

## EN 50155 Ethernet Powerline Bridge

### Viper-002-PL series

- **Compact rail-approved Ethernet broadband bridge**
  - Single model 24 - 110 VDC power range
  - 1 x 100 Mbps or 1 x 1 Gbps Ethernet port
  - 1 x 2-wire cable port
- **Externally tested and verified to EN 50155**
  - Surge resistance and isolation
  - Magnetic field immunity and conducted emission
  - Shock and vibration
- **Designed for long life and extreme operational environments**
  - IP67 anti-condensation GORE-TEX® membrane
  - Ambient temperature -40° to +70°C (-40° to +158°F)
  - Integrated M12 threading and high MTBF hours



**EN 45545-2**  
Fire Protection

**EN 50121-3-2**  
Rolling Stock

**EN 50121-4**  
Railway Trackside

**EN 50155**  
On Board Rail

**EN 61000-6-2**  
Industrial Immunity

**EN 61000-6-4**  
Industrial Emission

The Viper-002-PL series consists of Ethernet extenders and bridges for propagating Ethernet traffic over existing cabling. The series is based on power line communication (G.hn) and is capable of bridging high bandwidth Ethernet traffic over 2-wire cables, even when there are oxidized connectors.

By simply installing a Viper-002-PL product on each side of the coupler, a bridge connecting the Ethernet networks on each side is created. The power line technology allows using existing cables, which leads to significant financial savings when refurbishing trains. The fact that no configuration is needed further contributes to the ease of use.

The Viper-002-PL series has been thoroughly tested by certified labs to ensure its compliance with the standard for electronic equipment used on rolling stock, the EN 50155. For several characteristics, Westermo exceeds the requirements mandated by the standard, e.g. by providing 1.5 kVrms insulation on all ports.

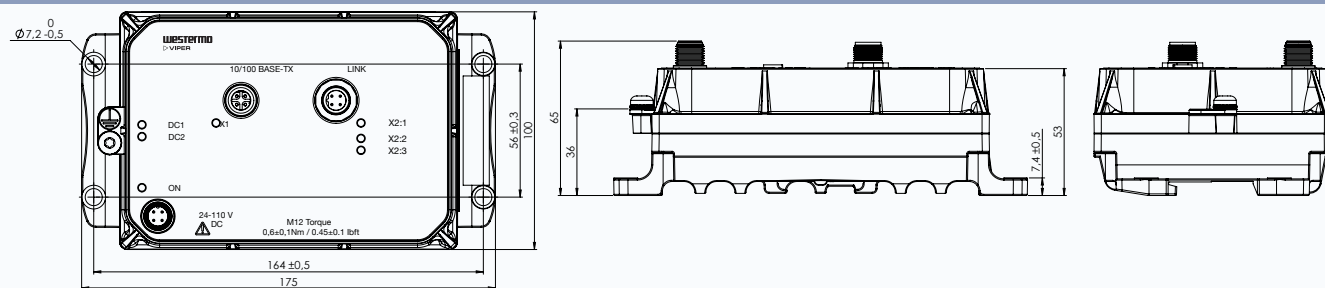
Furthermore, the design is based on Westermo's long experience within the rolling stock market, which brings benefits such as vibration safe integrated connector threading, IP67 ingress protection with GORE-TEX® membrane to prevent condensation water build-up and ultimately a high MTBF and long service life under the harshest conditions.

The Viper-002-PL series is built in Westermo's Swedish factory which is renowned for its extremely high standard, as confirmed by a multitude of quality audits by demanding international customers. The factory is organized according to lean manufacturing principles and it is equipped with sophisticated state-of-the-art quality assurance equipment.

Meeting the requirements for rolling stock, makes the Viper-002-PL series also very well suited for deployment in other applications with severe operating conditions and extreme environments .

# Specifications - Viper-002-PL series

## Dimensional drawing



## Technical data

<b>Dimensions (W x H x D)</b>	175 x 65 x 100 mm
<b>Weight</b>	1.2 kg
<b>Housing</b>	Full metal
<b>Rated voltage</b>	24 to 110 VDC
<b>Operating voltage</b>	16.8 to 143 VDC (14.4 VDC for 100 ms, 154 VDC for 1 second)
<b>Operating temperature</b>	-40 to +70 °C (-40 to +158°F)
<b>Storage and transport temperature</b>	-40 to +85 °C (-40 to +185 °F)
<b>Ingress protection</b>	IP67
<b>Humidity (operating)</b>	5 to 95 % relative humidity
<b>Altitude</b>	2000 m/80 kPa

## Rated current

<b>Max at 24 VDC</b>	200 mA
<b>Max at 110 VDC</b>	55 mA

## Interface

<b>Ethernet port</b>	1 pcs (100 Mbps, D-coded, or 1 Gbps, X-coded, depending on model)
<b>Powerline (B-coded)</b>	1 pcs (up to 500 Mbps) <sup>a</sup>
<b>Input power (A-coded)</b>	1 pcs

<sup>a</sup>For Viper-002-T1-PL1 models, up to 100 Mbps

## MTBF

<b>MIL-HDBK-217F2</b>	1,285,000 hours
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Type	Approval/Compliance
<b>Climate</b>	<ul style="list-style-type: none"> <li>EN 50155 class OT4 / IEC 60571 class TX, Railway applications - Electronic equipment used on rolling stock</li> <li>IEEE 1478 class 1, condition E4 (incl Salt Mist), Environmental conditions for transit rail car electronic equipment</li> </ul>
<b>EMC</b>	<ul style="list-style-type: none"> <li>EN/IEC 61000-6-2, Immunity industrial environments</li> <li>EN/IEC 61000-6-4, Emission industrial environments</li> <li>EN 50121-4/IEC 62236-4, Railway signalling and telecommunications apparatus</li> <li>EN 50121-3-2/IEC 62236-3-2, Railway applications - Rolling stock - apparatus</li> <li>Tested and verified for Class S1, DB EMC Regulation 06, Commodity team Radio compatibility in VDB Rev 1.0 (Shunting Radio)</li> <li>Tested and verified for FCC part 15b class A (CFR 47)</li> </ul>
<b>Mechanical (Shock and vibration)</b>	<ul style="list-style-type: none"> <li>EN 61373 category 1, class A and B</li> <li>EN 60068-2-27 20 g, 11 ms</li> </ul>
<b>Insulation (Coordination and test)</b>	<ul style="list-style-type: none"> <li>EN 50124-1, Railway applications - Insulation coordination</li> <li>EN 50155/IEC 60571, Railway applications - Electronic equipment used on rolling stock</li> </ul>
<b>Fire protection</b>	<ul style="list-style-type: none"> <li>EN 45545-2, Fire protection on railway vehicles</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>EN/IEC/UL 62368-1, Safety Requirements for audio/video, information and communication technology equipment</li> </ul>

**Warranty**

<b>Validity</b>	5 years
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**Ordering information<sup>a</sup>**

<b>Art. no.</b>	<b>Description</b>
3635-3000	Viper-002-T1-PL1
3635-3010	Viper-002-T1-PL1-DN2
3635-3100	Viper-002-T1G-PL1
3635-3110	Viper-002-T1G-PL1-DN2
3146-11xx	Patch and power cables, see <a href="http://www.westermo.com">www.westermo.com</a>

<sup>a</sup>In most cases, only the Viper-002-T1-PL1 model is used. In cases when two different Ethernet interfaces are used but only one transmission cable is present, different Viper-002-PL models can use same transmission cable without mixing Ethernet interfaces. The two models have different configurations which ensure that they will only connect to the same model and avoid crosstalk.