9.3 BigEye Series M42 and M42 to C or F Mount USB3.0 CMOS Camera

9.3.1 Characteristic

- Large scientific CMOS sensor (SONY or GSENSE Back-illuminated CMOS sensor);
- Wide spectrum range, some models even have high response in the ultra-violet to infrared wavelength;
- Real-time 8/12bit depth switch(depending on sensor);
- Ultra-fine™ HISP VP and USB3.0 5 Gbps interface ensuring high frame rates(Up to 30 frames for 10M resolution);
- Ultra low noise and low power dissipation by using column-parallel A/D conversion;
- With hardware resolution from 4.2M to 10.3M;
- Rolling Shutter or Global Shutter;
- Standard M42 mount and M42 to C-mount or F-mount;
- CNC aluminum alloy housing;
- With advanced video & image processing application ToupView;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain;

BigEye's different views

BigEye+F-mount BigEye + F-mount+Lens

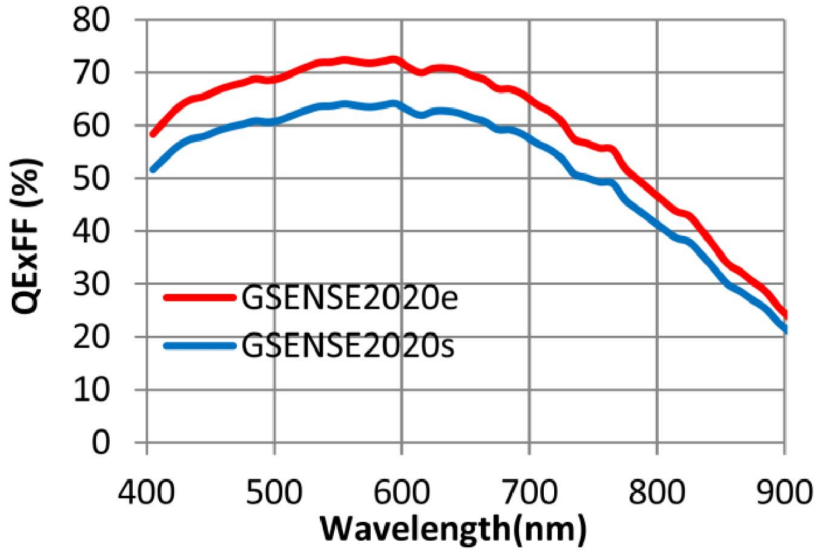
BigEye with F-mount+Lens

BigEye with F-mount and Lens

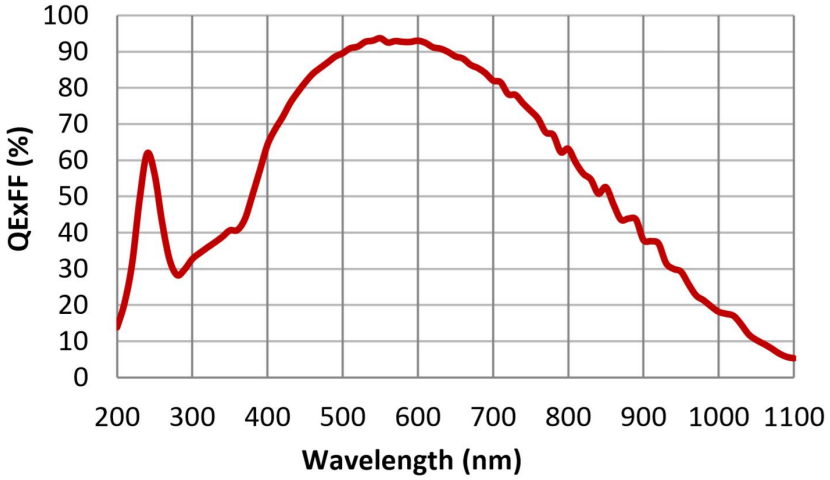
9.3.2 BigEye Datasheet (3)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
BigEye10000KPA BP910000A （New）	10.3M/IMX294(C) 4/3 “(17.47x12.86)	4.63 x4.63	419mv with 1/30s 0.12mv with 1/30s	30@3704x2778 34.5@4096x2160 39.5@2760x2072 62@2048x1080 86@1360x720	1x1, 1x1, 1x1, 2x2, 3x3	0.1ms~15s
BigEye4200KMA BM94200A （New）	4.2M/GSENSE2020S(M,RS or GS) 1.2”(13.31x13.31)	6.5x 6.5	$8.1x10^7$ (e-/((W/m2).s)) Peak QE 64.2% @595nm DS	45@2048x2046 45@1024 x 1023	1x1 2x2	0.01ms~1000s
BigEye4200KMB BM94200B （New）	4.2M/GSENSE2020BSI(M,UV, RS GS) 1.2”(13.31x13.31)	6.5 x 6.5	$1.1x10^8$ (e-/((W/m2).s)) Peak QE 93.7% @595nm	22@2048 x2046 22@1024 x1023	1x1 2x2	0.01ms~1000s

C: Color; M: Monochrome; GS: Global Shutter, UV: Good UV response



Spectral response of GSENSE2020e and GSENSE2020s



Spectral Response of GSENSE2020BSI

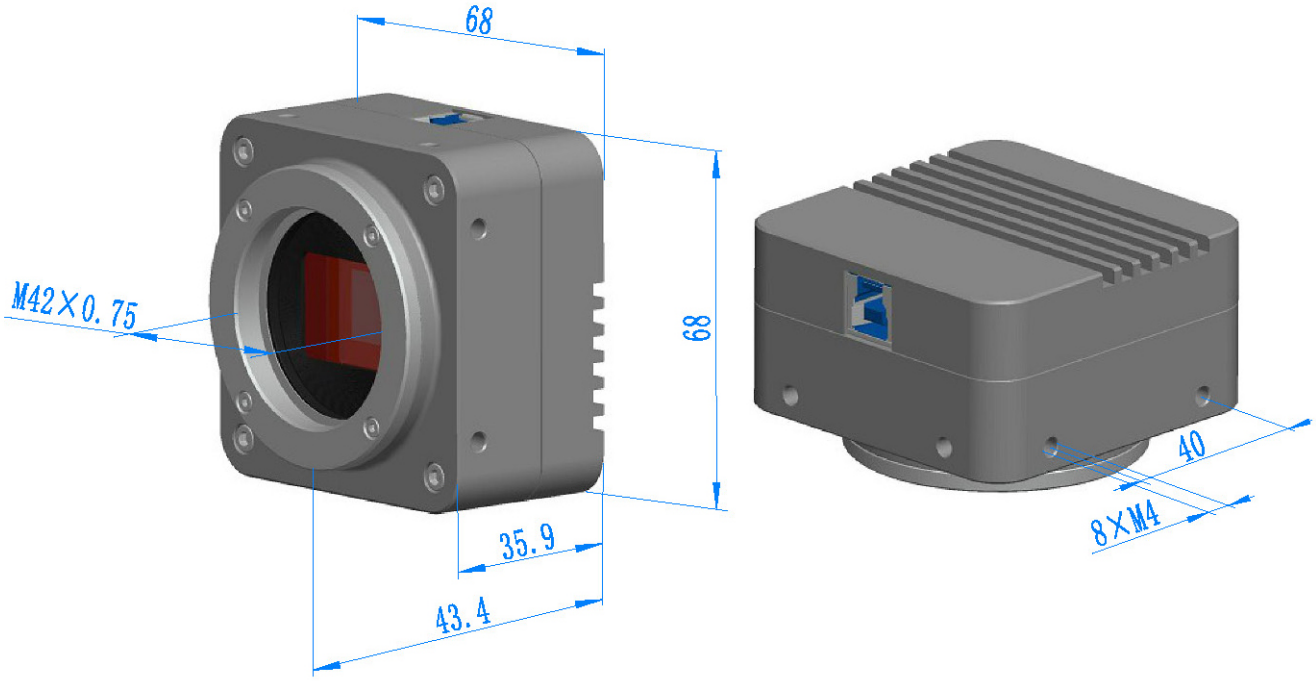
Other Specification for BigEye Camera

Spectral Range	200-1100nm (UV without IR-cut Filter) or 400-900nm
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-fine™ HISPVP /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Cooling System*	Natural

Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB3.0 High-speed Port
	Display: 17” or Larger
	CD-ROM

9.3.3 Dimension of BigEye

The BigEye body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT or AR glass to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of BigEye with M42x0.75 or F-mount Interface

9.3.4 Packing Information for BigEye

Packing Information of BigEye Series camera

Standard Camera Packing List		
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo	
B	Gift box L:15cm W:15cm H:10cm (0.58~0.6Kg/ box)	
C	BigEye series USB3.0 C-mount CMOS camera	
D	High-speed USB3.0 A male to B male gold-plated connectors cable /2.0m	
E	CD (Driver & utilities software, Ø12cm)	
Optional Accessory		
F	M42x0.75mm-mount to C-mount converter (If C-mount adapter is used)	
G	M42x0.75mm-mount to F-mount converter (If F-mount lens is used)	
H	Phototube to M42x0.75 mount adapter (U-TV1.2XT2) for Olympus microscope	
I	Phototube to M42x0.75 mount adapter (MQD42120 MBB42120) for Nikon microscope	
J	Phototube to M42x0.75 mount adapter (P95-T2 4/ P95-C 1" 1.0 x 3" 1.2x) for Zeiss Primo Star series , Zeiss Primo vert series microscope	
K	Phototube to M42x0.75 mount adapter (11541510-120 HT2-1.2X) for Leica microscope	
L	Phototube to M42x0.75 mount adapter (60N-T2 4/3" 1.2x) for Zeiss Axio series microscope	
	Note: For 4/3" sensor, 1.2X adapter with M42x0.75 mount should be chosen, for the 1.2" sensor, 1.0X adapter with C-mount could be used to get the better FOV;	
M	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)

9.4 I3 Series C-mount USB3.0 CMOS Camera with Hardware ISP

9.4.1 I3 Basic Characteristic

The basic characteristic of I3 cameras are as follows:

- Including I3ISPM (Color, GS) and I3CMOS (Mono, GG) series;
- , SONY Exmor R(Back-illuminated) C-mount CMOS sensor with USB3.0 interface;
- Real-time 8/12bit depth switch(depending on sensor);
- Ultra-fine™ HISP VP and USB3.0 5 Gbps interface ensuring high frame rates(Up to 17 frames for 21M Resolution);
- Ultra low noise and low power dissipation by using column-parallel A/D conversion;
- With hardware resolution among 0.5M to 5M;
- Support hardware/software triggering, free running mode;
- Support firmware updating;
- CNC aluminum alloy housing;
- With advanced video & image processing application ToupView;
- Providing Windows/Linux/Mac OS multiple platforms SDK;
- Native C/C++, C#/VB.Net, DirectShow, Twain, LabView

9.4.2 I3CMOS Datasheet (6)

Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
I3CMOS00500KMA IM700500A(New)	0.5M/Sony IMX433LLJ 1/1.7“ (7.31x5.58)	9.0x9.0	8100mv with 1/30s 0.30mv with 1/30s	166.5fps@812 × 620	1x1	15us~5s
I3CMOS01500KMA IM701500A(New)	1.5M/ Sony IMX273LLR 1/2.9“ (4.97x3.73)	3.45×3.45	1830mv with 1/30s 0.19mv with 1/30s	226.5@1440 × 1080 506@720 × 540	1x1 2x2	15us~5s
I3CMOS03100KMA IM703100A(New)	3.1M/ Sony IMX252LLR 1/1.8“ (7.07x5.30)	3.45×3.45	1830mv with 1/30s 0.15mv with 1/30s	110@2048 × 1536 235@1024 × 768	1x1 1x1	15us~5s
I3CMOS03100KMB IM703100B(New)	3.1M/ Sony IMX265LLR 1/1.8“ (7.07x5.30)	3.45×3.45	1830mv with 1/30s 0.15mv with 1/30s	55.6@2048 × 1536 116.6fps@1024 × 768	1x1 1x1	15us~5s
I3CMOS05000KMA IM705000A	5.0M/ Sony IMX250LLR 2/3“ (8.45x7.07)	3.45×3.45	1830mv with 1/30s 0.15mv with 1/30s	71@2448 × 2048 175.8@1224 × 1024	1x1 1x1	15us~5s
I3CMOS05000KMB IM705000B	5.0M/ Sony IMX264LLR 2/3“ (8.45x7.07)	3.45×3.45	1830mv with 1/30s 0.15mv with 1/30s	35.7@2448 × 2048 88.4@1224 × 768	1x1 1x1	15us~5s

9.4.3 I3ISPM Datasheet (6)

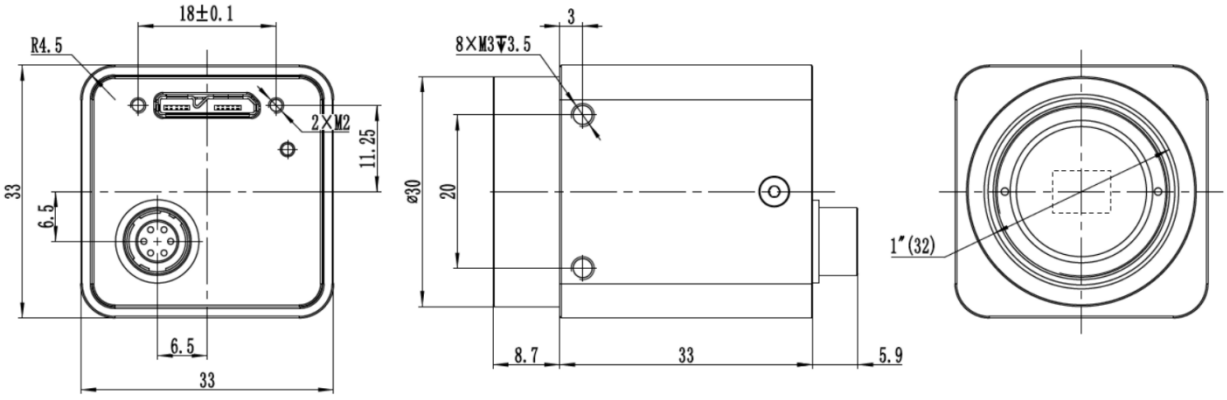
Order Code	Sensor & Size(mm)	Pixel(μm)	G Sensitivity Dark Signal	FPS/Resolution	Binning	Exposure
I3ISPM00500KPA IP800500A(New)	0.5M/IMX433LQJ(C,GS) 1/1.7“ (7. 31x5.58)	9.0x9.0	4610mv with 1/30s 0.3mv with 1/30s	166.5fps@812 × 620	1x1	15us~5s
I3ISPM01500KPA IP801500A(New)	1.5M/IMX273LQR(C,GS) 1/2.9“ (4.97x3.73)	3.45×3.45	1146mv with 1/30s 0.15mv with 1/30s	226.5@1440 × 1080 506@720 × 540	1x1 1x1	15us~5s
I3ISPM03100KPA IP803100A(New)	3.1M/IMX252LQR(C,GS) 1/1.8“ (7.07x5.30)	3.45×3.45	1146mv with 1/30s 0.15mv with 1/30s	114@2048 × 1536 231@1024 × 768	1x1 1x1	15us~5s
I3ISPM03100KPB IP803100B(New)	3.1M/IMX265LQR(C,GS) 1/1.8“ (7.07x5.30)	3.45×3.45	1146mv with 1/30s 0.15mv with 1/30s	55.6@2048 × 1536 116.6fps@1024 × 768	1x1 1x1	15us~5s
I3ISPM05000KPA IP805000A	5.0M/IMX250LQR(C,GS) 2/3“ (8.45x7.07)	3.45×3.45	1146mv with 1/30s 0.15mv with 1/30s	71@2448 × 2048 175.8@1224 × 1024	1x1 1x1	15us~5s
I3ISPM05000KPB IP805000B	5.0M/IMX264LQR(C,GS) 2/3“ (8.45x7.07)	3.45×3.45	1146mv with 1/30s 0.15mv with 1/30s	35.7@2448 × 1536、 88.4@1224 × 1024	1x1 1x1	15us~5s

C: Color; M: Monochrome; GS: Global Shutter

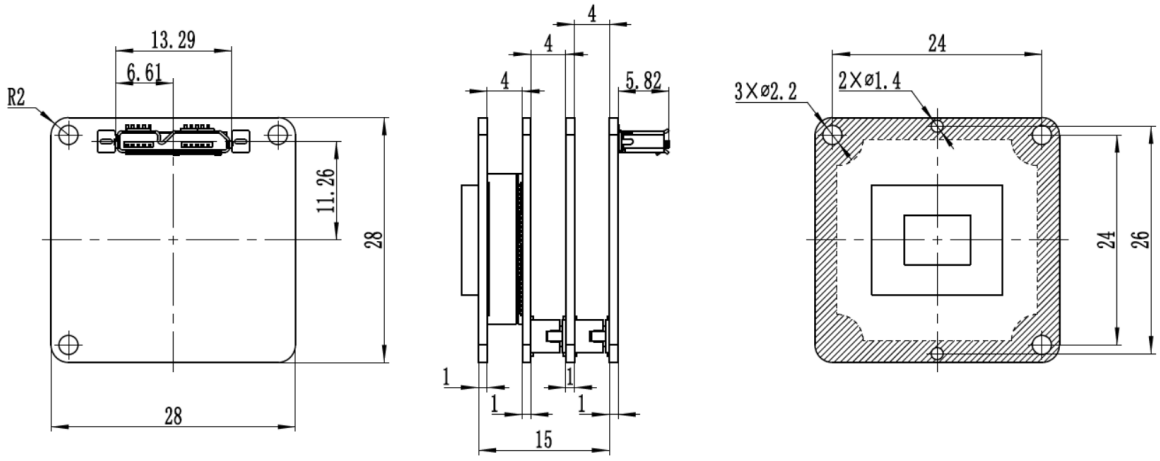
Other Specification for I3 Camera	
Spectral Range	380-650nm (with IR-cut Filter)
White Balance	ROI White Balance/ Manual Temp Tint Adjustment/NA for Monochromatic Sensor
Color Technique	Ultra-fine™ HISPVP /NA for Monochromatic Sensor
Capture/Control SDK	Windows/Linux/macOS/Android Multiple Platform SDK(Native C/C++, C#/VB.NET, Python, Java, DirectShow, Twain, etc)
Recording System	Still Picture and Movie
Running Mode	Free/Software Triggering /External Triggering
Cooling System*	Natural
Operating Environment	
Operating Temperature(in Centidegree)	-10~ 50
Storage Temperature(in Centidegree)	-20~ 60
Operating Humidity	30~80%RH
Storage Humidity	10~60%RH
Power Supply	DC 5V over PC USB Port
Software Environment	
Operating System	Microsoft® Windows® XP / Vista / 7 / 8 /10 (32 & 64 bit) OSx(Mac OS X) Linux
PC Requirements	CPU: Equal to Intel Core2 2.8GHz or Higher
	Memory: 2GB or More
	USB Port: USB3.0 High-speed Port
	Display: 17” or Larger
	CD-ROM

9.4.4 Dimension of I3

The I3 body, made from tough, CNC aluminum alloy, ensures a heavy duty, workhorse solution. The camera is designed with a high quality IR-CUT to protect the camera sensor. No moving parts included. This design ensures a rugged, robust solution with an increased lifespan when compared to other industrial camera solutions.



Dimension of I3



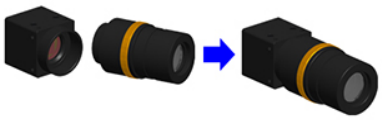
Dimension of I3 PC-board

9.4.5 Packing Information for I3

Packing Information of I3

Standard Camera Packing List			
A	Carton L:52cm W:32cm H:33cm (20pcs, 12~17Kg/ carton), not shown in the photo		
B	Gift box L:15cm W:15cm H:10cm (0.58~0.6Kg/ box)		
C	I3 series USB3.0 C-mount CMOS camera		
D1	High-speed USB3.0 A male to B male gold-plated connectors cable /3.0m		
D2	Lockable high-speed micro USB3.0 cable(Optional)		
E	6 Pin I/O cable		
F	CD (Driver & utilities software, Ø12cm)		
Optional Accessory			
G	Adjustable lens adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108001/AMA037 108002/AMA050 108003/AMA075 108004/AMA100
		C-mount to Dia.31.75mm eyepiece tube (Please choose 1 of them for your telescope)	108008/ATA037 108009/ATA050 108010/ATA075 108011/ATA100
H	Fixed lens Adapter	C-mount to Dia.23.2mm eyepiece tube (Please choose 1 of them for your microscope)	108005/FMA037 108006/FMA050 108007/FMA075 108008/FMA100
		C-Mount to Dia.31.75mm Eyepiece Tube (Please choose 1 of them for your telescope)	108011/FTA037 108012/FTA050 108013/FTA075 108014/FTA100
	Note: For F and G optional items, please specify your camera type(C-mount, microscope camera or telescope camera) , ToupTek engineer will help you to determine the right microscope or telescope camera adapter for your application;		
I	108015(Dia.23.2mm to 30.0mm Ring)/Adapter rings for 30mm eyepiece tube		
J	108016(Dia.23.2mm to 30.5mm Ring)/ Adapter rings for 30.5mm eyepiece tube		
K	108017(Dia.23.2mm to 31.75mm Ring)/ Adapter rings for 31.75mm eyepiece tube		
L	Calibration kit	106011/TS-M1(X=0.01mm/100Div.); 106012/TS-M2(X,Y=0.01mm/100Div.); 106013/TS-M7(X=0.01mm/100Div., 0.10mm/100Div.)	

9.4.6 Extension of I3 with Microscope or Telescope Adapter

<table>
<tr><th>Extension</th><th colspan="2">Picture</th></tr>
<tr><td>C-mount Camera</td><td>  </td><td>Machine vision; Medical imaging;
Semiconductor equipment; Test instruments;
Document scanners; 2D barcode readers;
Web camera and security video;
Microscope imaging;</td></tr>
<tr><td>Microscope Camera</td><td colspan="2" rowspan="2"> 
I3+AMAXXX(23.2mm Adapter)
 
I3+FMAXXX(23.2mm Adapter)
 
I3+ATAXXX(31.75mm Adapter)
 
I3+FTAXXX(31.75mm Adapter)</td></tr>
<tr><td>Telescope Camera</td></tr>
</table>