

New HW features and improvements 2022

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Logging modules 2022 - Overview

Overview can be downloaded as pdf [here!](#)

The data presented here in the overview always refers to the most comprehensive firmware of the respective module.
For many modules there are reduced firmware versions (see *Option*), for which more information can be found in the respective data sheets.

| Name | Logging | | CAN-Bus | | | | | | | Analog Inputs | | | Calc channels | Output channels | IMU | Serial GPS/GNSS Input | RS232 | Frequency Inputs | Max. Ethernet Ports | XCP/CCP | Size [mm] | Notes | Link |
|----------------|----------|--------------|---------|----|--------------------------|---------------------------|----------------|--------------------|-------------|--------------------------------------|-------------------|-------------|---------------|-----------------|-----------------------|-----------------------|-------|---------------------|---------------------|--------------------------------------|-----------------|---|---------------------------|
| | Internal | Sticklogging | Lines | FD | Max. ONLINE CAN channels | Streamlogging | Max. CAN speed | Max. sampling rate | CAN-Routing | Max. Inputs | Max. Samplingrate | Resolution | | | | | | | | | | | |
| | | | | | | Option | Option | Option | | Option | | | | | | | | | | Option | | | |
| Logger 9 | 32 GB | ✓ | 4 | ✗ | 512 | ✗ | 2 Mbit/s | 1000 Hz | ✓ | 32 | 10000 Hz | 16 Bit (HQ) | 16 | 2 | ✗ | ✓ | 1 | 4 (up to 100 Khz) | 2 | CCP/XCP ASAM 1.4 CAN/CAN-FD/Ethernet | 76 x 90 x 26 | | Datasheet |
| Sticklogger V1 | 32 MB | ✓ | 1 | ✗ | 128* | ✓ (Stream-FW required) | 1 Mbit/s | 1000 Hz | ✗ | | ✗ | | 8 | 1 | ✗ | ✓ | ✗ | ✗ | ✗ | CCP ASAM 1.0 CAN | 70 x 40 x 13 | Available for OEM costumers only | Datasheet |
| Sticklogger V2 | 32 MB | ✓ | 2 | ✗ | 128* | ✓ (Stream-FW required) | 1 Mbit/s | 1000 Hz | ✓ | 2 | 16000 Hz | 16 Bit | 24 | 1 | 6 axis IMU (optional) | ✓ (with RTK) | ✗ | ✗ | ✗ | CCP/XCP ASAM 1.4 CAN | 70 x 40 x 13 | | Datasheet |
| Sticklogger V3 | 32 MB | ✓ | 2 | ✗ | 128* | ✓ (Stream-FW required) | 2 Mbit/s | 2000 Hz | ✓ | 4 (1 can be used as Hybrid input) | 16000 Hz | 16 Bit | 24 | 1 | 6 axis IMU (optional) | ✗ | ✗ | 1 (up to 50 Khz) | ✗ | CCP/XCP ASAM 1.4 CAN | 70 x 40 x 13 | | Datasheet |
| Sticklogger V4 | 32 MB | ✓ | 2 | ✗ | 128* | ✓ (Stream-FW required) | 2 Mbit/s | 2000 Hz | ✓ | 4 (1 can be used as Hybrid input) | 16000 Hz | 16 Bit | 24 | 1 | 6 axis IMU (optional) | ✓ (with RTK) | ✗ | 1 (up to 50 Khz) | ✗ | CCP/XCP ASAM 1.4 CAN | 70 x 50 x 15 | Available with built-in Wi-Fi module ** | Datasheet |
| Sticklogger V5 | 32 MB | ✓ | 3 | 1 | 128* | ✓ (Stream-FW required) | 5 Mbit/s | 2000 Hz | ✓ | 8 (2 can be used as Hybrid input) | 16000 Hz | 16 Bit | 32 / 64 | 1 | ✗ | ✓ (with RTK) | ✗ | 2 (up to 50 Khz) | 1 | CCP/XCP ASAM 1.4 CAN/CAN-FD/Ethernet | 100 x 70 x 16 | Available with built-in Wi-Fi module ** | Datasheet |
| Cargo Security | 2 GB | ✗ | 2 | ✗ | 128 | ✗ | 2 Mbit/s | 1000 Hz | ✓ | 4 | 1000 Hz | 16 Bit | 32 | 1 | 6 axis IMU | ✓ | ✗ | ✗ | ✗ | ✗ | 100 x 73.1 x 30 | Battery powered Screw mounting IP65 | Datasheet |
| LED Bar | 32 MB | ✓ | 2 | ✗ | 32 | ✓ (Stream-FW required) | 2 Mbit/s | 1000 Hz | ✓ | | ✗ | | 24 | ✗ | ✗ | ✗ | ✗ | ✗ | ✗ | CCP/XCP ASAM 1.4 CAN | 62 x 32.5 x 15 | 10 progrm. Multi color LED | Datasheet |
| ColorDash | ✗ | ✓ | 3 | 1 | 128* | ✓ (Stream-FW required) | 5 Mbit/s | 1000 Hz | ✓ | 4 | 1000 Hz | 16 Bit | 32 / 64 | 1 | ✗ | ✓ (with RTK) | ✗ | 1 (up to 50 Khz) | ✗ | CCP/XCP ASAM 1.4 CAN/CAN-FD/Ethernet | 96 x 60 x 20 | Available with built-in Wi-Fi module ** | Datasheet |

* With Streamlogger firmware (available from 2021 and for Stickloggers and Dashboards) a measurement with an "unlimited" number of OFFLINE CAN-channels can be created! At Streamlogging all on CAN bus received CAN identifiers are recorded with unique time stamp and subsequently linked to a CAN-DB/DBC-file in postprocessing to create 2D Analyzer channels.

** With built-in Wi-Fi module for wireless WinIt communcation for setting changes and as RealDash interface for live displaying CAN-values on indivually designnable dashboards for smartphone/tablet/computer!

For all Stickloggers from 2022 on a "OneFileRecording"-firmware is available!

This FW does not write into the FAT of the USB Stick anymore.
Due to this change, the chance of loosing data during power fail/drop is eliminated.
All StickLoggers can be delivered with either old style - /OF- or OFStream firmware.

Improved Sticklogging - One File Recording

- Background

The new 2D One File Recording improves data security/integrity when recording to the USB stick when it is unplugged, or the system is switched off while data is being written to it. This is achieved by completely avoiding writing to the file system table of the USB stick. Logger settings and measurement data are now written to the same container file.

All known features of Stickloggers remaining the same, just the USB-Stick recording is improved significantly!

OneFileRecording can also be used with Streamlogging!

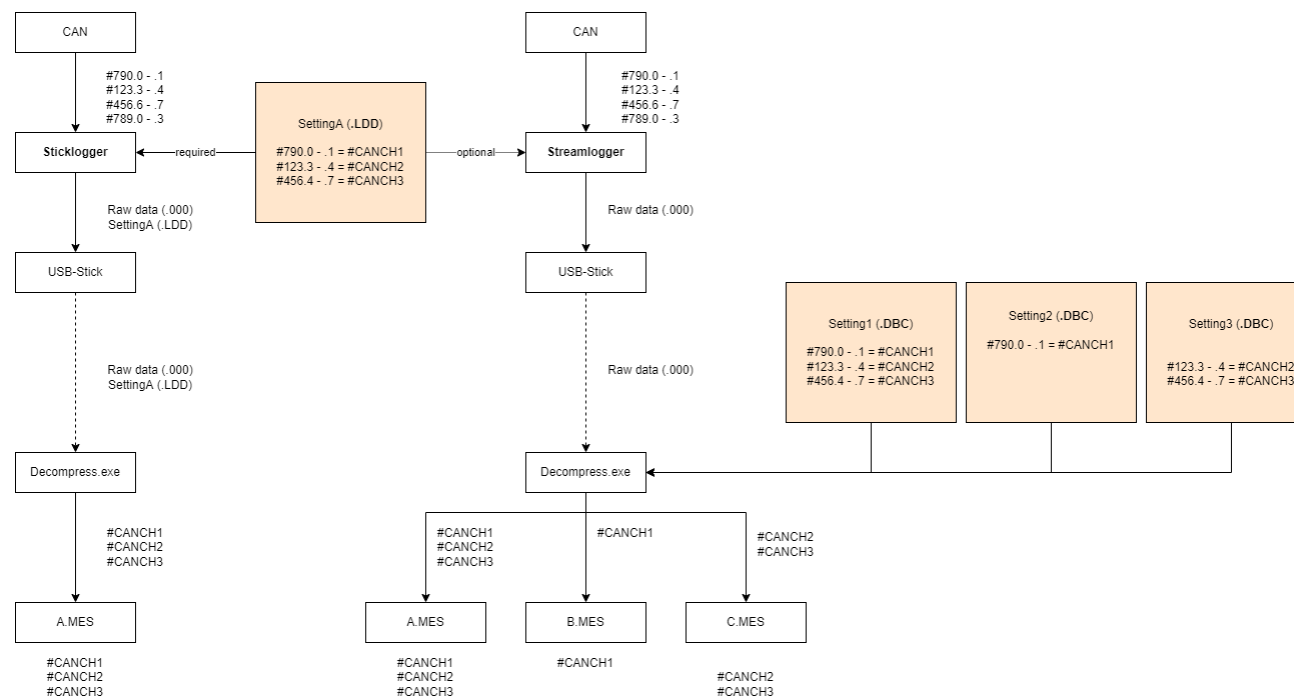
- Requirements to use One File Recording

At least Sticklogger FW 95 (better 105 ++)

At least Race2022 Software

Streamlogging

| Sticklogger | Streamlogger |
|---|--|
| Only records its CAN channels which are <u>defined by the previously done setting (.LDD)</u> | Records <u>all</u> on CAN Bus <u>received</u> CAN identifiers with unique time stamp. |
| Stickloggers can only record max. 128 ONLINE CAN channels | With Streamloggers max. 128 ONLINE CAN channels can be recorded <u>plus</u> a measurement with an <u>unlimited</u> number of OFFLINE CAN 2D Analyzer channels can be created at decompressing! |
| Recorded CAN channels are <u>immediately</u> available after download | Recorded (raw) CAN identifier data must be linked to a CAN-DBC file at decompressing (<i>only in CAN-DBC file used channels will be created as 2D-channels for Analyzer</i>) |
| | Recorded (raw) CAN identifier data can be used for creating different 2D measurements multiple times |
| | Streamlogger can also record <u>certain</u> defined CAN channels (.LDD) and all on CAN Bus received CAN channels, which must be decompressed with DBC, at same time. |



Streamlogging

- Further information

An important difference to Sticklogger is that Streamlogger, in addition to all known Sticklogger functions, can also record all messages sent on the CAN bus, allowing measurements to be made with an unlimited number of OFFLINE CAN channels!

So, the difference in Stick-and Streamlogging is only in behaviour of CAN-Bus channel logging because of another firmware!

With Streamlogger still 128 ONLINE CAN bus channels can be used for recording and other purposes like sending channels via CAN or using in CALC channels!

Stream- and Stickloggers can be still used for recording multiple CAN bus.

Because DashTFT is also able to record data, Streamlogging firmware is also available for DashTFT!

Total datarates Stick-&Streamlogger for writing on USB-stick:

V2/3/4 → 500 kByte/s (for recording channels from CAN-1 + CAN-2 + internal channels, data rate from single 1 Mbit CAN channel is max.
max. 100 kByte/s)

V5 → 3000 kbyte/s (for recording channels from CAN-1 + CAN-2 + internal channels, single CAN Bus with max. 100 kByte/s)

- Requirements to use Streamlogging

At least Streamlogger FW 105

At least Race2022 Software

- Streamplay

With Streamlogging it is possible to replay the original measurement with all its CAN messages (also GPS data if received via CAN) in real time and as often as desired!

This makes it possible to perform tests with real race track data in the office/garage, e.g. to test a display setting or GPS laptiming setting.

XCP/ASAM

- New converter for A2L 1.4 definition

 - Ldd file creation from A2L definition
 - CAN-DB file creation

- XCP communication with „unlimited“ number of channels via...

 - ...CAN-bus
 - ...CAN-FD
 - ...Ethernet

- Further information

 - Import and export of ASAM MDF measurements and Vector ASC or BLF CAN Streams
 - Analyze and Export Automotive Standard CAN Recording formats with 2D Software and Loggers.

Dashboards

- ColorDash ([Link to website](#))

Fully programmable dashboard 3" with sunlight readable 1000 nits, true colour TFT display

USB Sticklogging capabilities

Light and robust metal housing

Font and background color are individually adjustable in relation to the channel value

17 fully programmable high brightness RGB LED with 5ms reaction time with shift light bar function

Predictive laptiming



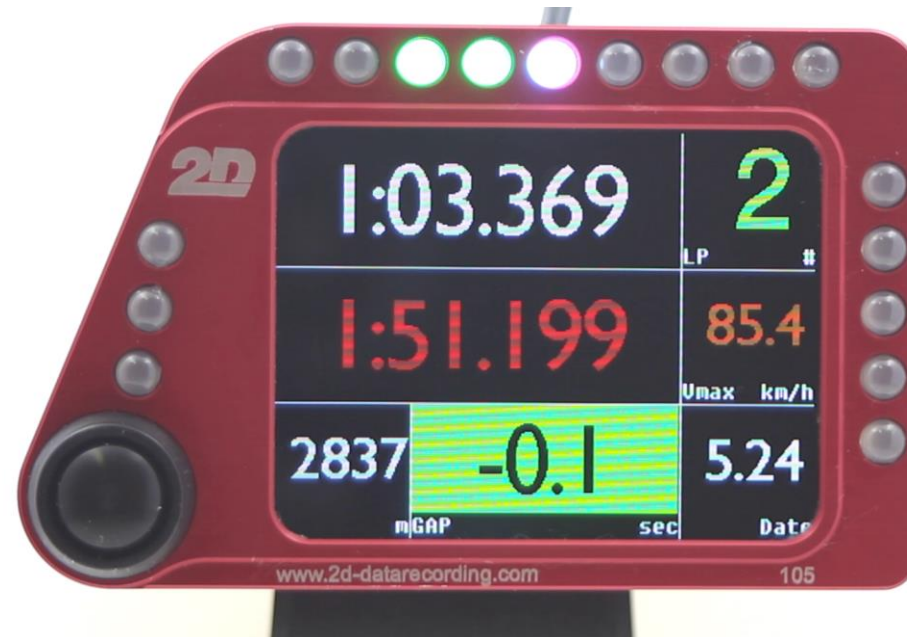
Dashboards

- GAP event (YouTube video)

The GAP time function is used to constantly indicate the current time difference to the same position in a reference lap.

A negative GAP time means that at the current position the driver is ahead the current position at reference lap, so the laptime is faster.

A positive GAP time means that at the current position the driver is behind the current position at reference lap, so the laptime is slower.



GPS/GNSS modules

- New GNSS modules(click here to download manual)

New modules and firmware have greatly improved the stability and reliability of the GPS/GNSS signals, as the satellites of all four major (GPS, Galileo, Glonass, Beidou) Global Navigation Satellite Systems (GNSS) are now used, not just GPS!

Access to many more GNSS satellites greatly increases the positional accuracy of the GNSS modules, especially in difficult receiving environments such as cities or forests.

Please click [here](#) for further information about the best GNSS antenna for your application!

Following overview can be downloaded as pdf [here](#)!

| Available since | Serial | CAN | Name | Rate | GPS/GNSS | CEP | IMU | RTK | Notes | Link |
|-----------------|--------|-----|----------------|---------|----------|----------|-----|-----|--|-------------------------|
| 2000 | ✓ | ✗ | 10 Hz Mouse | 10 Hz | GPS | 3.00 m | ✗ | ✗ | KIT antenna | Website |
| 2000 (2021) | ✓ | ✗ | 12.5 Hz Mouse | 12.5 Hz | GPS | 2.50 m | ✗ | ✗ | With Logger-Firmware > 100 the 12.5 Hz Mouse can also be set via Logger setting** to 10 Hz to receive signals from all GNSS instead of just GPS, which improves positional accuracy. | Website |
| | | | 10 Hz Mouse | 10 Hz | GNSS | 1.50 m | | | | |
| 2021 | ✓ | ✗ | 25 Hz Mouse | 25 Hz | GNSS | < 1.00 m | ✗ | ✗ | Logger-Firmware > 100 required to use 25 Hz Mouse | Website |
| 2015 (2021) | ✗ | ✓ | GPS2CAN* | 12.5 Hz | GPS | 2.50 m | ✗ | ✗ | Via firmware update of GPS2CAN modules from 2019+ can receive signals from all GNSS instead of just GPS, which improves positional accuracy. Update reduces the rate from 12.5 to 10 Hz. | Website |
| | | | | 10 Hz | GNSS | 1.50 m | | | | |
| | | | GPS2CAN_3A3G* | 12.5 Hz | GPS | 2.50 m | | | | |
| | | | | 10 Hz | GNSS | 1.50 m | ✓ | | Via firmware update of GPS2CAN modules from 2019+ can receive signals from all GNSS instead of just GPS, which improves positional accuracy. Update reduces the rate from 12.5 to 10 Hz. | |
| 2021 | ✗ | ✓ | GNSS2CAN* | 25 Hz | GNSS | < 1.00 m | ✗ | ✗ | | Website |
| | | | GNSS2CAN_3A3G* | | | | | | | |
| 2022 | ✓ | ✗ | 10 Hz RTK | 10 Hz | GNSS | 0.01 m | ✗ | ✓ | Logger-Firmware > 100 required to use RTK functionality | |

* The update to GPS/GNSS2CAN modules with/without IMU is done via firmware update and can therefore be carried out at any time!

** Set all GPS channels of Logger to sampling rate 10 Hz to receive signals from all GNSS instead of GPS only!

GPS/GNSS modules

- RTK (Real Time Kinematic)

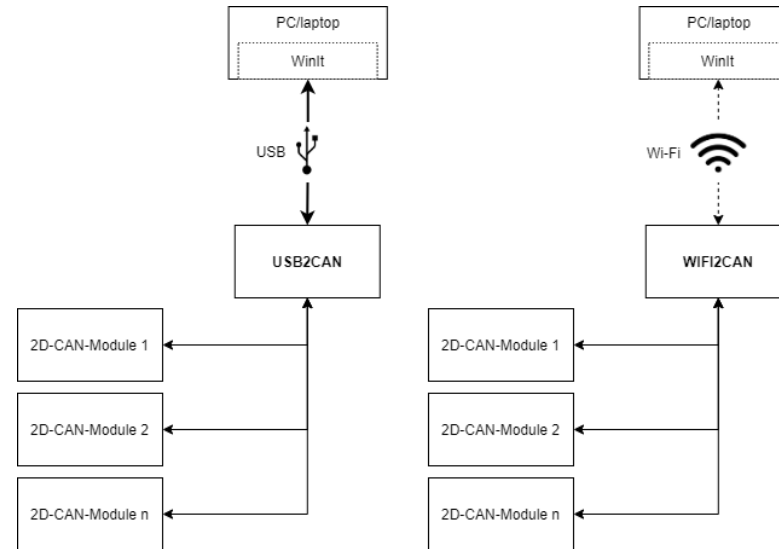
By using the RTK functionality, the accuracy of position data derived from GNSS is improved significantly!

It uses measurements of the phase of the carrier wave of the signal in addition to the information content of the signal and relies on a base station to provide real-time corrections that offer accuracy of up to one centimetre ($\pm 1\text{cm}$)!

WIFI2CAN module

- 2D Communication

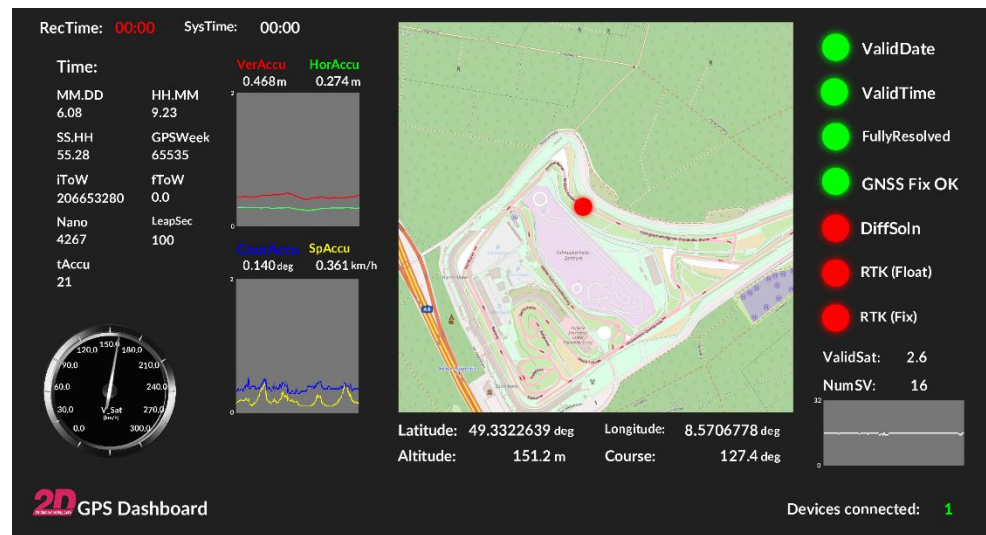
Similar to USB2CAN the WIFI2CAN module allows to communicate to all 2D-CAN-modules of a 2D system via Wi-Fi.
In comparison to USB2CAN, the WIFI2CAN does not need any physical connection to the system to communicate with.



WiFi2CAN module

- RealDash-Gateway

Visualizing CAN data received via WIFI from measurement system on individually designed dashboards on any device (PC, tablet, smartphone)



BLE2CAN module

- Bluetooth Low Energy - Heart Rate receiver

Via the BLE2CAN module, a rider's **heart rate** can be received and sent to a logger for recording via CAN, allowing conclusions to be drawn about physical exertion on track. The BLE2CAN module can be ordered as a set with a heart rate sensor with chest strap already connected.



Sound link

- **Audio file import**
(multichannel) .wav files can be imported into the measurement as analogue channels and then processed with CalcTool
- **Audio data recording**
Audio signals from microphones (rider comments, exhaust noise, etc.) can be recorded as analogue channel
- **Audio data filtering**
Analog sound data can be filtered and analysed with CalcTool and Analyzer
- **Audio file conversion/export**
Analog sound data can be converted into audio data by exporting as .wav file
- **Audio file replay**
Audio files (.wav) can be imported and synchronized to measurement data and playback with VideoPlugin