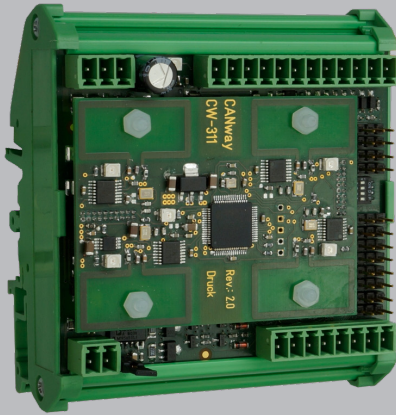# CW-311

WHEEL SPEED SENSOR AND WHEEL UNIT SIMULATION

CW-311 wheel speed and wheel unit simulator allows to simulate tire pressure, tire temperature and wheel speed sensors, as commonly used in the automotive industry. Fields of application are HiL - test benches (hardware-in-the-loop) for ecu (electronic control units).

The device receives real-time and control data via the integrated CAN bus interface. It is possible to transmit simulation data from any desired source to the device, for example an automation computer, which plays back a realistic route model. Wheel speed information is issued via a current interface. It is worth noting, that the CW-311 enables to simulate sensors from different manufacturers. Moreover, it is possible to influence various parameters dynamically, such as rolling direction and air gap.

Tire pressure and temperature data are transmitted via a radio interface in the 433 MHz band. Hereby the radio transmission power is hardware configurable. The detachable pressure module recognises different driving states from "parking" through to "travelling" via an internal finite state machine and implements the sensor protocols and data contents accordingly.

PERFORMANCE CHARACTERISTICS

- Simulates wheel speed, tire pressure and temperature sensors in a single device

- Independently changes the operating states via an internal finite state machine

- Physical interface of the wheel speed sensors (both current source and current sink) can be configured via hardware

- Hardware configurable radio transmission power

- 10 external trigger inputs to synchronize positions

- Top-hat rail housing for quick and easy installation

- Easy to extend and scale

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CAN-INTERFACE

Number	1
Type	ISO 11898-2 (highspeed) CAN-protocol version 2.0 A and 2.0 B, supports SAE J1939 (29-bit-identifier)
Data rate	500 kbit/s, on request: 50, 100, 125, 250, 500, 800 and 1000 kbit/s
Termination	120 Ω, optional

WHEEL SPEED SIMULATION

Sensor types	Sensors with current source or current sink
Protocol	Active wheel speed simulation with or without additional function
Waveform sensor without additional function	Rectangular pulse with 50 % duty cycle
Waveform sensor with additional function	Speed pulse (50 µs) and manchester-coded data (bit time 50 µs)
Current low-level	7 mA
Current high-level	14 mA
Current level speed pulse	28 mA (further current levels on request)
Load resistance	Current source: 50 - 380 Ohm Current sink: 50 - 390 Ohm (external voltage 12 VDC)
Voltage positive contact max.:	Current source: 13 VDC (digital signal for switching the source on and off) Current sink: 15 VDC
Power dissipation max.:	500 mW

TRANSMISSION RADIO INTERFACE (WHEEL UNIT SIMULATION)

Modulation	FSK
Center frequency	433,92 MHz (tolerance ± 70 kHz)
Frequency deviation	± 30 kHz (tolerance ± 10 kHz)
Transmission rate	19200 bit/s

POWER SUPPLY

Supply voltage	9 VDC to 36 VDC
Current consumption	110 mA to 180 mA at 12 VDC (without Wheel Unit Simulation) 180 mA to 240 mA at 12 VDC (with Wheel Unit Simulation)

ENVIRONMENTAL CONDITIONS

Temperature range operation / storage:	-20 °C to +70 °C / -20 °C to +85 °C
Relative humidity operation	Max. 80%, non-condensing, no frost
Relative humidity storage	35 % to 85 %, non-condensing

GENERAL INFORMATION

Housing	45 mm-DIN-top-hat rail housing
Dimensions (LxWxH)	82 mm x 90 mm x 55 mm
Weight	109 g

FURTHER DEVICES CW-300 SERIES

CW-301 CAN-controlled Power Supply	CW-326 Failure Injection Unit
CW-310 Wheel Speed Pulse Conditioning	CW-327 A/D-Converter
CW-321 Power Relay	CW-328 Current Measurement Interface
CW-322 20 Fold Signal Relay Interface	CW-329 Relay Control
CW-323 D/A-Converter	CW-390 High Load Relay up to 35 A
CW-324 Current Sink	CW-391 High Load Relay up to 70 A
CW-325 Bus and signal multiplexer	CW-392 High Load Relay with integrated current measurement