

tML<sup>®</sup> Xtended - FO Module 5HP 2x MPO/MTP<sup>®</sup> without Pins/12x LC Duplex w. shutter 50/125 $\mu$  OM5

## tML<sup>®</sup> Xtended

tML<sup>®</sup> Xtended 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. Heart of the system are the rear MPO/MTP<sup>®</sup> 12 fiber and Telco connectors, which can be used to connect at least six or twelve ports at a time. Depending on the module configuration, transfer rates of up to 200G are currently possible with SR4. The fibre optic and TP modules can be used together in a module carrier with a very high port density. The tde offers its tML<sup>®</sup> cabling system as a proven tML<sup>®</sup> standard system and in the highly innovative variants tML<sup>®</sup> 24 system and now tML<sup>®</sup> 32 system for extreme scalability and very easy migration to higher transmission rates such as 40G, 100G, 200G and 400G.

The utility patent protected tML<sup>®</sup> Xtended - module will be installed in the link on one side rotated 180 degrees. The associated tML<sup>®</sup> Xtended trunk cable has a type B pin out. The complete link corresponds to EIA / TIA "Method B". The advantage is that before and after migration uniformly configured patch cables and modules are used.

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

A special cleaning tool is required to clean the adapters with shutter.



**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

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	2 x MPO/MTP <sup>®</sup> Female Adapter (limegreen) back
Exit	6 x LC Quad Adapter (limegreen) 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	Stainless steel

## FO Adapters

Type	MPO/MTP <sup>®</sup>
Application	Multimode OM5
Design	without Flange
Connector style	SC Simplex
Key Orientation	Type A, Key up/down
Color	Limegreen
Material	Plastic
Sleeve	--
Shutter	--
Standards	IEC 61754-7 TIA 604-5
Manufacturer	US Conec

## FO Adapters

Type	LC Quad
Application	Multimode OM5
Design	with flange
Footprint	SC Duplex
Color	Limegreen
Material	Plastic
Sleeve	Zirkonia Staight Split
Shutter	Metall
Manufacturer	tde

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### 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> Female Push Pull Locking
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 $\mu$ OM5	MPO/MTP <sup>®</sup>	850 nm	≤ 0.16 dB	0.30 dB	30 dB

### FO Connectors

Connector Type	LC Unibody Simplex
Housing	Plastic, Limegreen
Ferrule	Zirkonia Staight 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 $\mu$ OM5	LC	850 nm	≤ 0.10 dB	0.30 dB	35 dB

### FO Fiber

Type	Corning ClearCurve <sup>®</sup> 50/125 $\mu$ OM5 multimode fiber
Design	Optical fibre G50/125 $\mu$ m (conform to IEC 60793-2-10 type A1a.4b) with optical core 50 $\mu$ m +/- 2.5 $\mu$ m diameter and optical cladding 125 $\mu$ m +/- 1 $\mu$ m diameter

#### Geometrical properties

Core concentricity error	< 5 %
Coating concentricity error	< 1 %
Core coating eccentricity	< 1.5 $\mu$ m

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Eccentricity of coating	< 12 $\mu$ m
Screen test	$\geq$ 0.7 GPa (100 kpsi)

### Transmission characteristics

Attenuation, maximum values 850 nm (cabled fibre)	2.5 dB/km
Attenuation, maximum values 953 nm (cabled fibre)	1.8 dB/km
Attenuation, maximum values 1300 nm (cabled fibre)	0.7 dB/km
Attenuation, maximum values 850 nm (uncabled fibre)	2.34 dB/km
Attenuation, maximum values 953 nm (uncabled fibre)	1.7 dB/km
Attenuation, maximum values 1300 nm (uncabled fibre)	0.64 dB/km
Macrobending, induced attenuation 100 turns, 37.5 mm	$\leq$ 0.5 dB (at 850 nm)
Macrobending, induced attenuation 100 turns, 37.5 mm	$\leq$ 0.5 dB (at 1300 nm)
Macrobending, induced attenuation 2 turns, 15 mm	$\leq$ 0.1 dB (at 850 nm)
Macrobending, induced attenuation 2 turns, 15 mm	$\leq$ 0.3 dB (at 1300 nm)
Macrobending, induced attenuation 2 turns, 7.5 mm	$\leq$ 0.3 dB (at 850 nm)
Macrobending, induced attenuation 2 turns, 7.5 mm	$\leq$ 0.5 dB (at 1300 nm)
Bandwidth (OFL), minimum values 850 nm	3500 MHz x km
Bandwidth (OFL), minimum values 953 nm	1850 MHz x km
Bandwidth (OFL), minimum values 1300 nm	500 MHz x km
Effective modal Bandwidth-length product min. 850 nm	4700 MHz x km
Effective modal Bandwidth-length product min. 953 nm	2470 MHz x km
Numerical aperture	0.200 +/- 0.015
Effective group of refraction 850 nm	1.482
Effective group of refraction 1300 nm	1.477

### Product variants & accessories

Art.-No.	Description
L-CLEAN-SMART-CS1.25	FO Cleaning Tool 1,25mm for CS and LC Duplex Adapter with self-closing shutter
TML-T12LCADK/MP09E-X	tML <sup>®</sup> Xtended - FO Module 5HP 2x MPO/MTP <sup>®</sup> without Pins/12x LC APC Duplex 9/125 $\mu$ OS2
TML-T12LCDK/MP09E-X	tML <sup>®</sup> Xtended - FO Module 5HP 2x MPO/MTP <sup>®</sup> without Pins/12x LC Duplex 9/125 $\mu$ OS2

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Art.-No.	Description
TML-T12LCDK/MP50G4X	tML <sup>®</sup> Xtended - FO Module 5HP 2x MPO/MTP <sup>®</sup> without Pins/12x LC Duplex 50/125 $\mu$ OM4
TML-T12LCDS/MP50G5X	tML <sup>®</sup> Xtended - FO Module 5HP 2x MPO/MTP <sup>®</sup> without Pins/12x LC Duplex w. shutter 50/125 $\mu$ OM5