

# UniCAN 2 Professional

- ▶ Stand-alone data logger with failsafe data acquisition
- ▶ 4 CAN bus interfaces, optional electrically isolated
- ▶ Digital I/O
- ▶ Integrated GPS receiver and UMTS/GPRS modem (optional)
- ▶ “Hot swap” CF Card up to 128 GB
- ▶ Recording of signals and messages in groups, with unique trigger conditions
- ▶ User-definable Pre-Trigger buffers; size is only limited by CF Card capacity
- ▶ Support of CCP protocol; others are in the pipeline
- ▶ Temperature range: -40 °C to +85 °C
- ▶ Quick start after “Power On”
- ▶ Very low stand-by power consumption



UniCAN 2 Professional is a  $\mu$ -Controller based stand-alone data logger. It has unique features and capabilities which are otherwise found only in high end devices. This is accomplished because:

- ▷ Essential functional features are optimized by direct implementation in hardware (FPGA).
- ▷ The unique REC09 data file management system (developed by CSM) that deals with the special data storage issues of modern large capacity memory cards.

## Fields of application

Acquisition of measurement data and ECU information in road test, endurance test, driver dynamics, benchmarks, etc. in the field of:

- ▷ Passenger Cars, Trucks, Busses, Off-road vehicles, Recreational vehicles
- ▷ Agricultural, Construction and special purpose vehicles
- ▷ Aircraft, Trains and Military vehicles

In particular, also suitable for test and validation of new technologies such as:

- ▷ Electro-
- ▷ Hybrid- and
- ▷ Fuel Cell-Drives

## Configuration

UniCAN 2 Professional currently offers two different methods for a fast, safe and convenient configuration:

- ▷ CompactFlash Card up to 128 GB Capacity
- ▷ GPRS, EDGE and UMTS/3G

CSM sells CF Cards meeting the environmental specifications of UniCAN 2 (temperature range -40 °C to +85 °C, robust design) which come already formatted with the failsafe CSM REC09 data file system and an appropriate label on it.

The configuration is accomplished via the new **UniCAN 2 Config Tool**. This new configuration tool emphasises simple and efficient operation. It combines the following features in one intuitive tool:

- ▷ Generation / administration of the logger configuration
- ▷ Formatting, reading, writing of CF Cards
- ▷ Configuration of device modem operation and remote data exchange (SIM cards, FTP server, ...)
- ▷ Fleet management
- ▷ Data flow control for data post processing with standard software
- ▷ Firmware upgrade (via CF Card or remote data exchange)



## **Data sources and outputs**

UniCAN 2 Professional is able to record data from different data sources:

- ▷ **CAN, free running** (“listen only” possible)
- ▷ **CAN with CCP protocol**  
(Seed & Key individually customer-specific)
- ▷ **GPS location data and other internal system signals**
- ▷ **Digital Inputs**

Additionally

- ▷ **Digital outputs** can be activated and
- ▷ **CAN messages** can be sent  
(allowing for “active node” support).

## **Data acquisition and recording**

UniCAN 2 Professional enables **simultaneously** time-based recording of **signals** in up to **8** separate **channel groups** and the event-driven recording of **CAN messages** (Trace) in up to **8** separate **message groups**.

The **signal definition** is taken from **DBC** or **A2L** description files and from **CANini signal database** (Including GPS, system signals).

Inside a channel group a unique sampling rate for each channel is available. The signal can be used in different channel groups, and can be recorded with independent sampling rates. Each channel group has its own unique trigger conditions and can be managed as linear or ring memory. The following are the possible sampling rate ranges:

- ▷ **CAN signals**  
**100 µs**, 200 µs, 500 µs, 1 ms, 2 ms, 5 ms, 10 ms, ... , 10 s, 30 s, 60 s, ..., **60 min**
- ▷ **GPS location data**  
**250 ms**, 500 ms, 1 s, 2 s, ..., **60 min**

The **definition of CAN messages** for each message group is handled via a **message filter**. Each message group can have its own individual trigger conditions and can be managed as linear or ring memory.

The unique CSM **REC09 data file system** provides a consistent and permanent data storage condition on the CF Card to ensure no data loss during a sudden power failure. As a result, the REC09 data file system enables virtually failsafe data logging!

**Voltage drops during recording or even removing the CF Card during recording** will not produce corrupted data. A maximum of the last 5 seconds of recording can be missing. After reinserting the CF Card and with active power supply, the recording continues.

Measurement data files are compressed during recording. In addition, during writing data to the CF Card, REC09 data file system runs a specific **Random Write Optimizing**.

This minimizes the dramatically increasing overhead time of data storage of modern large capacity memory cards, associated with increasing fragmentation of memory with small data packets.

Start-up performance: UniCAN 2 Professional is **immediately ready to measure**. Depending on the complexity of the configuration and the capacity of the used CF Card, data recording starts from about 600 ms after power on.

The internal timing cycle of the UniCAN 2 Professional is 1 µs. Making the resolution of time stamps of incoming CAN messages to 1 µs.

Furthermore it is possible to “**highly precise**” **synchronize several UniCAN 2 Professional** using the optional available real time clock via GPS signal. As an example, using this mechanism, two UniCAN 2 Professional in remote operation can easily be synchronized and automatically provide data in a common directory for evaluation.

## **Trigger conditions**

Extensive **trigger conditions** can be defined per individual **channel / message group** using the UniCAN 2 Config Tool. Alternatively or even additionally, simply all incoming CAN messages can be recorded.

For the trigger modes **Edge**, **Gate** and **Flip-Flop**, the following conditions are amongst others available:

- ▷ Up to 32 event / channel conditions can be defined using various logic functions in combination
- ▷ Range conditions with defined lead-time
- ▷ Absence of signals and / or messages  
(cycle monitoring)
- ▷ Error frames

### **□ Pre-Trigger / Post-Trigger**

For each channel and message group, individual pre- and post-trigger memory storage areas can be defined. These are directly saved on the CF Card, so that the only limitation of the size of the storage areas is the capacity of the CF Card.

As a result, when a trigger condition is met **the pre-events history data storage can be virtually unlimited**.

### **□ Start delay**

Users can activate a delay parameter (100 ms to 60 s), during which time signals are ignored, thus allowing irregular bus activity at start-up to settle.



## ❑ Wake-On-CAN

The optional additional function Wake-On-CAN turns the logger on, once CAN bus messages are transmitted.

## ***Storage format***

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Per channel and message group the memory area on the CF Card can be defined as:

- ▷ **Ring Memory:** If the memory capacity is reached, the oldest available data on the card will be overwritten with new data, or
- ▷ **Linear memory:** If the memory capacity is reached, the measurement stops. Measurement data will never be overwritten.

The maximum summary of the individual memory areas may not exceed **approximately 128 GB**.

Nowadays, CF Cards valid for industrial temperature ranges are available up to 16 GB.

## ***Data flow of control***

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Measurement data is transmitted in two different ways with the UniCAN 2 Config Tool:

- ▷ **Read data directly from CF Card**
- ▷ **Remote data transmission via modem / FTP server**

Acquired measurement data can be filtered and converted into **different data formats** (e.g. Vector MDF, ASCII, ...) for further analyses with standard software.

**The CF Card can be inserted in and removed from the UniCAN 2 Professional, while power is on.** This “**hot swap**” functionality offers an appropriate way to exchange huge amounts of data simply by exchange of memory cards.

Using the **remote transmission**, the user must configure the mode for “data transmission from logger to FTP server” and the conditions to convert the transferred data into files, using the UniCAN 2 Config Tool.

Available data transfer modes are:

- ▷ **After ignition off**
- ▷ **At predefined time intervals, e.g. every hour**
- ▷ **Continuous – simultaneous to data acquisition and storage**

When there is an interruption of the modem connection, data transmission will resume once the modem reconnects to a valid network.

In order to guarantee highest data security and integrity, CSM employs a unique binary data transmission procedure. This procedure also minimizes the need for redundant data retransmissions due to interrupted modem connections. It has proven itself over the long term with major fleet OEMs in Europe, USA and Asia.

The incoming data on the FTP server is tapped automatically by the especially developed **CSM data post-processing** software. The measurement data is analyzed, assembled into the desired file format (e.g. MDF) and saved into the specified directories for further processing.

# Specification UniCAN 2 Professional

Technical Data	UniCAN 2 Professional as external box with slot protection cover
Dimension (L x H x W) Weight	Metal case approx. 109 x 35 x 150 mm approx. 500 g
Power supply	6.5 V to 50 V DC
Power consumption	Stand-by current (PowerControl OFF) < 500 $\mu$ A at 12 V approx. 3 W (in operation, without options)
CAN interfaces	Up to 4 x <b>CAN 2.0B</b> <b>High-Speed CAN</b> (ISO 11898-2), max. 1 MBit/s, <b>Low-Speed CAN</b> (ISO 11898-3) Optional <b>electrical isolation</b>
GPRS/EDGE and UMTS/3G	Internal <b>GPRS/EDGE/UMTS</b> modem with external antenna (optional)
GPS	Internal <b>GPS</b> module with external passive or active antenna (optional)
USB2.0	1 x <b>USB Type B</b> (connection with a PC) 1 x <b>USB Type A</b> (for <b>WiFi connectivity</b> or memory stick)
RS232	1 x <b>external</b> (up to 115.2 kBaud)
Digital I/O	4 available digital I/O - up to 4 x <b>digital IN</b> (TTL-threshold) / up to 2 x <b>digital OUT</b> <sup>1)</sup>
CF Card slot	One slot for CF Card (Type I) at front; " <b>hot swap</b> " capability
LED indicators	2 multi-color LED at rear for status and network 2 multi-color LED at front for status and card access
Environmental condition	- 40 °C to + 85 °C (operation and storage) Humidity max. 90 % (non-condensing)
Conformity	<b>CE</b>

<sup>1)</sup> Available is a total of 4 digital I/O. Standard: 3 digital inputs and one digital output. Other combinations are possible.

## Standard Shipping Contents:

- ▷ **UniCAN 2 Professional**  
in metal case with Installation Guide
- ▷ **CD containing UniCAN 2 Config Tool**  
(including data post-processing software) for  
Windows 7, Vista und XP
- ▷ **Detailed documentation**

## Accessories:

- ▷ **CAN Splitter cable** to connect up to 4 CAN bus
- ▷ **Power Cable** (open end), **Serial** and **I/O cable**
- ▷ **Multiple selection of antennas**
- ▷ **UniCAN 2 DataCard Professional**  
available capacity up to 16 GB

## Optional available features:

- ▷ **Internal GPS-Module**  
16 channel ANTARIS 4 positioning engine, 4 Hz position update rate
- ▷ **Internal GPRS/EDGE/UMTS Modem**
- ▷ **Electrically isolated CAN Busses**
- ▷ **Wake-On-CAN**

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