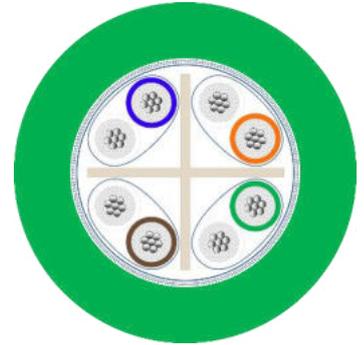


2170487	DATA SHEET	
valid from: 01.03.2023	ETHERLINE® PN FD P Cat.7 4x2x24/7 AWG	

Application

Field of use:	Highly flexible data cable for energy chain use acc. to the general standards ISO/IEC 11801 and EN 50173. Meeting the transmission requirements of IEC 61156-6, Category 7. Compliant to the "PROFINET Cabling and Interconnection Technology" guideline.
Performance:	4-pair, screened foiled twisted pair cable (SF/FTP), having a nominal impedance of 100 Ω, supporting a bandwidth of 10 Gbit/s (e.g. 10GBASE-T, 1000BASE-T, 2.5GBASE-T, 5GBASE-T, 10GBASE-T) over up to 100 m.
Characteristics:	flame retardant, halogen free, UV resistant, oil resistant, abrasion resistant
Applications:	PROFINET Type C, EtherCAT, EtherNet/IP, PoE (IEEE 802.3af), PoE+ (IEEE 802.3at) and others



Design

Certification	E236660 cULus CMX 75 °C acc. to UL 444 & CSA 22.2 No. 214 E63634 cRUus AWM Style 21576 AWM I/II A/B 80°C 1000V FT2 acc. to UL 758 & CSA 22.2 No. 210
Conductor	stranded tinned copper 24/7 AWG
Insulation	foam-skin polyolefine core diameter: max. 1.45 mm
Core identification code	pair 1: white/blue, pair 2: white/orange, pair 3: white/green, pair 4: white/brown
Stranding	cores twisted to pairs acc. to color identification code pairs stranded around central separating element
Pair screen	plastic laminated aluminium foil
Screen	conductive wrapping on top: braid of tinned copper wires (coverage 85 % ±5 %)
Outer sheath	TPU green, similar RAL 6018 outer diameter: 9.4 mm ± 0.3 mm

Electrical properties at 20 °C

Loop resistance	≤ 17.52 Ω/100 m	
Insulation resistance	≥ 5 GΩ×km	
Mutual capacitance	1000 Hz:	nom. 50 nF/km
Transfer impedance	1 MHz:	≤ 15 mΩ/m
	10 MHz:	≤ 10 mΩ/m
	30 MHz:	≤ 30 mΩ/m
	100 MHz:	≤ 100 mΩ/m
Coupling attenuation	30 MHz:	≥ 80 dB
	100 MHz:	≥ 80 dB
	500 MHz:	≥ 66 dB
	1000 MHz:	≥ 60 dB
Characteristic impedance	100 MHz:	100 Ω acc. to IEC 61156-6
Velocity of propagation	100 MHz:	0.74 c
Maximum operating voltage	IEC/EN:	100 V (not for power purposes)
Rated voltage	cULus CMX:	300 V
	cRUus AWM:	600 V
Test voltage	core/core:	2000 V
	core/screen:	2000 V

Creator: KIOS / PDC	Document: DB2170487EN	Page 1 of 2
Released: ALTE / PDC	Version: 01	

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Electrical transmission properties at 20°C

The transmission characteristics meet the requirements of the IEC 61156-6 for category 7 and the requirements of the PROFINET Cabling and Interconnection Technology Guideline.

Frequency	(max.) Phase delay	(max.) Differential delay	(max.) Attenuation	(min.) TCL Level 1	(min.) EL TCTL Level 1	(min.) NEXT	(min.) PS NEXT	(min.) ACR-F	(min.) PS ACR-F	Char. Impedance	(min.) RL
f [MHz]	[ns/ 100 m]	[ns/ 100 m]	[dB/ 100 m]	[dB]	[dB]	[dB]	[dB]	[dB/ 100 m]	[dB/ 100 m]	[Ohm]	[dB]
4	552.0	20.0	5.6	34.0	23.0	78.0	75.0	78.0	75.0	—	23.0
10	545.4	20.0	8.8	30.0	15.0	78.0	75.0	79.0	76.0	—	25.0
20	542.0	20.0	12.4	27.0	9.0	78.0	75.0	74.5	71.5	—	25.0
62.5	538.6	20.0	22.3	22.0	—	75.5	72.5	67.1	64.1	—	20.7
100	537.6	20.0	28.5	20.0	—	72.4	69.4	64.0	61.0	100 ± 5	19.0
200	536.5	20.0	41.2	17.0	—	67.9	64.9	59.5	56.5	—	16.4
250	536.3	20.0	46.5	16.0	—	66.4	63.4	58.0	55.0	—	15.6
500	535.6	20.0	67.9	—	—	61.9	58.9	53.5	50.5	—	15.6
600	535.5	20.0	75.1	—	—	60.7	57.7	52.3	49.3	—	17.3

Mechanical and thermal properties

Minimum bending radius	fixed installation:	8× outer diameter
	continuous flexing:	15× outer diameter
Temperature range	fixed installation:	-40°C up to +80°C
	continuous flexing:	-10°C up to +70°C
	c(UL)us CMX:	75 °C
	cRUus AWM:	80 °C
Bending cycles and power chain operation parameters	travel distance:	5 m
	Acceleration:	3 m/s ²
	Velocity:	3 m/s
	Cycles:	3.000.000
Flammability	flame retardant acc. to IEC 60332-1-2 resp. EN 60332-1-2	
	FT2 acc. to UL 1581 §1100	
Halogen free	acc. to IEC 60754-1 resp. EN 60754-1	
UV resistance	acc. to EN ISO 4892-2-2013, method A (change of color allowed)	
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).

Creator: KIOS / PDC	Document: DB2170487EN	Page 2 of 2
Released: ALTE / PDC	Version: 01	