HARTING Ha-VIS EtherRail® cable, 4x AWG 22/7, Cat. 5 / 5e

Ha-VIS EtherRail® flexible
data cable, 4-wire, Cat. 5 / 5e

Advantages

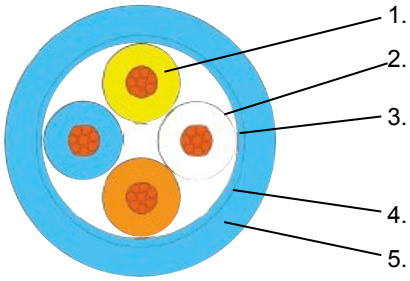
- Transmission of Fast Ethernet 100Base-T acc. to IEEE 802.3
- Suitable for data cabling in rail vehicles and buses
- Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50264-1
- Temperature range: -40 °C … +85 °C
- UV resistant
- RoHS conform, halogen free LSZH
- Additionally certified acc. to DIN, NFF, BS, ASTM and UL 1685

Application

This data cable was especially designed for installation within rail vehicles and buses. The cable fulfils the fire protection requirements according to the international standards for railway vehicles and buses and is suitable for operation over a wide temperature range. Cable design, material and compounds as well as processing (electron beam cross-linking) follow the basic requirements of the European standardisation for railway applications EN 45545-1, -2 and -5 (Railway applications – Fire protection on railway vehicles). The robust star quad cable construction guarantees a reliable data transmission up to 100 Mbit/s. The cable has been designed to be compatible with products from HARTING Han® M12 crimp, RJ Industrial RJ45 (IP20 and IP65 / IP67) PushPull and Han® 3 A ranges.

Identification	Part number
Ha-VIS EtherRail® flexible data cable, star quad 1x4xAWG 22/7, category 5 / 5e	
Sheath material: Elastomer, electron beam cross-linked	
Colour: blue	
Cable sheath diameter: (6.6 ± 0.2) mm	
Transmission performance: Cat. 5 / 5e / transmission class D up to 100 MHz according ISO/IEC 11801 and EN 50173-1	
Transmission rate: 10/100 Mbit/s	
Operating temperature range: -40 °C … +85 °C	
Cable weight: 71 kg/km	
Order information:	
10 m ring	09 45 600 1400
50 m ring	09 45 600 1410
100 m ring	09 45 600 1420
500 m drum	09 45 600 1430
1000 m drum	09 45 600 1440

Drawing



1. **Conductor**
   4 x stranded copper wire, tin-plated
   AWG 22/7 x 0.25 mm
2. **Insulation**
   PE cellular, Comp. 717, Ø 1.5 mm
   Colours: blue, yellow, white, orange
3. **Wrapping**
   Plastic tape
4. **Screening**
   Aluminium foil-clad polyester
   with tin-plated copper braid
5. **Jacket**
   Elastomer electron beam cross-linked Comp. 603

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Technical characteristics

Transmission performance	Category 5 / 5e acc. to EN 50288-2-1, IEC 61156-6 acc. to ISO/IEC 11801 and EN 50173	
Mechanical features		
Minimum bending radius	Repeated bending: Singular bending:	6 x cable diameter 5 x cable diameter
Tensile strength	max. 60 N	
Electrical characteristics at 20 °C		
Coupling attanuation at 100 MHz	< 13 mOhm/m	
Conductor resistance	max. 54.4 Ohm/km	
Insulation resistance	min. 500 MOhm x km	
Signal run time	5.3 ns/m	
Characterisic impedance at 100 MHz	100 Ohm ± 5 Ohm	
Test voltage (wire/wire/screen rms 50 Hz for 1 min)	2000 V	
Operating voltage	125 V	
Chemical characteristics		
Fire load	0.258 MJ/m	
Fire protection for railway vehicles	DIN 5510-2 EN 45545-2	Level of protection 1 … 4 Hazard level HL1 - HL3
Vertical flame propagation on single cables	EN 60332-1-2	Carbonisation > 50 and ≤ 540 mm
Smoke density	EN 61034-2	Transparency > 70 %
Toxicity of smoke gases	EN 50305	ITC ≤ 3
Fire protection in railway vehicles	EN 50264-1	
Halogen free	EN 50267-2-1 EN 60684-2	HCl and HBr < 0.5 % HF < 0.1 %
Corrosiveness of smoke gases	EN 50267-2-2	pH > 4.3 Conductivity < 10 µs / mm
Material charateristics		
Ozone resistance	EN 50306-4	72 h/40 °C, Procedere B Volume concentration 200x10^{-6}
Oil resistance	EN 50306-4	72 h/100 °C, IRM 902
Fuel resistance	EN 50306-4	168 h/70 °C, IRM 903
Marginal fire load	DIN 51900	
Temperature range		
Fixed installation Free installation	-40 °C … +85 °C -25 °C … +70 °C	
Printing	“HARTING” Ha-VIS EtherRail® CAT 5 LSZH 4xAWG22/7 “094560001021100” ”Chargecode” “Meter”	
Weight	71 kg/km	
Copper number	3 kg/100 m	

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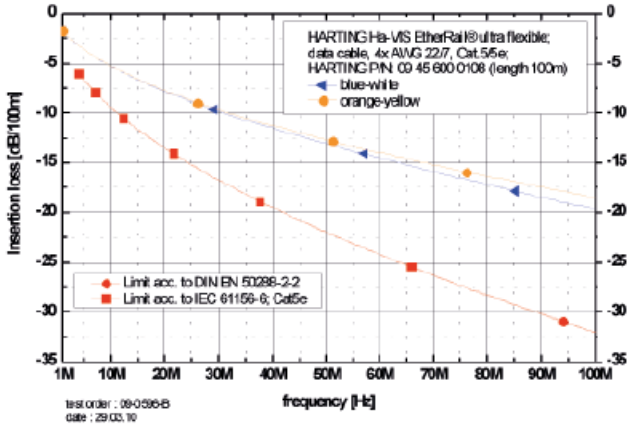
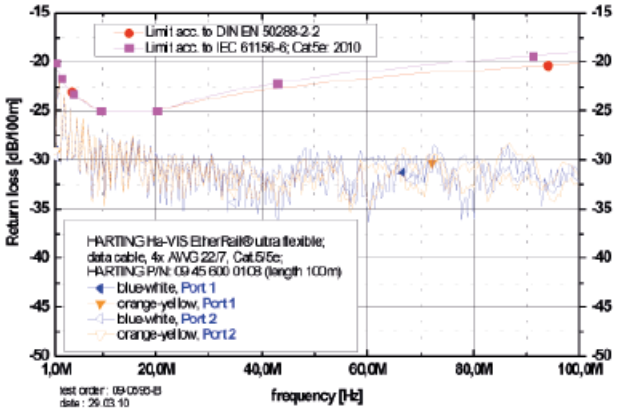
Technical characteristics, transmission performance

Diagrams:

Attenuation



Return loss



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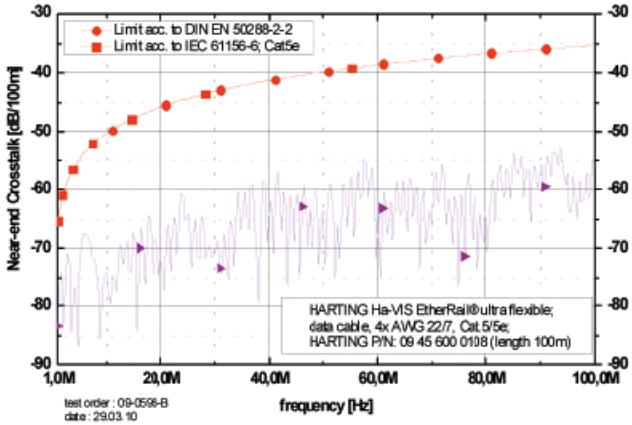
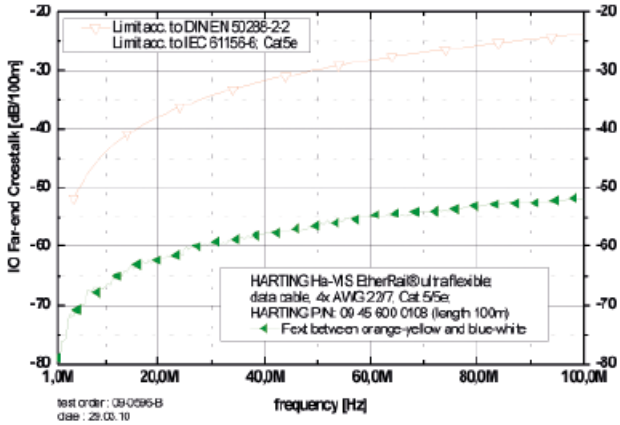


EL Fext



Additional certifications

Additionally acceptance tests / certificates

HARTING‘s Declaration of Conformity No.: EL ICPN 0001
Tested by MPA Dresden / Germany

• DIN EN 60 332-1: 2005-06	Vertical flame propagation on separated wires under definded conditions Test Report No. 2011-B-1906/06.1
• DIN EN 60 332-3-25: 2010-08	Vertical flame propagation on bundles of cables burning under definded conditions Test Report No. 2011-B-1909/07.1
• DIN EN 61 034-2: 2006-03	Smoke densitiy of cables burning under definded conditions Test Report No. 2011-B-1909/08.1

HARTING‘s Declaration of Conformitiy No.: EL ICPN 0002
Tested by ISSeP Liège / Belgium

• NF C 32-070: 2001-01	Cables of category C1 NF C 32,070 Test Report No. 2130-1/2011
• NF F 16-101: 1988-10	Reaction to fire – Cable classification Test Report No. 2130-2/2011
• NF X 10-702: 1994	Smoke densitiy testing Test Report No. 2130-3/2011
• NF X 70-100: 2006-04	Analysis of pyrolysis and combustion gases Test Report No. 2130-4/2011
• NF X 16-101: 1988-10	Smoke index – F classification Test Report No. 2130-5/2011

HARTING‘s Declaration of Conformitiy No.: EL ICPN 0005
Tested by MPA Dresden / Germany

• BS 6853: 1999 Table 13, Annex D	Measurement of smoke densitiy Test Report No. 2011-B-1909/09.1
• BS 6853: 1999 Table 13, Annex D	Measurement under fire conditions, Flammability Test Report No. 2011-B-1909/10.1

HARTING‘s Declaration of Conformitiy No.: EL ICPN 0007
Tested by Govmark Inc. New York / USA

• AASTM E 162	Surface flammability Test Report No. 2-87105-0-
• ASTM E 662	Specific optical density and Smoke density Test Report No. 2-87105-1-
• BSS 7239	Toxicity of gases FL & NF (ASTM F814) Test Report No. 2-87105-2

GOST (Russia)

ČD (Czech Republic)