The MS41-12Ex0-R is a single channel device with an intrinsically safe input circuit. It is designed for counting and dividing of pulse sequences.

The input operates with sensors according to EN 50227 (NAMUR) or with mechanical contacts.

Changes in the input current, which correspond to the actuation of a NAMUR sensor or the opening of a contact in the input circuit, are evaluated as input pulses.

Jumps P1, P2 and P4 at terminals 1...16 determine the number of input pulses (counts) needed to cause the relay output to switch (see table 1). If more than 7 input pulses are required, the selector switch of the logic controller (pulse counter/pulse divider) must be in the lower position (n + 8). If input pulses between 1 and 7 are needed, select the upper position (n).

When used as a pulse counter, the output relay changes state for one pulse duration if the pre-determined count is reached.

When used as a pulse divider, the output relay changes state for the entire preset pulse sequence (number of preset counts) if the number of preset input pulses has been reached (see table on page 4-4).

A yellow LED indicates the switching status of the relay.

The device’s counter is reset to zero when power is applied to the device.

### Table 1: Pulse count programming

<table>
<thead>
<tr>
<th>Program count &quot;n&quot;</th>
<th>P1 (11-12)</th>
<th>P2 (13-14)</th>
<th>P4 (15-16)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch position 1...4(n)</td>
<td>1</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>2</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>3</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>4</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>5</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>6</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>7</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Switch position 1...4(n+8)</td>
<td>8</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>9</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>10</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>11</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>12</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>13</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>14</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>15</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

---

**Intrinsically safe input circuit [EEx ia] IIC**

**Galvanic isolation between input circuit, output circuit and power supply**

**1 relay output with 2 SPDT contacts**

---

A selector switch located on the front of the device provides a choice of the following relay output functions:

- Switch position 1:
  - Pulse counter NO
- Switch position 2:
  - Pulse counter NC
- Switch position 3:
  - Pulse divider NO
- Switch position 4:
  - Pulse divider NC

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**Pulse Counter/Pulse Divider**

**MS41-12Ex0-R**

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**4**
### Pulse Counters/ Pulse Dividers

#### Type
- **Ident-No.**
  - MS41-12Ex0-R/230VAC: 53 611
  - MS41-12Ex0-R/24VDC: 53 617

#### Supply Voltage \( U_B \)
- **Line frequency/ripple \( W_{pp} \)**: 48...62 Hz
- **Power/current consumption**: ≤ 3.5 VA
- **Galvanic isolation**: between input circuit, output circuit and supply voltage for 250 V rms, test voltage 2.5 kVrms

#### Input Circuits
- **Supply Voltage**: UB 184...250 VAC 20...28 VDC
- **Line frequency/ripple \( W_{pp} \)**: ≤ 10 %
- **Power/current consumption**: ≤ 10 %

#### Output Circuits
- **Switching voltage**: ≤ 250 VAC/60 VDC
- **Switching current**: ≤ 4 A
- **Switching capacity**: ≤ 1000 VA/60 W
- **Switching frequency**: ≤ 10 Hz

#### Ex-Approval acc. to Certificate of Conformity
- **BVS 94.C.2006 X**

#### Maximum nominal values
- **No-load voltage \( U_0 \)**: 11.0 V
- **Short-circuit current \( I_k \)**: 14.0 mA
- **Maximum external inductances/capacitances**
  - \([\text{EEx ia}]\) IIC: 1 mH/600 nF

#### LED Indication
- **Switching status**: yellow

#### Housing
- **Mounting**: 50 mm wide, Polycarbonate/ABS panel mounting or snap-on clamps for top-hat rail (DIN 50022)
- **Connection**: 2 x 8 self-lifting pressure plates with wire sleeves
- **Degree of protection (IEC 60529/EN 60529)**: IP20
- **Operating temperature**: -25... +60 °C

#### Output functions

<table>
<thead>
<tr>
<th>Pulse counter</th>
<th>N.O. mode</th>
<th>N.C. mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: N.O. mode</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>2: N.C. mode</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pulse scaler</th>
<th>N.O. mode</th>
<th>N.C. mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>3: N.O. mode</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>4: N.C. mode</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

**Fig.1 output function and switching status**