



GPS 100



GPS 100.PRO

TECHNICAL SPECIFICATION

WWW.BUECH-IT.DE



The gps100.PRO is the result of continuous development of the gps.100 product family in numerous highly challenging test environments. An example of this is motorsport development on the Nürburgring Nordschleife.

In a compact housing, the well-proven GPS performance of the gps.100 series is combined with a 3-axis accelerometer as well as a 3-axis gyroscope. Sensors such as a magnetic field sensor, are combined with GPS data in a specially developed sensor fusion algorithm. This is supplemented by an air pressure sensor and digital compass. This results in a very low-noise speed signal.

In addition to this, a permanent plausibility check of the signal is carried out via a second HighEnd LowSpeed GPS receiver. This leads to less false information and a more stable signal.

All sensor values are output with a measurement frequency of up to 400Hz.

The gps.100PRO receiver supports all current GNSS systems (GPS, Glonass, Galileo, BeiDou). SBAS/EGNOS information is also received and included for correction. Optionally, RTK correction values can be imported into the system via Ethernet / RS232 to achieve accuracies in the cm range.

A sophisticated standstill detection "PSD" (Precise Stop Detection) lowers the trigger threshold to almost 0.00 km/h without additional filters and thus also the latencies during start-up.

With the optional IMU fitted, the roll/pitch as well as the yaw angle (dynamic / static) can be measured directly via the internal sensors. Additionally, side slip angle and other accelerations can also be measured and output directly, both with and without gravity correction.

Three analog and two digital inputs are available. The three analog outputs create the connection to existing hardware. In addition, data can be imported via OBD-II (incl. WWH support) and/or CAN (Classic 2.0B / FD). The speed signal can be output as an analog voltage or as a digital pulse sequence. Furthermore, all data can be output on the CAN bus or stored in the system (logging function).

All data is provided with a time stamp, which allows internal latencies and runtimes on the CAN bus to be compensated. The device software is optimised for processing with the lowest possible latency.

Internal apps can perform fully automatic measurements and tests such as braking distance measurement, lap time and driving performance. These results can be output on the CAN bus. The gps.100PRO internal apps have an intelligent test recognition and can thus, automatically record a driven test via previously defined trigger thresholds (braking distance measurement).

The device can be parameterised with an easy to use configuration software, where configurations and profiles can be saved directly to the device.

Data can be stored internally and then copied to a USB stick. Collected data can be analysed with own or third-party software and tools as well as exported to Google Earth, for example.

With the gps.100PRO measurements according to ECE R13H are possible.

Applications:

- Driving performance measurement
- Brake tests
- Homologation
- Driving dynamics & Handling
- Consumption & exhaust gas measurement
- Real Driving Emission
- Driver Assistance Systems development
- High Performance GPS Measurements

GENERAL
GPS system

up to 400Hz
GPS L1, also supports
Glonass, Galileo, BeiDou
integrated IMU

Slave GPS

up to 20Hz
GPS L1/Glonass/Galileo/BeiDou

CPU/MCU

High-Performance
CPU with 1.4GHz
QuadCore 2GB RAM, 32GB
Flash

Display

4.3" TFT touch display (colour)

Housing

anodized aluminium housing with
mounting plate

Supply

9V to 70V, DC
max. 500mA
(Peak up to 2A) @ 12V

Temperature

Operating
-30°C to 70°C
Storage
-30°C to 70°C

INPUT
CAN

2 channel (Shared
In/Out) CAN 2.0 A/B, up
to 1MBaud, adjustable
Supports CAN FD up
to 8MBaud

Input of CAN signals via DBC
into the data pool

OBD-II*

ISO15765 configurable CAN
Various signals can be
retrieved by the vehicle

*Vehicle dependent, option

Digital

2 Digital trigger inputs
>5V High level
<1V low level
Latency <1µS

Analog

3 Analog inputs
0-20V DC, 12Bit resolution
100Hz sampling rate
-3dB @ 55 Hz

OUTPUT
CAN

2 channel (Shared In/Out)
CAN 2.0 classic, up to 1MBaud,
adjustable, standard 11bit IDs
Supports CAN FD to
8MBaud

All values incl. time stamp

Digital

2 Digital TTL outputs 0V /
5V level, max. 50mA
Refresh rate: 100Hz

Analog

3 Analog output
0 - 5V, 10mV per km/h
Refresh rate: 100Hz

IMU - STANDARD
GYRO
Range

+/- 2000 °/sec

Nonlinearity

0.1% FS

3dB bandwidth

250 Hz

Stability

0.0027 °/sec

ACCELEROMETER
Range

+/- 16g

Nonlinearity

0.5% FS

3dB bandwidth

250Hz

Stability

0.03mg

MAGNETOMETER
Resolution

0.25mG

Full range

8 G

OTHER
Calibration

In-house calibration service
with GPS test stand

Warranty

1 year limited factory warranty

GPS Performance / Accuracies

Speed	Accuracy: 0.054 km/h 0.02 m/s (1 σ RMS) Resolution: up to 0.01 km/h Latency: 0ms (with time stamp) max. 500 km/h Refresh rate: 400Hz max.
Position accuracy	Horizontal (SBAS): 1.5m (1 σ STD) without RTK <1cm (1 σ STD) with RTK up to 1km to base. Vertical (SBAS): 2m (1 σ STD) <20cm (1 σ STD) with RTK up to 5km to base Refresh rate: 400Hz max.
Heading	Accuracy: 0.1° (Static / Dynamic), Single Antenna Resolution: 0.01°
Roll / Pitch	Accuracy: 0.35° / Static and Dynamic (typical, standard IMU) 0.15° / Static (with High Resolution IMU)* 0.2° / Dynamic (with High Resolution IMU)*
Yaw	Accuracy (without GPS): 1.5° (standard IMU) 1° (with High Resolution IMU)*

*optional

The gps100.PRO can optionally be equipped with a better, higher resolution and more stable IMU. This allows for a more accurate position and altitude determination and thus a more accurate speed signal.

ATTENTION:

Delivery with HighRes IMU only possible with confirmation of non-military use.

GYRO**Range**

+/- 450 °/sec

Nonlinearity

0.01% FS

3dB bandwidth

410 Hz

Stability

0.0027 °/sec

ACCELEROMETER**Range**

+/- 20g

Nonlinearity

0.1 % FS

3dB bandwidth

370Hz

Stability

0.015mg

MAGNETOMETER**Resolution**

0.25mG

Full range

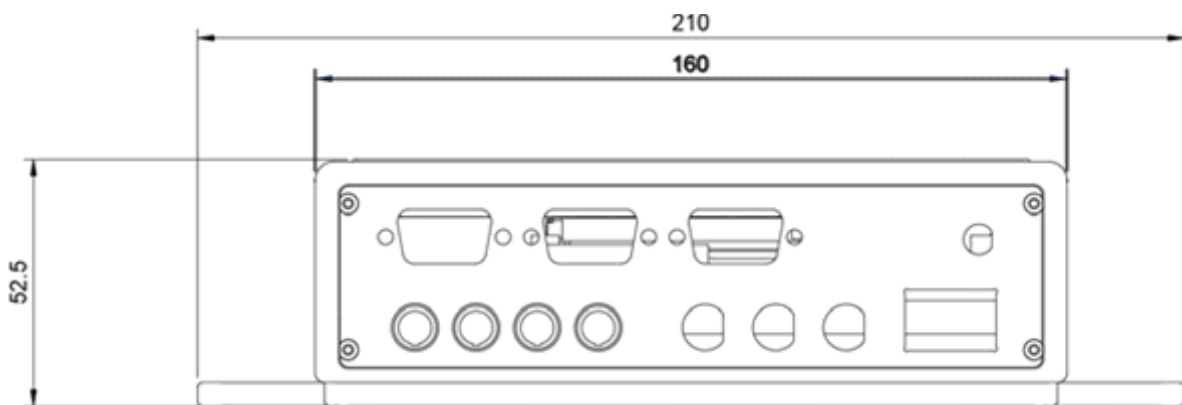
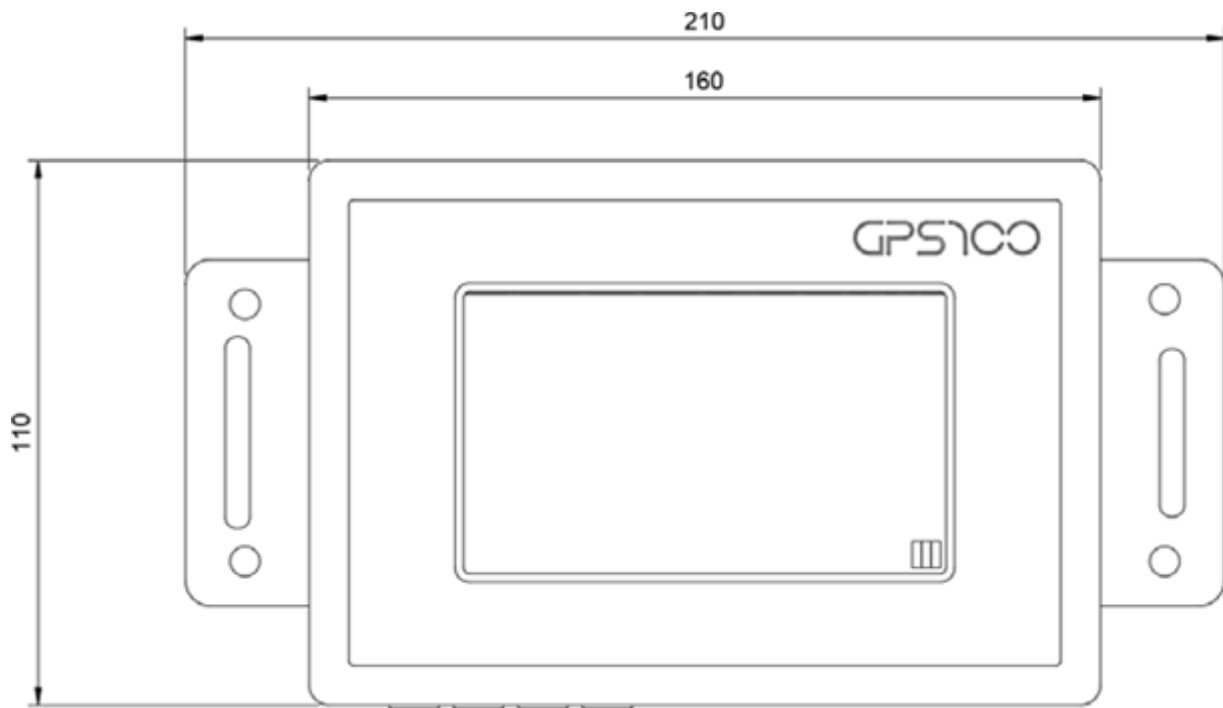
8 G

BAROMETER**Resolution**

0.08m

Full range

300-1100 hpa



Büch.IT

Steinenbrück 18
57642 Alpenrod
Germany

<https://www.buech-it.de>
info@buech-it.de

+49-2662-500477-0