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|-----------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|
| <b>2173004</b>                    | <b>DATA SHEET</b>                        |  |
| <b>valid from:<br/>01.01.2019</b> | <b>UNITRONIC® TRAIN WTB<br/>1x2x0,75</b> |                                                                                     |

## Application

Wire Train Bus (WTB) stands for a field bus for the Train Communication Network (TCN) and is normatively specified by IEC 61375-2-1 (Edi.1.0/2012-06). It has a data transfer rate of 1.0 Mbit/s and is used primarily for the transmission of commands in a railway vehicle. The WTB is used in conjunction with the MVB (Multifunction Vehicle Bus) for data communication in trains.

## Design

|                          |                                                                                                                                                                                                                                                                                                          |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Certification            | classification<br>EN 45545-2: Hazard Level HL1, HL2, HL3<br>classification acid and alkaline resistance acc. to EN 50264-1, EM 104<br>NF F 16-101: Internal: Vehicle Categories A1, A2, B<br>External: Vehicle Categories A1, A2, B<br>Category C for flame propagation<br>Category F0 for smoke density |
| Conductor                | tinned copper wire<br>19 x 0.226 mm, $\varnothing$ approx. 1.10 mm                                                                                                                                                                                                                                       |
| Insulation               | foamed skin polyethylene (02YS), $\varnothing$ 2.80 mm (nominal value)                                                                                                                                                                                                                                   |
| Core identification code | core identification code white/black                                                                                                                                                                                                                                                                     |
| Stranding                | 2 cores stranded to pair, fillers in stranding gore                                                                                                                                                                                                                                                      |
| Screen                   | aluminium laminated shield foil under braid,<br>braid of tinned copper wires, coverage approx. 85 %                                                                                                                                                                                                      |
| Taping                   | plastic tape<br>Wrapping (optional)<br>thin non-woven tape                                                                                                                                                                                                                                               |
| Outer sheath             | Outer sheath electron beam cross-linked polymer compound, halogen free and flame retardant<br>acc. to EN 50264-1, EM 104<br>colour: black (similar RAL 9005), outer $\varnothing$ : 830 mm                                                                                                               |

## Electrical properties at 20°C

|                          |                                                                                                                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conductor resistance     | DC resistance (conductor) max. 26,7 $\Omega$ /km                                                                                                                                    |
| Insulation resistance    | Insulation resistance min. 5 G $\Omega$ x km                                                                                                                                        |
| Inductance               | nom. 850 $\mu$ H/km (1 kHz)                                                                                                                                                         |
| Capacitive coupling      | max. 65 nF/km (1 MHz)                                                                                                                                                               |
| Characteristic impedance | Characteristic impedance<br>- normative 120 $\Omega$ ( $\pm$ 10%), (0.5-2) MHz<br>Characteristic impedance<br>- nominal 120 $\Omega$ ( $\pm$ 10%), (0.5-5) MHz                      |
| Attenuation              | attenuation<br>- normative max. 10 dB/km (1 MHz)<br>max. 14 dB/km (2 MHz)<br>attenuation<br>- nominal nom. 21.1 dB/km (3 MHz)<br>nom. 24.1 dB/km (4 MHz)<br>nom. 26.7 dB/km (5 MHz) |
| Velocity of propagation  | v/c ratio nom. 0.74                                                                                                                                                                 |
| Signal transit time      | nom. 450 ns/100m (2 MHz)                                                                                                                                                            |
| Transfer impedance       | Transfer impedance<br>- normative max. 20 m $\Omega$ /m (20.0 MHz)<br>Transfer impedance<br>- nominal nom. 10 m $\Omega$ /m (20.0 MHz)                                              |
| Peak operating voltage   | 125 V (not for power purposes)                                                                                                                                                      |
| Test voltage             | conductor/conductor 1000 V<br>conductor/screen 1000 V                                                                                                                               |

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## Mechanical and thermal properties

|                        |                                                                                                                                                   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Minimum bending radius | moved: 10 x cable Ø<br>fixed installation: 6 x cable Ø                                                                                            |
| Temperature range      | moved: -35° C up to +90° C<br>fixed installation: -45° C up to +90° C                                                                             |
| Flammability           | flame retardant acc. to IEC 60332-1-2<br>no flame propagation > 6 mm and <12 mm: acc. to IEC 60332-3-25 / acc. to NF C 32-070, Category C1 and C2 |
| Halogen free           | acc. to EN 60684-2 (fluorine)<br>acc. to IEC 60754-1; EN 60754-1; EN 50267-2-1 (chlorine and bromine)                                             |
| Corrosivity of gases   | acc. to EN 50264-1, pH ≥ 4.3 and conductivity ≤ 10µS/mm<br>acc. to IEC 60754-2; EN 60754-2; EN 50267-2-2                                          |
| Smoke density          | acc. to EN 50264-1 ( light transmission: min. 70%)<br>acc. to IEC 61034-2; EN 61034-2 / acc. to NF X 10-702                                       |
| Toxicity               | acc. to EN 50264-1 (< 3)<br>acc. to EN 50305 / acc. to NF X 70-100                                                                                |
| UV resistance          | acc. to EN 50525-1 (VDE 0285-525-1) are cables with black sheath suitable for permanent outdoor use.                                              |
| Ozone resistance       | acc. to EN 50264-3-2, method A or B<br>acc. to EN 50305                                                                                           |
| Oil resistance         | acc. to EN 50264-1, EM 104                                                                                                                        |
| Fuel resistance        | acc. to EN 50264-1, EM 104                                                                                                                        |
| General requirements   | This cable is conform to the EU-Directive 2011/65/EU<br>(RoHS, Restriction of the use of certain hazardous substances).                           |

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