

Helios™ 2+

Factory Tough™ HDR Imaging and High Speed Time-of-Flight (ToF)



- High Dynamic Range imaging
- High Speed Time-of-Flight, up to 110 fps
- IP67 Protection, Industrial Immunity
- Sony DepthSense IMX556 Sensor
- Superior 3D Depth Data with Sub-millimeter Precision



Depth Map and Intensity

3D Point Cloud



GEN*i*CAM

Model	MP	Resolution	FPS	Sensor	Format	Pixel Size	Shutter	Output	GigE Interface
Helios2+ ToF HTP003S-001	0.3 MP	640x480 px	110 fps	Sony DepthSense™ IMX556PLR CMOS	1/2"	10 µm	Global	3D Point Cloud, Intensity and Confidence	M12

Physical, Interface, and Power Information		Imaging Properties	
Digital Interface	1000BASE-T GigE, M12 X-coded, PoE	Working Distance	0.3 m up to 8.3 m
GPIO Interface	8-pin M8 connector	Operating Distance Modes	6 Modes: (1) 1250 mm, (2) 3000 mm, (3) 4000 mm, (4) 5000 mm, (5) 6000 mm, (6) 8333 mm High Speed ToF, 3 Modes: (1) 625 mm, (2) 1250 mm, (3) 2500 mm
I/O ports	1 input (2.5V-24V and 10.5V-24V) 1 output	Accuracy	See next page
Dimension	60 x 60 x 77.5 mm	Precision	See next page
IP Rating	IP67 (Must use IP67 cabling)	Lens Field of View	69° x 51° (nominal)
Ambient Light Filter	Yes, integrated on-camera	Illumination	4 x VCSEL laser diodes @ 850nm, Class 1, Eye Safe
Weight	398 g	Pixel Formats	
Power Requirement	PoE+ (IEEE 802.3at) or 18-24 V through GPIO	Range Data	(All unsigned)
Power Consumption	12-24Vdc, Pavg <12W, <30W peak power	Coord3D_ABCY16	4-ch point cloud XYZ + Intensity, 16 bits per channel
Camera Features		Coord3D_ABCL16	3-ch point cloud XYZ, 16 bits per channel
User Sets	1 default and 2 custom user set	Coord3D_CL16	Depth map Z plane, 16 bits
Exposure Control	HDR: Auto ; Manual 3 settings: 62.5 µs, 250 µs, or 1000 µs	Coord3D_CL16Y8	Depth Map Z plane, 16 bits + Intensity, 8 bits, unsigned
Gain Control	Manual, 2 settings: High or Low	Coord3D_CY16	Depth Map Z plane + Intensity, 16 bits for each channel, unsigned
Output Formats	Binary .PLY file (via Arena SDK)	Intensity Image	
OS Support	Windows and Linux	Mono8	8 bit per pixel monochrome raw image
Flying Pixel Filter	Yes	Mono12Packed	12 bit per pixel monochrome raw image
Communication Channels	5 Channels. Allows users to operate up to 5 Helios2 cameras without interference between cameras.	Mono12p	12 bit per pixel in bit stream, monochrome raw image
Standard and Certifications		Mono16	16 bit per pixel monochrome raw image
Standard	GigE Vision v2.0, GenICam 3D	Confidence Data	
Compliance	CE, FCC, RoHS, REACH, WEEE, Eye Safety Class 1 IEC 60825-1:2014	Confidence16	Confidence map, 16 bits
Shock and Vibration	DIN EN 60068-2-27, DIN EN 60068-2-64*		
Industrial Immunity	EN 61000-6-2		
Operating Temperature	-20° C to 50° C (case temperature)		

*Listed specification testing in progress and is subject to change



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Helios™ 2+



Factory Tough™ HDR Imaging and High Speed Time-of-Flight (ToF)

Helios2+ Accuracy*

Distance (m)	Accuracy
1250mm Mode (up to 1.25m)	± 4 mm
3000mm Mode (up to 3.0m)	± 10 mm
4000mm Mode (up to 4.0m)	± 10 mm + 0.25% of depth
5000mm Mode (up to 5.0m)	± 4 mm + 0.1% of depth
6000mm Mode (up to 6.0m)	± 10 mm + 0.5% of depth
8300mm Mode (up to 8.3m)	± 4 mm + 0.2% of depth

Helios2+ Precision*

*Accuracy and Precision data is preliminary, therefore subject to change

Distance (m)	1250mm Mode	3000mm Mode	4000mm Mode	5000mm Mode	6000mm Mode	8300mm Mode
0.5*	1.0 mm	1.9 mm	2.1 mm	0.7 mm	3.6 mm	0.8 mm
1	0.8 mm	1.3 mm	2.1 mm	0.6 mm	2.7 mm	0.6 mm
1.5	1.1 mm	2.5 mm	2.9 mm	0.9 mm	4.0 mm	1.1 mm
2	1.8 mm	3.7 mm	4.9 mm	1.4 mm	7.8 mm	1.7 mm
3		5.7 mm	8.6 mm	2.2 mm	10.0 mm	2.5 mm
4			12.3 mm	3.3 mm	15.7 mm	4.1 mm
5				5.1 mm	28.1 mm	6.1 mm
6					30.1 mm	7.9 mm
7						11.8 mm
8						14.48 mm

Accuracy and Precision Test Conditions:

- Target: White paper mounted on bar attached to motion stage
- Helios2 positioning: mounted on tripod, laser distance meter used to measure distance from case front to stage zero position
- Camera setting: Coord3D_C16 Pixel Format, bilateral filtering OFF, camera warmed up for 20 minutes.
- Imaging environment: Room light on during testing, black material used to minimize reflections off floor
- Motion stage moved in 50mm steps, for each step measure depth over 10x10 pixel ROI at image center, repeat 32 times at each position
- Accuracy measured as difference between camera's average measured depth across the ROI and 32 images and the ground truth depth (stage zero distance + stage position)

*0.5 m distance precision measured with 250 µs exposure time, all other distances using 1000 µs exposure time measured with white paper target.

NORMAL MODES - MAXIMUM FRAMERATES

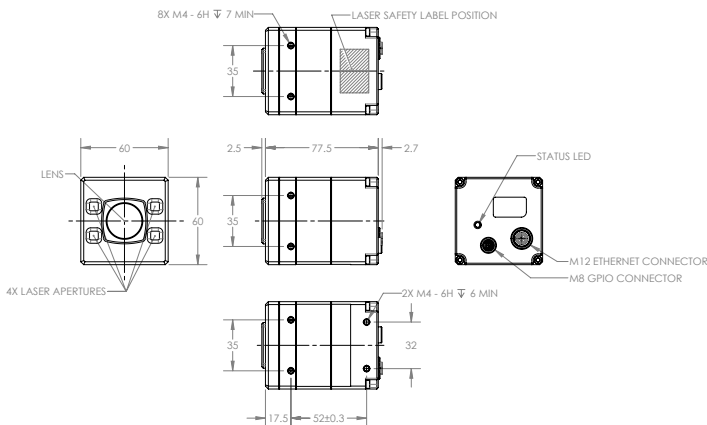
Mode	Frequency	FPS
1250mm	120 MHz	30 FPS
3000mm	50 MHz	30 FPS
4000mm	37 MHz	30 FPS
5000mm	120 + 90 MHz	30 FPS
6000mm	25 MHz	30 FPS
8300mm	90 + 72 MHz	30 FPS

HDR MODES - MAXIMUM FRAME RATES

HDR Mode	Description	Number of Depth Frames	FPS
Standard HDR	Exposure fusion of: • 1 x 62.5 µm • 1 x 250 µm • 1 x 1000 µm (x2 in multi-frequency modes)	3 (x2 in multi-frequency modes)	10
Low Noise HDR (4x1000us)	Exposure fusion of: • 1 x 62.5 µm • 1 x 250 µm • 4 x 1000 µm (x2 in multi-frequency modes)	6 (x2 in multi-frequency modes)	5
Low Noise HDR (8x1000us)	Exposure fusion of: • 1 x 62.5 µm • 1 x 250 µm • 8 x 1000 µm (x2 in multi-frequency modes)	10 (x2 in multi-frequency modes)	3
Low Noise HDR (16x1000us)	Exposure fusion of: • 1 x 62.5 µm • 1 x 250 µm • 16 x 1000 µm (x2 in multi-frequency modes)	18 (x2 in multi-frequency modes)	1.67
Low Noise HDR (32x1000us)	Exposure fusion of: • 1 x 62.5 µm • 1 x 250 µm • 32 x 1000 µm (x2 in multi-frequency modes)	34 (x2 in multi-frequency modes)	0.88

HIGH-SPEED MODES - MAXIMUM FRAMERATES

Mode	Frequency	FPS (Pixel Format: Coord3D_ABCY16)	FPS (Pixel Format: Coord3D_ABC16)	FPS (Pixel Format: Coord3D_CY16)	FPS (Pixel Format: Coord3D_C16, Confidence16, Mono8 12p16)
625mm	100 MHz	45 FPS	60 FPS	90 FPS	110 FPS
1250mm	50 MHz	45 FPS	60 FPS	90 FPS	110 FPS
2500mm	25 MHz	45 FPS	60 FPS	90 FPS	110 FPS



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