Counter Module
MC 13-49B
4 channels

The counter module MC 13-49B features 4 channels with intrinsically safe input circuits. These are galvanically isolated from each other and the power supply and may be connected to sensors according to EN 50227 (NAMUR) or mechanical contacts. Wire-break and short-circuit monitoring can be activated separately for each channel using the requisite software or the module’s DIP switches. When using the DIP switches, the settings apply to all channels. Input circuit errors are transferred to the control system via the diagnosis telegram. This module requires 8 input and 8 output bytes of the master’s memory.

Each input circuit is monitored by a dual colour LED for signal/error indications:
- yellow: input circuit activated
- off: input circuit de-activated
- red: wire-break or short-circuit

The dual colour „Status“ LED indicates the module status:
- green: supply voltage is present, the module is operating
- green flashing: initialisation of link to the master; constant green flashing: connection cannot be established
- red flashing: wrongly inserted module
- off: hardware error, the module is not operating.

- Four channel counter module
- 16 bit up-counter
- 2 limit values per counter
- Intrinsically safe input circuits [EEx ia] IIC
- Input circuits galvanically isolated from the power supply and from the bus
- Separate input circuit monitoring for short-circuit and wire-break of each channel
- Dual colour LED for signal/fault display of each channel
- Direct control of output modules via internal interrupt
General information

The counter module features 4 channels. Each counter operates independently as a 16 bit up-counter. NAMUR sensors as well as mechanical contacts can be used as a signal source. When using mechanical contacts, the bounce time may not exceed 1 ms.

Counter initialisation and evaluation is accomplished by software. The initialisation values transferred by the host system are stored in the volatile memory of the counter module. Therefore the counter modules requires re-initialisation after an error condition.

To achieve short reaction times when reaching limit values, the counter module can be assigned to one or two output modules. The modules must be inserted into the same or the cascaded module rack and are controlled directly by the counter module.

**Type**

<table>
<thead>
<tr>
<th>Type</th>
<th>MC13-49B</th>
</tr>
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<tbody>
<tr>
<td>Ident-No.</td>
<td>90 301 02</td>
</tr>
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</table>

**Operating voltage** $U_B$

<table>
<thead>
<tr>
<th>Current consumption</th>
<th>$\leq 200$ mA</th>
</tr>
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<tbody>
<tr>
<td>Galvanic isolation</td>
<td>input circuits from bus and from power supply</td>
</tr>
</tbody>
</table>

**Input circuits**

<table>
<thead>
<tr>
<th>Operating values</th>
<th>per EN 50227 (NAMUR), intrinsically safe</th>
</tr>
</thead>
<tbody>
<tr>
<td>- No-load voltage $U_0$</td>
<td>8 V</td>
</tr>
<tr>
<td>- Short-circuit current $I_b$</td>
<td>8 mA</td>
</tr>
<tr>
<td>Switching threshold</td>
<td>1.55 mA</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.2 mA</td>
</tr>
<tr>
<td>Wire-break threshold</td>
<td>$\leq 0.15$ mA</td>
</tr>
<tr>
<td>Short-circuit threshold</td>
<td>$\geq 6$ mA</td>
</tr>
<tr>
<td>Input frequency</td>
<td>$\leq 100$ Hz</td>
</tr>
<tr>
<td>Pulse time</td>
<td>$\geq 5$ ms</td>
</tr>
<tr>
<td>Pulse duration</td>
<td>$\geq 5$ ms</td>
</tr>
</tbody>
</table>

**Resistor circuit**

![Resistor circuit diagram]

**Ex-Approvals acc. to Certificate of Conformity**

<table>
<thead>
<tr>
<th>TÜV 98 ATEX 1287 X</th>
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**LED indications**

<table>
<thead>
<tr>
<th>Power &quot;on&quot;/bus error</th>
<th>green/red (dual-colour LED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching status/error</td>
<td>yellow/red (4 dual-colour LEDs)</td>
</tr>
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</table>

**Eurocard module**

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<thead>
<tr>
<th>100 x 160 mm (DIN 41494)</th>
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<thead>
<tr>
<th>Base material</th>
<th>Epoxy resin, glass fibre reinforced, quality class FR4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front panel</td>
<td>plastic, $4TE = 20.32$ mm, for individual interlocking</td>
</tr>
<tr>
<td>Connection</td>
<td>sensoplex® MC rack assembly</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>$0...50$ °C</td>
</tr>
</tbody>
</table>

**Coding (No. 815)**

![Coding diagram]