

tML<sup>®</sup> - FO Module 5HP black MPO/MTP<sup>®</sup> with Pins/6x E2000 Compact 50/125 $\mu$  OM2



## tML<sup>®</sup> - tde Modular Link

tML<sup>®</sup> 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<sup>®</sup> - FO Module 5HP MPO/MTP<sup>®</sup> is intended for the installation in the tML<sup>®</sup> Rack Mount Enclosure 3U (for 17 x Modules).



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## tML<sup>®</sup> - FO Module 5HP black MPO/MTP<sup>®</sup> with Pins/6x E2000 Compact 50/125 $\mu$ OM2

### Technical Data

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP<sup>®</sup>plug has a defined fiber height of 1 - 3.5 $\mu$ . The max. adjacent fiber height difference is 0.2 $\mu$ m and for all fibers 0.3 $\mu$ m. All system components (modules, trunk cables and patch cords) are co-ordinated for the reaching of the performance particularly. The module is marked with sequential serial number and article number. The modules are ROHS compliant.

Entry	1 x MPO/MTP <sup>®</sup> Male Adapter (beige) back
Exit	6 x E2000 Compact Adapter (beige/orange) front
Tests	Interferometer, Insertion Loss, Return Loss and Visual Final Inspection; all measured values are electronically archived
	QS-Managementsystem ISO 9001, ISO 14001 and TL 9000

Box	Galvanized steel sheet
Front Panel	black

### FO Adapters

Type	MPO/MTP <sup>®</sup>
Application	Multimode OM1/OM2
Design	without Flange
Connector style	SC Simplex
Key Orientation	Type A, Key up/down
Color	Beige
Material	Plastic
Sleeve	--
Shutter	--
Standards	IEC 61754-7 TIA 604-5
Manufacturer	US Conec

### FO Adapters

Standardisation	acc. to IEC61754-15, DIN EN 186270
Mating cycles	min. 1000
Pull-out force	min. 70 N
Number of connectors (A)	1
Connector type (A)	E2000 <sup>™</sup> Compact
Protection class (IP) connector (A)	20
Polishing connector (A)	PC
Attenuation grade IL - connector (A)	$\leq$ 0.2 dB, testing method acc. to IEC 61300-3-4
Connector color (A)	beige
Lever- frame-coding connector (A)	color

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Frame color connector (A)	orange-orange
Sleeve material	Zirkonia Staight Split
Holder for connector / module	support plate
Fiber type	Multimode (MM)
Dimensions	74.7 / 42 x 14.7 / 22.95 x 13 / 16.6 mm
Material	steel: X10CrNi18-8 (1.4310) / plastic: PBT, fiber-glass reinforced (halogen-free)
Manufacturer	R&M

### FO Connectors

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

#### Connector

Type	MPO/MTP <sup>®</sup> Male Push Pull Locking with Elite Pins (beige)
Ferrule	12 Fiber MM Elite <sup>®</sup> ferrule, PPS
Boot colour	Black
Temperature range	-40°C to +75°C
Manufacturer	tde/US Conec

#### Optical Performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
50/125 $\mu$ OM2	MPO/MTP <sup>®</sup>	850 nm	≤ 0.25 dB	0.45 dB	20 dB
62.5/125 $\mu$ OM1	MPO/MTP <sup>®</sup>	850 nm	≤ 0.25 dB	0.45 dB	

### FO Connectors

Type	E2000
Ferrule	Ceramic
Ferrule Hole	126 $\mu$
Connector colour	Beige
Lever colour	Black
Boot colour	Black
Manufacturer	RDM

#### Optical performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
50/125 $\mu$ OM2	E2000	850 nm	≤ 0.25 dB	0.45 dB	30 dB
62.5/125 $\mu$ OM1	E2000	850 nm	≤ 0.25 dB	0.45 dB	

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### FO Fiber

Type	Corning 50/125 $\mu$ OM2 multimode fiber
Manufacturer	Corning

### Optical Specifications

Bandwidth	500 at 850 nm / 500 at 1300 nm
Attenuation	At 850 nm max. $\leq$ 2.5 dB/km At 1300 nm max. $\leq$ 0.8 dB/km
Numerical Aperture	0.200 $\pm$ 0.015

### Dimensional Specifications

Core Diameter	50.0 $\pm$ 3.0 $\mu$ m
Cladding Diameter	125.0 $\pm$ 2.0 $\mu$ m
Core-Clad Concentricity	$\leq$ 3.0 $\mu$ m
Cladding Non-Circularity	$<$ 2.0%
Core Non-Circularity	$\leq$ 5.0%
Coating Diameter	245 $\pm$ 5 $\mu$ m
Coating-Cladding Concentricity	$<$ 12 $\mu$ m

### Environmental Specifications

Environmental Test	Test Condition	Induced Attenuation 850 nm and 1300 nm (dB/km)
Temperature Dependence	-60°C to +85°C	$\leq$ 0.20
Temperature Humidity Cycling	-10°C to +85°C and 4% to 98% RH	$\leq$ 0.20
Operating Temperature Range	-60°C to +85°C	

### Mechanical Specifications

Proof Test	The entire fiber length is subjected to a tensile stress $\geq$ 100 kpsi (0.7 GN/m <sup>2</sup> ).
Length	Fiber lengths available up to 8.8 km/spool.

### Performance Characterizations

Refractive Index Difference	2%
Effective Group Index of Refraction	850 nm: 1.490 1300 nm: 1.486
Fatigue Resistance Parameter (nd)	20
Coating Strip Force	Dry: 0.6 lbs (2.7N) Wet: 14 days in 23°C water soak: 0.6 lbs (2.7N)
Chromatic Dispersion	Zero Dispersion Wavelength ( $\lambda_0$ ): 1300 nm $\leq$ $\lambda_0$ $\leq$ 1320 nm Zero Dispersion Slope (S0): $\leq$ 0.101 ps/(nm <sup>2</sup> *km)

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## Product variants & accessories

Art.-No.	Description
TML-T06E2AC/MPP09ES	tML <sup>®</sup> - FO Module 5HP black MPO/MTP <sup>®</sup> with Pins/6x E2000 APC Compact 9/125 $\mu$ OS2
TML-T06E2C/MPP09ES	tML <sup>®</sup> - FO Module 5HP black MPO/MTP <sup>®</sup> with Pins/6x E2000 Compact 9/125 $\mu$ OS2
TML-T06E2C/MPP50G3S	tML <sup>®</sup> - FO Module 5HP black MPO/MTP <sup>®</sup> with Pins/6x E2000 Compact 50/125 $\mu$ OM3
TML-T06E2C/MPP50G4S	tML <sup>®</sup> - FO Module 5HP black MPO/MTP <sup>®</sup> with Pins/6x E2000 Compact 50/125 $\mu$ OM3
TML-T06E2C/MPP50GS	tML <sup>®</sup> - FO Module 5HP black MPO/MTP <sup>®</sup> with Pins/6x E2000 Compact 50/125 $\mu$ OM2
TML-T06E2C/MPP62GS	tML <sup>®</sup> - FO Module 5HP black MPO/MTP <sup>®</sup> with Pins/6x E2000 Compact 62,5/125 $\mu$ OM1