

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



Helios2 / Helios2+ / Helios2Ray

Helios2 Wide



Helios2 Narrow

- High Accuracy with Submillimeter Precision
- IP67 Protection, Industrial Immunity
- Sony DepthSense IMX556PLR CMOS ToF Sensor
- 8.3 m Working Distance
- M12 and M8 Connectors



GEN<i>i</i>CAM

Model	P/N:	MP	Resolution	Sensor	FPS	Exposure Settings	FoV	VCSEL	GigE Interface
Helios2+	HTP003S-001	0.3MP	640x480 px	Sony DepthSense IMX556PLR	30 fps (Normal) 10 fps (HDR) 103 fps (High-Speed)	HDR / 62.5 / 250 / 1000 μ s	69° x 51°	850nm	M12, PoE+
Helios2	HLT003S-001	0.3MP	640x480 px	Sony DepthSense IMX556PLR	30 fps	62.5 / 250 / 1000 μ s	69° x 51°	850nm	M12, PoE+
Helios2 Wide	HTW003S-001	0.3MP	640x480 px	Sony DepthSense IMX556PLR	30 fps (10 fps*) <small>*FPS for 3000μs Exposure</small>	187.5 / 750 / 3000 μ s	108° x 78°	850nm	M12
Helios2 Narrow	HTN003S-100	0.3MP	640x480 px	Sony DepthSense IMX556PLR	30 fps	62.5 / 250 / 1000 μ s	31° x 24°	850nm	M12, PoE+
Helios2 Ray	HTR003S-001	0.3MP	640x480 px	Sony DepthSense IMX556PLR	30 fps	13 / 88 / 350 μ s	69° x 51°	940nm	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	398g (HTP, HLT, HTR) / 390g (HTW)
Power Requirement	18-24 V through GPIO (HTW, HLT, HTP, HTR) PoE+ (IEEE 802.3at) (HLT, HTP only)
Power Consumption	18-24Vdc \pm 5%, P _{avg} <12W, <30W peak power

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
Lens Field of View	(see above)
Illumination	4 x VCSEL laser diodes Class I, Eye Safe
Communication Channels	Yes, 5 channels for multi-camera use. All Helios2 models (HTW, HLT, HTP, HTR, HTN) are cross compatible with each other.

Camera Features

User Sets	1 default and 2 custom
Exposure Control	Manual, Presets (see above)
Gain Control	Manual, 2 Presets (High and Low)
Output Formats	3D Point Cloud, Intensity and Confidence Binary .PLY file. Intrinsic parameters available.
OS Support	Windows and Linux

Pixel Formats

Range Data	(All unsigned)
Coord3D_ABCY16	4-ch point cloud XYZ + Intensity, 16 bits per channel
Coord3D_ABCI16	3-ch point cloud XYZ, 16 bits per channel
Coord3D_CI16	Depth map Z plane, 16 bits
Coord3D_CI6Y8	Depth Map Z plane, 16 bits + Intensity, 8 bits, unsigned (HTP only)
Coord3D_CY16	Depth Map Z plane + Intensity, 16 bits for each channel, unsigned (HTP only)

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

ConfidenceI16	Confidence map, 16 bits
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Standard and Certifications

Standard	GigE Vision v2.0, GenlCam 3D
Compliance	CE, FCC, RoHS, REACH, WEEE, Eye Safety Class 1 IEC 60825-1:2014
Shock and Vibration	EN 60068-2-6, EN 60068-2-27, EN 60068-2-64
Industrial Immunity	EN 61000-6-2
Operating Temperature	-20° C to 50° C (case temperature)

Accuracy

Distance mode	Helios2/2+	Helios2 Ray	Helios2 Wide
1250mm Mode	± 4 mm	± 5 mm	± 6 mm
3000mm Mode	± 10 mm	± 10 mm	± 10 mm + 0.5% of depth
4000mm Mode	± 10 mm + 0.25% of depth	± 10 mm ± 0.25% of depth	± 15 mm + 1.0% of depth
5000mm Mode	± 4 mm + 0.1% of depth	± 5 mm ± 0.1% of depth	± 5 mm + 0.1% of depth
6000mm Mode	± 10 mm + 0.5% of depth	± 15 mm ± 1.0% of depth	± 30 mm + 2.0% of depth
8300mm Mode	± 4 mm + 0.2% of depth	± 5 mm + 0.2% of depth	± 7 mm + 0.1% of depth

Precision - Helios2 & 2+ / Helios2 Ray / Helios2 Wide / *Helios2+ HDR Low Noise Mode (5000mm mode results only)

Distance (m)	1250mm Mode	3000mm Mode	4000mm Mode	5000mm Mode	6000mm Mode	8300mm Mode
0.5	1.0 / 0.92 / 1.08mm	1.9 / 1.76 / 2.08mm	2.1 / 2.97 / 2.85mm	0.7 / 0.74 / 0.81 / *0.63mm	3.6 / 3.82 / 4.42mm	0.8 / 0.97 / 0.92mm
1	0.8 / 1.05 / 1.01mm	1.3 / 2.16 / 1.74mm	2.1 / 2.31 / 2.76mm	0.6 / 0.8 / 0.72 / *0.29mm	2.7 / 4.42 / 4.27mm	0.6 / 0.98 / 0.81mm
1.5	1.1 / 1.60 / 1.12mm	2.5 / 3.47 / 3.97mm	2.9 / 4.71 / 4.29mm	0.9 / 1.24 / 1.13 / *0.46mm	4.0 / 5.42 / 5.51mm	1.1 / 1.55 / 1.34mm
2	1.8 / null / null mm	3.7 / 3.99 / 4.76mm	4.9 / 5.28 / 6.47mm	1.4 / 1.6 / 1.94 / *0.73mm	7.8 / 8.76 / 10.31mm	1.7 / 2.07 / 2.02mm
3		5.7 / 8.53 / 9.26mm	8.6 / 9.3 / 11.55mm	2.2 / 3.04 / 3.2 / *1.30mm	10.0 / 13.3 / 14.83mm	2.5 / 4.07 / 5.49mm
4			12.3 / 15.2 / 21.45mm	3.3 / 4.98 / 5.04 / *1.90mm	15.7 / 27.8 / 25.04mm	4.1 / 6.3 / 6.57mm
5				5.1 / 7.08 / 8.48 / *2.85mm	28.1 / 37 / 51.64mm	6.1 / 8.59 / 10.03mm
6					30.1 / 40.5 / 61.93mm	7.9 / 13.5 / 12.94mm
7						11.8 / 15 / 20.68mm
8						14.48 / 19.6 / 25.48mm

