2170281	DATA SHEET	LAPP
valid from: 2024-04-26	ETHERLINE® P Cat. 5e 2x2x24/1 AWG	

Application

Field of use:	Industrial Ethernet cable for generic cable system acc. to ISO/IEC 11801 and EN 50173. Suitable for fixed installation. Meeting the transmission requirements of IEC 61156-5, Category 5e and EN 50288-2-1.
Performance:	2-pair, overall braid and foil screened symmetrical cable (SF/UTP), 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.
Characteristic:	flame retardant, halogen free, oil resistant, UV resistant, abrasion resistant, mechanical resistant, largely resistant to acids and alkalis
Applications:	PoE (IEEE 802.3af), EtherCAT, EtherNet/IP and other

Design

Certification	E63634 cRUus AWM Style 21576 AWM I/II A/B 80°C 1000V FT2 acc. to UL 758 and CSA 22.2 No. 210
Conductor	bare copper wire 24/1 AWG (0.22 mm²)
Insulation	PO (Polyolefine) core diameter: max. 1.09 mm
Core identification code	pair 1: white-orange/orange; pair 2: white-green/green
Stranding	cores twisted to pairs pairs stranded to bundle (with fillers)
Taping	platic tape
Screen	plastic laminated aluminum foil on top: braid of tinned copper wires (coverage nom. 85 %)
Outer sheath	TPU (thermoplastic polyurethane) blue, similar RAL 5021 outer diameter: 5.8 mm ± 0.3 mm

Electrical properties at 20 °C

Loop resistance	≤ 17.18 Ω/100 m	
Test voltage	core/core: core/screen:	3000 V 3000 V
Rated voltage	UL:	1000 V
Maximum operating voltage	IEC/EN:	125 V (not intended to be used in conjunction with low impedance sources, such as utility mains)
Insulation resistance	≥ 5 GΩxkm	
Mutual capacitance	1 kHz:	nom. 50 nF/km
Capacitance unbalance	1 kHz:	≤ 1600 pF/km
Transfer impedance	Grade 1 acc. to IEC 61156-6 1 MHz: 10 MHz: 30 MHz: 100 MHz:	 ≤ 15 mΩ/m ≤ 10 mΩ/m ≤ 30 mΩ/m ≤ 100 mΩ/m

Coupling attenuation	Type I acc. to IEC 61156-6	
	30 MHz:	≥ 85
	100 MHz:	≥ 85
	1000 MHz:	≥ 65
Velocity of propagation	100 MHz:	nom. 0,67 c

Transmission properties at 20°C

The transmission characteristics meet the requirements of IEC 61156-5 for category 5e.

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	45.0	4.1	34.0	23.0	56.3	53.3	55.0	52.0	—	23.0
10	545.4	45.0	6.5	30.0	15.0	50.3	47.3	49.0	46.0	—	25.0
16	543.0	45.0	8.3	28.0	10.9	47.2	44.2	45.9	42.9	—	25.0
20	542.0	45.0	9.3	27.0	9.0	45.8	42.8	44.5	41.5	—	25.0
30	540.6	45.0	11.5	25.2	5.5	43.1	40.1	41.8	38.8	—	23.8
62.5	538.6	45.0	17.0	22.0	—	38.4	35.4	37.1	34.1	—	21.5
100	537.6	45.0	22.0	20.0	—	35.3	32.3	34.0	31.0	100 ± 5	20.1

Mechanical and thermal properties

Minimum bending radius	fixed installation:	8× outer diameter
Temperature range	fixed installation:	-30 °C up to +80 °C
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	
Oil resistance	acc. to. EN 50363-10-2	
UV resistance	acc. to. ISO 4892-2, method A	

General requirements These cables are conform to the EU-Directive 2011/65/EU (RoHS, Restriction of the use of certain hazardous substances) and the LV-Directive 2014/35/EU (Low voltage Directive).

Environmental information These cables meet the substance-specific requirements of the EU Directive 2011/65/EU (RoHS).