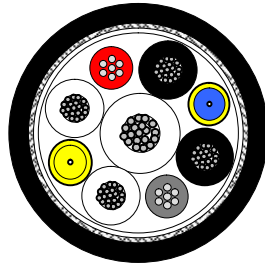


SMPTE 311M-HD-Hybrid-Camera Cable

Hybrid-HDTV-Camera Cable



Application

This Hybrid HD Camera Cable 2SM 9/125 + 4 x AWG20 + 2 x AWG24 acc. to SMPTE 311M-Standard contains Single-Mode Optical Fibres, Auxiliary- and Signal Conductors. It is used in professional video productions for simultaneous transmission of energy, video, audio and control signals and is intended to interconnect Camera Units and Base Stations in conjunction with the Connector Interface Standard. It is suitable for all new digital camera systems of well-known manufacturers.

Standards

SMPTE 311M

Flame resistance

FRNC jacket: IEC 60332-1, IEC 60754-2, IEC 61034, Class E_{ca}
FRNC-C jacket: IEC 60332-3-24, Class C_{ca}

Construction

Element 1: Auxiliary Conductors AWG20 (4 x 0.6 mm²)

Conductor	tinned stranded copper wires, 19 x 0.20 mm, diameter 1.0 mm
Insulation	HDPE, diameter 1.5 mm (FRNC-C = LSOH)
Identification	2 x black, 2 x white

Element 2: Signal Conductors AWG24 (2 x 0.22 mm²)

Conductor	tinned stranded copper wires, 7 x 0.20 mm, diameter 0.6 mm
Insulation	HDPE, diameter 1.1 mm (FRNC-C = LSOH)
Identification	1 x red, 1 x grey

Element 3: Fibre Optic Simplex Single Mode (2 x 9/125µ) (BBXS)

Mode field diameter	at 1310 nm, diameter 9.5 µm ± 1 µm
Cladding diameter	diameter 125 µm ± 1 µm
Concentricity error	≤ 1 µm
Coating material	UV-cross-linked Acrylate, diameter 245 µm
Buffer material	Thermoplastic, diameter 0.9 µm ± 0.05 µm
Identification	1 x blue, 1x yellow
Strength Element	Aramid yarn
Sheath	1 x blue, 1x yellow, diameter 1.6 mm

Element 4: Strength Member AWG16 (1 x 1.22 mm²)

Conductor	galvanized steel wires, diameter 1.6 mm
Insulation	HDPE, diameter 2.1 mm (FRNC-C = LSOH)
Identification	1 x white

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Construction

Stranding	Core: 1x Element 4, diameter 2.1 mm Layer: 4x Element 1 + 2x Element 2 + 2x Element 3, diameter 5.2 mm Sequence according to the above drawing
Wrapping	1 x non-woven fabric tape, diameter 5.4 mm
Screen	Copper wire braid, tinned, diameter 5.9 mm
Sheath	PUR or LSOH or FRNC-C (FRNC-C with additional Al-Pet foil) diameter 9.2 mm black, RAL 9005
Printing	PUR: DRAKA SMPTE 311 M Zero-Loss HD Cable + batch number + meter marking LSOH: DRAKA SMPTE 311 M Zero-Loss HD Cable FRNC + batch number + meter marking CPR class Eca FRNC-C: DRAKA SMPTE 311 M Zero-Loss HD Cable FRNC-C + batch number + meter marking CPR class Cca s1a d1

Mechanical properties

Temperature range PUR (FRNC)	during operation	- 40° C to + 70° C (-25°C to +70°C)
Temperature range FRNC-C	during operation	-20°C to + 70° C
Max. humidity		95 %

Electrical properties

at 20°C

Auxiliary Conductors AWG20 (4 x 0.6 mm²)

DC resistance		≤ 35.3 Ω/km
Loop resistance		≤ 70.6 Ω/km
Insulation resistance		≥ 10 ⁴ MΩ*km
Test voltage		1750 V _{AC rms}
Operating voltage		≤ 300 V _{AC rms}

Signal Conductors AWG24 (2 x 0.22 mm²)

DC resistance		≤ 97.5 Ω/km
Loop resistance		≤ 184 Ω/km
Insulation resistance		≥ 10 ⁴ MΩ*km
Test voltage		1750 V _{AC rms}
Operating voltage		≤ 300 V _{AC rms}

Overall screen

DC resistance		≤ 20 Ω/km
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Optical properties

at 20°C

Fibre Optic Simplex Single Mode (2 x 9/125μ)

Cut-off wavelength		1100 – 1350 nm
Attenuation	at 1310 nm	0.5 dB
Dispersion	at 1310 nm	3.5 ps/nm*km

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C25: Properties of cabled BendBright-XS Patch Cord fibre; ITU G.557 A2 and G.657 B2

General and application

Draka BendBright-XS single-mode fibre combines three attractive features: excellent low macro-bending sensitivity, Draka's revolutionary new ColorLock®^{XS} coating and tight glass geometry. Together they create the ideal performance for all patch cord, interconnect & jumper applications.

IEC 60793-2-50 Category B6_a and B6_b
EN 60793-2-50: Class B6_a and B6_b
ITU Recommendation G.657.A2 and G.657.B2 (2009)
ITU Recommendation G.652 designations A, B, C and D

EN 50 173-1:2007, cat. OS2
ISO/IEC 11801:2002, cat. OS1
ISO/IEC 24702:2006 cat. OS2
and OS1 IEEE 802.3 – 2002 incl.

Standards and Norms

Attenuation (cabled fibre)

IEC 60793-1-40

1310 nm	≤ 0.38 dB/km
1383 nm*	≤ 0.38 dB/km
1550 nm	≤ 0.23 dB/km
1625 nm	≤ 0.25 dB/km
Inhomogeneity of OTDR trace for any two 1000 metre fibre lengths	Max. 0.1 dB/km

* Including H2-ageing according to IEC 60793-2-50, type B.1.3, @1383nm

Group Index of refraction

IEC 60793-1-22

Group index of refraction at 1310 nm	1.467
Group index of refraction at 1550 nm	1.467
Group index of refraction at 1625 nm	1.468

Other properties

IEC 60793-1-xx

Cladding diameter	IEC/EN 60793-1-20	µm	125.0 ± 0.4
Cladding non-circularity	IEC/EN 60793-1-20	%	≤ 0.3
Core (MDF) -cladding concentricity error	IEC/EN 60793-1-20	µm	≤ 0.3
Primary coating diameter – ColorLock® ^{XS} and natural	IEC/EN 60793-1-21	µm	242 ± 5
Primary coating non-circularity	IEC/EN 60793-1-21	%	≤ 5
Primary coating-cladding concentricity error	IEC/EN 60793-1-21	µm	≤ 12
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1 %)
Strip force (peak)	IEC/EN 60793-1-32	N	1.2 ≤ F _{peak,strip} ≤ 8.9
Static fatigue, aged n _s		-	>23
Chromatic dispersion coefficient: In the interval 1285 nm – 1330 nm	IEC/EN 60793-1-42	ps/km • nm	≤ 13.71
At 1550 nm		ps/km • nm	≤ 18.5
At 1625 nm		ps/km • nm	≤ 23.0
Zero dispersion wavelength, A ₀		nm	1300 - 1324
Zero dispersion slope		ps/(nm ² • km)	≤ 0.092
Cut-off wavelength	IEC/EN 60793-1-44	A _{cc} nm	≤ 1260 *
Mode field diameter at 1310 nm	IEC/EN600793-1-45	µm	8.8 ± 0.4
Mode field diameter at 1550 nm		µm	9.8 ± 0.5

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Macro bending loss 10 turns on a mandrel R = 15 mm, @1550nm 10 turns on a mandrel R = 15 mm, @1625nm 1 turn on a mandrel R = 10 mm, @1550nm 1 turn on a mandrel R = 10 mm, @1625nm 1 turn on a mandrel R = 7.5 mm, @1550nm 1 turn on a mandrel R = 7.5 mm, @1625nm	IEC/EN 60793-1-47	dB	≤ 0.03 ≤ 0.1 ≤ 0.1 ≤ 0.2 ≤ 0.5 ≤ 1.0
Polarisation mode dispersion (PMD) coefficient, cabled	IEC/EN 60793-1-48	ps/km	≤ 0.15
PMD _Q Link Design Value (computed with Q=0.01%, N=20)	IEC/EN 60794-3	ps/km	≤ 0.08

* guaranteed value according to the ITU-T (ATM G650) method

All measurements in accordance with ITU-T G650 recommendations.

Technical data

Product code	Type	Weight kg/km	Drum size PWD	Copper content	Tensile force N	Minimum bending radius mm	Storage
60014967	9.2mm SMPTE 311M Hybrid Camera Cable PUR	115	760/470/500	47.2	800	65	inside
60011474	9.2mm SMPTE 311M Hybrid Camera Cable PUR rubber	115	760/470/500	47.2	800	65	inside
60014834	9.2mm SMPTE 311M Cable LSOH IEC 60332-1	115	760/470/500	47.2	800	90	inside
60049477	9.2mm SMPTE 311M Cable FRNC-C Cca s1a d1 a1	138	760/470/500	47.2	800	90	Inside
60056019	15mm SMPTE 311M Hybrid PUR Camera Cable	250	1100/780	47.2	800	150	inside
60028797	16mm SMPTE 311M Hybrid PUR Camera cable	250	1100/780	47.2	800	160	inside
92987002	SMPTE 311M PUR SWB Rodent protected*	233	755/470/500	47.2	800	150	inside

Eca
CPR

Cca
CPR

*Remark: Standard SMPTE311M PUR cable with an additional steel wire braid and an additional PUR jacket Ø=12.10mm