

Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

Manufacturer	TELDOR Cables & Systems
Address	Kibbutz Ein-Dor, 1933500, Israel
Place of Production	TELDOR Cables & Systems Kibbutz Ein-Dor, 1933500, Israel
Type	Digital communication cables
Description	BUS / FieldBus cables for Marine, OIL/GAS, Offshore and Industrial applications. The cables are made from solid or stranded conductors with SHF1 / SHF2 / SHF2-Mud-resistant per NEK606 jackets. The cables are flame retardant per IEC60332-3, fire resistant (optional) per IEC60331-23, halogen free, low smoke emission, armored and Non-armored. The cables are oil resistant and designed for harsh conditions. Includes: ProfiBus (100,150), CanBus, DeviceNet, FieldBus H1 Ethernet/IP, RS-485, RS-422.
Trade Name	Teldor BUS / FieldBus
Application	Digital communication cable for Marine and Offshore applications
Specified Standard	IEC 61156-1: 2009; IEC 61156-2:2010,IEC 61156-5:2020, IEC 61156-7:2012, IEC 61156-6:2020, IEC 61158-2 ed. 1:2010, IEC60092 -350:2020, IEC 60092-360:2021, IEC 61784-1:2010; IEC 61784-2:2010, IEC61189-1:2007, IEC 60754-1/2:2019, IEC 61034-1/2:2019, IEC 60332-1-1/2/3:2015,IEC 60332-3-22:2018, IEC 60332-3-24:2018, IEC 60331-1:2018, IEC 60331-2:2018,IEC 60331-23:1999, NEK

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606:2016; ISO/IEC 11801:2017, ANSI/TIA/EIA568:2016, BS6387:2013, CSA 22.2 No. 03:2009 (Cold bend, Cold Impact), SOLAS Amendements chapterII-1, Part D, Reg. 45, 5.2.

Ratings

Details see certificate appendix

This certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register Classification Society (China) Co Ltd of any modification or changes to the equipment in order to obtain a valid Certificate.

The Design Appraisal Document LR21328265TA and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Appendix

SPECIAL PROPERTIES:

Halogen free per IEC 60754-1/2
 Flame retardant per IEC 60332-3-22 (cat.A), 60332-3-24 (cat.C), IEC 60332-1-1/2/3, IEC 60332-2, Low Smoke per IEC 61034-1/2 Armor/Non-Armor Fire resistant per IEC 60331-23 (Optional) Various types: ProfiBus (100,150), CanBus, DeviceNet, FieldBus H1 Ethernet/IP, RS-485, RS-422 Various Jacket types (SHF1, SHF2, SHF2-MUD resistant per NEK606) Designed for marine and offshore application Oil resistant Designed for harsh conditions

DETAILED DESCRIPTION:

Cable types :

ProfiBus 100
ProfiBus 150
CanBus
DeviceNet
FieldBus-H1
Ethernet/IP BUS
RS-485
RS-422

IEC 61158-2	Type A		Type B						Units
	U	P	C	D	F	E	R	S	
Bus Type	ProfiBUS 150	ProfiBUS 100	CanBUS	DeviceNET	FieldBUS-H1	Ethernet/IP BUS	RS-485	RS-422	
Impedance	150 f=3-20MHz	100 f>100KHz	100-130 f>100KHz	120 f>100KHz	120 - 100 f>100KHz	100 f>100KHz	100 - 120 f>100KHz	100 - 120 f>100KHz	Ohm
Capacitance (f=800Hz)	<30	35 - 44	40 - 55	35 - 44	40 - 55	40 - 55	35 - 50	35 - 50	pF/m
DC Resistance	94 - 10	94 - 10	94 - 13	94 - 10	95 - 5	150-54	94 - 10	94 - 10	Ohm/Km
Voltage rating	150 - 300	150 - 300	150 -300	300	300	48	300	300	Vrms
Conductor cross-sectional area	≥ 0.34	≥ 0.22	≥ 0.22	≥ 0.22	≥ 0.22	≥ 0.22	≥ 0.22	≥ 0.22	mm ²
Conductor size options	20,22	16, 18, 20	16,18,20,22,24	16,18,20,22,24	16, 18	20,22,24	16,18,20,22,24	16,18,20,22,24	AWG
Number of pairs	1	1	1-8	1 data + 1 power	1 - 12	2-4	1 - 12	2, 4 , 6, 8, 10, 12	-

Individual shield	None	None	1, 2, 5, 6	2	1, 2, 5, 6	1, 2, 5, 6	1, 2, 5, 6	1, 2, 5, 6	-
Overall shield	2, 5, 6	2, 5, 6	1, 2, 5, 6	5	1, 2, 5, 6	1, 2, 5, 6	1, 2, 5, 6	1, 2, 5, 6	-
Wire A Color	Green	N/S	N/S	N/S	N/S	N/S	N/S	N/S	-
Wire B Color	Red	N/S	N/S	N/S	N/S	N/S	N/S	N/S	-
Additional wires (option)	Common wire	Common wire	Common wire	None	Common wire	Common wire	Common wire	Common wire	-

Max. Cable length vs data rates

Data Rate	9.6 kbps	19.2 kbps	93.75 kbps	187.5 kbps	500 kbps	1.5 Mbps	3 Mbps	6 Mbps	12 Mbps
Max. Length - Cable Type A	1200 m	1200 m	1200 m	1000 m	400 m	200 m	100 m	100 m	100 m
Max. Length - Cable Type B	1200 m	1200 m	1200 m	600 m	200 m	70 m	N/A		

Optional Constructions :

Conductor material	Bare annealed copper or Tin-coated annealed copper
Conductor construction	Stranded - IEC 60228 Class 2 or Class 5
Insulation material	PO + Optional Fire resistance tape
Fillers and bedding	Halogen-Free, Low-Smoke, Flame retardant
Individual Shield	Optional metal foil + drain or metal braid or metal foil + metal braid
Individual jacket	Optional taped or extruded jacket
Overall Shield	Optional metal foil + drain or metal braid or metal foil + metal braid
Braid construction	0.15mm min., 0.25mm max. tin-coated or bare copper wires, 84% coverage min.
Inner jacket material	SHF1 or SHF2 or SHF2-MUD per IEC60092-360 (Single or double layer)
Armor and MB (Optional)	Bonded Aluminum Moisture barrier Braided galvanized steel wire Corrugated steel tape Served (Galvanized) steel wire Bronze wire braid

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	Copper wire braid Tinned copper wire braid
Outer jacket material (Optional)	SHF1 or SHF2 or SHF2-MUD per IEC60092-360
Outer jacket layers	Single or double layer
Overall diameter	2.0 mm min. - 40 mm max.
Max. pulling force	Specified in the detailed specification.
Special properties	Flame retardant, Fire Resistant, Halogen Free, Low Smoke, Mud Resistant

No. of Data Pairs	BUS Type	AWG (Data pairs)	Conductors	Individual Shield	Overall Shield	Armor (optional)	Voltage rating	Fire Resistance	Jacket Type (Inner/Outer)
Nn	P: ProfiBUS 100 U: ProfiBUS 150 C: CanBUS D: DeviceNET F: FieldBUS-H1 E: Ethernet/IP BUS R: RS-485 S: RS-422	24: 24AWG 22: 22AWG 20: 20AWG 18: 18AWG 16: 16AWG	T: Tin-coated copper B: Bare copper	1: Unshielded 2: Al. foil 3: Copper foil 4: BC braid 5: TC braid 6. Al. foil + TC braid 7. CU foil + BC braid	1: Unshielded 2: Al. foil 3: Copper foil 4: BC braid 5: TC braid 6. Al. foil + TC braid 7. CU foil + BC braid	B: Galvanized Braided Steel Wire M: Aluminum moisture barrier P: Braided Bronze wire R: Corrugated Steel Tape W: Galvanized Served Steel Wire C =Copper wire braid T =Tin Copper wire braid	0: 48V 1: 150V 3: 300V	F=fire resistant (opt.)	SHF1 SHF2 MUD Resistance(NEK 606)

APPLICATION LIMITATION:

Operation temperature: -40°C to +90°C
 Storage temperature: -40°C to +90°C
 Installation temperature: -15°C to +50°C