

tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP<sup>®</sup> Male/48x LC duplex 50/125 $\mu$  OM3



## 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 tSML HD module can be used only in conjunction with the tSML HD patch cord.



**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

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## Technical Data

Box	stainless steel
Front plate	stainless steel
Entry	8 x MPO/MTP <sup>®</sup> Male adapter (aqua) back
Exit	48 x LC duplex adapter (aqua) front
Dimensions	19", 0.5 U, depth: 11 cm
Identification	silkscreen at the front
	19" mounting set enclosed
	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	LC Quad
Application	Multimode OM3
Design	with flange
Footprint	SC Duplex
Color	Aqua
Material	Plastic
Sleeve	Zirkonia Straight Split
Shutter	--
Manufacturer	tde

## 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

## tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP<sup>®</sup> Male/48x LC duplex 50/125 $\mu$ OM3

### 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	$\leq 0.14$ dB	0.25 dB	35 dB

### FO Connectors

Connector Type	LC Unibody Simplex
Housing	Plastic, Aqua
Ferrule	Zirkonia Straight Split, Spring-loaded Axially
Ferrule Hole	126 $\mu$
Mating Cycles	1.000
Operating Temperature	-40°C up to +75°C
Strain Relief to	100 N
Manufacturer	tde

#### Optical performance

Fiber	Type	Wavelength	Insertion loss typ.	Insertion loss max.	Return loss min.
50/125 $\mu$ OM3	LC	850 nm	$\leq 0.20$ dB	0.35 dB	30 dB

### 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).

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### 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
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

## tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP<sup>®</sup> Male/48x LC duplex 50/125 $\mu$ OM3

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
TSML-M48LCAD/MPP09E	tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP <sup>®</sup> Male/48x LC APC duplex 9/125 $\mu$ OS2
TSML-M48LCD/MPP09E	tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP <sup>®</sup> Male/48x LC duplex 9/125 $\mu$ OS2
TSML-M48LCD/MPP50G3	tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP <sup>®</sup> Male/48x LC duplex 50/125 $\mu$ OM3
TSML-M48LCD/MPP50G4	tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP <sup>®</sup> Male/48x LC duplex 50/125 $\mu$ OM4