

Using the HDL-32E & VLP-16 Interface Box

Caution!

There is no internal polarity nor over voltage protection in the sensors; therefore it is imperative that the Interface Box and/or protective circuitry is incorporated in every installation.

The interface box contains circuitry to protect against:

1. Over Voltage:

The Interface Box accepts 9-32VDC input voltage. The over voltage protection will kick in at 34V until the 3A fuse blows.

2. Reverse Voltage:

The reverse voltage protection kicks in at 0.6V until the 3A fuse blows or the TVS diode burns out.

Important!

When shortening the interface cable, take care to ensure the terminal block is correctly wired. Reversing the power and ground at the terminal block may result in irreparable damage to the sensors.

Using the HDL-32E & VLP-16 sensors in hardwired applications.

The sensors may be integrated into a custom system by removing the Interface Box and cutting the interface cable to the desired length. When integrated into a custom system, adequate circuit protection – similar to that provided by the interface box - must be included to safeguard against damaging the sensors.

Failing to provide adequate circuit protection may result in irreparable damage to the sensors.

The schematic of Velodyne's interface circuit is contained on page 4 of this document.

Time Synchronization with an External GPS/INS System

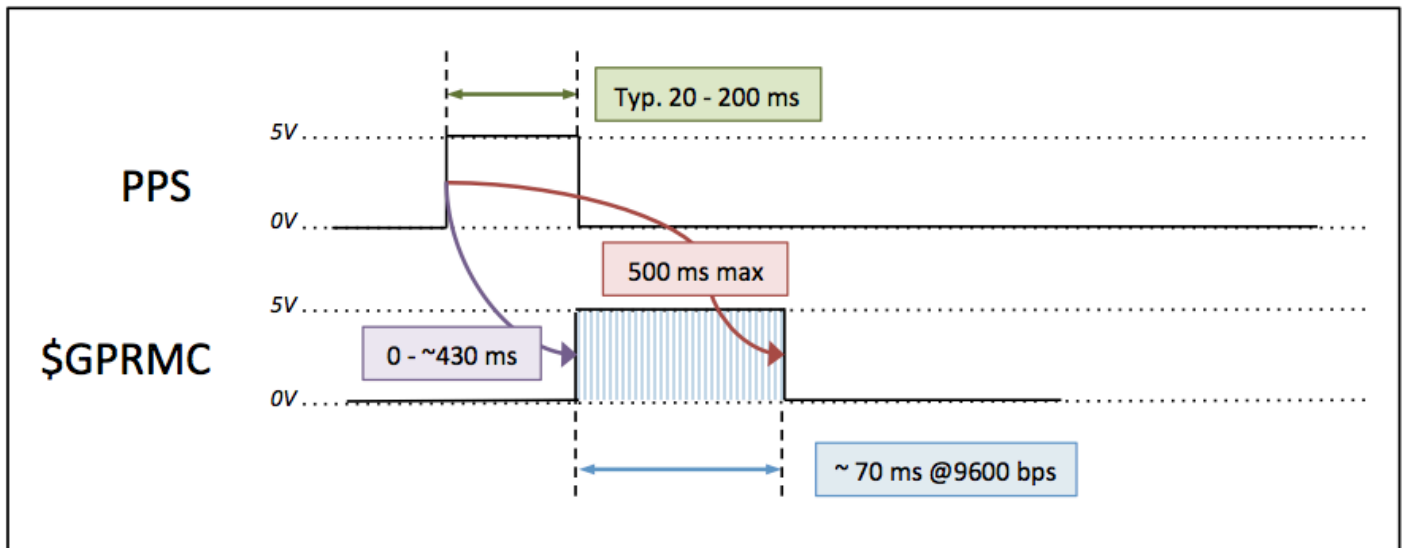
The sensors can synchronize their data with precise GPS-supplied time. Synchronizing to the GPS pulse-per-second (PPS) signal provides users the ability to compute the exact firing time of each data point which aids in geo-referencing and other applications.

To utilize these features the user must configure their GPS/INS device to issue a once-per-second synchronization pulse in conjunction with a once-per-second NMEA \$GPRMC sentence. No other NMEA message will be accepted by the sensors. Other NMEA sentences might be misinterpreted by the sensors.

For additional information, please refer to the tables and diagrams in the following section “Interface Cable Signal Description.”

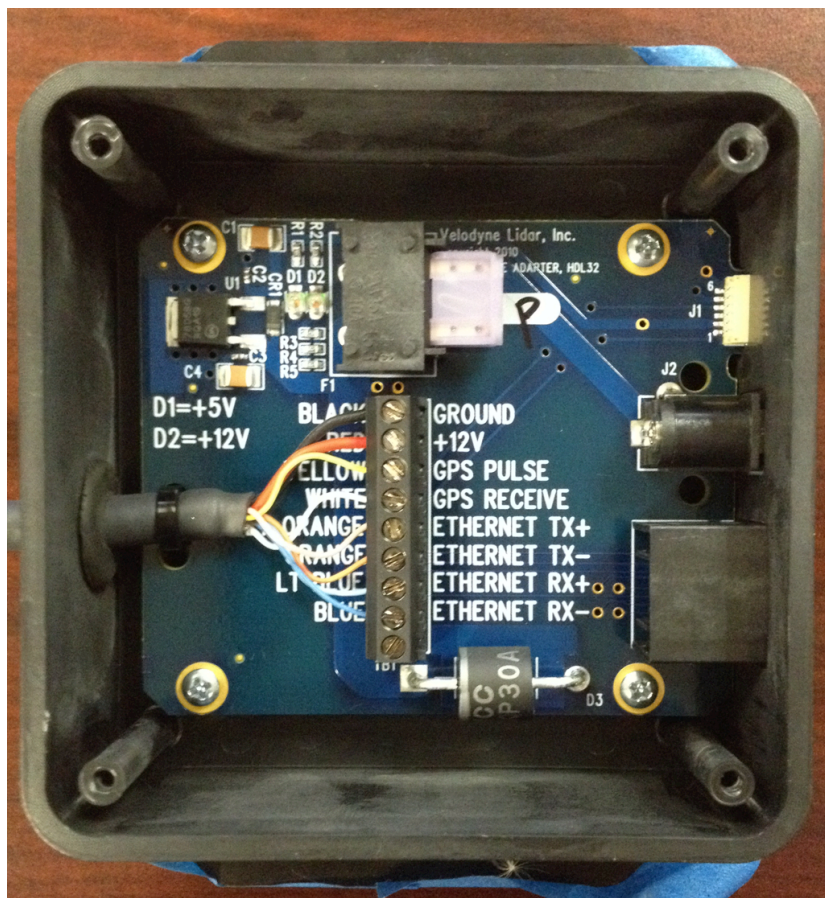
- The serial data output from the GPS receiver should be connected to the sensor Interface Box via the screw terminal labeled: “GPS RECEIVE.”
- The PPS output from the GPS/INS should be connected to the sensor Interface Box via the screw terminal labeled: “GPS PULSE.”
- The ground signal(s) from the GPS/INS should be connected to the sensor Interface Box via the screw terminal labeled: “GROUND.”
- Serial configuration for the NMEA Message should be 9600 baud, 8N1.

The PPS synchronization pulse and \$GPRMC message may be issued concurrently or sequentially. The PPS synchronization pulse length is not critical (typical lengths are between 20ms and 200ms), but reception the \$GPRMC sentence must conclude less than 500ms after the rising edge of the synchronization pulse.



Interface Cable Signal Description

Wire	Signal	Input/Output	Specifications
Black	Ground	Input	System Ground
Red	Power	Input	9-15V DC / 12W
Yellow	GPS Sync Pulse	Input	TTL
White	GPS Serial Receive	Input	TTL
Light Orange	Ethernet TX+	Output	Differential
Orange	Ethernet TX-	Output	Differential
Light Blue	Ethernet RX+	Input	Differential
Blue	Ethernet RX-	Input	Differential



6

5

4

3

2

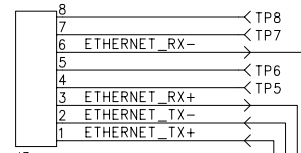
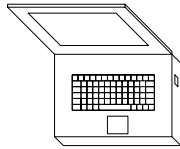
1

REVISION RECORD			
REV	DESC	APPROVED	DATE
01	END RELEASE	TL	03/07
02	SHIPPED J2	TL	11/10

COMPUTER

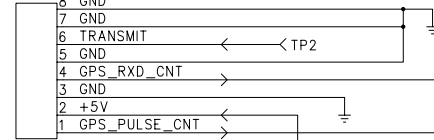
T-568B STRAIGHT THROUGH ETHERNET CABLE

ETHERNET

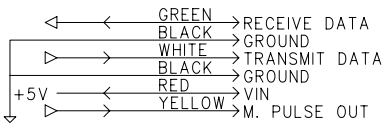
J3
43860-0001

GPS

PIN 7 & 8 ARE MTG PINS

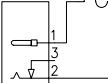
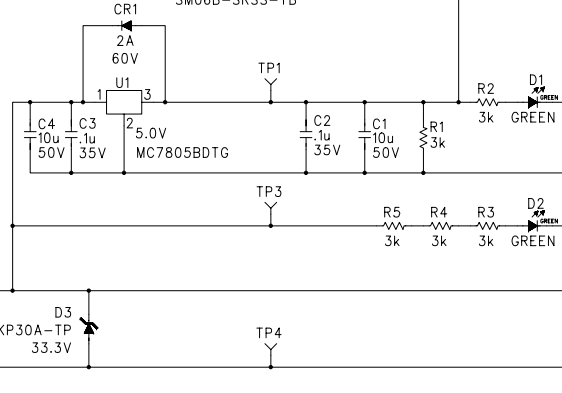
J1
SM06B-SRSS-TB

GPS-18

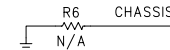
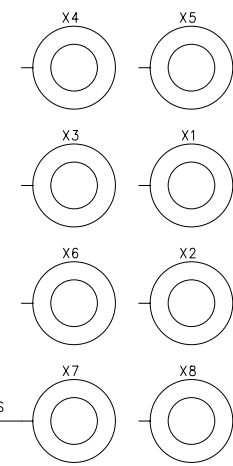


GPS 18 LVC: 3 meter
 Gmin #010-00321-05
 60mA @ 5.0V

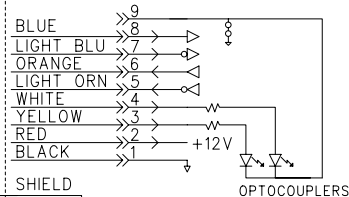
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J2
PJ-102A

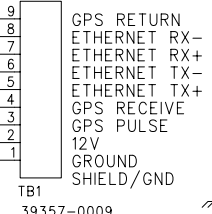
POWER

CHASSIS
N/A

HDL32 HEAD

CABLE WILL CHANGE TO 9
CONDUCTOR WITH SHIELD

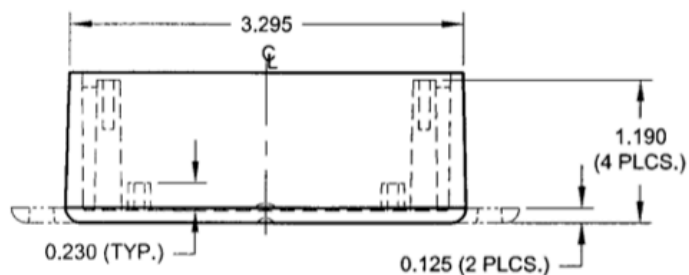
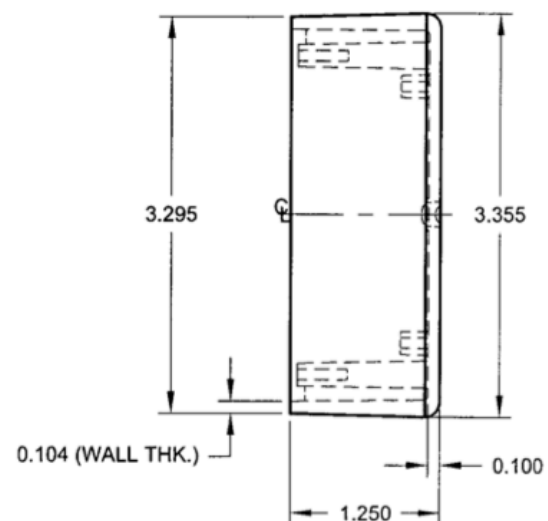
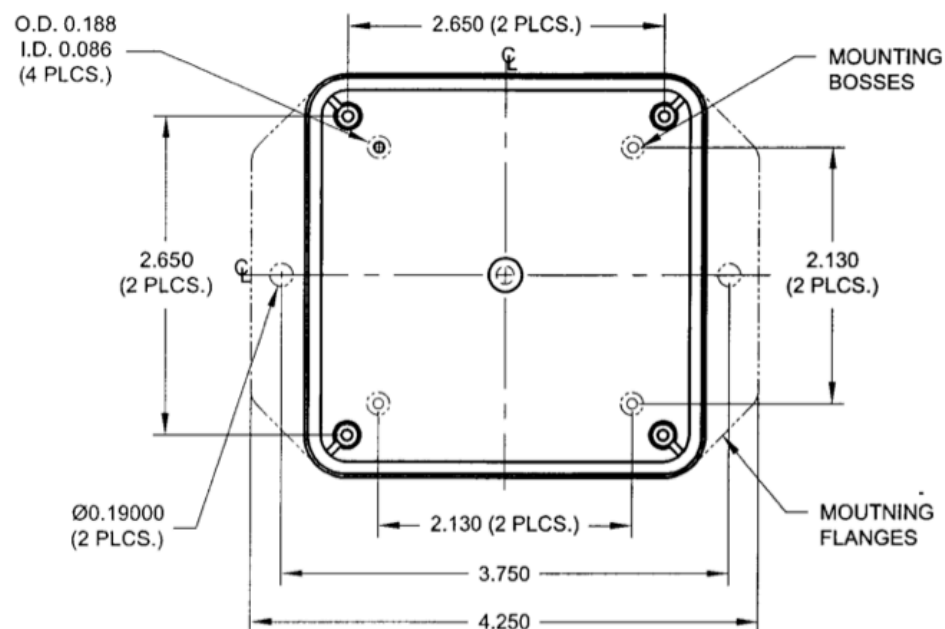
TERMINAL BLOCK

TB1
39357-0009

84-8200B.SCH

COMPANY: Velodyne Lidar, Inc.

NEXT ASSY 82-521		TITLE: SCHEMATIC, HDL CABLE ADAPTER	
DRW KJD	DATE 11/18/10	SIZE: B	DRAWING NO: Sm-8200
CHK	DATE	REV: B	
END KJD	DATE 11/10/10	SCALE: NONE	SHEET: 1 of 1



NOTES:

- 1.) PC BOARD BOSSES WILL ACCEPT A #4 X 1/4" THREAD FORMING SCREW (SCREWS AVAILABLE FROM POLYCASE)

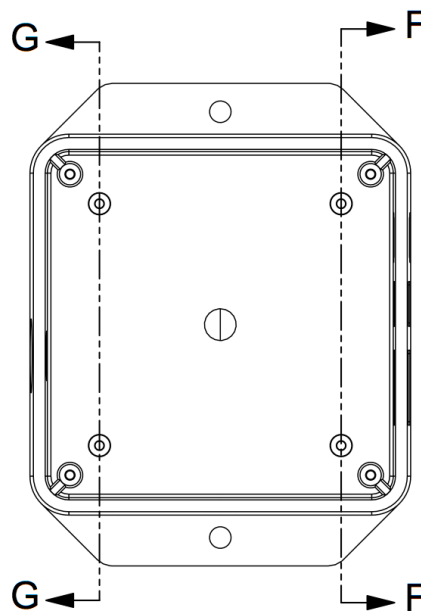
Page 1 of 1

					Page 1 of 1			
					Velodyne®			
					DRWN BY M.M.T.	APP. BY B.B.	SCALE FULL	DATE 08/16/00
					JOB NO:		PRODUCT: LP-41B	
					CUSTOMER:			
					TITLE: PRODUCT DETAIL DRAWING			
REV	DESCRIPTION	BY	CHK	DATE				

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN DECIMAL INCHES.
2. MATERIAL: MAKE FROM 58-756 POLYCASE LP-41BFMB1
3. FINISH: PRINT WITH SUPPLIED ARTWORK (VELODYNE P/N 63-9082) - COLOR: PANTONE 877C
4. MACHINE FEATURES SHOWN.

REVISIONS				
ECN	REV	DESCRIPTION	APPROVAL	DATE
	E1	INITIAL ENGINEERING RELEASE	TAR	11/09/10
111863	A	ADD 58-756 ENCLOSURE, LP-41 TO BOM; RELEASE FOR PRODUCTION	JLC	7/14/11



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN DECIMAL INCHES AND METRIC		SOLIDWORKS2006 GENERATED DRAWING DO NOT MANUALLY UPDATE!		Velodyne Acoustics, Inc. FAB ENCLOSURE, ADAPTER,ABS,BLK,P2.0	
		TOLERANCES ARE: DECIMALS ANGLES .XX ± .03 (0.76) ± N/A XXX ± .005 (0.127)	APPROVALS DATE DESIGNED BY 11/09/10 CHECKED BY		
XX-XXX	SEE NOTES		MATERIAL		SIZE DWG. NO. REV B 50-6001 A SCALE= NTS SHEET 1 of 1
	FINISH		DATE		
NEXT ASSY	DO NOT SCALE DRAWING		DESIGNED BY 11/09/10 CHECKED BY		