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MAXIMUM TRANSMISSION DISTANCE AT 12GB/S UHD (4K)

Coaxial cables for UHD (4K) use.

With the increasing demand for bandwidth in the broadcasting field, studios and broadcasters realized that many cables are not suitable for UHD. The practical test is a guide and tool to determine the calculated and maximum transmission distance for 12Gb/s UHD (4K).

The SMPTE ST2082 and the calculated transmission distance of 4K

Compared to 1.5Gb/s (SMPTE 292M) and 3Gb/s (SMPTE 424M) the calculation of the max. length at 12Gb/s is different: 40dB max. loss at half clock frequency (SMPTE 292M and 424M = 20dB max. loss at half clock frequency)

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PROCEDURE TO FIND THE MAXIMUM DISTANCE AT 12GB/S

Connectors
Coax Connectors LTD BNC 75 Ohm
Damar & Hagen BNCpro UHD 4K
Neutrik Zürich AG, connector BNC 75 Ohm

Matrix to determine max. transmission length

Draka video cables	Single link 12Gb/s [m]	Dual link 6Gb/s [m]	Quad link 3Gb/s [m]	OD [mm]
ULTRA HD PRO 50 UHD	50	74	108	4.5
ULTRA HD PRO 100 UHD	87	132	195	7.0
ULTRA HD PRO 150 UHD	141	197	288	12.7
ULTRA HD PRO 200 UHD	197	305	465	14.7
HD PRO 0.6/2.8 AF	41	67	99	4.5
HD PRO 0.8/3.7 AF	56	86	127	5.9
HD PRO 1.0/4.8 AF	71	107	160	7.0

The maximum transmission distances are based on 40dB maximum loss at half clock frequency. Today's devices use equalizers mainly designed for 20dB loss (see SMPTE 292M and SMPTE 424M). For the technical realization it is essential to check the equipment e.g. equalizers if they are suitable for 4K to achieve the maximum values.

Measurement results of the maximum application lengths / video cables for 1080i/720p

Draka video cables	1.5Gb/s HD 1080i max. application length [m]
0.6/2.8 AF	90
0.8/3.7 AF	120
0.8L/3.7 Dz	100
1.0/4.8 AF	140
1.4/6.6 AF	200
1.6/7.3 AF	240
HD PRO 0.6/2.8 AF	95
HD PRO 0.8/3.7 AF	125
HD PRO 1.0/4.8 AF	145

Remark: the max. transmission distance depend on the devices e.g. hardware like equalizer