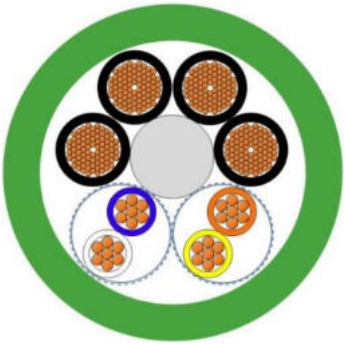
2170887	DATA SHEET	LAPP
valid from: 13.11.2020	ETHERLINE® Cat5 FRNC HYBRID 2x2x22/7 AWG + 4x1.5	

Application

ETHERLINE® Cat. 5 FRNC HYBRID is a hybrid industrial ethernet cable for simultaneous data transmission and power supply.
The cable is designed for fixed installation and occasional movement.
The separately screened core pairs ensure high transmission reliability in areas with a high load of electromagnetic capacity.
The cable is halogen free and sunlight resistant.



Design

Certification	UL AWM Style 21282 80°C, 150V acc. to UL 758
Conductor	data cores: stranded bare copper 22/7 AWG power cores: fine-wire stranded bare copper 1.5 mm²
Insulation	data cores: foamed Polyolefine outer ⌀: ca. 1.5 mm power cores: FRNC outer ⌀: ca. 2.4 mm
Core identification code	data cores: pair 1: white/blue, pair 2: yellow/orange power cores: black with numbers
Stranding	two data cores twisted to pairs screened data pairs and power cores twisted together with central filler
Screen	plastic laminated aluminium foil (overlapping) on top: braid of tinned copper wires (coverage 75 % ± 5 %)
Taping	data pairs: non-woven tape (overlapping) complete cable: non-woven tape (overlapping)
Outer sheath	FRNC green, similar to RAL 6018 outer Ø: 10.3 mm (± 0.3 mm)

Electrical properties at 20°C

Conductor resistance	power cores:	max. 14 Ω/km
Loop resistance	data cores:	max. 11.48 Ω/100 m
Insulation resistance	data cores: power cores:	min. 500 MΩxkm min. 20 MΩxkm
Mutual capacitance	data cores:	nom. 47 nF/km
Characteristic impedance	nom. 100 Ω acc. to IEC 61156-6	
Signal propagation time	<440 ns/100 m	
Delay skew	≤ 25 ns/100 m	
Operating voltage (max.)	EN:	100 V (not for power purposes)
Rated voltage	UL:	150 V
Test voltage	data cores: core/core: core/screen: power cores: core/core: core/screen:	 700 V 700 V 1500 V 700 V

Electrical transmission properties at 20°C

The transmission characteristics meet the requirements of the standards EN 50288-2-2 and IEC 61156-6 for category 5e.
The normative requirements for the transmission properties are shown in the following table:

f [MHz]		4	10	16	20	31,25	62,5	100
(max.) Attenuation	[dB/100 m]	6	9,5	12,1	13,5	17,1	24,8	32
(min.) TCL	[dB]	34	30	28	27	25,1	22	20
(min.) EL TCTL	[dB/100 m]	23	15	10,9	9	5,1	—	—
(min.) NEXT	[dB]	56,3	50,3	47,2	45,8	42,9	38,4	35,3
(min.) PS EL FEXT	[dB/100 m]	49	41	36,9	35	31,1	25,1	21
(min.) ACR-F/EL FEXT	[dB/100 m]	52	44	39,9	38	34,1	28,1	24
(min.) Return Loss	[dB]	23	25	25	25	23,6	21,5	20,1

Mechanical and thermal properties

Minimum bending radius	fixed: occasional flexing:	5x cable diameter 10x cable diameter
Temperature range	fixed: occasional flexing:	-20 °C up to +70 °C 0 °C up to +50 °C
Flammability	flame retardant acc. to. IEC 60332-1-2 resp. EN 60332-1-2 HFT acc. to UL 1581 §1090	
Halogen free	acc. to IEC 60754-1 resp. EN 60754-1	
Corrosivity of gases	acc. to IEC 60754-2 resp. EN 60754-2	
UV resistance	SUN RES acc. to UL 1581 §1200	
General requirements	This cable is conform to EU-Directive 2014/35/EU (Low Voltage Directive) and to EU-Directive 2011/65/EU (RoHS, Restriction of the use of certain hazardous substances).	
Environmental information	These cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).	