

CAN Module – GPS

GPS / Lap timing / Speed



Description

The CS-VB10 is a non-contact speed and position sensor based on GPS technology. Data output is via CAN Bus to allow easy integration into most motor sport and testing applications.

The use of the digital & analogue outputs may be defined at the time of ordering from the following list.

Analogue – **lap pulse** / lateral G / longitudinal G / speed / roll angle /

Digital – **speed** / lap pulse

A short push of an external push button switch is used to mark the GPS location for activating the lap beacon whenever this point is re-passed, a longer press >1.5sec denotes an 'end' GPS position for events where the start and end of lap are in different GPS locations.

CAN data may be mapped directly or integrated with any Digitek logger using a dedicated LPS configuration.



GPS data – Update rate 10Hz

Velocity

Accuracy 0.2 Km/h
Units Km/h or Mph
Max speed 1000 Km/h
Min velocity 0.1 Km/h
Resolution 0.01 Km/h
Latency 160 ms

Distance

Accuracy 0.05% (<50 cm per km)
Units Met / feet
Resolution 1 cm
Height accuracy 10 metres CEP**

Absolute positioning

Accuracy 2.5m 95% CEP**
Resolution 1 cm

Time

Resolution 0.1 sec
Accuracy 0.1 sec

Heading

Resolution 0.01 °
Accuracy 0.2 °

Acceleration

Accuracy 1 %
Maximum 4 g
Resolution 0.1 g

**CEP = Circle of probable error / 95% CEP means 95% of the time the position readings will fall within a circle of the stated diameter

Technical data

Electrical / Mechanical

Supply 8 > 30 V dc
Consumption typical 130 mA
Container IP66
Size (exc connectors) 90 x 92 x 28 mm
Operating temperature -10 > + 70 °c
GPS Antenna 3V Active
Connector – Loom ASDD 6 06 09 PN HE

Speed 115200 baud

Analogue output

Range 0 > 5 Vdc
Options ... speed / lat G / long G / Roll / Lap
Default Lap Pulse

CAN

Speed 125 / 250 / 500 / 1 mbps
Default 1 mbps
Termination Open
Synch frame Not required

Digital output

Min voltage 0 V
Max voltage 5 V
Freq range 10 > 1000 p/m
Max Hz 4.4 Khz
Options Speed / Lap pulse
Default Speed at 20 p/m

RS232

Output data rate 10 Hz
Data NMEA \$GPGGA and \$GPVTG

Digital input

Functions Cold start & Set lap beacon

Ordering information

Part No.	Description	Order Code
CS-VB10	GPS based speed / timing beacon system	Use part No.

For further details please contact

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CAN

Frame 1 0x0301

	Size	Type	Bit Address	length	Dec
1- Satellites in View.....	Byte.....	unsigned	63	8	0
2 - Position latitude*	Long.....	signed	31	32	5

*Output is in Minutes and then 5 decimal places of each minute

Frame 2 0x0302

	Size	Type	Bit Address	length	Dec
3 - Position longitude*	Long.....	signed	63	32	5
*Output is in Minutes and then 5 decimal places of each minute					
4 - Speed – knots**	Word.....	unsigned	31	16	2
**Apply Gain of 0.01151 to convert Knots to Kmh					
5 – Heading (Gain.01).....	Word.....	unsigned	15	16	2

Frame 3 0x0303

	Size	Type	Bit Address	length	Dec
6 - Altitude	3Byte (Long)	signed	63	24	2
7 - Vertical velocity	Word.....	signed	39	16	2
8 - Status.....	Byte.....	unsigned	7	8	0

Frame 4 0x0304

	Size	Type	Bit Address	length	Dec
9 - X axis – Long G	Word.....	signed	31	16	2
10 - Y axis – lat G.....	Word.....	signed	15	16	2

Frame 5 0x0305

	Size	Type	Bit Address	length	Dec
11 - Module distance.....	Long.....	unsigned	63	32	0

Frame 6 0x0306

	Size	Type	Bit Address	length	Dec
12 - Lean angle (bikes only).....	Word.....	signed	47	16	2
13 - Radius of turn (Gain .01) ...	Long.....	signed	31	32	0

1. If Satellites in view < 3 then only Identifier 0x301 transmitted and bytes 2 to 8 are set to 0x00.
2. Position, Latitude * 100,000 (311924579 = 51 Degrees, 59.24579 Minutes North). This is a true 32bit signed integer, North being positive.
3. Position, Longitude * 100,000 (11882246 = 0 Degrees, 58.82246 Minutes West). This is a true 32bit signed integer, West being positive.
4. Velocity, 0.01 knots per bit.
5. Heading, 0.01° per bit. – 0 = North / 90 = East / 180 = South / 270 = West
6. Altitude, 0.01 meters per bit, signed.
7. Vertical Velocity, 0.01 m/s per bit, signed.
8. Status is an 8 bit unsigned char. Bit 0 is always set, Bit 4 = Lap Beacon active.
9. Longitudinal Acceleration, 0.01G per bit, signed.
10. Lateral Acceleration, 0.01G per bit, signed.
11. Distance travelled in meters since module reset.
12. Lean Angle, 16-bit signed integer * 100. (Motorcycles only)
13. Radius of Turn 32-bit signed * 100.

Electrical connections

Pin	Function
1	RS232-RX
2	Power 8 > 30 Vdc
3	CAN N
4	CAN P
5	Analogue output – Default = Lap pulse

Pin	Function
6	Lap marker input
7	Digital output – Default = 20p/m speed signal
8	RS232-TX
9	Ground