

HiTEC DLVR-L05D Airspeed Sensor User Manual

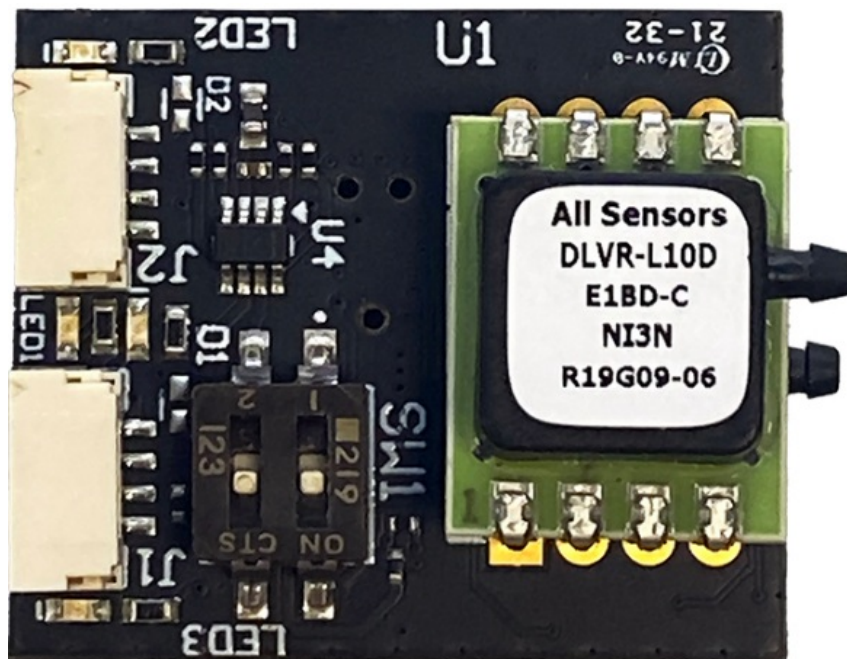
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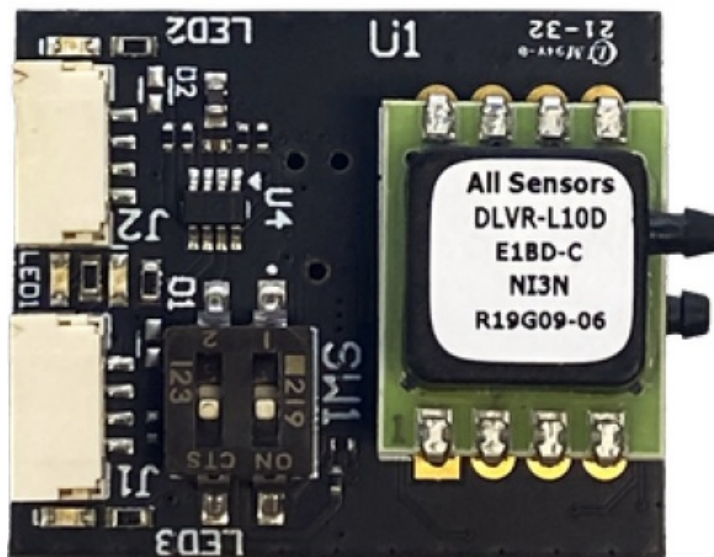


HiTEC DLVR-L05D Airspeed Sensor



Introduction

Thank you for purchasing the Hitec Commercial Solutions Airspeed Sensor, featuring the best-in-class DLVR pressure sensor. All Sensors' CoBeam2 technology improves both sensitivity and long-term stability, allowing the Hitec Airspeed Sensor to provide accurate and reliable performance for professional use. Plus, its flexible interfaces and open-source firmware enable seamless compatibility with unmanned systems and other demanding applications.



Specifications

Variants

The Hitec Airspeed Sensor is offered in four configurations, each with a different operating pressure range.

Pressure Sensor	Sensing Range (in. H2O)	Speed Range (at STP and AMSL)
DLVR-L05D	+/- 5	~ 80kts (41m/s)
DLVR-L10D	+/- 10	~ 120kts (62m/s)
DLVR-L20D	+/- 20	~ 170kts (87m/s)
DLVR-L60D	+/- 60	~ 280kts (144m/s)

Hardware & Sensors

Pressure Sensor	DLVR-LxxD-E1BD-I-PI3N
MCU	STM32G441
Firmware	AP_Periph
Interfaces	I2C, CAN

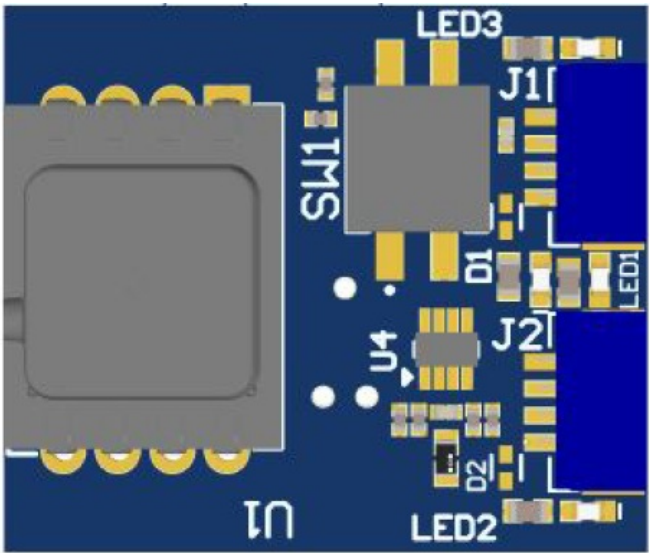
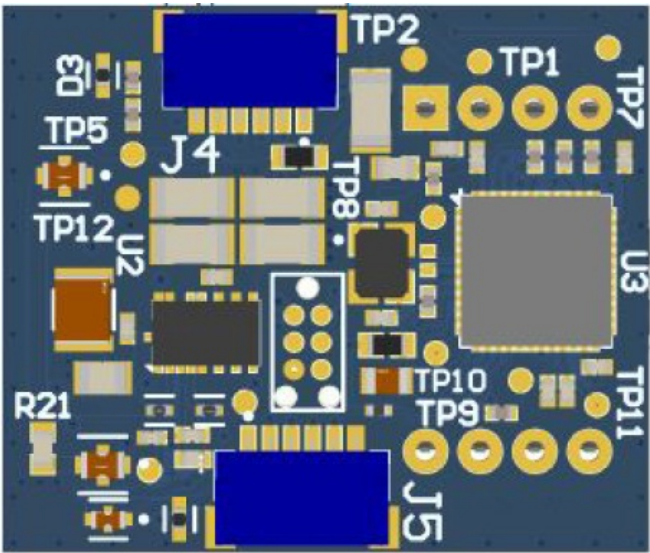
Physical

Dimensions	30 x 25 mm (1.18 x 0.98 in)
Weight	6 g (0.2 oz)

Performance

Input Voltage Range	5 to 36VDC
Operating Temperature Range	-20C to 85C
Humidity Range	0 to 95% RH
Proof Pressure	200 in. H2O (75KPa)
Burst Pressure	300 in. H2O (125KPa) 800 in. H2O (200KPa) for DLVR-L60D

Connectivity



Components & Functions

J1	JST-GH 4-pin	DroneCAN connection to AP_Periph
J2	JST-GH 4-pin	I2C connection to pressure sensor
J4	JST-SH 6-pin	Debug connector for MCU
J5	JST-SH 6-pin	UART and GPIO/ADC node connector

SW1	2-Position DIP Switch	Toggle connection mode & CAN termination
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LED Indicators

Mode/State	LED1 Bootloader	LED2 I2C Status	LED3 CAN Status	LED4 Power
Power Applied No Firmware	Off	Off	Off	On
Bootloader Mode	Blinking quickly	Off	Off	On
CAN Mode DNA Server Found	Off	Off	Blinking at 1Hz	On
CAN Mode Awaiting DNA	Off	Off	Triple blink pattern	On
I2C Mode	Off	Blinking at 1Hz	Off	On
No Power	Off	Off	Off	Off

Pinouts

J1	Pin 1	VIN (5-36VDC)
	Pin 2	CAN H
	Pin 3	CAN L
	Pin 4	GND

J2	Pin 1	VIN (5-36VDC)
	Pin 2	I2C SCL
	Pin 3	I2C SDA
	Pin 4	GND

J4	Pin 1	STM32_VDD
	Pin 2	UART3 TX
	Pin 3	UART4 RX
	Pin 4	SWDIO
	Pin 5	SWCLK
	Pin 6	GND

J5	Pin 1	+3V3
	Pin 2	UART1 TX
	Pin 3	UART1 RX
	Pin 4	GPIO1 / ADC1_6
	Pin 5	GPIO2 / ADC1_7
	Pin 6	GND

Pitot Tube

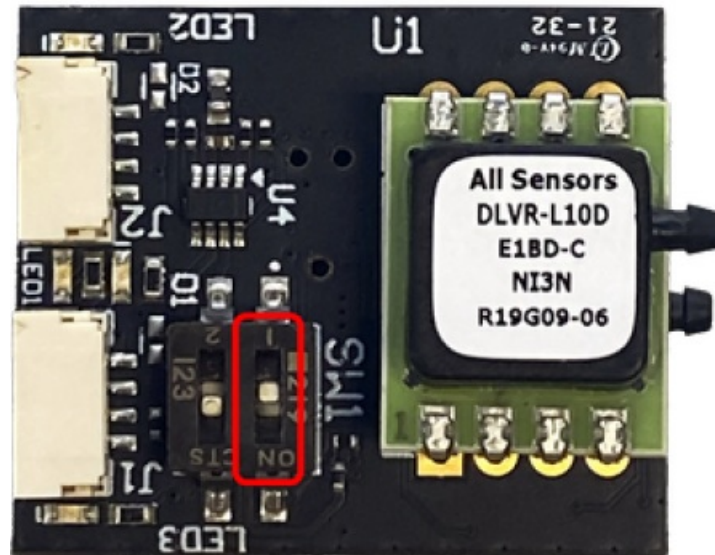
The Airspeed Sensor should be connected to the pitot tube using 1/16" flexible tubing. Ensure that the tubing is secure on the barbs of the DLVR pressure sensor. Tube order does not matter when configured appropriately in Ardupilot.

Ardupilot Integration Guide

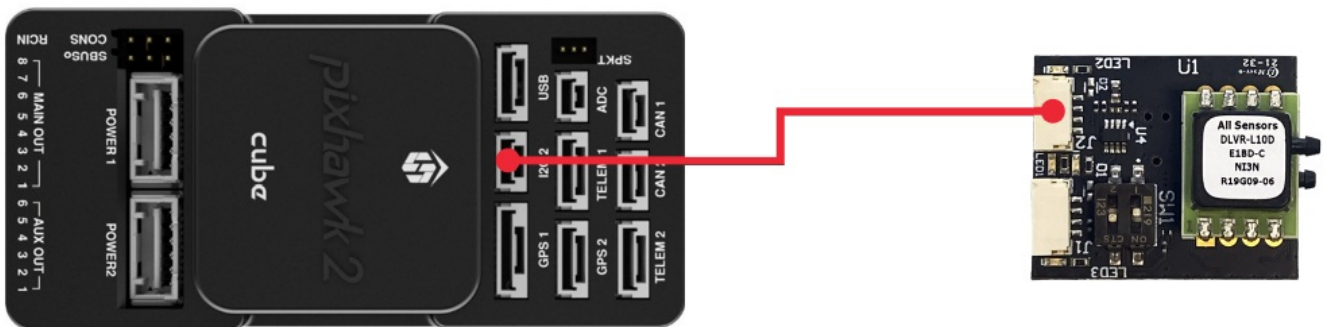
I2C

Connecting to the Airspeed Sensor using the I2C connector uses a direct I2C connection for the DLVR pressure sensor. The MCU still boots but is disconnected from the I2C bus.

- Move position 2 of the DIP switch to the OFF position, towards the J2 connector. This places the Airspeed Sensor in I2C mode.



- Connect the J2 connector of the Airspeed Sensor to the autopilot's I2C connector using the provided JST-GH cable. Or make your own wiring harness using the pinouts detailed previously.



- Configure the following parameters to enable the Airspeed Sensor and select the appropriate DLVR sensor driver. Note that some parameters may vary by flight controller hardware – consult autopilot manufacturer documentation as required. Reboot the autopilot for the changes to take effect.

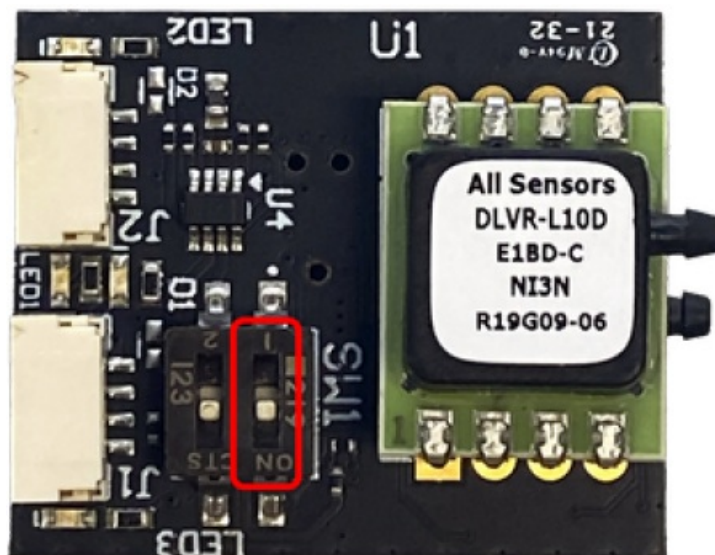
Sensor	DLVR-L05D	DLVR-L10D	DLVR-L20D	DLVR-L60D
ARSPD_TYPE	7	9	10	12

ARSPD_BUS	0
ARSPD_TUBE_ORDER	2
ARSPD_USE	1

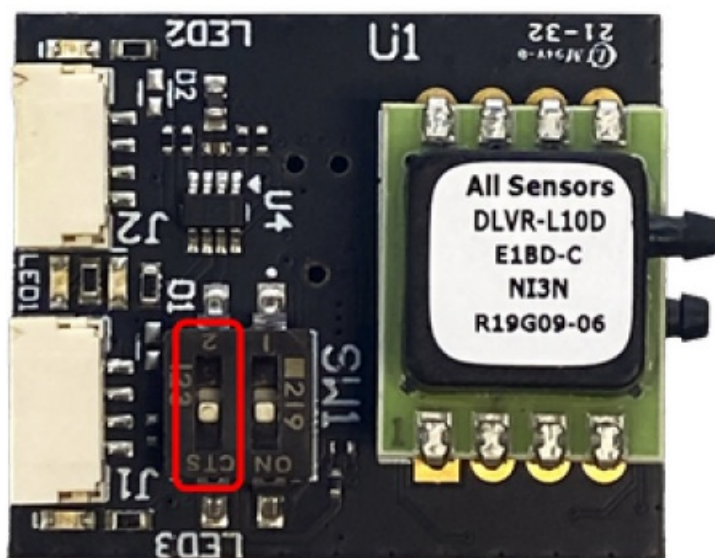
DroneCAN

Connecting to the Airspeed Sensor using the CAN connector uses the AP_Periph firmware on the MCU to manage DroneCAN communications with the DLVR sensor. It also provides a DroneCAN node for external peripherals connected to the board's UART and GPIO signals in the J4 expansion connector.

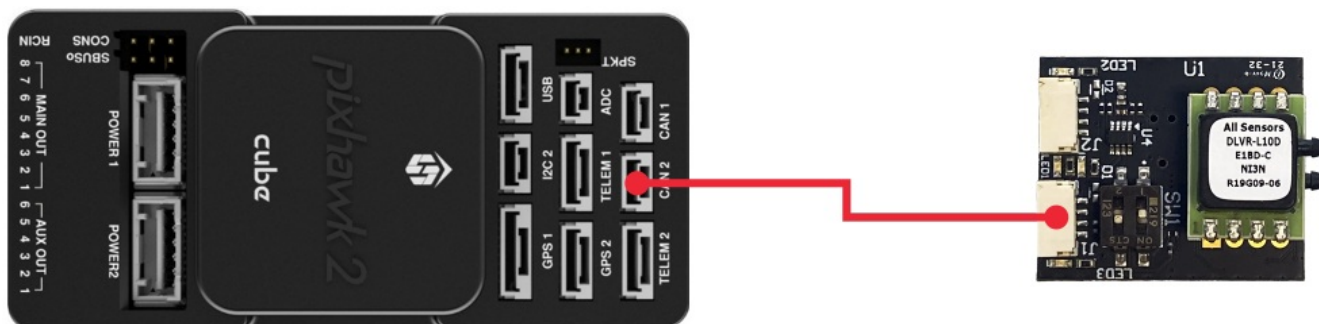
- Move position 2 of the DIP switch to the ON position, towards the J1 connector. This places the Airspeed Sensor in CAN mode.



- If bus termination is desired, move position 1 of the DIP switch to the ON position. This connects an on-board 120-ohm termination resistor between the CAN signal lines.



- Connect the J1 connector of the Airspeed Sensor to the autopilot's CAN connector using the provided JST-GH cable. Or make your own wiring harness using the pinouts detailed previously.



- Configure the following parameters to enable the Airspeed Sensor and DroneCAN communications in general. In this case, the correct DLVR sensor driver for your board's pressure range is preconfigured within the MCU. Note that some parameters may vary by flight controller hardware – consult autopilot manufacturer documentation as required.

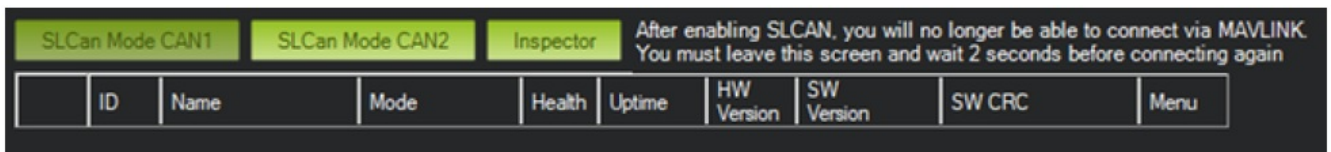
ARSPD_TUBE_ORDER	2
ARSPD_USE	1
ARSPD_TYPE	8

CAN_D1_PROTOCOL	1
CAN_P1_BITRATE	1000000
CAN_P1_DRIVER	1

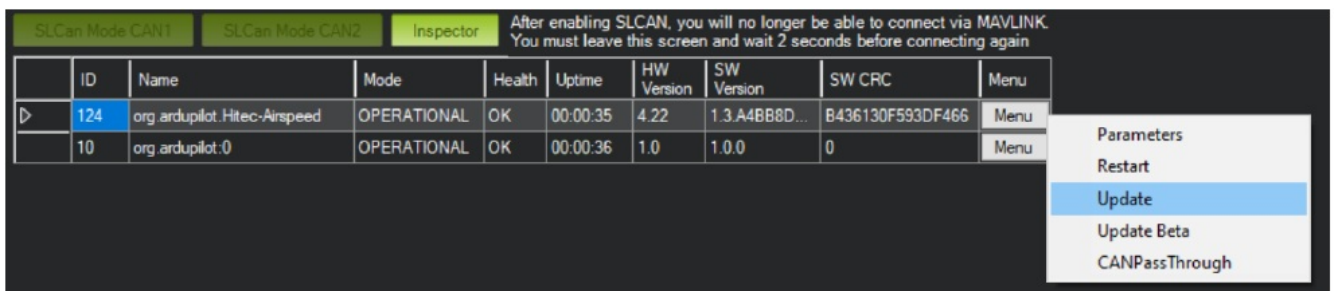
Firmware Update

The AP_Periph firmware on the Airspeed Sensor can be updated over SLCAN using Mission Planner. The latest firmware releases are automatically maintained by the Ardupilot firmware server.

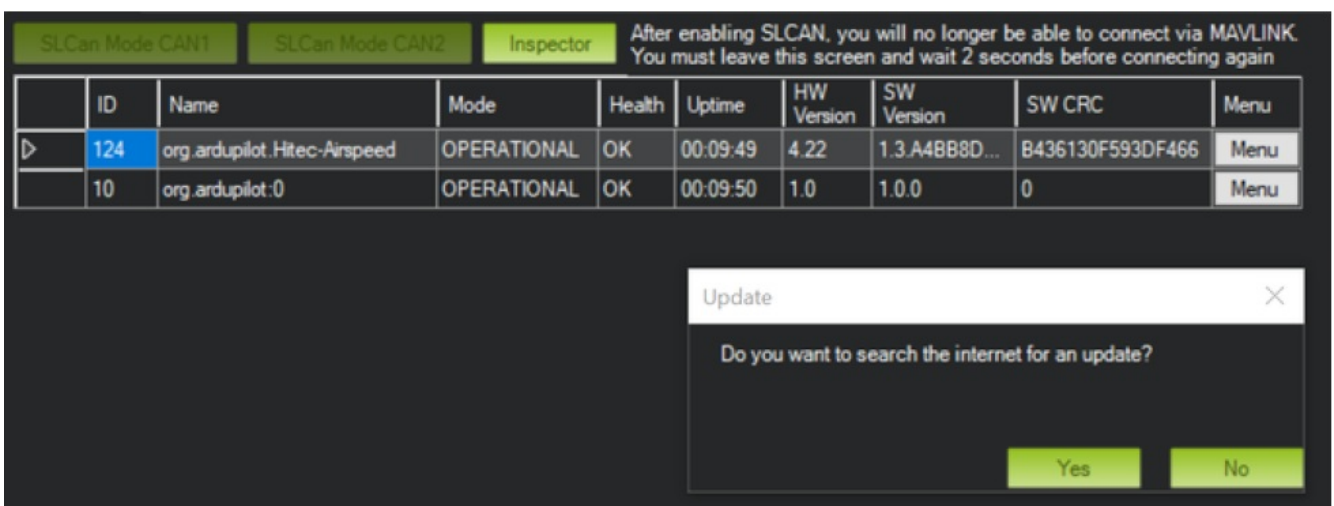
- Use the “SLCan Mode CAN1” (or “SLCan Mode CAN2 if appropriate”) button in Mission Planner to enter SLCAN mode.



- Once the CAN device corresponding to the Airspeed Sensor appears, expand the menu and choose the “Update” option.





- When prompted, click “Yes” to search the internet for an update or “No” to browse for a firmware file manually.



- The update will be performed, and the device will restart once complete.

Documents / Resources

 	<p>HiTEC DLVR-L05D Airspeed Sensor [pdf] User Manual DLVR-L05D Airspeed Sensor, DLVR-L05D, Airspeed Sensor, Sensor</p>
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