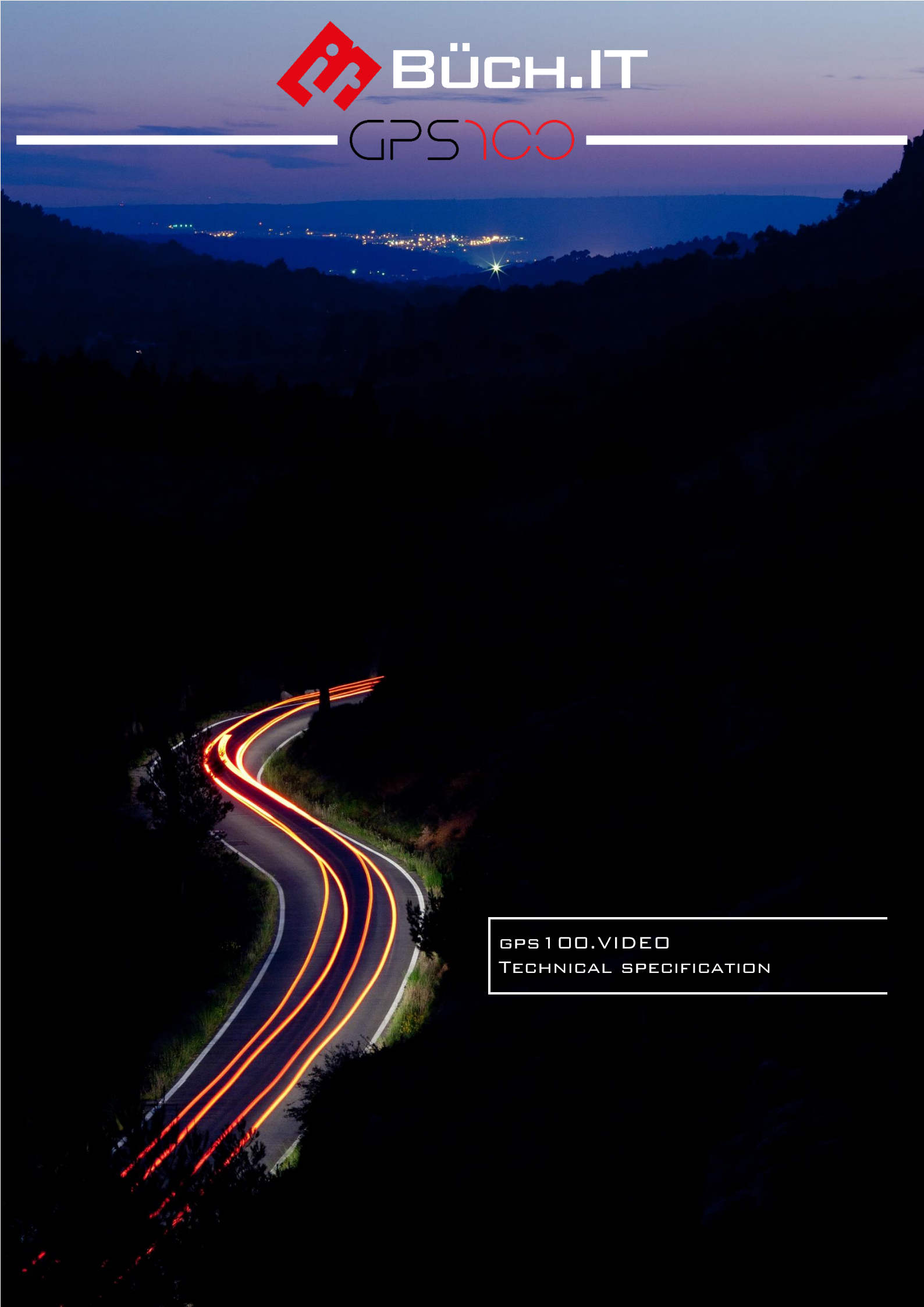
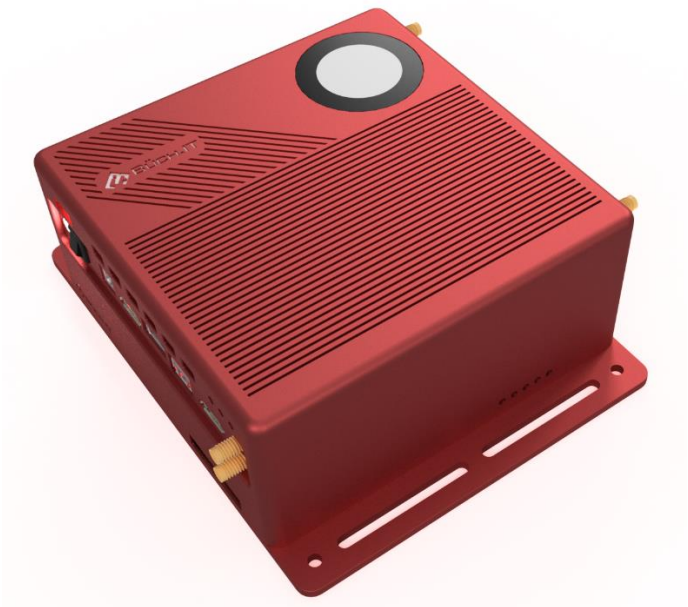
BÜCH.IT

GPS100



GPS100.VIDEO
Technical specification

Product Images gps100.VIDEO:



Applications:

- Datalogging & bespoke computing with high performance cluster computing in bespoke compact anodised aluminium housing for automotive Applications
- Brake tests, driving dynamics & handling, driving performance measurement
- Homologation
- Consumption & exhaust gas measurement (WLTP, RDE, etc.)
- Development of driver assistance and autonomous driving systems
- High-Performance GPS-Measurements
- Crashtest runs and measurements (NCAP, etc.)

Product Information gps.100VIDEO (Base system):

- 4 Digital Inputs
  < 0.2V Low, >3V High (Voltage resistant up to 50V)
- 4 Digital outputs as switches
  (Low-Side Switch, up to 1A@12V, switch to GND)
- Amplifier certified with Q1 for automotive applications with a safety factor of 2
- 2 CAN FD interfaces (max. 1/8MBaud), supports Baudrate-Switching
- 4 Analog inputs with 0-30V, 100 Hz
- 2 Camera inputs for max. FullHD 1080p@max. 60fps incl. Software guided teaching Camera Videostream can be recorded in Parallel
- 1 Time-Code output for external Video recording for high-precision synchronisation. (Optional, HW vorbereitet)
- Optional camera input for 4k/120fps recording without analysis function.
- GPS Module with 20Hz
- (Optional 100Hz, RTK or 400Hz IMU/INS)
- Status display (TFT, 240x240 Pixel) for crucial information such as error messages. Additional information / status displays etc. are available via a web browser.
- Configuration via web browser / browser interface, live-data display
- USB Host, Gigabit Ethernet (integrated DHCP Server)
- USB-C Host
- Processor based on X86 with customised Debian/Ubuntu running on Linux with RT kernel extension
- Robust aluminium housing
- Voltage Range 9-32V DC

Core-System

CPU/GPU-Options

Intel Core i3 (up to 1315U), Core i5 (up to 1340) or Core i7 (up to 1360) are available depending on application. Up to 5GHz Boost-Frequency, max. 4 Performance Cores + 8 Efficiency Cores, Supports VTx/VTd

Intel Iris Xe Graphic, OpenGL 4.6, OpenCL 3.0

Automatic Throttle and Temperature Management (passive cooling available w/ Core i3 UltraLowPower CPU)

RAM

Standard 8GByte, Optional max. 64GByte

DDR4-3200, 1.2V, non-ECC (soft-ECC)

SSD/HDD-System

Operating system on 128GByte NVMe Festplatte (Optional up to 2TByte), max. 2 NVMe drives à 2TByte, only for Software/Operating system

Memory

Max. 6xHDD or SSD, 2.5" or 3.5" SATA, max. 24TB/drive

Operating system

Standard:

Linux based Ubuntu 22.04 LTS w/ RT-Preempt Kernel Enhancement

Optional:

Linux based Ubuntu Pro (20.04 LTS / 22.04LTS)

Linux based RedHat Linux (V9, Enterprise Subscription)

Windows 11 Pro (BYOL) or Enterprise (BYOL)

AI-Acceleration (Optional)

Coral USB Accelerator integrated in Ubuntu Linux w/ 4TOPS ML-Accelerator (Google Edge TPU)

AI/GPU/ML-Acceleration (Optional)

Integrated nVidia Jetson TX2, 1.4TFLOPS KI w/ 256 Core Graphic Accelerator, 8GByte RAM, 16-32GB Memory, coupled over Gigabit Ethernet w/ Embedded Linux HPC

or

Integrated nVidia Jetson Orin NX, 100TFLOPS KI w/ 1024 Core Graphic and 32 Tensor Cores, 8 Core ARM CPU, 2 Core NVDLA v2, 1x PVA v2, 16GB RAM, 64GB Memory, coupled over Gigabit Ethernet w/ Embedded Linux HPC

Interfaces (base)

2x HDMI Output for Display, 2xDP 1.4a

2x Thunderbolt 4

3x USB 3.2

1x USB 2.0 (specific for Input Devices to reduce EMI)

1x Intel Gigabit Controller

1x Intel WiFi 6

1x PCIe x4, 1x PCIe x2 (internal on M.2)

1x Intel HD-Audio

Interfaces (Optional)

1x 10Gbit Ethernet (RJ45)

2x RS232

2-8x HDMI-Input (4k)

2-8x Direct Camera Input (Digital)

8x USB 3.2

2x Framegrabber Video Encoder

Video-System

Standard 2 Channel FullHD max. 60fps Video-Input, fully synchronised with Date output. Capable to show and log Timecode output.

Optional up to 8 channel 4K/8K, max. 120fps Video-Input or 8 channel FullHD bis 480fps Video-Input (Farbe)

Optional 2 channel HighSpeed 1000fps Camera Input-System for High Speed Grabbing

The exact gps100.VIDEO specification is optimally adapted to your needs depending on the application after consultation.

Image- and Object recognition (Optional)

Built-in object recognition (small and large animals, 2-wheel vehicles, pedestrians etc.). Detection icons on dash (Engine control lights, Errors, Warnings, Drive Assistant). Recognition and conversion from vehicle data such as speed, data alignment of internal Data (f.e. Speedometer variation), Trigger and time measurement in between or of events, driver warnings and other – capable of undertaking newest NCAP-Crashtest procedures and runs. System capability of facial recognition with eyes open or closed. Recognition changeable using Live-Teaching.

Data storage (Optional)

Integrated data storage 6 x 24TByte, RAID 0/1/5/10 possible, RAID 1 recommended, Data storage expandable via Ethernet or USB to max. 8x 3.5" drives

It is recommended to integrate as little data storage as possible into the device and use a 4G/WiFi supported redundant and secured (OnPremise/Cloud) storage.

Cloud-Support

Direct connection to the Büch.IT Measurement Cloud via WiFi or 4G/LTE/5G. Live Data and videostream/transfer for remote testing or triggered data transfer.

Zt/Zk-Architecture provides absolute data protection, encryption and data security.

Data storage OnPremise available.

Warnings and data transfer via E-Mail and Push-Messages.

See more: Büch.IT Measurement Cloud (buech-it.de)

Configuration

Using an easy to use webbrowser-based configuration client the gps100.VIDEO can be configured to suit testing needs. This enables remote configuration via the Büch.IT measurement Cloud, E-Mail or USB-Memory.

Other specifications (some features are optional)

General

GPS System
Up to 400Hz
GPS L1, also supports
Glonass, Galileo,
BeiDou

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

GPS MCU
High-Performance
CPU with 1.0GHz
DualCore 512MB RAM,
4GB Flash

Interfaces
USB 2.0 Host
Gigabit Ethernet (RJ45)

Housing
anodised aluminium housing

Supply
9V to 32V, DC
max. 4A
(Peak bis zu 10A) @ 12V

Temperature
Betrieb
-40°C bis 85°C
Lagerung
-40°C bis 85°C

Dimensions
max. 144x144x140mm

Input

CAN
2 Channel (Shared In/Out)
CAN 2.0 A/B
Develops CAN FD up to
1/8MBaud
max. 4 channel (Optional)

OBD-II*
ISO15765 configurable CAN
Various signals can be
retrieved by the vehicle

*Vehicle dependent, Option

Digital
4 Digital trigger inputs
> 3V high level
< 0.2V low level
Latenz <1uS

Analog
4 Analog inputs
0–30V DC, 24Bit resolution
100Hz sample rate (1kHz Option)
(optional ICP Input)

Output

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

Digital
4 Digital Outputs
LowSide switch up to 1A@12V
Switch-Rate: 1kHz max.

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

IMU (Optional)

Gyro
Range
+/- 2000°/sec

Nonlinearity
0.1% FS

3dB bandwidth
250Hz

Stability
0.0022°/sec

Accelerometer
Range
+/- 8G

Nonlinearity
0.1% FS

3dB Bandwidth
250Hz

Stability
0.015mg

Magnetometer
Resolution
0.25mG

Full Range
8G

Other
Calibration
In-house with
GPS test stand

Warranty
1 year limited
factory warranty

GPS Performance / Accuracies (some Equipment optional)

Speed	Accuracy better than 0.01 km/h (RMS) 0.02 m/s (1 σ RMS) Accuracy: up to 0.01 km/h Latency: 0ms (with Timestamp) max. 500 km/h Refresh rate: 400Hz max.
Position accuracy	Horizontal (SBAS): < 1.0m (CEP) without RTK < 2cm (CEP) with RTK up to 1km to Base. Vertikal (SBAS): 2m (CEP) <20cm (CEP) 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: 0.25° / Static and Dynamic (typical, standard IMU)
Yaw	Accuracy (ohne GPS): 1.0° (standard IMU)

With IMU installed, GPS and IMU work together as INS. The IMU supports GPS, Galileo, BeiDou, Glonass Positioning Systems in parallel.

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