VBOX Sigma

(RLVBSIGMA)

VBOX Sigma is a cost-effective, RTK enabled 10 Hz data logger with integrated NTRIP modem.

Its multi-constellation, multi-frequency GNSS engine offers outstanding RTK performance even in areas with poor and multi-path satellite coverage.

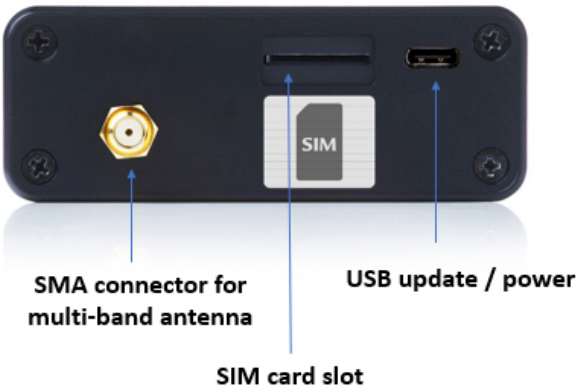
When used in conjunction with an RTK base station or NTRIP correction service, VBOX Sigma is accurate to within a centimetre and is the ideal reference for ground truth.

The in-built NTRIP modem makes it easy to receive RTK correction messages from an NTRIP network, either via Wi-Fi or a 4G cellular connection.

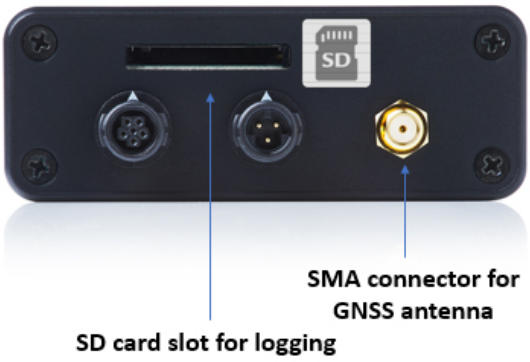
Key Features

- Centimetre-level position accuracy with RTK
- 10 Hz GNSS receiver (GPS, GLONASS, Galileo & BeiDou)
- Receive NTRIP corrections via internal 4G modem (using a Standard SIM card) or Wi-Fi hotspot (2.4 GHz only)
- Integrated OLED screen which displays status and connection information
- CAN Bus output to 3rd party data logger or another device
- Serial output for live data display on your PC or laptop (running the VBOX Test Suite software)

Top View



Bottom View



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Inputs

Unit Power	
Input Voltage Range (automotive)	7 V to 30 V DC (Hirose) 5 V (USB-C)
Power Consumption	<5 W

GNSS Antenna Supply	
Supply Voltage	3 V DC

Outputs

CAN Bus	
Output Data Rate	125 kbit/s, 250 kbit/s, 500 kbit/s & 1 Mbit/s selectable baud rate. Software controlled CAN termination.
Data available	Satellite count, time, position, speed, heading, altitude, vertical velocity, longitudinal acceleration, lateral acceleration, solution type, date, correction age, serial number
RS232	
Output Data Rate	10 Hz
Data available	Satellite count, time, position, speed, heading, altitude, vertical velocity, longitudinal acceleration, lateral acceleration, solution type, date, correction age

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GNSS Specifications

Velocity		Distance	
Accuracy	0.1 km/h (averaged over 4 samples)	**Accuracy**	0.05 % (< 50 cm per km)
Update rate	10 Hz	**Resolution**	1 cm
Maximum velocity	1,600 km/h	**Update rate**	10 Hz
Minimum velocity	0.5 km/h		
Resolution	0.01 km/h		

Position		Acceleration	
Accuracy (Standalone)*	H: 1.5 m CEP	**Accuracy**	1 %
Accuracy (with SBAS)*	H: 1.0 m CEP	**Maximum**	4 g
Accuracy (with RTK)*	H: 0.01 m + 1 ppm CEP V: 0.01 m + 1 ppm R50	**Update rate**	10 Hz
Update rate	10 Hz	**Resolution**	0.01 g
Resolution	0.00185 m		

Heading			
Resolution	0.01°		
Accuracy	0.3°		
Update rate	10 Hz		

* Specifications will vary depending on the number of satellites used, obstructions, satellite geometry (PDOP), multipath effects, and atmospheric conditions. For maximum system accuracy, always follow best practices for GNSS data collection.
1 ppm means 1 mm/km away from base. ppm is limited to baselines up to 20 km

Supported GNSS Signals

GPS	GLONASS	Galileo	BeiDou
L1C/A (1575.420 MHz)	L1OF (1602 MHz + k* 562.5 kHz, k = –7,..., 5, 6)	E1-B/C (1575.420 MHz)	B1I (1561.098 MHz)
L2C (1227.600 MHz)	L2OF (1246 MHz + k* 437.5 kHz, k = –7,..., 5, 6)	E5B (1207.140 MHz)	B2I (1207.140 MHz)

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Specifications

Environmental and Physical	
Operating Temperature	0°C to 65°C
Storage Temperature	-20°C to 80°C
Weight	247 g (with multi-band antenna)
Dimensions (mm)	142.8 (l) x 81.13 (w) x 27.8 (d)
Protection Rating	IP20

Power	
Supply Voltage	12 V DC (7 V to 30 V)
Protection	Over-voltage and reverse polarity protected
Power Consumption	<5 W

Cellular Module Features	
Frequency Bands	LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28 LTE-TDD: B38/B39/B40/B41 WCDMA: B1/B2/B4/B5/B6/B8/B19 GSM: B2/B3/B5/B8

Wireless Module Features	
Wi-Fi	IEEE 802.11b/g/n 2.4GHz
Access Modes	AP Mode (DHCP server) and Station mode (WPA and WPA2)
Internet Protocol	IPv4

Cellular Antenna	
Cellular Antenna Connector	SMA Female 50 Ω

Serial Interface	
RS232	115200 Baud rate, 8N1, No flow control

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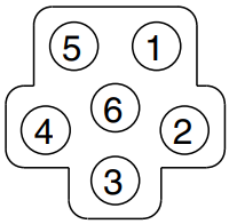
Pin Allocation

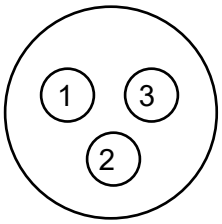
6 Way Hirose HR30 Connector

Pin	Product Function
1	RS232 Rx (Data IN to VBOX Sigma)
2	RS232 Tx (Data OUT of VBOX Sigma)
3	GND
4	CAN L
5	CAN H
6	Power



3 Way Hirose Connector

Pin	Product Function
1	Power
2	Ground
3	N/C



Dimensions

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Package Contents

Description	Product Code
VBOX Sigma Unit	VBSIGMA-V1
GNSS Antenna	RLACS308
USB-A to USB-C Fast Data/Power Cable	TTV1AM20MB31
Hirose 3 W Plug to Cigar Plug Power Cable, 2 m	RLCAB010H
8 GB SD Ultima Pro UHS-1 Memory Card	RLACS313
Multi-Band Antenna	ANTMSTUBSMAM

Optional Cables

Description	Product Code
6 Way Hirose to 5 Way Lemo (2 m) – Power and CAN for connection to an MFD Touch	RLCAB170
6 Way Hirose to 9 W D-Connector – Serial cable for PC or telemetry connection	RLCAB001-H
6 Way Hirose to 9 W D-Connector- CAN cable to take VBOX CAN out to 3rd party system	RLCAB181
6 Way Hirose to Unterminated – Open for custom connection, includes power-CAN and Serial	RLCAB164