Product Environmental Profile

2-WIRE RS-485 INSULATED REPEATER
General information

Representative product
2-WIRE RS-485 INSULATED REPEATER - TRV00211

Description of the product
The product is a 2-WIRE RS-485 INSULATED REPEATER included in passive products - non-continuous operation category.
The main purpose of the product is to monitor or control electrical values, alarm status, open/close signals in the ULP connection System which is isolated and inserted between the Modbus network inside the equipment and the Modbus network outside the equipment.

Functional unit
To monitor or control electrical values, alarm status, open/close signals in the ULP connection System which is isolated and inserted between the Modbus network inside the equipment and the Modbus network outside the equipment for 20 years.

Constituent materials

Reference product mass
105.9 g including the product, its packaging and additional elements and accessories

Substance assessment

Products of this range are designed in conformity with the requirements of the RoHS directive (European Directive 2011/65/EU of 8 June 2011) and do not contain, or only contain in the authorised proportions, lead, mercury, cadmium, hexavalent chromium or flame retardants (polybrominated biphenyls - PBB, polybrominated diphenyl ethers - PBDE) as mentioned in the Directive

As the products of the range are designed in accordance with the RoHS Directive (European Directive 2002/95/EC of 27 January 2003), they can be incorporated without any restriction in an assembly or an installation subject to this Directive.

Details of ROHS and REACH substances information are available on the Schneider-Electric Green Premium website
The 2-WIRE RS-485 INSULATED REPEATER presents the following relevant environmental aspects

**Design**
- Manufactured at a Schneider Electric production site ISO14001 certified

**Distribution**
- Weight and volume of the packaging optimized, based on the European Union's packaging directive
- Packaging weight is 35.3 g, consisting of cardboard (30.0g) and paper (5.3g)
- Product distribution optimised by setting up local distribution centres

**Installation**
- TRV00211 does not require any installation operations.

**Use**
- The product does not require special maintenance operations.

**End of life**
- End of life optimized to decrease the amount of waste and allow recovery of the product components and materials
- This product contains PCBA bigger than 10 cm² (7.0g) and Plastic parts with brominated FR (2.0g) that should be separated from the stream of waste so as to optimize end-of-life treatment.
- The location of these components and other recommendations are given in the End of Life Instruction document which is available on the Schneider-Electric Green Premium website http://www2.schneider-electric.com/sites/corporate/en/products-services/green-premium/green-premium.page

**Environmental impacts**

<table>
<thead>
<tr>
<th>Reference life time</th>
<th>20 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product category</td>
<td>Passive products - non-continuous operation</td>
</tr>
<tr>
<td>Installation elements</td>
<td>No special components needed</td>
</tr>
<tr>
<td>Use scenario</td>
<td>Product dissipation is 0.36 W full load, loading rate is 30% and service uptime percentage is 30%</td>
</tr>
<tr>
<td>Geographical representativeness</td>
<td>Europe</td>
</tr>
</tbody>
</table>

**Technological representativeness**
- The product is a 2-WIRE RS-485 INSULATED REPEATER included in passive products - non-continuous operation category.
- The main purpose of the product is to monitor or control electrical values, alarm status, open/close signals in the ULP connection System which is isolated and inserted between the Modbus network inside the equipment and the Modbus network outside the equipment.

<table>
<thead>
<tr>
<th>Energy model used</th>
<th>Manufacturing</th>
<th>Installation</th>
<th>Use</th>
<th>End of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy model used: China</td>
<td>Electricity Mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
<td>Electricity Mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
<td>Electricity Mix; AC; consumption mix, at consumer; &lt; 1kV; EU-27</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact indicators</th>
<th>Unit</th>
<th>2-WIRE RS-485 INSULATED REPEATER - TRV00211</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to mineral resources depletion</td>
<td>kg Sb eq</td>
<td>2.34E-04 (Manufacturing) 2.34E-04 (Total) 0* (Distribution) 0* (Installation) 5.09E-07 (Use) 0* (End of Life)</td>
</tr>
<tr>
<td>Contribution to the soil and water acidification</td>
<td>kg SO₂ eq</td>
<td>8.76E-02 (Manufacturing) 3.06E-03 (Total) 6.24E-05 (Distribution) 1.06E-05 (Installation) 8.45E-02 (Use) 2.51E-05 (End of Life)</td>
</tr>
<tr>
<td>Contribution to water eutrophication</td>
<td>kg PO₄³⁻ eq</td>
<td>3.83E-03 (Manufacturing) 6.42E-04 (Total) 1.44E-05 (Distribution) 2.51E-06 (Installation) 3.17E-03 (Use) 8.74E-06 (End of Life)</td>
</tr>
<tr>
<td>Contribution to global warming</td>
<td>kg CO₂ eq</td>
<td>1.30E+01 (Manufacturing) 1.77E+00 (Total) 1.37E-02 (Distribution) 3.38E-03 (Installation) 1.12E+01 (Use) 2.13E-02 (End of Life)</td>
</tr>
<tr>
<td>Contribution to ozone layer depletion</td>
<td>kg CFC11 eq</td>
<td>2.89E-06 (Manufacturing) 1.73E-07 (Total) 0* (Distribution) 0* (Installation) 2.71E-06 (Use) 8.61E-10 (End of Life)</td>
</tr>
</tbody>
</table>
## Resources use

<table>
<thead>
<tr>
<th>Impact indicators</th>
<th>Unit</th>
<th>Total Manufacturing Distribution Installation Use End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to photochemical oxidation</td>
<td>kg C₂H₄ eq</td>
<td>4.34E-03 3.41E-04 4.45E-06 1.11E-06 3.99E-03 2.42E-06</td>
</tr>
</tbody>
</table>

### Optional indicators

- **2-WIRE RS-485 INSULATED REPEATER - TRV00211**

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<thead>
<tr>
<th>Impact indicators</th>
<th>Unit</th>
<th>Total Manufacturing Distribution Installation Use End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to fossil resources depletion</td>
<td>MJ</td>
<td>1.37E+02 2.12E+01 1.92E-01 4.78E-02 1.15E+02 1.07E-01</td>
</tr>
<tr>
<td>Contribution to air pollution</td>
<td>m³</td>
<td>6.55E+02 1.74E+02 5.81E-01 3.74E-01 4.79E+02 8.47E-01</td>
</tr>
<tr>
<td>Contribution to water pollution</td>
<td>m³</td>
<td>7.86E+02 3.14E+02 2.25E+00 4.00E-01 4.69E+02 1.25E+00</td>
</tr>
</tbody>
</table>

### Resources use

<table>
<thead>
<tr>
<th>Impact indicators</th>
<th>Unit</th>
<th>Total Manufacturing Distribution Installation Use End of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of secondary material</td>
<td>kg</td>
<td>3.67E-04 3.67E-04 0* 0* 0* 0*</td>
</tr>
<tr>
<td>Total use of renewable primary energy resources</td>
<td>MJ</td>
<td>1.74E+01 1.16E+00 0* 0* 1.62E+01 0*</td>
</tr>
<tr>
<td>Total use of non-renewable primary energy resources</td>
<td>MJ</td>
<td>2.35E+02 2.47E+01 1.93E-01 5.78E-02 2.10E+02 1.29E-01</td>
</tr>
<tr>
<td>Use of renewable primary energy excluding renewable</td>
<td>MJ</td>
<td>1.67E+01 4.56E-01 0* 0* 1.62E+01 0*</td>
</tr>
<tr>
<td>Use of renewable primary energy resources used as</td>
<td>MJ</td>
<td>7.07E-01 7.07E-01 0* 0* 0* 0*</td>
</tr>
<tr>
<td>Use of non renewable primary energy excluding non</td>
<td>MJ</td>
<td>2.34E+02 2.33E+01 1.93E-01 5.78E-02 2.10E+02 1.29E-01</td>
</tr>
<tr>
<td>Use of non renewable primary energy resources used as</td>
<td>MJ</td>
<td>1.44E+00 1.44E+00 0* 0* 0* 0*</td>
</tr>
<tr>
<td>Use of non renewable secondary fuels</td>
<td>MJ</td>
<td>0.00E+00 0* 0* 0* 0* 0*</td>
</tr>
<tr>
<td>Use of renewable secondary fuels</td>
<td>MJ</td>
<td>0.00E+00 0* 0* 0* 0* 0*</td>
</tr>
</tbody>
</table>

### Waste categories

- **Hazardous waste disposed**
  - kg: 2.49E+00 2.27E+00 0* 7.07E-02 0* 1.48E-01
- **Non hazardous waste disposed**
  - kg: 4.20E+01 2.53E-01 0* 0* 4.18E+01 0*
- **Radioactive waste disposed**
  - kg: 3.42E-02 1.19E-04 0* 0* 3.41E-02 0*

### Other environmental information

- **Materials for recycling**
  - kg: 3.03E-03 2.96E-04 0* 0* 0* 2.73E-03
- **Components for reuse**
  - kg: 0.00E+00 0* 0* 0* 0* 0*
- **Materials for energy recovery**
  - kg: 4.78E-03 2.30E-04 0* 0* 0* 4.55E-03
- **Exported Energy**
  - MJ: 0.00E+00 0* 0* 0* 0* 0*
* represents less than 0.01% of the total life cycle of the reference flow

Life cycle assessment performed with EIME version EIME v5.5, database version 2015-04.

The use phase is the life cycle phase which has the greatest impact on the majority of environmental indicators (based on compulsory indicators).

Please note that the values given above are only valid within the context specified and cannot be used directly to draw up the environmental assessment of an installation.

<table>
<thead>
<tr>
<th>Registration N°</th>
<th>SCHN-00010-V01.01-EN</th>
<th>Drafting rules</th>
<th>PCR-ed3-EN-2015 04 02</th>
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<tbody>
<tr>
<td>Verifier accreditation N°</td>
<td>VH08</td>
<td>Supplemented by</td>
<td>PSR-0005-ed1-EN -2012 12 11</td>
</tr>
<tr>
<td>Date of issue</td>
<td>03-2016</td>
<td>Information and reference documents</td>
<td><a href="http://www.pep-ecopassport.org">www.pep-ecopassport.org</a></td>
</tr>
</tbody>
</table>

Independent verification of the declaration and data, in compliance with ISO 14025 : 2010

Internal External X

The PCR review was conducted by a panel of experts chaired by Philippe Osset (SOLINNEN)

The elements of the present PEP cannot be compared with elements from another program.

Document in compliance with ISO 14025 : 2010 « Environmental labels and declarations. Type III environmental declarations »

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