![HYPERSEN Logo] **HYPERSEN** HYPERSEN TECHNOLOGIES CO., LTD.

HPS-3D160 Pro

Solid-State LiDAR Sensor

Description

HPS-3D160 Pro 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 8m on 90% reflective white targets. Flexible user defined region of interest (ROI) function, Simple-HDR, Auto-HDR, and Super-HDR modes, make HPS-3D160 Pro suitable for various applications.

HPS-3D160 Pro 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 Pro to be used in complex environments.
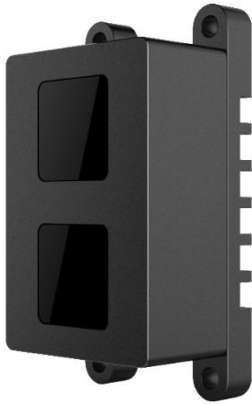
Features

- 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 and optocoupler isolated GPIO.
- Support GPIO synchronized measurement.
- Measuring range up to 8m
- 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.
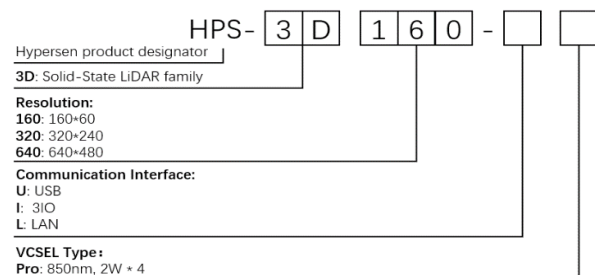
Applications

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

Ordering information

HPS- 3D 160 - ☐ ☐

Hypersen product designator
3D: Solid-State LiDAR family
Resolution:
160: 160×60
320: 320×240
640: 640×480
Communication Interface:
U: USB
I: 3IO
L: LAN
VCSEL Type:
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	9	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）	°
Measurable distance	0.25~3m @10% reflectivity 0.25~8m @90% reflectivity	m
Maximum output frame rate	35 *2	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 or USB or USB-IO*3	-
Optocoupler isolated I/O	HPS-3D160-U Pro：Input x 1, output x 1 HPS-3D160-I Pro：Input x 3，output x 3 HPS-3D160-L Pro：output x 1	-
Cable length	200	cm

Note: *1 Not include cable

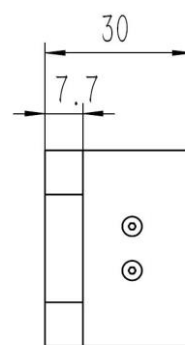　　　*2 The frame rate will be higher if the ROI is defined.
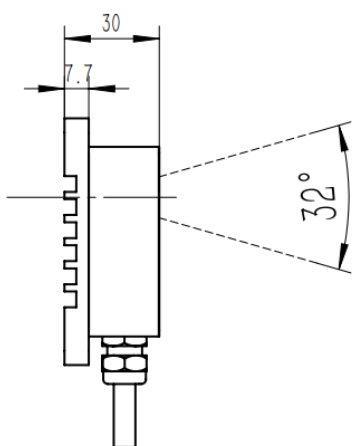
　　　*3 Model HPS-3D160-I Pro support USB interface.
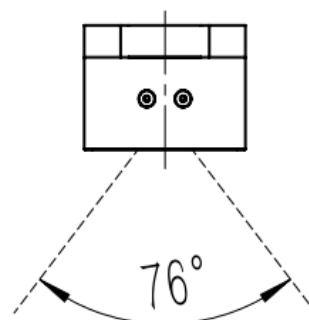
1.2   Dimensions and cable definitions
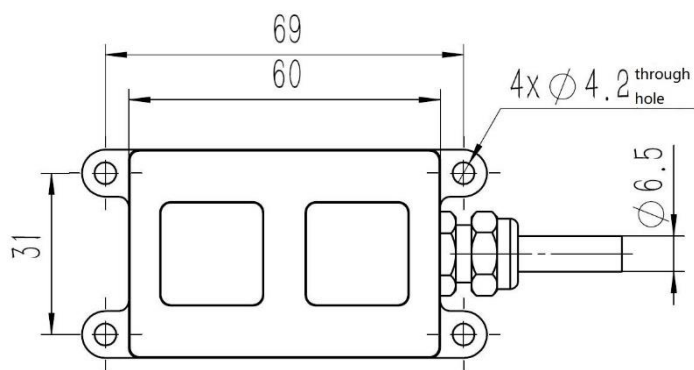
HPS-3D160 Pro front view

HPS-3D160 Pro left view

HPS-3D160 Pro vertical FoV

HPS-3D160 Pro horizontal FoV

HPS-3D160-U Pro

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+	
Orange/white	DATA-	Digital	USB D-	
Shield layer	SHIELD	-	Cable shield layer，internal part connects to product outer shell	

HPS-3D160-L Pro

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 Pro

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+	
White	DATA-	Digital	USB D-	
Shield layer	SHIELD	-	Cable shield layer，internal part connects to product outer shell	

2.1   Communication interface

HPS-3D160 Pro can communicate with host through LAN or USB interface. HPS-3D160-I Pro equipped with 3 optocoupler isolated input terminals and 3 optocoupler isolated output terminals, HPS-3D160-U Pro equipped with 1 optocoupler isolated input terminals and 1 optocoupler isolated output terminals, HPS-3D160-L Pro 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 Pro 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-U/L/I Pro
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.
2021/01/23	1.5	Modified the Measurable distance information, deleted RS232 interface.

IMPORTANT NOTICE – PLEASE READ CAREFULLY

Hypersen Technologies Co., Ltd. reserve the right to make changes, corrections, enhancements, modifications, and improvements to Hypersen products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on Hypersen products before placing orders. Hypersen products are sold pursuant to Hypersen's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of Hypersen products and Hypersen assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by Hypersen herein.

Resale of Hypersen products with provisions different from the information set forth herein shall void any warranty granted by Hypersen for such product.

Hypersen and the Hypersen logo are trademarks of Hypersen. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.