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.

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
### 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

<table>
<thead>
<tr>
<th>Single-track input (input 1)</th>
<th>Multiple-track input (input 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of tracks / signals</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Input voltage</strong></td>
<td>±15 V</td>
</tr>
<tr>
<td><strong>Frequency range</strong></td>
<td>0.2 Hz ... 1 MHz</td>
</tr>
<tr>
<td><strong>Counter resolution</strong></td>
<td>10 ns</td>
</tr>
<tr>
<td><strong>Measurement uncertainty</strong></td>
<td>≤0.015 % of measured value</td>
</tr>
<tr>
<td><strong>Input impedance</strong></td>
<td>Approx. 1 MΩ</td>
</tr>
<tr>
<td><strong>Thresholds</strong></td>
<td>Can be set per channel</td>
</tr>
<tr>
<td><strong>Internal pull-up</strong></td>
<td>Approx. 1 MΩ</td>
</tr>
<tr>
<td><strong>Coupling</strong></td>
<td>AC/DC, switchable</td>
</tr>
<tr>
<td><strong>Galvanic isolation</strong></td>
<td>1 kΩ</td>
</tr>
<tr>
<td><strong>Overvoltage protection</strong></td>
<td>±50 V (50 µs)</td>
</tr>
</tbody>
</table>

#### 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
- **MD04.1**: Measurement amplifier for SMT systems for temporal interpretation of pulse-shaped signals (4 channels)
- **MD04.1-CAL**: MD04.1 calibration