



# CNT-Scan MiniModul

- ▶ Very compact CAN measurement module
- ▶ 4 electrically isolated inputs for
  - ▶ frequency measurement
  - ▶ cycle/pulse duration
  - ▶ duty cycle/PWM
  - ▶ event counter and speed
  - ▶ time offset measurement
- ▶ User selectable On/Off trigger thresholds for each individual channel, switchable AC coupling
- ▶ Sensor excitation
- ▶ Operating temperature: -40°C to +125°C
- ▶ Robust aluminium housing: IP67
- ▶ 8 logical channels

## CNT-Scan MiniModul

The **CNT-Scan MiniModule** is a high-precision measurement module for frequencies up to 300 kHz, for measurement of duty cycles/PWM signals, cycle/pulse duration measurement as well as event counting. Speed measurement (RPM) is calculated directly in the module and displayed as value on the CAN bus. Additionally, the time/event offset between adjacent channels can be measured.

The inputs are completely electrically isolated and connected sensors can be powered directly from the module. Each measurement mode requires only one signal input, however, one signal input can simultaneously collect two measurement parameters from the same physical signal – thereby allowing for up to 8 logical channels.

User selectable per-channel triggering for On and Off signal levels is supported. The On-/Off-Trigger thresholds are individually adjustable for each channel. Switchable AC coupling allows for suppression of undesired DC offset of the input signal.

High frequencies as well as low frequencies are automatically captured with **constant high accuracy**. This applies also to short and long periods and pulses.

Depending on the selected measurement mode many useful configuration options are available:

- ▷ Selectable Edge Detection: for measurements of rising or falling edges, and whether or not an "active high" or "active low" signal is measured, allowing for measurement of unusual signal forms.



- ▷ Configurable timeout value: e.g. for setting the minimum measureable frequency.
- ▷ Event counting: additional counting mode (overflow/saturation), resetting properties and overflow/saturation values are configurable.
- ▷ Direct speed measurement (RPM): the number of counting pulses and missing teeth are configurable.
- ▷ Channel-to-channel time offset: measures the time difference of events between two channels. A selectable input edge marks the start of the measurement; a selectable edge of an adjacent input marks the end of it.

## Shipping content

CAN bus MiniModule, CSM ConfigTool, documentation, calibration certificate

## Maintenance

We recommend a calibration interval of 1 year. For further technical information and references please ask our technical sales and distribution.


## Part numbers

ART0200927	CNTMM 4 (Slide Case)
ART0200990	CNTMM 4

## Accessories

Cables for CAN and power supply, CAN adapter cable, signal cables for sensor connection, CAN bus termination and mounting angles. For further details please see the data sheet "**MiniModul Accessories**".

## Specifications CNT-Scan MiniModul

Technical Data	CNTMM 4
<b>Inputs / logical channels</b>	4 / 8
Input signal level	±60 V DC
On/Off trigger thresholds	±5 V, in 10 mV steps or ±50 mV, in 100 mV steps each channel separately adjustable, AC coupling switchable
Internal resolution	approx. 60 ns
Measurement data rate per channel	1, 2, 5, 10, 20, 50, 100, 200, 500 Hz and 1 kHz
Input protection <sup>(1)</sup>	
Operational safety	±60 V permanent
Device safety	±100 V permanent, additional ESD protection
Input impedance	500 k    1 nF
<b>Operating modes and measurement ranges</b>	
Frequency measurement	0.1 Hz to 300 kHz
Cycle / pulse duration	1 µs to 100 s
Duty cycle / PWM	0 % to 100 %
Event counter	0 to 65535 (16 bit)
Speed	0.01 rpm to 60,000 rpm
Time offset measurement	1 µs to 100 s
<b>Measurement accuracy</b>	
at 25 °C	typ. 0.01 % of measurement value + 1 LSB
Temperature drift	max. 100 ppm over complete temperature range
<b>Sensor excitation</b>	
Voltage	5, 8, 10, 12, 15 V DC, max. 30 mA per channel <sup>(2)</sup> , switchable
<b>Galvanic insulation<sup>(3)</sup></b>	no safety insulation in terms of high-voltage applications
Channel / channel	500 V
CAN / channel	500 V
CAN / power supply	500 V
<b>CAN interface</b>	
Configuration	CAN2 0B (active), High Speed (ISO11898) 125 kBit/s to max. 1 MBit/s, data transfer is free running via CAN-Bus with CSM ConfigTool or CSM INCA AddOn, settings and configurations stored in the device alternatively: configuration and data transfer via CANopen protocol <sup>(4)</sup>
<b>Power supply</b>	
Minimum	6 V DC (-10 %)
Maximum	50 V DC (+10 %)
Power consumption	typ. 1.4 W
LED indicator	power (green) / status (red)
<b>Housing</b>	aluminium – gold anodized
Protection class	IP67
Weight	approx. 230 g, approx. 300 g (Slide Case)
Dimensions (w x h x d)	approx. 93 x 30 x 46 mm, approx. 120 x 37 x 50 mm (Slide Case)
<b>Connectors<sup>(5)</sup></b>	
CAN / voltage	LEMO 0B 5-pole
Signal inputs	LEMO 0B 6-pole
<b>Operating and storage conditions</b>	
Operating temperature	-40 °C to +125 °C
Relative humidity	5 % to 95 %
Pollution degree	3
Storage temperature	-55 °C to +150 °C
<b>Conformity</b>	

1) Observe the information regarding the intended use: see CSM document "Safety Instructions MiniModul".

2) 120 mA in total, distributed to the 4 channels, as required.

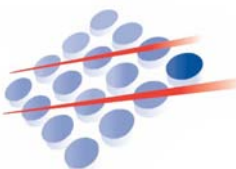
3) These MiniModul devices are designed for measurements in vehicles with 12 V-, 24 V-, or 42 V onboard power supply systems. The maximum operating voltage at the measuring inputs is 60 V. **Not suitable** to be used in systems with higher operating voltages, e.g. high-voltage batteries of hybrid- or electric cars.

4) CANopen: see separate data sheet.

5) Optionally available in other variants.



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