

tML[®] - FO Micro Distribution Trunk Cable MPO/MPO 96E9/125µ OS2 LSHF Crossover, Length: xxxxx



tML[®] - tde Modular Link

tML[®] is a patented, modular cabling system consisting of the three key components module, trunk cable and rack mount enclosure. The system components are 100 percent manufactured, pre-assembled and tested in Germany. They enable plug-and-play installation on site - especially in data centres, but also in industrial environments - within the shortest possible time. The system is characterized by highest packing density and highest flexibility during migration to higher transmission rates. Fibre optic and TP modules can be combined in one rack mount enclosure. 96x fibre optics LC Duplex or 96x MPO connectors can be used modularly on a 19-inch height unit. Thanks to its patented polarity and dark fibre modules, the tML system offers the simplest migration options to 100G and more.

The tML[®] - FO micro distribution trunk cable is intended for the connection of two tML[®]- FO Modules.



tde[®] trans data elektronik GmbH

Headquarter address:

Lingener Str. 2
D-49626 Bippen/Ohrte
Tel.: +49 5435 9511 0
Fax.: +49 5435 9511 32

Sales office address:

Prinz-Friedrich-Karl-Str. 46
D-44135 Dortmund
Tel.: +49 231 914 36 99
Fax.: +49 231 914 31 29

info@tde.de | www.tde.de

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Technical Data

The tML[®]- FO trunk cable is preterminated with MPO/MTP[®]connectors on both ends. The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®]plug has a defined fiber height of 1 - 3.5 μ . The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m. All system components (modules, trunk cables and patch cords) are co-ordinated for the reaching of the performance particularly. The fan-out unit is optimized for tML[®] - Cable Mounting Bracket for Fan-out Units. The module is marked with sequential serial number and article number.

FO Connectors

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®] plug has a defined fiber height of 1 - 3.5 μ . The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m.

Connector

Type	MPO/MTP [®] Female Push Pull Locking (Green)
Ferrule	12 Fiber SM Elite [®] ferrule, PPS
Boot colour	Black
Temperature range	-40°C bis +75°C
Manufacturer	tde/US Conec

Optical Performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
9/125 μ OS2	MPO/MTP [®] APC	1310 / 1550 nm	≤ 0.10 dB	0.25 dB	75 dB

FO Fan-Out

Parallel connectors	4
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FO Cables

Standards	Environmental and mechanical tests according to EN 187000 and IEC 60794-1-2.
Flame retardant	IEC 60332-3
Halogen free	IEC 60754-1
Low smoke emission	IEC 61034-1/2
Reaction to fire (Euroclasses)	D _{ca}

Type	Micro Distribution Indoor Cable
Fibers	96 (8 x 12)
Strength members	Aramid Yarns
Outer jacket	LSZH
Color	Gelb (RAL1021)

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Weight	96 kg/km
Outer \varnothing	9.5 \pm 0.5 mm
Tensile Load	1500 N
Crush	700 N
Temperature range	-20°C to +70°C
Min. bending radius	10 x \varnothing Outer

FO Fiber

Type	Corning Ultra SMF-28 [®] 09/125 μ OS2 singlemode fiber
Maximum Attenuation	At 1310 nm max. 0.32 dB/km At 1383 nm max. 0.32 dB/km At 1490 nm max. 0.21 dB/km At 1550 nm max. 0.18 dB/km At 1625 nm max. 0.20 dB/km
Attenuation vs. Wavelength	Range: 1285 - 1330 nm; Ref. λ : 1310 nm; Max. Difference: 0.03 dB/km Range: 1525 - 1575 nm; Ref. λ : 1550 nm; Max. Difference: 0.02 dB/km
Macrobend Loss	Mandrel Radius: 10mm; Number of Turns: 1; Wavelength: 1550nm; Induced Attenuation: \leq 0.50 dB Mandrel Radius: 10mm; Number of Turns: 1; Wavelength: 1625nm; Induced Attenuation: \leq 1.5 dB Mandrel Radius: 15mm; Number of Turns: 10; Wavelength: 1550nm; Induced Attenuation: \leq 0.05 dB Mandrel Radius: 15mm; Number of Turns: 10; Wavelength: 1625nm; Induced Attenuation: \leq 0.30 dB Mandrel Radius: 25mm; Number of Turns: 100; Wavelength: 1310nm, 1550nm, 1625nm; Induced Attenuation: \leq 0.01 dB
Point Discontinuity	Wavelength: 1310 nm; Point Discontinuity: \leq 0.05 dB Wavelength: 1550 nm; Point Discontinuity: \leq 0.05 dB
Cable Cutoff Wavelength (λ_{ccf})	$\lambda_{ccf} \leq$ 1260 nm
Mode-Field Diameter	At 1310 nm = 9.2 \pm 0.4 μ m At 1550 nm = 10.4 \pm 0.5 μ m
Dispersion	At 1550 nm = \leq 18.0 [ps/(nm*km)] At 1625 nm = \leq 22.0 [ps/(nm*km)]
	Zero Dispersion Wavelength (λ_0): 1304 nm $\leq \lambda_0 \leq$ 1324 nm Zero Dispersion Slope (S_0): \leq 0.092 ps/(nm ² *km)
Polarization Mode Dispersion (PMD)	PMD Link Design Value = \leq 0.04 ps/ \sqrt km Maximum Individual Fiber = \leq 0.1 ps/ \sqrt km

Dimensional Specifications

Fiber Curl	\geq 4.0 m radius of curvature
Cladding Diameter	125.0 \pm 0.7 μ m
Core-Clad Concentricity	\leq 0.5 μ m
Cladding Non-Circularity	\leq 0.7%
Coating Diameter	242 \pm 5 μ m
Coating-Cladding Concentricity	$<$ 12 μ m

Environmental Specifications

Environmental Test	Test Condition	Induced Attenuation 1310 nm, 1550 nm & 1625 nm
Temperature Dependence	-60°C to +85°C	\leq 0.05

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Temperature Humidity Cycling	-10°C to +85°C up to 98% RH	≤ 0.05
Water Immersion	23°C ± 2°C	≤ 0.05
Heat Aging	85°C ± 2°C	≤ 0.05
Operating Temperature Range	-60°C to +85°C	

Mechanical Specifications

Proof Test	The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.69 GPa).
Length	Fiber lengths available up to 63.0 km/spool.

Performance Characterizations

Core Diameter	8.2 μm
Numerical Aperture	0.14
Effective Group Index of Refraction	1310 nm: 1.4676 1550 nm: 1.4682
Fatigue Resistance Parameter (nd)	20
Coating Strip Force	Dry: 0.6 lbs (3N) Wet: 14 days room temperature: 0.6 lbs (3N)
Rayleigh Backscatter Coefficient (for 1 ns Pulse Width)	1310 nm: -77 dB 1550 nm: -82 dB

Product variants & accessories

Art.-No.	Description
TML-MP/MP09I96Exxxxx	tML [®] - FO Micro Distribution Trunk Cable MPO/MPO 96E9/125μ OS2 LSHF Crossover, Length: xxxxx
TML-MP/MP50I96G4-xxx	tML [®] - FO Micro Distribution Trunk Cable MPO/MPO 96G50/125μ OM4 LSHF Crossover, Length: xxx