
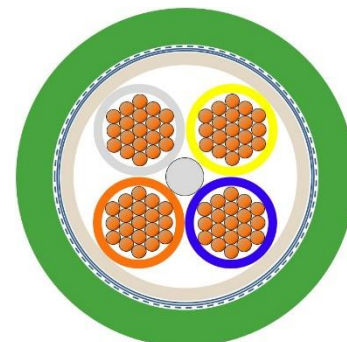


2170941	DATA SHEET	
valid from: 01.04.2022	ETHERLINE® ROBOT PN Cat.5e FC 1x4x22/19 AWG	

Application

Field of use:	Connecting cable for cabling systems acc. to ISO/IEC 11801 and EN 50173. Suitable for highly flexible applications under torsional stress, for highly flexible applications in power chains and permanent moved machine parts. Meeting the transmission requirements of IEC 61156-6, Category 5e. Compliant to the "PROFINET Cabling and Interconnection Technology" guideline.
Performance:	starquad, screened foiled cable (SF/UTQ), having a nominal impedance of 100 Ω, supporting a bandwidth of 100 Mbit/s (e.g. 10BASE-T, 100BASE-T) over up to 100 m.
Characteristics:	halogen free, flame retardant, UV resistant, oil resistant, abrasion resistant, the "Fast Connect" design allows easy stripping and assembly of the cable
Applications:	PROFINET Type R cable for robotic applications, EtherCAT, EtherNet/IP, PoE (IEEE 802.3af), PoE+ (IEEE 802.3at) and others




Design

Certification	E63634 UL AWM Style 21238 80°C, 600V acc. to UL 758
Conductor	fine-wire stranded bare copper 22/19 AWG
Insulation	polyolefin core diameter: max. 1.6 mm
Core identification code	pair 1: white/blue, pair 2: yellow/orange
Stranding	star quad with central filler
Inner sheath	FRPE outer diameter: nom. 4.4 mm
Screen	plastic laminated aluminium foil (overlapping) on top: braid of tinned copper wires (coverage 85 % ± 5 %)
Outer sheath	TPU green, similar to RAL 6018 outer diameter: nom. 6.8 mm (± 0.3 mm)

Electrical properties at 20 °C

Loop resistance	≤ 11.8 Ω/100 m	
Insulation resistance	≥ 5 GΩ×km	
Mutual capacitance	1000 Hz:	nom. 47 nF/km
Transfer impedance	1 MHz:	≤ 20 mΩ/m
	10 MHz:	≤ 20 mΩ/m
	30 MHz:	≤ 50 mΩ/m
	100 MHz:	≤ 200 mΩ/m
Coupling attenuation	30 MHz – 100 MHz:	≥ 80 dB
	100 MHz – 1000 MHz:	≥ 80 – 20×log ₁₀ (f / 100)
Characteristic impedance	100 MHz:	100 Ω acc. to IEC 61156-6
Velocity of propagation	100 MHz:	0,67 c
Signal propagation time	4 MHz – 100 MHz:	≤ 510 ns/100 m
Delay skew	4 MHz – 100 MHz:	≤ 20 ns/100 m
Maximum operating voltage	IEC/EN:	100 V (not for power purposes)
Rated voltage	UL:	600 V
Test voltage	core/core:	2000 V
	core/screen:	2000 V

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Electrical transmission properties at 20°C

The transmission characteristics meet the requirements of the standard IEC 61156-6 for category 5e. The normative requirements for the transmission properties are shown in the following table exemplary:

f [MHz]		4	10	16	20	31,25	62,5	100
(max.) Attenuation	[dB/100 m]	6,0	9,5	12,1	13,5	17,1	24,8	32,0
(min.) NEXT	[dB]	56,3	50,3	47,2	45,8	42,9	38,4	35,3
(min.) PS NEXT	[dB]	53,3	47,3	44,2	42,8	39,9	35,4	32,3
(min.) ACR-F/EL FEXT	[dB/100 m]	55,0	49,0	45,9	44,5	41,6	37,1	34,0
(min.) PS EL FEXT	[dB/100 m]	52,0	46,0	42,9	41,5	38,6	34,1	31,0
(min.) Return Loss	[dB]	23,0	25,0	25,0	25,0	23,3	20,7	19,0

Mechanical and thermal properties

Minimum bending radius	fixed:	8 × outer diameter
	continuous flexing:	12 × outer diameter
Temperature range	fixed:	-40 °C up to +80 °C
	continuous flexing:	-20 °C up to +60 °C
	UL:	80 °C
Bending cycles and power chain operation parameters	travel distance:	5 m
	Acceleration:	10 m/s ²
	Velocity:	3 m/s
	Cycles:	5.000.000
Torsional stress	Torsion angle:	± 180°/m
	Cycles:	5.000.000
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	
Oil resistance	acc. to. EN 50363-10-2	

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).

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