DUETTO engineering
STEFAN ROMAN MÜLLER

MEASURING SOLUTIONS

# gps100BS

# 100 Hz Dual GPS System

## 100 Hz Dual GPS System with assist GPS 20 Hz

## Precise stand still detection

## Online plausibility check

## Time stamp function to exclude latency problems

## Triax accelerometer / Triax gyroscope (option!)


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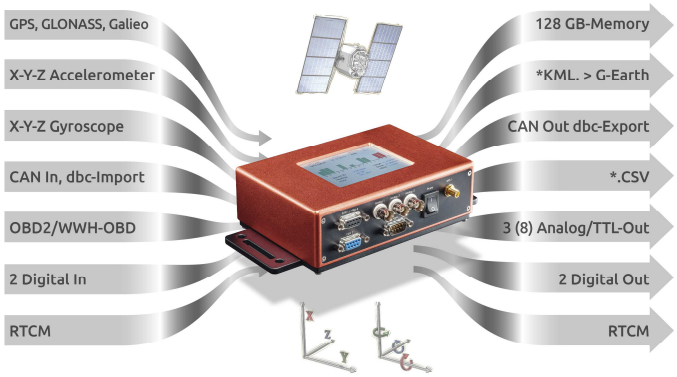
## *Triax accelerometer with dynamic zero balancing (Option!)*

Extensive manual adjustment belongs to the past! The system *gps100BS* identifies all 3 spatial axes, independent of mounting position, over a short accelerating drive from 0 to 30 kph on a straight and even distance, and aligns the orientation of vehicle accordingly. For data evaluation of measuring results the original data and the revised accelerating values are released via CAN output




Die Abbildung oben zeigt beispielhaft das erweiterte System gps100PRO

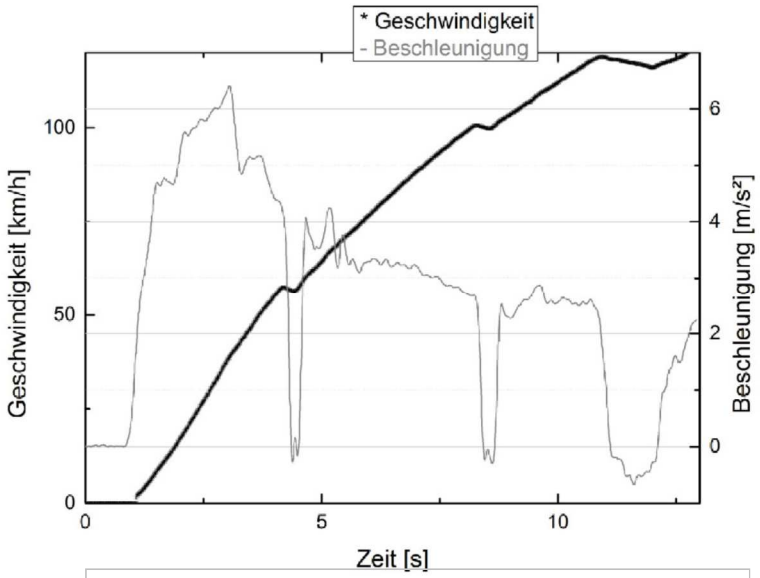
## *Triax gyroscope (Option!)*

Another integrated triax gyroscope sensor (Option!) expands the system for detailed vehicle dynamics evaluation.

## *Raw data / switchable signal filters*

The system *gps100BS* works with raw data only for signal processing and CAN output (unfiltered!). Additionally there are many filter types to be applied (Butterworth, Chebychev, Bessel), 8th order, each with cut-off frequency of 10, 20 and 50Hz, for smoothing of the accelerating values.

The signal curve on the right side shows a typical accelerating test drive. The measuring values of IMU provide a signal curve that reproduces an optically quick determined and realistic image of the accelerating drive where no relevant data are suppressed by filtering.




**Accelerating drive:**

GPS speed signal and measuring data of the integrated accelerometer, filtered by Butterworth filter, 8th oder and a cut-off frequency of 20Hz.

The measuring curve shows shifting processes and provides a plausible information of the grade of acceleration.

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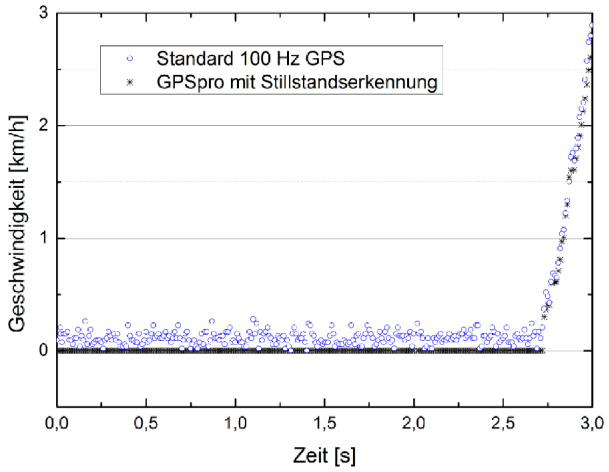
### *Intelligent stand still detection*

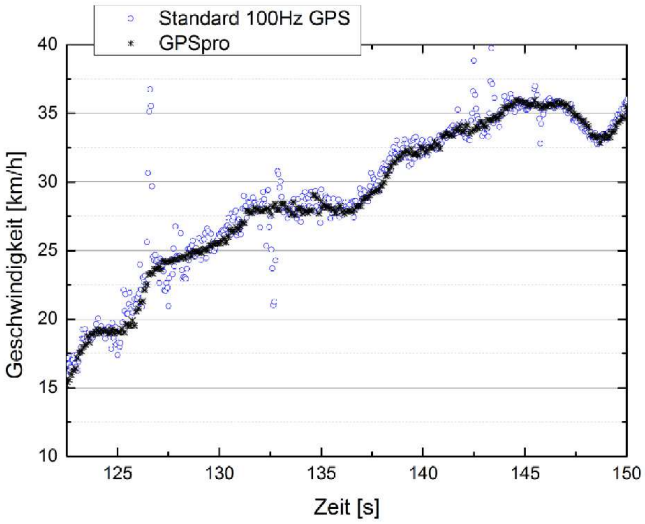
The intelligent stand still detection of combined main and assist GPS provides a reliable and precise threshold level from a range of 0,15 kph (!) already at acceleration tests. Especially for performing standardized tests this secured trigger is essential!

Due to this applied and smart process in the *gps100BS* the lower threshold could be reduced by 70% compared to other conventional GPS receivers.




### *Plausibility check*

At detection of an implausible change of speed the data of the sensitive main system are rejected and replaced by data of the of the less fragile assist GPS for the period of interference. The result in comparison with conventional GPS systems is depicted in the image at the right side. Typical spikes are checked for feasibility and corrected in the *gps100BS.*




### *Time stamp function avoids latency errors*

The accuracy of the original data which is necessary for post-processing data evaluation is guaranteed in the *gps100BS* over a GPS related time stamp function. The GPS signals are „stamped“ after validation by CPU and released together with time stamp range via CAN. The GPS information, free of latencies now, can be used for correlation together with other „stamped“ signals over a suitable software tool. The unwanted influence of system run time, CAN latency and influence of subsequent measuring chain now can be removed by knowing the exact time of acquisition of position and speed calculation.

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### *Vmax measurement: Safe signal behaviour at different speed settings*

The required accuracy of the gps100PRO/BS for standardized measuring processes at constant speed settings (30, 60, 180, 200 kph) has been confirmed against measurements with a high end intertial system (OXTS).

### *System version gps100PRO*

With *gps100PRO* we offer an extended version based on same technical specification. The system includes 3 free programmable analog/TTL outputs, OBD/WWH interface, memory function with threshold monitoring and versatile trigger functions with data memory up to 128 GB via exchangeable SDHC.

### *gps100BS + PRO / VarioVIEW7*

All acquired information of *gps100BS* can be displayed in combination with the multi-functional 7“ display *VarioVIEW7* over various graphical elements. Optionally a threshold monitoring can be used to set acoustical or visual alarm signals.

The modular structure allows the user to extend the system into a self-sustaining, versatile logging unit.


### *Technical Details*

- ◊ Intelligent Dual GPS System 100 Hz / 20 Hz
- ◊ Modular System Setting
- ◊ CPU ARM7, 72MHz, 16MB RAM, Mini USB 2.0,
- ◊ integrated Colour-touch-Display 128x64 Pixel
- ◊ CAN Output GPS, Acceleration and Gyro signal values
- ◊ 2 Trigger– Inputs (Light beam, Brake contact, pusbutton, ect.).
- ◊ 2 Trigger-Outputs 12 Volt / 500 mA
- ◊ Anodized Aluminum Housing
- ◊ Power supply +8 bis +32 Volt
- ◊ Inclusive GPS Antenna with 5 m connection cable

### *Options / System extensions*

| | |
|---|---|
| ◊ ***3 ANA-OUT*** | 3 Analog outputs individually selectable, 16 Bit, connection over 3 BNC sockets (gps100PRO) |
| ◊ ***OBD2*** | Tapping of correlating vehicle data via onboard diagnosis bus OBD2/WWH-OBD (gps100PRO) |
| ◊ ***MEM-SDHC*** | Memory function incl. threshold monitoring. (gps100PRO) |
| ◊ ***GEARTH*** | Data conversion *.KML for transfer of GPS data to Google Earth |
| ◊ ***Triax-ACC*** | Triax accelerometer, +/- 5 g, DC-330 Hz. |
| ◊ ***Triax-GYRO*** | Triax gyroscope ±75°/sec, ±150°/sec, ±300°/sec., statisch bis 300 Hz |

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