	
Full well charge	12bit	1.30ke-(HCG 12x) 39.2ke-(LCG 3x)	
	12bit Global reset	TBD	
	HDR16	TBD	
SNR	12bit	30.7dB(HCG 12x) 45.9dB(LCG 3x)	
	12bit Global reset	TBD	
	HDR16	TBD	
Sensitivity		26.58 V/(lux-s)@550nm	
Dark current		0.15e-/s/pix	
QE		90% @ 550nm	
Dark signal inhomogeneity		0.5e-	
Optical signal inhomogeneity		0.2%	
Exposure time range		12us-3600s	
Gain Range		1x – 12x	
Shutter mode		Rolling shutter / Global reset	
Binning mode		Software 2x2, 3x3, 4x4	
Data interface		USB3.0 / CameraLink	
Digital I/O		One optical-coupling isolated input, one optical-coupling isolated output, tow non-isolated input and output	
Data Format		8bit / 12bit / 16bit	
Cooling temperature difference		Below room temperature 40 degrees Celsius	
General parameters			
Power supply		DC19V 4.74A power supply	
Power consumption		TEC ON: 58.7W; TEC OFF: 16.2W; TEC OFF + CameraLink Only: 8.2W	
Temperature		Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C	
Humidity		0-95%	
Size		100*100*127.7	
Weight		1317g	
Lens mount		M54 x 0.75	
Software		ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc	
SDK		C, C++, C#, Python	
Operating system		Windows, Linux	

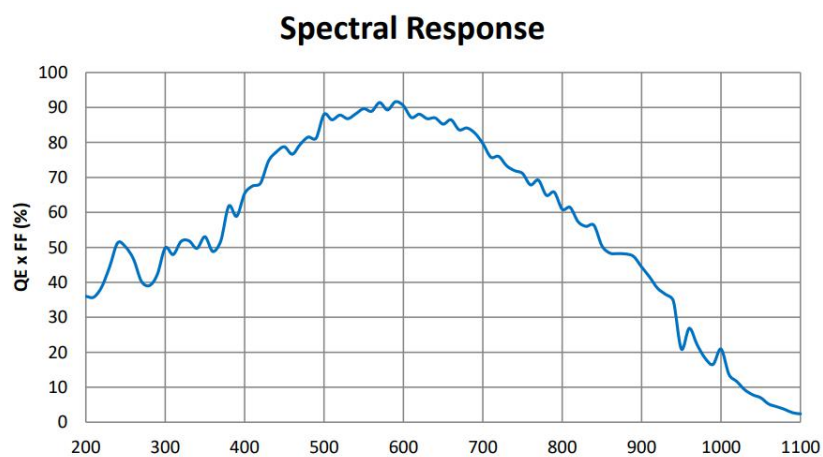


Figure 3 The spectral QE of GSENSE4040BSI

2.4 sCCD01AM

Table 2- 4 sCCD01AM camera specifications

Parameter	Model
	sCCD01AM
	Camera
Sensor model	E2V CCD261
Sensor type	CCD
Spectral range	300nm - 1000nm
pixel size	15 μm x 15 μm
Target size	30.7mm x 4.0mm
Resolution	TBD@2048 x 264
Memory	512MB (4Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	3e- rms
Full well charge	75ke-
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	95% @ 800nm
Dark signal inhomogeneity	TBD
Optical signal inhomogeneity	TBD
Exposure time range	$\leq 60\text{mins}$
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / GigE
Digital I/O	TBD
Data Format	8bit / 16bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 $^{\circ}\text{C}$, storage temperature - 40 ~ 60 $^{\circ}\text{C}$
Humidity	0-95%
Size	100*80*79.25
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

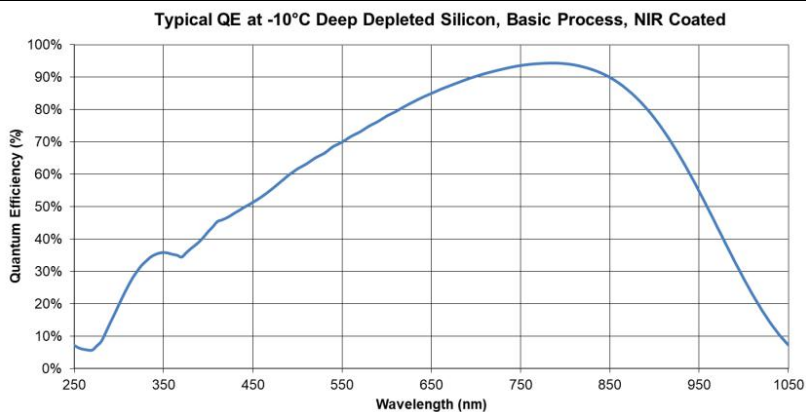


Figure 4 The spectral QE of CCD261

2.5 sNIRII640A-U3-10G

Table 2- 5 sNIRII640A-U3-10G camera specifications

Parameter	Model
	sNIRII640A-U3-10G
	Camera
Sensor model	Nationally produced InGaAs Image sensor
Spectral range	900nm - 1700nm
pixel size	15 μm x 15 μm
Target size	3/4"
Resolution	TBD@640 x 512
Memory	512MB (4Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	75ke-
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	TBD
Dark signal inhomogeneity	TBD
Optical signal inhomogeneity	TBD
Exposure time range	TBD
Gain Range	TBD
Shutter mode	TBD
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / 10GigE
Digital I/O	TBD
Data Format	8bit / 16bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

3 High Speed Camera Specification(6)

3.1 SS21MPA-U3-CXP

Table 3- 1 SS21MPA-U3-CXP camera specifications

Parameter	Model
	SS21MPA-U3-CXP
	Camera
Sensor model	GSPRINT4521-AVC
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	4.5μm x 4.5 μm
Target size	1.86''
Resolution	TBD@5120 x 4096 TBD@2560 x 2048(bin 2x2)
Memory	1024MB (8Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	TBD
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / CXP
Digital I/O	TBD
Data Format	8bit / 10bit / 12bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

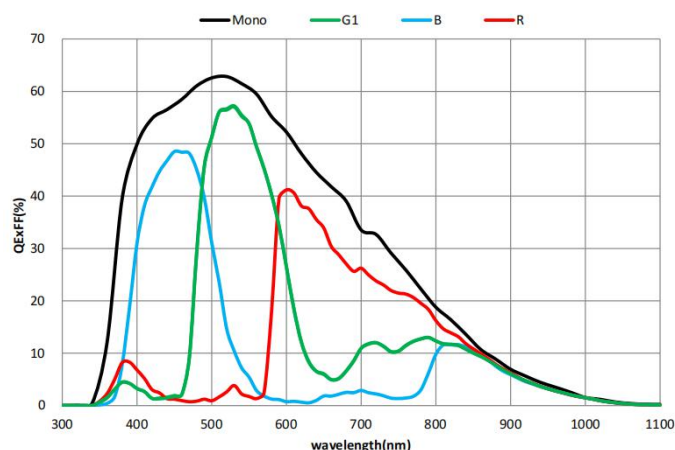


Figure 5 The spectral QE of GSPRINT4521

3.2 SS21MMA-U3-CXP

Table 3- 2 SS21MMA-U3-CXP camera specifications

Parameter	Model
	SS21MMA-U3-CXP
	Camera
Sensor model	GSPRINT4521-AVM
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	4.5μm x 4.5 μm
Target size	1.86"
Resolution	TBD@5120 x 4096 TBD@2560 x 2048(bin 2x2)
Memory	1024MB (8Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	62.8%@520nm (Mono)
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / CXP
Digital I/O	TBD
Data Format	8bit / 10bit / 12bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

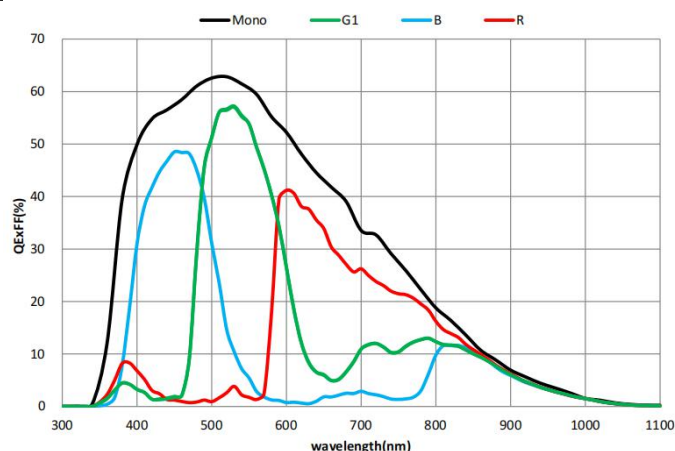


Figure 6 The spectral QE of GSPRINT4521

3.3 SS10MPA-U3-CXP

Table 3- 3 SS10MPA-U3-CXP camera specifications

Parameter	Model
	SS10MPA-U3-CXP
	Camera
Sensor model	GSPRINT4510-AVC
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	4.5μm x 4.5 μm
Target size	1.44”
Resolution	TBD@4608 x 2176 TBD@2304 x 1088 (bin 2x2)
Memory	1024MB (8Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	TBD
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / CXP
Digital I/O	TBD
Data Format	8bit / 10bit / 12bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

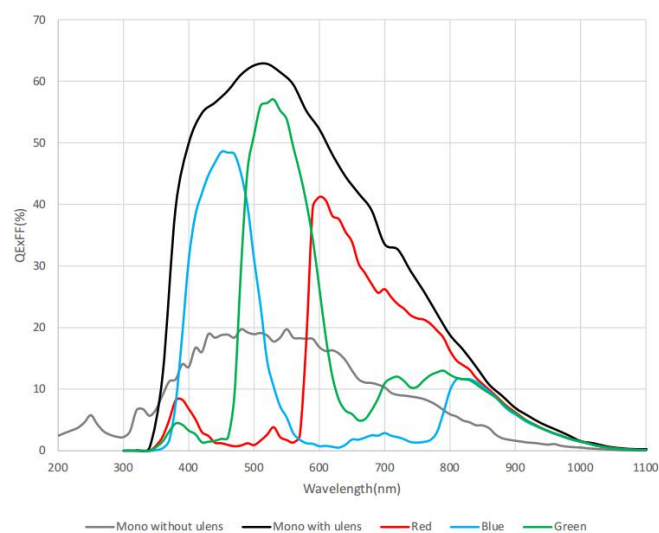


Figure 7 The spectral QE of GSPRINT4510

3.4 SS10MMA-U3-CXP

Table 3- 4 SS10MMA-U3-CXP camera specifications

Parameter \ Model	SS10MMA-U3-CXP
	Camera
Sensor model	GSPRINT4510-AVM
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	4.5μm x 4.5 μm
Target size	1.44”
Resolution	TBD@4608 x 2176 TBD@2304 x 1088 (bin 2x2)
Memory	1024MB (8Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	63%@550nm (Mono)
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / CXP
Digital I/O	TBD
Data Format	8bit / 10bit / 12bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

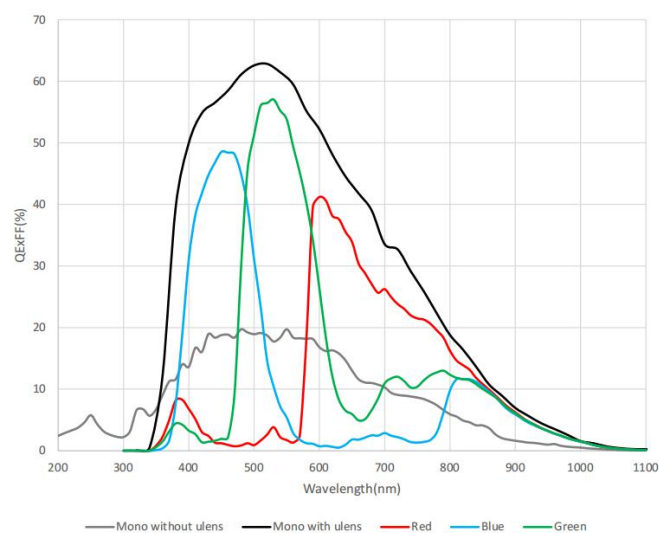


Figure 8 The spectral QE of GSPRINT4510

3.5 SS02MPA-U3-CXP

Table 3- 5 SS02MPA-U3-CXP camera specifications

Parameter	Model
	SS02MPA-U3-CXP
	Camera
Sensor model	GSPRINT4502-AVC
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	4.5μm x 4.5 μm
Target size	0.67”
Resolution	TBD@2048 x 1216 TBD@1024 x 608 (bin 2x2)
Memory	1024MB (8Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	TBD
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / CXP
Digital I/O	TBD
Data Format	8bit / 10bit / 12bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

3.6 SS02MMA-U3-CXP

Table 3- 6 SS02MMA-U3-CXP camera specifications

Parameter	Model
	SS02MMA-U3-CXP
	Camera
Sensor model	GSPRINT4502-AVM
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	4.5μm x 4.5 μm
Target size	0.67”
Resolution	TBD@2048 x 1216 TBD@1024 x 608 (bin 2x2)
Memory	1024MB (8Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	65.7%@550nm (Mono)
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Global Shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0 / CXP
Digital I/O	TBD
Data Format	8bit / 10bit / 12bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

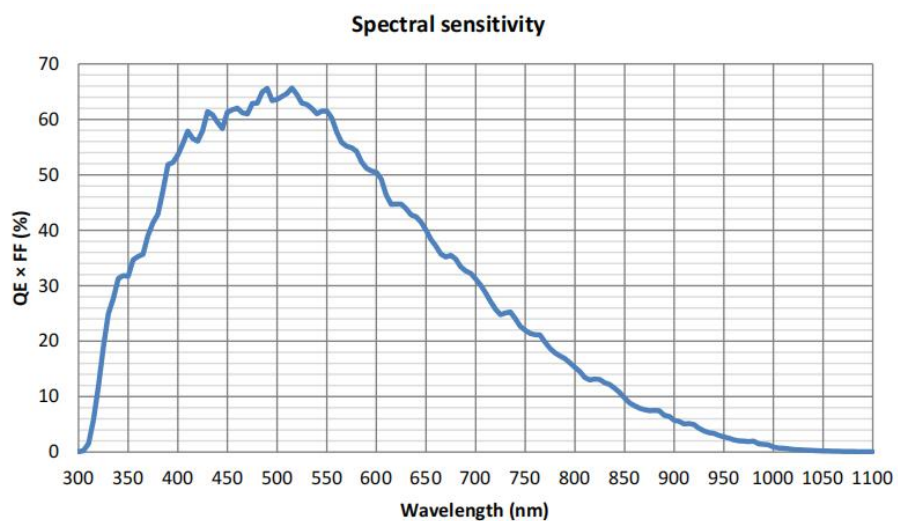


Figure 9 The spectral QE of GSPRINT4502

4 High Resolution Camera Specification(1)

4.1 SR600MMA

Table 4- 1 SR600MMA camera specifications

Parameter	Model
	SR600MMA
	Camera
Sensor model	VPS2163A
Sensor type	CMOS
Spectral range	300nm-1100nm
pixel size	0.5μm x 0.5 μm
Target size	1.08”
Resolution	20480 x 27200
Inter-frame space	6s
Memory	512MB (4Gb)
Conversion gain	TBD
Dynamic Range	TBD
Read noise	TBD
Full well charge	TBD
SNR	TBD
Sensitivity	TBD
Dark current	TBD
QE	TBD
Exposure time range	TBD
Gain Range	TBD
Shutter mode	Rolling shutter
Binning mode	Software 2x2, 3x3, 4x4
Data interface	USB3.0
Digital I/O	TBD
Data Format	8bit / 10bit
Cooling temperature difference	Below room temperature 40 degrees Celsius
	General parameters
Power supply	DC19V 4.74A power supply
Power consumption	TBD
Temperature	Working temperature -30 ~ 45 °C, storage temperature - 40 ~ 60 °C
Humidity	0-95%
Size	TBD
Weight	TBD
Lens mount	TBD
Software	ToupView, CLView software based on Delsa acquisition card, LabView, MATLAB, etc
SDK	C, C++, C#, Python
Operating system	Windows, Linux

5 Camera Dimension and Interface

5.1 sMAX04BM

5.1.1 Mechanical Housing Dimensions

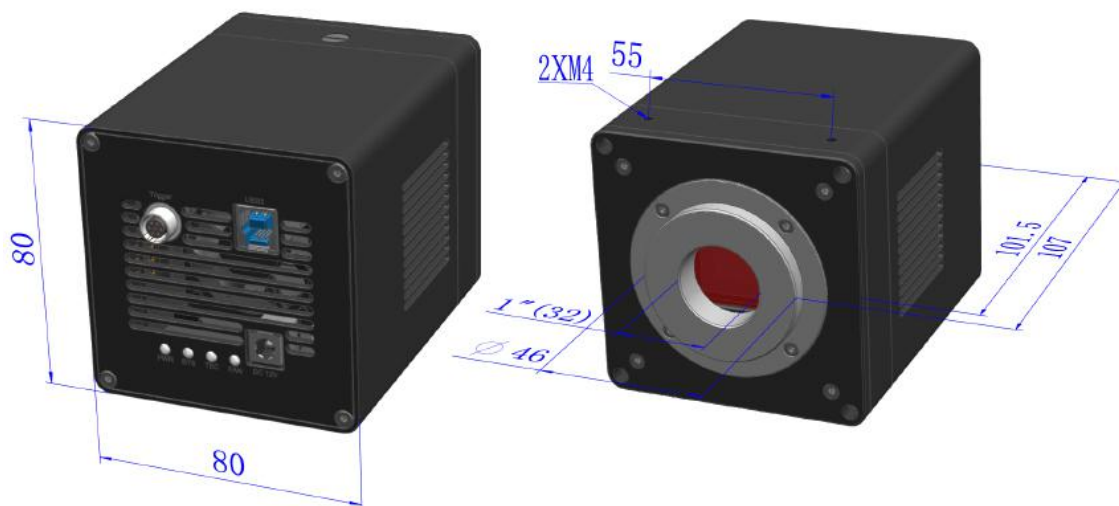


Figure 5- 1 sMAX04BM & sMAX04BM-U100 dimensions (mm)

5.1.2 Interface Description

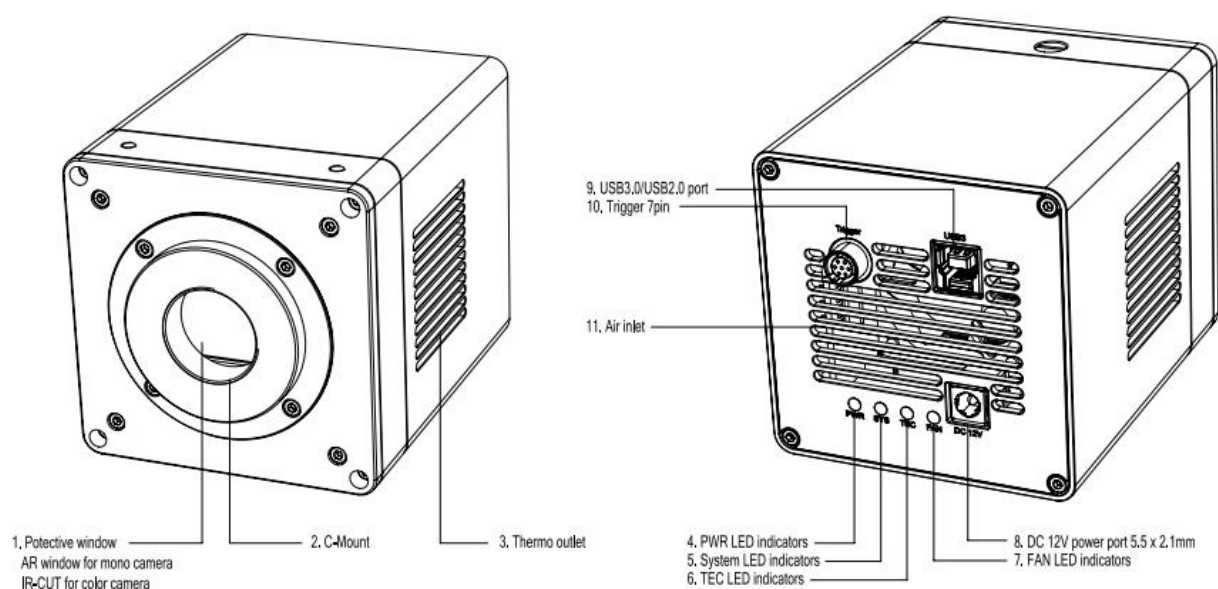


Figure 5- 2 sMAX04BM & sMAX04BM-U100 Camera interface diagram

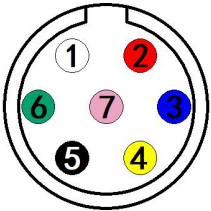
Table 5- 1 sMAX04BM & sMAX04BM-U100 Camera interface definition

Item	Specification
1	Filter window,AR window for mono camera
2	C mount
3	Thermo outlet
4	Power LED indicators
5	System LED indicators
6	TEC LED indicators
7	FAN LED indicators

8	DC 12V power port
9	USB 3.0/ USB 2.0 port
10	Trigger 7PIN
11	Air inlet

5.1.3 Power Supply and I/O Connector

Table 5- 2 sMAX04BM & sMAX04BM-U100 series pin signal definition

	Color	Pin	Signal	Signal description
	White	1	GND	Direct-coupled signal ground
	Red	2	12V	12VDC power input or output
	Blue	3	OPTO_GND	Opto-isolated signal ground
	Yellow	4	DIR_GPIO0	Direct-coupled General Purpose I/O (Software configurable input/output) (line2)
	Black	5	DIR_GPIO1	Direct-coupled General Purpose I/O (Software configurable input/output) (line3)
	Green	6	OPTO_IN	Opto-isolated input signal (line0)
	Pink	7	OPTO_OUT	Opto-isolated output signal (line1)

5.1.4 Packing Information

Table 5- 3 Recommended accessories

Order number	Accessories name	Quantity	Instruction
1	Camera	1	Camera referred in this manual
2	Power adapter	1	Input: AC 100~240V 50Hz/60Hz,output: DC 12V 3A
3	I/O cable	1	7 Pin cable or extended cable
4	Cable	1	USB3.0 cable
5	Lens (optional)	1	C-mount lens

5.2 sMAX04BM-CL100

5.2.1 Mechanical Housing Dimensions

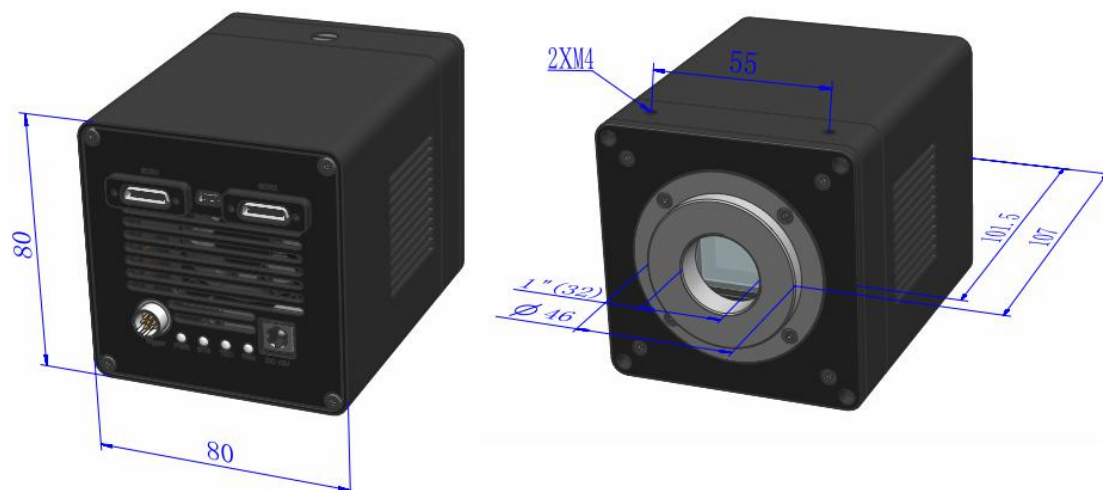


Figure 5- 3 sMAX04BM-CL100 dimensions (mm)

5.2.2 Interface Description

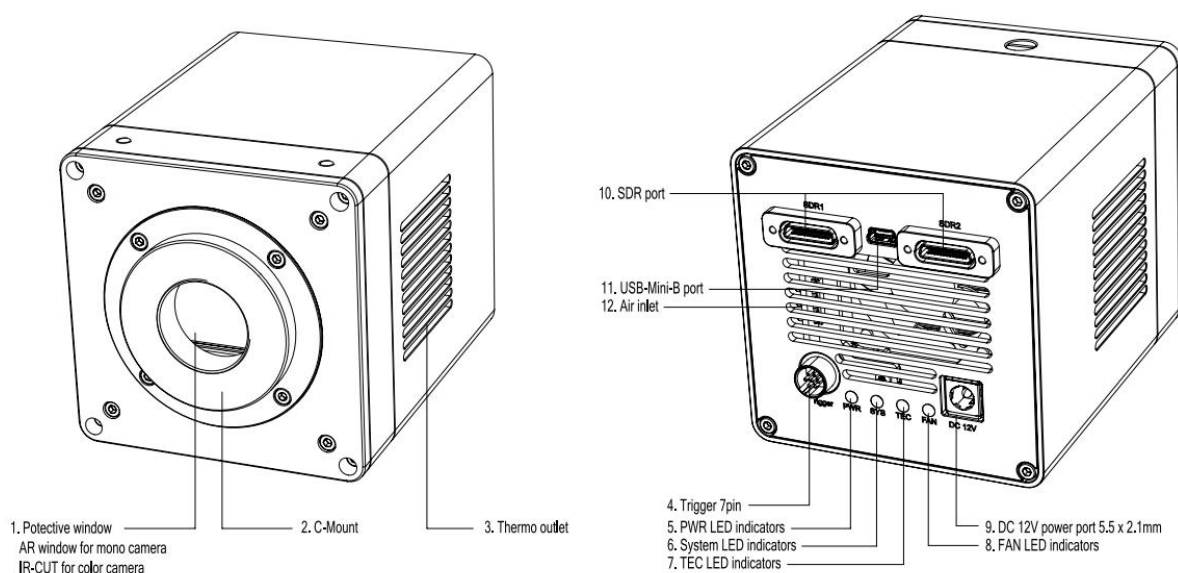


Figure 5- 4 sMAX04BM-CL100 Camera interface diagram

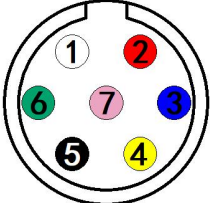
Table 5- 4 sMAX04BM-CL100 Camera interface definition

Item	Specification
1	Filter window, AR window for mono camera
2	C mount
3	Thermo outlet
4	Trigger 7PIN
5	Power LED indicators
6	System LED indicators
7	TEC LED indicators
8	FAN LED indicators
9	DC 12V power port, 5.5 × 2.1mm
10	CameraLink port

11	USB-Mini-B port
12	Air inlet

5.2.3 Power Supply and I/O Connector

Table 5- 5 sMAX04BM-CL100 series pin signal definition

	Color	Pin	Signal	Signal description
	White	1	GND	Direct-coupled signal ground
	Red	2	12V	12VDC power input or output
	Blue	3	OPTO_GND	Opto-isolated signal ground
	Yellow	4	DIR_GPIO0	Direct-coupled General Purpose I/O (Software configurable input/output) (line2)
	Black	5	DIR_GPIO1	Direct-coupled General Purpose I/O (Software configurable input/output) (line3)
	Green	6	OPTO_IN	Opto-isolated input signal (line0)
	Pink	7	OPTO_OUT	Opto-isolated output signal (line1)

5.2.4 Packing Information

Table 5- 6 Recommended accessories

Order number	Accessories name	Quantity	Instruction
1	Camera	1	Camera referred in this manual
2	Power adapter	1	Input: AC 100~240V 50Hz/60Hz,output: DC 12V 3A
3	I/O cable	1	7 Pin cable or extended cable
4	Cable	1	CameraLink cable
5	Lens (optional)	1	C-mount lens

5.3 sMAX16AM & sMAX16BM

5.3.1 Mechanical Housing Dimensions

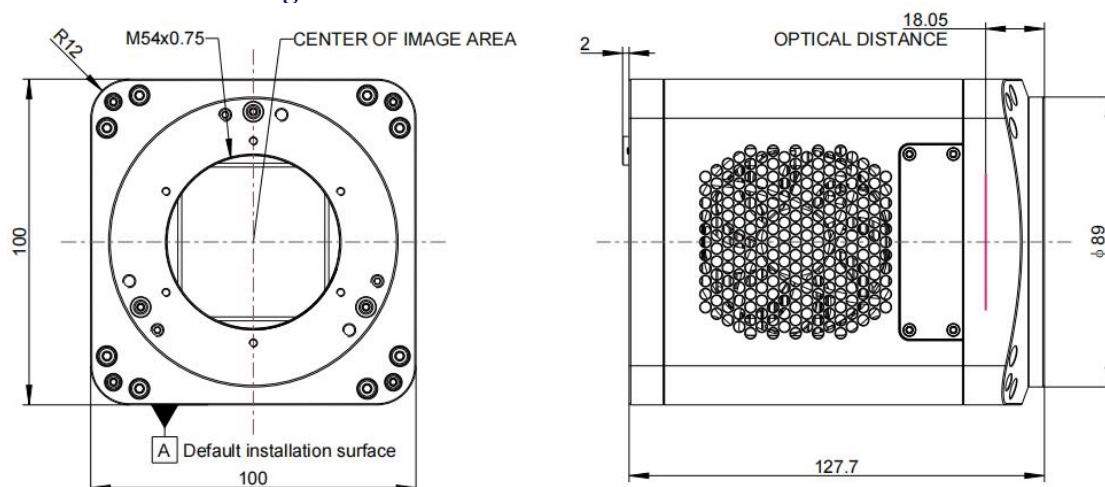


Figure 5- 5 sMAX16AM & sMAX16BM dimensions (mm)

5.3.2 Interface Description

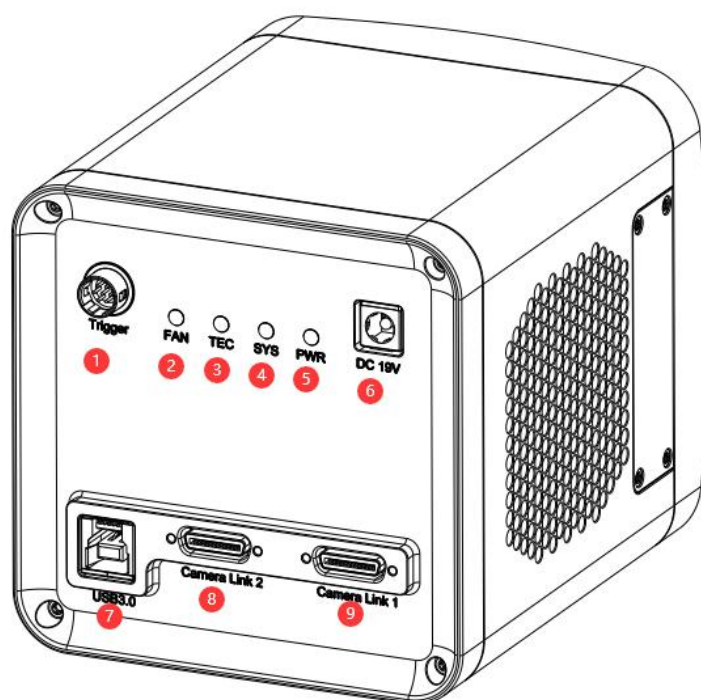


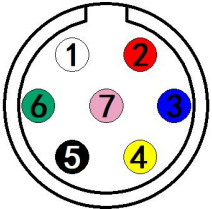
Figure 5- 6 sMAX16AM & sMAX16BM Camera interface diagram

Item	Specification
1	Trigger 7PIN
2	FAN LED indicators
3	TEC LED indicators
4	System LED indicators
5	Power LED indicators
6	DC 19V power port
7	USB 3.0 port

Table 5- 7 sMAX16AM & sMAX16BM Camera interface definition

5.3.3 Power Supply and I/O Connector

Table 5- 8 sMAX16AM & sMAX16BM series pin signal definition

	Color	Pin	Signal	Signal description
	White	1	GND	Direct-coupled signal ground
	Red	2	19V	19VDC power input or output
	Blue	3	OPTO_GND	Opto-isolated signal ground
	Yellow	4	DIR_GPIO0	Direct-coupled General Purpose I/O (Software configurable input/output) (line2)
	Black	5	DIR_GPIO1	Direct-coupled General Purpose I/O (Software configurable input/output) (line3)
	Green	6	OPTO_IN	Opto-isolated input signal (line0)
	Pink	7	OPTO_OUT	Opto-isolated output signal (line1)

5.3.4 Packing Information

Table 5- 9 Recommended accessories

Order number	Accessories name	Quantity	Instruction
1	Camera	1	Camera referred in this manual
2	Power adapter	1	Input: AC 100~240V 50Hz/60Hz,output: DC 19V 4A
3	I/O cable	1	7 Pin cable or extended cable
4	Cable	1	USB3.0 and CameraLink cable
5	Lens (optional)	1	C-mount lens

5.4 sCCD01AM

5.4.1 Mechanical Housing Dimensions

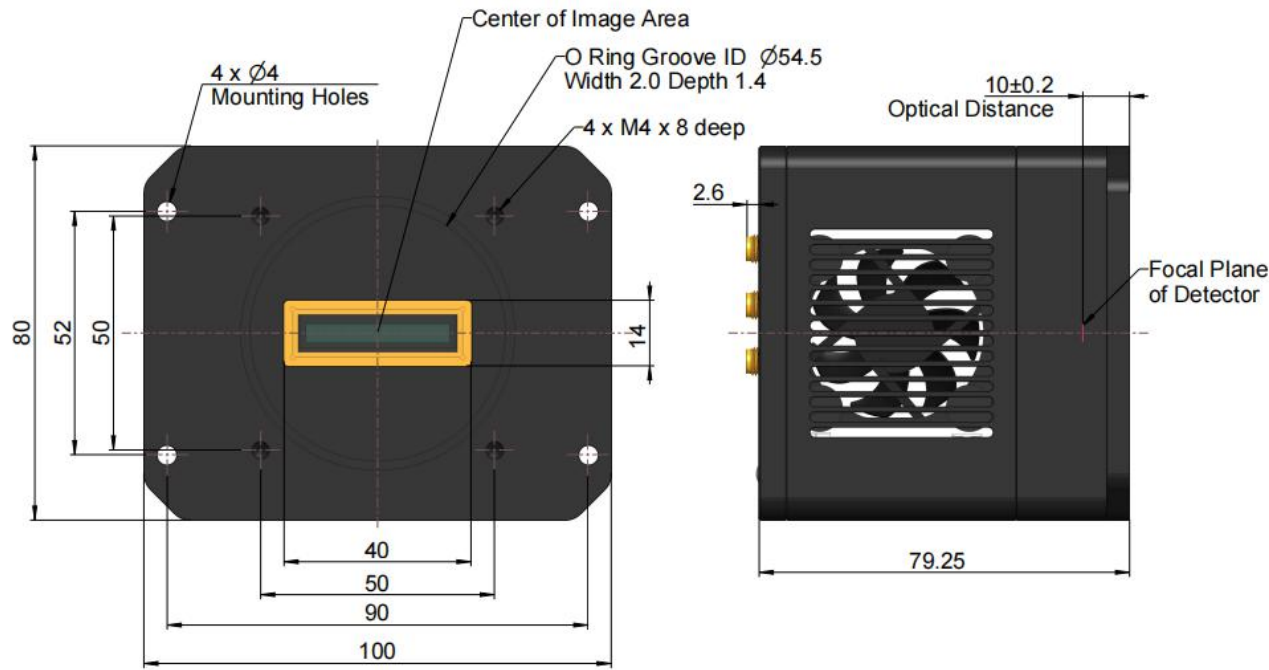


Figure 5- 7 sCCD01AM dimensions (mm)

5.4.2 Interface Description



Figure 5- 8 sCCD01AM Camera interface diagram

Item	Specification
1	DC 19V power port
2	USB 3.0 port
3	GigE port
4	
5	
6	

Table 5- 10 sCCD01AM Camera interface definition

5.4.3 Power Supply and I/O Connector

5.4.4 Packing Information

Table 5- 11 Recommended accessories

Order number	Accessories name	Quantity	Instruction
1	Camera	1	Camera referred in this manual
2	Power adapter	1	Input: AC 100~240V 50Hz/60Hz,output: DC 19V 4A
3	I/O cable	1	7 Pin cable or extended cable
4	Cable	1	USB3.0 and GigE cable
5	Lens (optional)	1	