

tSML - FO Dark Fiber Module 19"/0.5U straight 16x MPO/MTP<sup>®</sup> Male/ 24x MPO/MTP<sup>®</sup> Male 50/125 $\mu$   
OM3, SR4



## tSML - tde Semi Modular Link

tSML is a modular developed cabling system, which consists of two core components: module and trunk cable. The system components, preterminated with connectors and tested ex works, facilitate very fast installation of both twisted pair and fiber-optic cables. Ready-made trunk cables, providing a high number of pairs or fibers, can simply be plugged together using patch panels. Up to 96x LC duplex and/or 48 x RJ45 of haven can be accommodated in such a way on 1U. At the heart of the System are MPO/MTP<sup>®</sup> and Telco connectors, with which 12 optical fibers or 24 copper pairs can be connected simultaneously. Fiber-optic and twisted pair modules can be combined on 1U within a panel without difficulty.

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 coordinated for the reaching of the performance particularly. The module is marked with sequential serial number and article number. The modules are ROHS compliant.



**tde<sup>®</sup> 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

tSML - FO Dark Fiber Module 19"/0.5U straight 16x MPO/MTP<sup>®</sup> Male/ 24x MPO/MTP<sup>®</sup> Male 50/125 $\mu$   
OM3, SR4

## Technical Data

Entry	16 x MPO/MTP <sup>®</sup> 12 fibers Adapter (aqua) back
Exit	24 x MPO/MTP <sup>®</sup> 12 fibers Adapter (aqua) 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

## tSML - FO Modules 19"/ 0.5U

Box	stainless steel
Front plate	stainless steel
Dimensions	19", 0.5U, depth 11 cm

## FO Adapters

Type	MPO/MTP <sup>®</sup>
Application	Multimode OM3
Design	without Flange
Connector style	SC Simplex
Key Orientation	Type A, Key up/down
Color	Aqua
Material	Plastic
Sleeve	--
Shutter	--
Standards	IEC 61754-7 TIA 604-5
Manufacturer	US Conec

## FO Connectors

### Connector

Type	MPO/MTP <sup>®</sup> Male Push Pull Locking (aqua)
Ferrule	12 Fiber MM Elite <sup>®</sup> ferrule, PPS
Boot colour	Black
Manufacturer	tde/US Conec

### Optical Performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
50/125 $\mu$ OM3	MPO/MTP <sup>®</sup>	850 nm	≤ 0.14 dB	0.25 dB	35 dB

## tSML - FO Dark Fiber Module 19"/0.5U straight 16x MPO/MTP<sup>®</sup> Male/ 24x MPO/MTP<sup>®</sup> Male 50/125 $\mu$ OM3, SR4

### FO Fiber

Type	Corning ClearCurve <sup>®</sup> 50/125 $\mu$ OM3 multimode fiber
Optimized Data Rate over Distance	40/100 Gb/s über 140 m* 10 Gb/s over 300 m 1 Gb/s over 1000 m
Standard Compliance	ISO/IEC 11801: type OM3 fiber IEC 60793-2-10: type A1a.2 fiber TIA/EIA: 492AAAC-B ITU: ITU G651.1
*	Distances specified in the 40G/100G per IEEE 802.3ba standard are 150m on OM4 and 100m on OM3; Corning fibers are manufactured to tighter dispersion specifications and thereby support the extended distances shown in the table (assuming cable attenuation $\leq 3.0$ dB/km and same 1.0 dB of connector loss for OM3 that the standard requires for OM4).

### Optical Specifications

Bandwidth	High Performance EMB* (MHz.km): 2000 at 850 nm only Legacy Performance EMB* (MHz.km): 1500 at 850 nm / 500 at 1300 nm
Attenuation	At 850 nm max. $\leq 2.3$ dB/km At 1300 nm max. $\leq 0.6$ dB/km
Macrobend Loss	Mandrel Radius (mm): 37.5 / 15 / 7.5 Number of Turns: 100 / 2 / 2 Induced Attenuation (dB) at 850 nm: $\leq 0.05$ / $\leq 0.1$ / $\leq 0.2$ Induced Attenuation (dB) at 1300 nm: $\leq 0.15$ / $\leq 0.3$ / $\leq 0.5$
Numerical Aperture	0.200 $\pm$ 0.015
*	Ensured via miniEMBc, per TIA/EIA 455-220A and IEC 60793-1-49, for high performance laser-based systems (up to 10 Gb/s).
**	OFL BW, per TIA/EIA 455-204 and IEC 60793-1-41, for legacy and LED-based systems (typically up to 100 Mb/s).

### Dimensional Specifications

Core Diameter	50.0 $\pm$ 2.5 $\mu$ m
Cladding Diameter	125.0 $\pm$ 1.0 $\mu$ m
Core-Clad Concentricity	$\leq 1.5$ $\mu$ m
Cladding Non-Circularity	$\leq 1.0\%$
Core Non-Circularity	$\leq 5.0\%$
Coating Diameter	242 $\pm$ 5 $\mu$ m
Coating-Cladding Concentricity	$< 12$ $\mu$ m

### Environmental

Environmental Test	Test Condition	Induced Attenuation 850 nm & 1300 nm (dB/km)
Temperature Dependence	-60°C to +85°C	$\leq 0.10$
Temperature Humidity Cycling	-10°C to +85°C and 4% to 98% RH	$\leq 0.10$
Water Immersion	23°C $\pm$ 2°C	$\leq 0.20$

## tSML - FO Dark Fiber Module 19"/0.5U straight 16x MPO/MTP<sup>®</sup> Male/ 24x MPO/MTP<sup>®</sup> Male 50/125 $\mu$ OM3, SR4

Heat Aging	85°C $\pm$ 2°C	$\leq$ 0.20
Damp Heat	85°C at 85% 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 17.6 km/spool.

### Performance Characterizations

Refractive Index Difference	1%
Effective Group Index of Refraction	850 nm: 1.480 1300 nm: 1.479
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 ( $\lambda_0$ ): 1295 nm $\leq \lambda_0 \leq$ 1315 nm Zero Dispersion Slope (S0): $\leq$ 0.101 ps/(nm <sup>2</sup> *km)

### Product variants & accessories

Art.-No.	Description
TSMLM24MPP/16MPP50G3	tSML - FO Dark Fiber Module 19"/0.5U straight 16x MPO/MTP <sup>®</sup> Male/ 24x MPO/MTP <sup>®</sup> Male 50/125 $\mu$ OM3, SR4
TSMLM24MPP/16MPP50G4	tSML - FO Dark Fiber Module 19"/0.5U straight 16x MPO/MTP <sup>®</sup> Male/ 24x MPO/MTP <sup>®</sup> Male 50/125 $\mu$ OM4, SR4