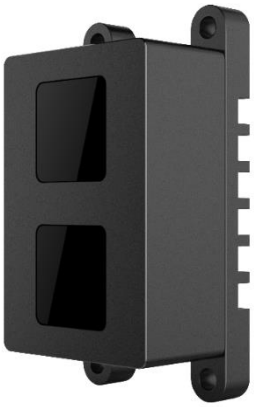
HPS-3D160

Solid-State LiDAR Sensor



Features

- Full frame rate up to 35 fps
- Field of View: 76° x 32°, resolution: 160 x 60
- Support 16 groups of user defined region of interest settings. Each group supports multiple user defined regions
- Various communication interfaces, support USB, RS-232 and optocoupler isolated GPIO.
- Support GPIO synchronized measurement.
- Measuring range up to 12m
- Centimeter point cloud accuracy
- Excellent ambient light suppression capability
- Embedded anti-interference algorithm, support multiple LiDAR simultaneous operation
- Total solid structure, industrial IP67 protection
- Support Normal mode, Simple-HDR mode, Auto-HDR mode and Super-HDR mode, with good scene adaptability.

Applications

- AGV/Robot collision avoidance
- Safety area protection
- People counting
- Automatic toll station
- Empty bay detection
- Volume measurement of parcel

Description

HPS-3D160 is a new generation high-performance solid-state LiDAR sensor based on time-of-fight (ToF) principle. Equipped with optimized lighting system and low distortion infrared optical lens, measurable distance up to 12m on 90% reflective white targets. Flexible user defined region of interest (ROI) function, Simple-HDR, Auto-HDR, and Super-HDR modes, make HPS-3D160 suitable for various applications.

HPS-3D160 integrates high-power 850nm infrared VCSEL emitters and high-photosensitive CMOS. Embedded high-performance processor, advanced data processing, filtering and compensation algorithms, enable very stable and simultaneous measure data output. Full solid structure, industrial IP67 protection design and sturdy aviation aluminum housing enable the HPS-3D160 to be used in complex environments.

Ordering information

HPS- 3 D 1 6 0 - □ □

Hypersen product designator

3D: Solid-State LiDAR family

Resolution:
160: 160*60
320: 320*240
640: 640*480

Communication Interface:
U: USB
S: RS-232
I: 3IO
L: LAN

VCSEL Type:
None: 850nm, 1W * 4
Pro: 850nm, 2W * 4

Class1 laser product.
Laser classification measurement according to IEC60825-1: 2014.

CE FC RoHS

Overview

1.1 Technical specification

Parameter	Values	Unit
Size	78（L）x 40（W）x 30（H）	mm
Weight	110 *1	g
Power supply	11 ~ 24	V
Maximum power consumption	6 (9W for Pro Version)	W
Quiescent power consumption	0.7	W
Storage temperature	-40 ~ 85	℃
Operating temperature	-10 ~ 55	℃
Infrared VCSEL emitter	850	nm
Emitting angle	76（Horizontal）x 32（Vertical）	°
Maximum measurable distance	12 *2	m
Minimum measurable distance	0.25	m
Maximum output frame rate	35 *3	fps
Output data	Depth, average distance, signal strength, quantity of weak signal pixels, quantity of saturated pixels, maximum distance, minimum distance	-
Operating mode	Normal mode, Auto-HDR mode, Super-HDR mode, Simple-HDR mode	-
Power-on initialization time	3000	ms
Interface	Option：LAN*4 or USB or RS232	-
Optocoupler isolated I/O	HPS-3D160-U/S：Input x 1, output x 1 HPS-3D160-I：Input x 3，output x 3 HPS-3D160-L：输出 x 1	-
Cable length	200	cm

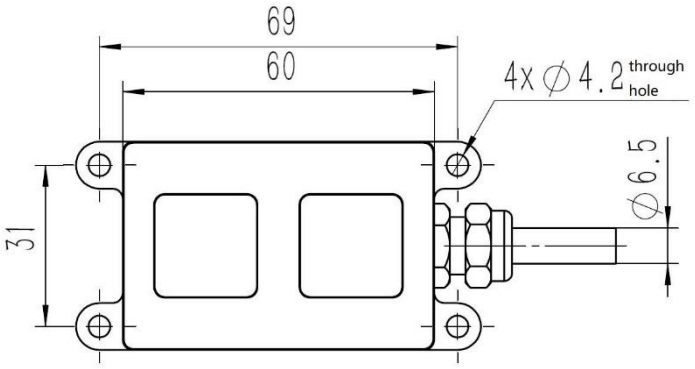
Note: *1 Not include cable

*2 Tested on a 90% reflectance white target

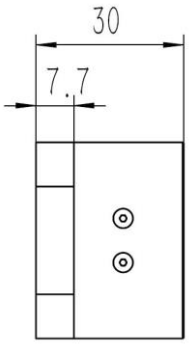
*3 The frame rate will be higher if the ROI is defined.

*4 Model HPS-3D160-I do not support LAN interface.

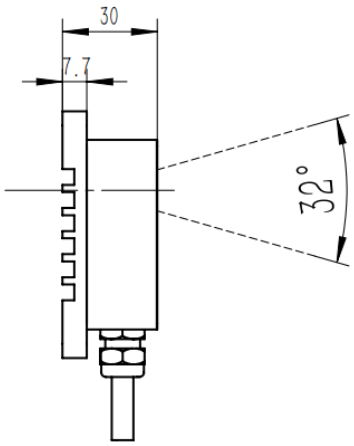
1.2 Dimensions and cable definitions



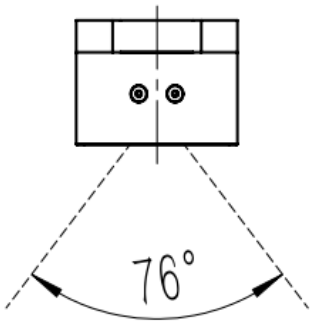
HPS-3D160 front view



HPS-3D160 left view



HPS-3D160 vertical FoV



HPS-3D160 horizontal FoV

HPS-3D160-U/S

Cable color	Signal name	Signal type	Description	Remark
Red	VCC	Power	Power, connect to DC +11 ~ 24V	The product with different communication interface has different definition for DATA+ and DATA- terminals.
Black	GND	GND	Power ground	
Blue	OUT	I/O	Optocoupler isolated output terminal	
Blue/White	IN	I/O	Optocoupler isolated input terminal	
Purple/White	COM	I/O	Optocoupler isolated COM terminal	
Purple	GND	Digital	Signal ground	
Orange	DATA+	Digital	USB D+ / RS-232 TX	
Orange/white	DATA-	Digital	USB D- / RS-232 RX	
Shield layer	SHIELD	-	Cable shield layer，internal part connects to product outer shell	

HPS-3D160-L

Cable color	Signal name	Signal type	Description	Remark
Red	VCC	Power	Power, connect to DC +11 ~ 24V	The product with different communication interface has different definition for DATA+ and DATA- terminals.
Black	GND	GND	Power ground	
Blue	DATA-	Digital	TXN(-)	
Blue/White	DATA+	Digital	TXP(+)	
Orange	DATA-	Digital	RXN(-)	
Orange/white	DATA+	Digital	RXP(+)	
Purple	COM	I/O	Optocoupler isolated ground terminal	
Purple/White	OUT	I/O	Optocoupler isolated output terminal	
Shield layer	SHIELD	-	Cable shield layer，internal part connects to product outer shell	

HPS-3D160-I

Cable color	Signal name	Signal type	Description	Remark
Red	VCC	Power	Power, connect to DC +11 ~ 24V	The product with different communication interface has different definition for DATA+ and DATA- terminals.
Black	GND	GND	Power ground	
Yellow	OUT1	I/O	Optocoupler isolated output terminal 1	
Gray	OUT2	I/O	Optocoupler isolated output terminal 2	
Purple	OUT3	I/O	Optocoupler isolated output terminal 3	
Brown	IN1	I/O	Optocoupler isolated input terminal 1	
Transparent	IN2	I/O	Optocoupler isolated input terminal 2	
Orange	IN3	I/O	Optocoupler isolated input terminal 3	
Green	COM	I/O	Optocoupler isolated COM terminal	
Pink	GND	Digital	Signal ground	
Blue	DATA+	Digital	USB D+ / RS-232 RX	
White	DATA-	Digital	USB D- / RS-232 TX	
Shield layer	SHIELD	-	Cable shield layer，internal part connects to product outer shell	

2.1 Communication interface

HPS-3D160 can communicate with host through LAN, USB or RS232 interface. HPS-3D160-I equipped with 3 optocoupler isolated input terminals and 3 optocoupler isolated output terminals, HPS-3D160-U/S equipped with 1 optocoupler isolated input terminals and 1 optocoupler isolated output terminals, HPS-3D160-L equipped with 1 optocoupler isolated output terminals which are convenient to connect with PLC or relay.

2.2 Mutual interference between LiDARs.

2.2.1 Mutual interference-tolerant

By numbering each LiDAR, up to 16 HPS-3D160 LiDARs can work together without interfering each other.

2.2.2 Programmable device address.

Each LiDAR has a programmable device address (default address 0x00, broadcast address 0xFF), change the device address to enable multiple LiDARs working in the same field bus.

2.3 SDK

SDK for Windows, Linux and SCM is available. Please contact sales@hypersen.com for more information.

Packet information

Type	HPS-3D160
Dimension	78 (L) x 40 (W) x 30 (H)
Weight	110g / unit (not include cable)
Packet box	183 (L) x 173 (W) x 66 (H) 1 pcs / box

Revision history

Date	Revision	Description
2018/10/15	1.0	Initial version.
2018/11/16	1.1	Corrected CRC initial value (0 -> 0xffff).
2018/12/04	1.2	Hardware updated to V1.3. Support 11~24V power supply, 3 optocoupler isolated output terminal, 3 optocoupler isolated input terminal. Deleted command details and CRC code.
2019/03/26	1.3	Deleted command and protocol chapters. Modified the power up initializing time and power supply voltage. Added description of HPS3D160-I/L.
2019/07/16	1.4	Modified the ordering information, added the description of Pro version.

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