Helios™2

Time-Of-Flight (ToF) Camera with Sony DepthSense

- **High Accuracy with Sub-millimetre Precision**
- **IP67 Protection, Industrial Immunity**
- **Sony DepthSense IMX556 Sensor, 640 x 480 at 30FPS**
- **8.3 m Working Distance**
- **M12 and M8 Connectors**

Depth Map and Intensity

3D Point Cloud

Model	MP	Resolution	FPS	Sensor	Format	Pixel Size	Shutter	Output	GigE Interface
Helios2 ToF (HLT003S-001)	0.3 MP	640x480 px	30 fps	Sony DepthSense™ IMX556PLR CMOS	1/2"	10 µm	Global	3D Point Cloud, Intensity and Confidence	M12

Physical, Interface, and Power Information	
Digital Interface	1 Gigabit Ethernet with M12 connector IEC 61076-2-109
GPIO Interface	8-pin M8 connector IEC 61076-2-104
I/O ports	1 input, 1 output, 2 bidirectional
Dimension	60 x 60 x 77.5 mm
IP Rating	IP67 (Must use IP67 cabling)
Ambient Light Filter	Yes, integrated on-camera
Weight	398 g
Power Consumption	< 15 W, Power over Ethernet, or GPIO
Camera Features	
User Sets	1 default and 2 custom user set
Exposure Control	Manual, 3 Presets
Gain Control	Manual, 2 Presets
Output Formats	Binary .PLY file Intrinsic parameters avilable.
OS Support	Windows and Linux
Standard and Certifications	
Standard	GigE Vision v2.0, GenICam 3D
Compliance	CE, FCC, RoHS, REACH, WEEE, Eye Safety Class 1 IEC 60825-1:2014
Shock and Vibration	EN 60068-2-27, EN 60068-2-64
Industrial Immunity	EN 61000-6-2
Operating Temperature	-20° C to 50° C (case temperature)

Imaging Properties	
Working Range	0.3 m up to 8.3 m
Operating Distance Modes	6 Modes: (1) 1250 mm, (2) 3000 mm, (3) 4000 mm, (4) 5000 mm, (5) 6000 mm, (6) 8333 mm
Accuracy	See next page
Precision	See next page
Lens Field of View	69° x 51° (nominal)
Illumination	4 x VCSEL laser diodes @ 850nm, Class 1, Eye Safe
Pixel Formats	
Range Data	(All unsigned)
Coord3D_ABCY16	4-ch point cloud XYZ + Intensity, 16 bits per channel
Coord3D_ABC16	3-ch point cloud XYZ, 16 bits per channel
Coord3D_C16	Depth map Z plane, 16 bits
Intensity Image	
Mono8	8 bit per pixel monochrome raw image
Mono12Packed	12 bit per pixel monochrome raw image
Mono12p	12 bit per pixel in bit stream, monochrome raw image
Mono16	16 bit per pixel monochrome raw image
Confidence Data	
Confidence16	Confidence map, 16 bits

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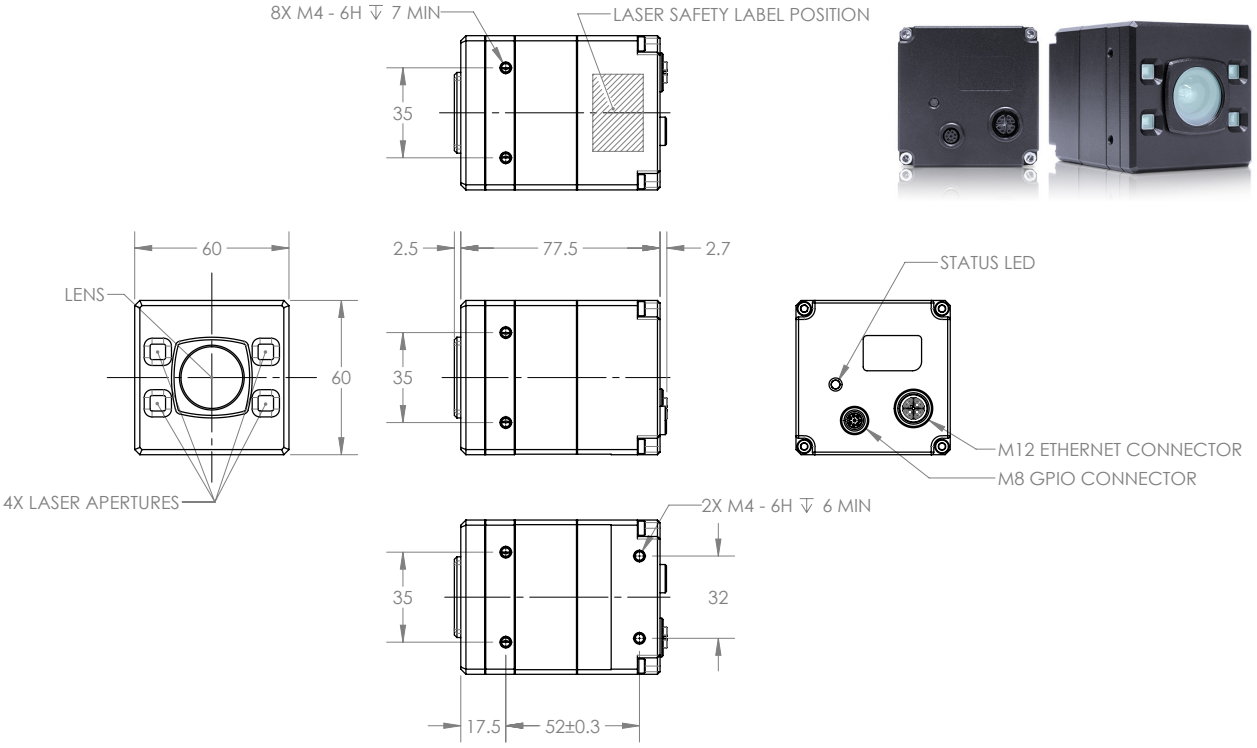
Helios2 Accuracy

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

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

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



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 10×10 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)

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