


2173002	<b>DATA SHEET</b>	
valid from: 26.09.2022	<b>UNITRONIC® TRAIN MVB 2x2x0.5</b>	

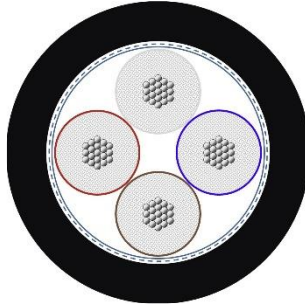
### Application

Field of use: Flexible bus cable for the Multifunction Vehicle Bus (MVB) for serial data communication in railway vehicles. MVB is a component of the Train Communication Network (TCN) and standardized in IEC 61375-3-1.

Performance: Screened foiled star quad cable, having a nominal impedance of 120 Ω. Designed for transmission rates of 1.5 Mbit/s. The MVB transmits time-critical control signals in real time.

Characteristics: flame retardant, no flame propagation, halogen free, low smoke density, ozone resistant, UV resistant, oil resistant, fuel resistant, resistant to acids and alkalis

Applications: MVB, TCN, RS-485 and others



### Design

Certification EN 45545-2: Hazard Level HL1, HL2, HL3  
fire prevention acc. to NF F 16-101  
Internal: Vehicle Categories A1, A2, B  
External: Vehicle Categories A2, B  
Category D for flame propagation  
Category F0 for smoke density

Conductor fine-wire stranded tinned copper  
0.5 mm<sup>2</sup> (19 x 0.185 mm)  
conductor diameter: ca. 0.92 mm

Insulation foamed polyolefine  
core diameter: ca. 2.3 mm

Core identification code pair 1: red/blue, pair 2: grey/brown

Stranding cores stranded to star quad

Screen plastic laminated aluminium foil (overlapping)  
on top:  
braid of tinned copper wires (coverage 85 % ± 5 %)  
diameter over braid: ca. 5.9 mm

Taping thin non-woven tape (optional)

Outer sheath cross-linked polymer compound, halogen free and flame retardant  
acc. to EN 50264-1, EM 104  
black, similar RAL 9005  
outer diameter: ca. 8.3 mm

### Electrical properties at 20 °C

Conductor resistance max. 40.1 Ω/km

Insulation resistance min. 5 GΩ x km

Mutual capacitance max. 46 nF/km (1.5 MHz)

Capacitive coupling max. 1500 pF/km (1.5 MHz)

Characteristic impedance 120 Ω ± 10% (0.75 MHz - 3 MHz)

Attenuation max. 15 dB/km (1.5 MHz)  
max. 20 dB/km (3 MHz)

Near-end cross-talk min. 45.0 dB/km (0.75 MHz - 3 MHz)


Velocity of propagation 0.74 c

Transfer impedance max. 20 mΩ/m (20 MHz)

Maximum operating voltage 125 V (not for power purposes)

Test voltage core/core: 1000 V  
core/screen: 1000 V

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### Mechanical and thermal properties

Minimum bending radius	occasional flexing: 10 x outer diameter fixed installation: 3 x outer diameter
Temperature range	occasional flexing: -35 °C up to +90 °C fixed installation: -45 °C up to +90 °C
Burning load	0.286 kWh/m (calculated value)
Flammability	flame retardant acc. to IEC 60332-1-2 resp. EN 60332-1-2 flame propagation acc. to IEC 60332-3-25 resp. EN 60332-3-25
Halogen free	acc. to IEC 60754-1 resp. EN 60754-1 acc. to EN 50264-1 appendix B
Corrosivity of gases	acc. to IEC 60754-2 resp. EN 60754-2
Smoke density	acc. to IEC 61034-2 resp. EN 61034-2
Toxicity	acc. to EN 50305
Weather and UV resistance	acc. to EN 50289-4-17 resp. VDE 0819-289-4-17 cables with black sheath are suitable for permanent outdoor use
Ozone resistance	acc. to EN 50305
Oil resistance	acc. to EN 50264-1, EM 104
Fuel resistance	acc. to EN 50264-1, EM 104
Tests	Test procedures for electrical characteristics and transmission characteristics acc. to EN 50288-1.
General requirements	These cables conform to the EU-Directive 2011/65/EU (RoHS, Restriction of the use of certain hazardous substances) and the LV-Directive 2014/35/EU (Low voltage Directive).
Environmental information	These cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).

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