

# MD04.1

## Measurement Amplifier for SMT Systems for Temporal Interpretation of Pulse-Shaped Signals

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To be able to cover as many applications as possible, each channel has flexibly configurable signal conditioning with up to three tracks. This supports the acquisition of frequency and PWM signals as well as counter applications.



### Areas of Application

- Frequency measuring
- Counter applications
- Evaluation of incremental encoders, for example for speed, angle or distance measurements
- Acquisition of other sensors with frequency or PWM output

### Advantages

- Can be adapted flexibly per channel to various kinds of signal sources
- Simple parameterization using transducer memory
- Optical indication of channel and module state

### Single-Track Input

The single-track input is galvanically isolated per channel. The value-continuous input signal is digitized using a comparator with thresholds and hysteresis that can be set per channel. A high DC offset can be decoupled internally if required; a pull-up resistor can be connected to acquire low-side switches. To check the parameters set, every channel has a monitor jack via which the value-discrete signal is output.

### Multiple-Track Input

Up to three tracks are available per channel for incremental encoders. Their use can be adapted to the particular encoder using the software. The input signal is digitized using TTL thresholds.

### Evaluation

The evaluation of the content depends on the measuring mode set. Derived variables, such as angle or distance information, can be calculated using the SMT system software PEA if required.



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## Technical Data

General	
Number of channels	4
Transducer	Voltage pulse sources
Operating modes	Frequency, PWM (duty cycle), counters Can be set per channel
Data rate	1 SPS ... 50 kSPS online, can be set per module
Transducer memory	TEDS ready

Measurement Input	Single-track input (input 1)	Multiple-track input (input 2)
No. of tracks / signals	1	3
Input voltage	±15 V	0 ... 3.3 V
Frequency range	0.2 Hz ... 1 MHz	0.2 Hz ... 1 MHz
Counter resolution	10 ns	10 ns
Measurement uncertainty	≤0.015 % of measured value Over temperature range, at 10 Hz	≤0.015 % of measured value Over temperature range, at 10 Hz
Input impedance	Approx. 1 MΩ	Approx. 1 MΩ
Thresholds	Can be set per channel Within the input voltage range	CMOS 3.3 V
Internal pull-up	1 kΩ	-
Coupling	AC/DC, switchable	DC
Galvanic isolation	Per channel	No
Overvoltage protection	±50 V (50 μs)	±50 V (50 μs)

Sensor Supply	
Output voltage & current	+5 V / 300 mA +15 V / 300 mA Current-limited, short-circuit-proof
Galvanic isolation	No

Environmental Conditions	
Storage	-30 °C ... +85 °C, 10 % ... 90 % rel. humidity, non-condensing
Operation	-30 °C ... +70 °C, 10 % ... 90 % rel. humidity, non-condensing

## Order Numbers

<b>MD04.1</b>	Measurement amplifier for SMT systems for temporal interpretation of pulse-shaped signals (4 channels)
<b>MD04.1-CAL</b>	MD04.1 calibration