

ONYX 2

Introduction

SPILBA ONYX 2 is a 3-in-1 data acquisition system with CAN BUS, integrating a 25Hz GNSS engine, 6-axis IMU (Inertial Measurement Unit), and expandable SD memory module. This model features a CNC machined and anodized aluminum housing, Motorsport quality, and is ideal for use as a standalone data-logger or as an expansion to another system via CAN BUS.

ONYX 2 features a GNSS module with a sampling rate of 25 Hz, capable of receiving and processing signals in the GPS (L1), GLONASS (L1), Galileo (E1), and Beidou (B1) bands, as well as simultaneous reception of SBAS and QZSS, always ensuring maximum resolution of position and velocity.

It contains a three-axis accelerometer to measure lateral, longitudinal, and vertical acceleration, as well as a three-axis angular velocity sensor (gyroscope) to measure rotations: pitch, roll, and yaw (X, Y, Z axes).

The recording of acquired data is done on an external SD or SDHC memory. It supports memories formatted in FAT32, with capacities up to 2 TB.



General features:

- GPS+GLO+GAL+BDS y SBAS + QZSS @ 25 Hz
- Three-axis accelerometer (with auto-calibration on startup)
- Three-axis gyroscope (with auto-calibration on startup)
- Expandable memory via SD or SDHC
- Periodic synchronization with SD to avoid data loss
- Anodized CNC aluminum design, Motorsport quality
- Status LEDs
- Automatic system reset on failure

Technical specifications

Core specifications	
Core	32 bit ARM Cortex-M4
Performance	80 MHz

GNSS specifications	
Frequency bands	GPS (L1) GLONASS (L1) Galileo (E1) Beidou (B1)
Acquisition rate	25 Hz
Accuracy	< 2 m CEP
Sensitivity	Acquisition -160 dbm
	Navigation -167 dbm
	Tracking -167 dbm

Accelerometer specifications	
Number of axes	3 (X, Y, Z)
Maximum acquisition speed	1000 Hz
Range	±4 G
Resolution	0,0001 G

Gyroscope specifications	
Number of axes	3 (X, Y, Z)
Maximum acquisition speed	8000 Hz
Range	±250 °/s
Resolution	0,01 °/s

Memory specifications	
Supported card types	SD
	SDHC
Supported file system	FAT32
Supported sizes	Up to 2TB
Write speed	Variable and adaptable to the card used
Recording Time	Depending on the capacity of the card used. Typically 3.2 MB/hour.

Power supply, consumption, and operating conditions	
Supply voltage	+9 a +24V DC
Current consumption	130mA Typical
Protections	Overvoltage protection, voltage reversal and overcurrent with self-resetting fuse, varistors, and protection diodes.
Operating temperature	-25 °C ~ +70 °C

GNSS antenna	
Frequencies	1575 Mhz/ 1602 Mhz
Total gain with LNA	26 ± 3dBic @ Zenith @ 1575.42MHz 27 ± 3dBic @ Zenith @ 1602MHz
Nominal output impedance	50 Ω 66.52 +j3.85 Ohm@ 1575MHz 46.77 +j0.98 Ohm@ 1602MHz
Polarization	Right-hand circular
VSWR	2.6 dB maximum
Mounting	Magnetic Base
Degree of protection	IP67
Connector type	SMA 26 GHz bandwidth
Operating temperatures	-40C +85C

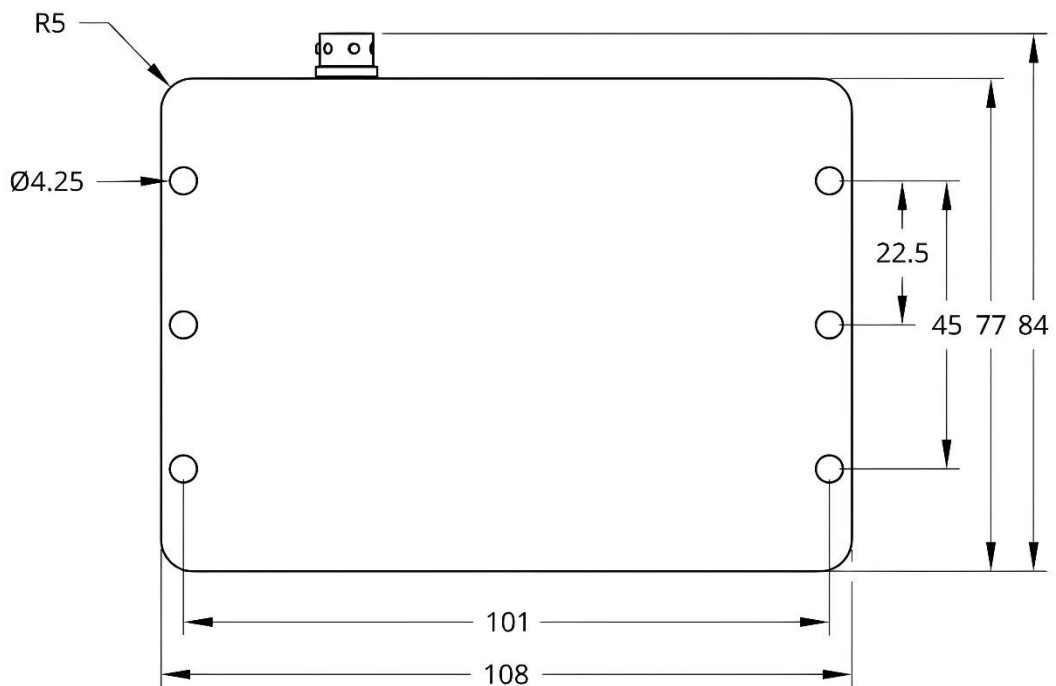
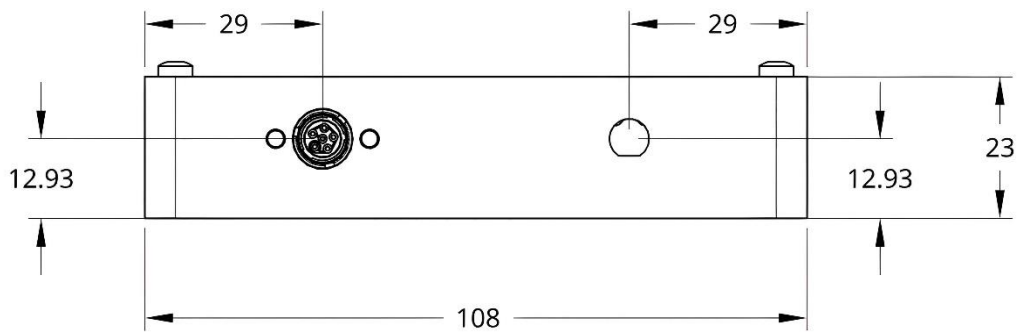
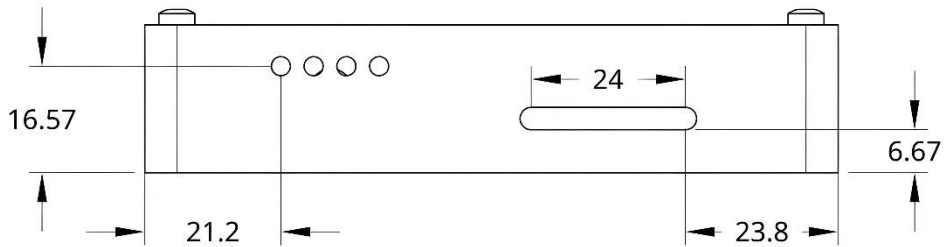
RS232 output	
Configuration	115.200-8-N-1 (the baudrate can be factory configured to 57.600 on request)
NMEA	GGA y RMC

CAN BUS (1Mbit/s)										
Name	Address	Byte	Length	Order	Type	Multiplier	Divider	Adder	Unit	Freq
Latitude	0x02D0	1	4	Intel	Signed	1	10,000,000	0	DD.DDDDDDD	25 Hz
Longitude	0x02D0	5	4	Intel	Signed	1	10,000,000	0	DD.DDDDDDD	25 Hz
UTC_TIME*	0x02D4	1	3	Intel	Unsigned	1	100	0	seg/100	25 Hz
Speed	0x02D4	5	2	Intel	Unsigned	1	100	0	km/h	25 Hz
Heading	0x02D4	7	2	Intel	Unsigned	1	100	0	°	25 Hz
Sats	0x02D8	1	1	Intel	Unsigned	1	1	0	unit	25 Hz
Height	0x02D8	2	2	Intel	Unsigned	6	100	0	meters	25 Hz
Vbatt	0x02D8	4	1	Intel	Unsigned	1	10	0	Volts	25 Hz
Temp	0x02D8	5	2	Intel	Signed	1	10	0	°C	25 Hz
ACCX	0x02DC	1	2	Intel	Signed	1	1000	0	G	100 Hz
ACCY	0x02DC	3	2	Intel	Signed	1	1000	0	G	100 Hz
ACCY	0x02DC	5	2	Intel	Signed	1	1000	0	G	100 Hz
GYROX	0x02E0	1	2	Intel	Signed	1	131	0	°/s	100 Hz
GYROY	0x02E0	3	2	Intel	Signed	1	131	0	°/s	100 Hz
GYROZ	0x02E0	5	2	Intel	Signed	1	131	0	°/s	100 Hz

*This is a count of 4 ms intervals since midnight UTC

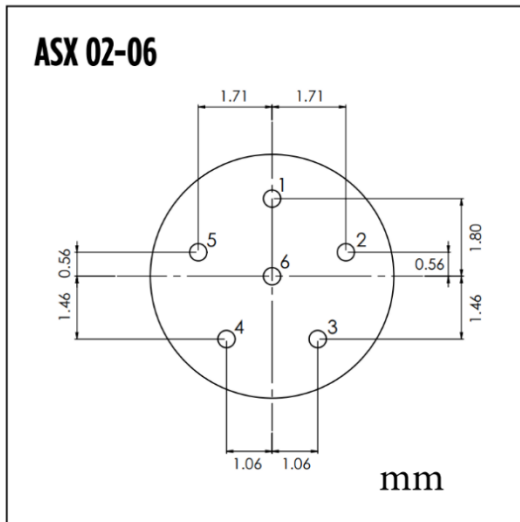
Dimensions

Note: All dimensions are in mm. Figures are not to scale.



Connectors

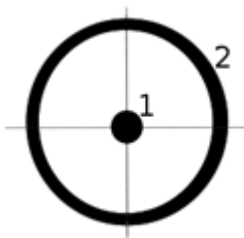
DEUTSCH AUTOSPORT: ASX002-06PN-HE



MATING CONNECTOR: ASX602-06SN-HE

PIN	Function
1	Vbat +
2	Pushbutton
3	CAN_H
4	CAN_L
5	RS-232 output
6	Vbat -

SMA AMPHENOL: GNSS ANTENNA HG (GPS + GLONASS)



1	Signal/VCC
2	GND

