

tML[®]

tde Modular Link System

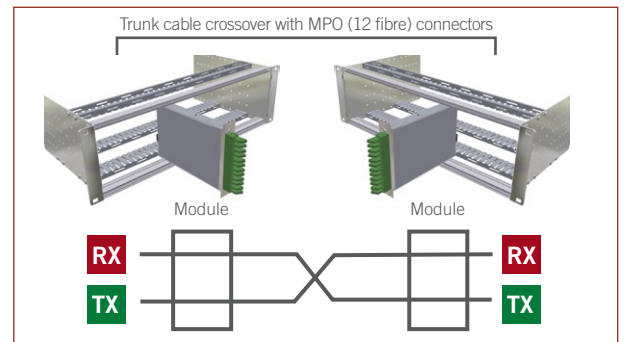
Complex networks in "Plug & Play"!

Modular Cabling System

tML® – FO cabling plan

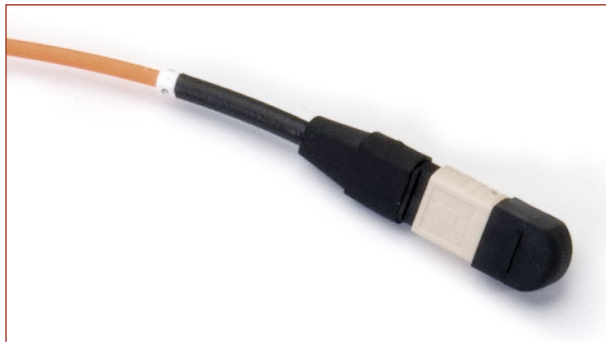
A crossover of both optical fibres is required for transmission between the transmitting and receiving diodes in any fibre-optic cabling system.

This is accomplished in a trunk cable in the tML system. A typical configuration therefore consists of an crossover MPO/MPO trunk cable and two standard modules.



TIA / EIA-568-B.1 Method C

tML® – FO Trunk Cable



Round fibre optic cable (3mm):

- > In 10/100/1000 Mbit/s and 10 Gigabit/s versions, for Ethernet transfer
- > The loose tube design is ideally suited to short runs of up to 50m inside buildings
- > The small diameter and special cable design provide an easy installation.

Fibre Round Cable	Part Number
50/125µ OM2	TML-MP/MP50I12G xxx ¹
50/125µ OM3	TML-MP/MP50I12G3- xxx ¹
50/125µ OM4	TML-MP/MP50I12G4- xxx ¹
62,5/125µ	TML-MP/MP62I12G xxx ¹
9/125µ	TML-MP/MP09I12E xxx ¹

¹ xxx stands for the cable length in meters (every length available)

² yy stands for the fibre counts: 12, 24, 48, 72, 96, 144



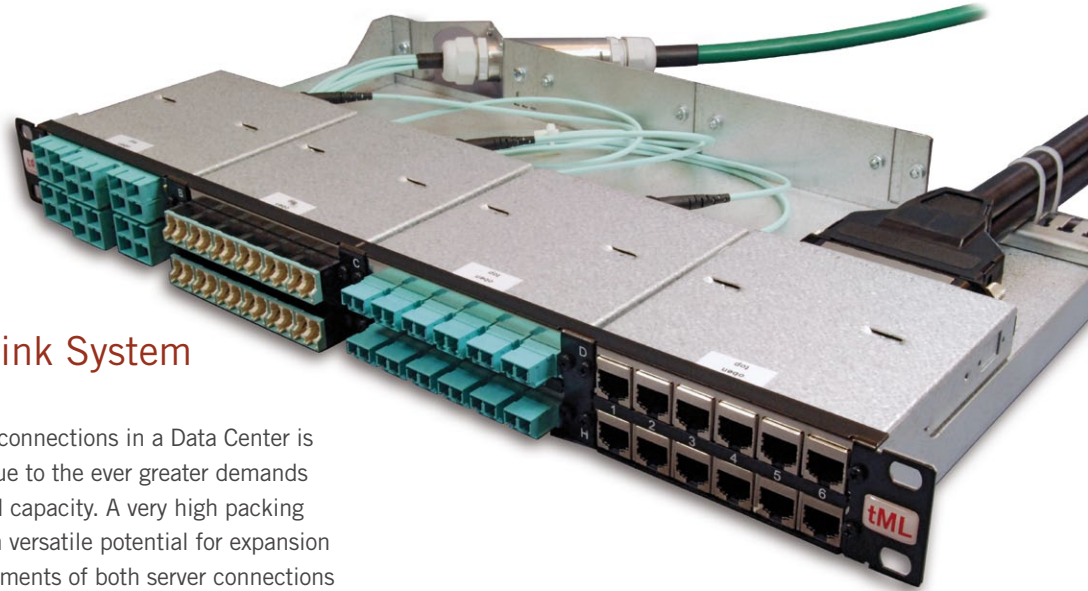
Universal fibre optic cable:

- > For covering distances between 10m and 1000m, indoors and outdoors

All universal cable sections come with a pulling sock at one end.

Universal Fibre Optical Cable	Part Number
50/125µ OM2	TML-MP/MP50B yy ² G xxx ¹
50/125µ OM3	TML-MP/MP50B yy ² G3- xxx ¹
50/125µ OM4	TML-MP/MP50B yy ² G4- xxx ¹
62,5/125µ	TML-MP/MP62B yy ² G xxx ¹
9/125µ	TML-MP/MP09B yy ² E xxx ¹

tML[®] tde Modular Link System



The number of network connections in a Data Center is increasing constantly, due to the ever greater demands made on technology and capacity. A very high packing density and cabling with versatile potential for expansion are fundamental requirements of both server connections and pure storage area networks.

Standard cabling entails a high outlay for any modification to the network infrastructure, as whole sections of the existing cabling frequently have to be replaced and tested. The **tML – tde Modular Link System** starts where traditional systems stop.

The system components, ready-fitted with connectors and tested ex works, facilitate very fast installation of both twisted pair and fibre-optic cables. Ready-made trunk cables, providing a high number of pairs or fibres, can simply be plugged together using patch panels.

At the heart of the **tML – tde Modular Link Systems** are MPO and Telco connectors, with which 12 optical fibres or 24 copper pairs can be connected simultaneously. Fibre-optic and twisted pair modules can be combined on one rack unit within a panel without difficulty.

This also achieves a high level of investment security whilst doing something for the environment at the same time, as individual components can be replaced and reused when the network is modified, making a contribution to green IT.

Highly compact



Telco for 6 x RJ45
GbE TP links

tML[®] Systemcable
(right)
by comparison
to the standard

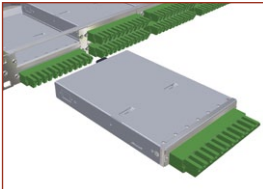
MPO for 6 x fibre-
optic links

Product characteristics

- > Very high packing density
- > Twisted pair and fibre-optic modules can be combined on a single rack unit
- > Quick and simple „plug and play“ installation thanks to tested system components, ready fitted with connectors
- > Up to 576 fibres on one rack unit
- > LC, MU, SC or E2000 mating face
- > Available in OS2, OM1, OM2, OM3 & OM4 configurations
- > 48x RJ45 GbE or 10GbE ports screened on one rack unit
- > Strong, screened Telco connectors with locking screws
- > All cables are halogen-free and highly flexible
- > All MPO cables are round
- > System component reusability ensures environmental friendliness
- > Made in Germany

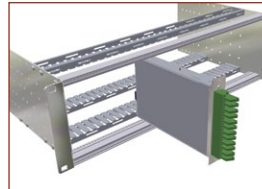
tML® - FO Modules MPO

MPO to 6 x E2000 Compact



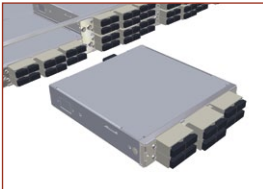
Fibre	Part Number
50/125µ OM2	TML-M06E2C/MPP50G
50/125µ OM3	TML-M06E2C/MPP50G3
50/125µ OM4	TML-M06E2C/MPP50G4
62,5/125µ	TML-M06E2C/MPP62G
9/125µ	TML-M06E2C/MPP09E
9/125µ	TML-M06E2AC/MPP09E

MPO to 6 x E2000 Compact 5HP



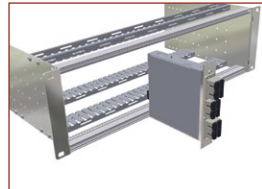
Fibre	Part Number
50/125µ OM2	TML-T06E2C/MPP50G ⁵
50/125µ OM3	TML-T06E2C/MPP50G3 ⁵
50/125µ OM4	TML-T06E2C/MPP50G4 ⁵
62,5/125µ	TML-T06E2C/MPP62G ⁵
9/125µ	TML-T06E2C/MPP09E ⁵
9/125µ	TML-T06E2AC/MPP09E ⁵

MPO to 6 x SC Duplex



Fibre	Part Number
50/125µ OM2	TML-M06SCDK/MPP50G
50/125µ OM3	TML-M06SCDK/MPP50G3
50/125µ OM4	TML-M06SCDK/MPP50G4
62,5/125µ	TML-M06SCDK/MPP62G
9/125µ	TML-M06SCDK/MPP09E
9/125µ	TML-M06SCADK/MPP09E

MPO to 6 x SC Duplex 5HP



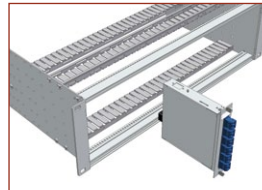
Fibre	Part Number
50/125µ OM2	TML-T06SCDK/MPP50G ⁵
50/125µ OM3	TML-T06SCDK/MPP50G3 ⁵
50/125µ OM4	TML-T06SCDK/MPP50G4 ⁵
62,5/125µ	TML-T06SCDK/MPP62G ⁵
9/125µ	TML-T06SCDK/MPP09E ⁵
9/125µ	TML-T06SCADK/MPP09E ⁵

MPO to 6 x LC Duplex



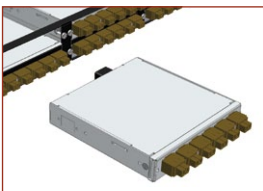
Fibre	Part Number
50/125µ OM2	TML-M06LCDKH/MPP50G
50/125µ OM3	TML-M06LCDKH/MPP50G3
50/125µ OM4	TML-M06LCDKH/MPP50G4
62,5/125µ	TML-M06LCDKH/MPP62G
9/125µ	TML-M06LCDKH/MPP09E
9/125µ	TML-M06LCADKH/MPP09E

MPO to 6 x LC Duplex 5HP



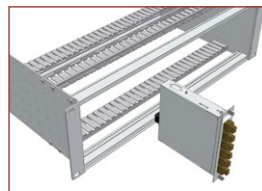
Fibre	Part Number
50/125µ OM2	TMLT06LCDKH/MPP50G ⁵
50/125µ OM3	TMLT06LCDKH/MPP50G3 ⁵
50/125µ OM4	TMLT06LCDKH/MPP50G4 ⁵
62,5/125µ	TMLT06LCDKH/MPP62G ⁵
9/125µ	TMLT06LCDKH/MPP09E ⁵
9/125µ	TMLT06LCADKH/MPP09E ⁵

MPO to 6 x MU Duplex



Fibre	Part Number
50/125µ OM2	TML-M06MUDK/MPP50G
50/125µ OM3	TML-M06MUDK/MPP50G3
50/125µ OM4	TML-M06MUDK/MPP50G4
62,5/125µ	TML-M06MUDK/MPP62G
9/125µ	TML-M06MUDK/MPP09E

MPO to 6 x MU Duplex 5HP



Fibre	Part Number
50/125µ OM2	TML-T06MUDK/MPP50G ⁵
50/125µ OM3	TML-T06MUDK/MPP50G3 ⁵
50/125µ OM4	TML-T06MUDK/MPP50G4 ⁵
62,5/125µ	TML-T06MUDK/MPP62G ⁵
9/125µ	TML-T06MUDK/MPP09E ⁵

⁵ These products are also available in black.
Please add an „S“ at the end of the part number.

tML® – TP Trunk Cable Telco Female/Female

(for the connection of...)



... TP Telco Modules:

... active Devices
(Telco) & TP Modules:

Description	Part Number
Telco to Telco (180° back shell) shielded:	TML-TELCO-FF- xx ³
2x Telco female (180°) to 1x Telco male (45°) shielded:	TML-TELCO-2XF/1XM- xx ³

³ xx stands for the cable length in meters (max. length 60m)

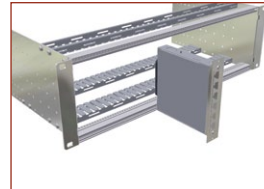
tML® – TP Module Telco

tML® – TP Module Telco to 6 x RJ45 GbE



Description	Part Number
shielded for Rack Mount Enclosure 19"/ 10" 1U	TML-M06RJ45/TELCO-M

tML® – TP Module Telco to 6 x RJ45 GbE 5HP



Description	Part Number
shielded for Rack Mount Enclosure 19"/ 3U	
stainless steel	TML-T06RJ45/TELCO-M
black	TML-T06RJ45/TELCO-MS

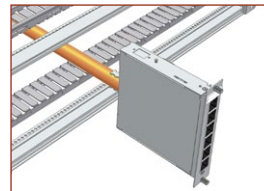
tML® – TP Trunk Cable on both ends preterminated 10GbE Modules

tML® – TP Trunk Cable on both ends 6xRJ45 10GbE



Description	Part Number
shielded for Rack Mount Enclosure 19"/ 10" 1U	TML-M06RJ45- xx ⁴

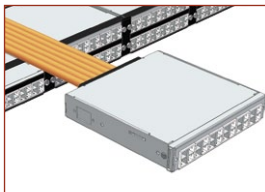
tML® – TP Trunk Cable on both ends 6xRJ45 10GbE 5HP



Description	Part Number
shielded for Rack Mount Enclosure 19"/ 3U	
stainless steel	TML-T06RJ45- xx ⁴
black	TML-T06RJ45-S- xx ⁴

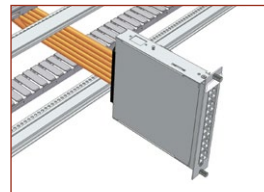
tML® - TP Trunk Cable on both ends preterminated EC7 Modules

tML® – TP Trunk Cable on both ends 6xEC7



Description	Part Number
shielded for Rack Mount Enclosure 19"/ 10" 1U	TML-M06EC7- xx ⁴

tML® – TP Trunk Cable on both ends 6xEC7 5HP



Description	Part Number
shielded for Rack Mount Enclosure 19"/ 3U	
stainless steel	TML-T06EC7- xx ⁴
black	TML-T06EC7-S- xx ⁴

⁴ xx stands for the cable length in meters (max. length 50m)

tML® – Patch Cord Management 19" Panels

tML®– Patch Cord Management 19" 1U for FO



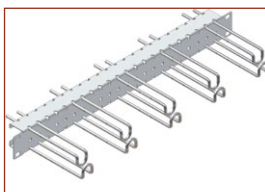
Description	Part Number
5 Rings 56mm	
stainless steel	TML-RP-L-5
black	TML-RP-L-5-S

tML®– Patch Cord Management 19" 1U for TP



Description	Part Number
5 Rings 75mm	
stainless steel	TML-RP-TP-5
black	TML-RP-TP-5-S

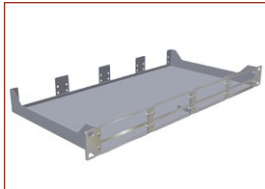
tML®– Patch Cord Management 19" 1U Vario for TP



Description	Part Number
10 Rings	
lightgrey	TML-RP-TP-V-GR
black	TML-RP-TP-V-S

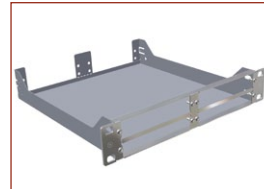
tML® – Rack Mount Enclosures + Accessories

tML® – Rack Mount 19" 1U



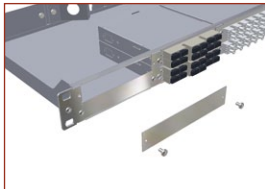
Description	Part Number
for 8x Modules	
stainless steel	TML-19/1HE-8-M
black	TML-19/1HE-8-M-S

tML® – Rack Mount 10" 1U



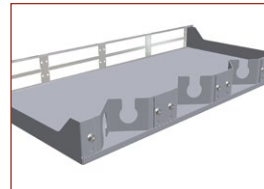
Description	Part Number
for 4x Modules	
stainless steel	TML-10/1HE-4-M
black	TML-10/1HE-4-M-S

tML® – Blind plate



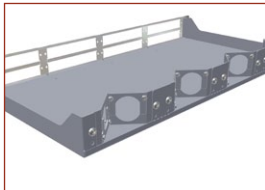
Description	Part Number
for Rack Mount Enclosure 19"/ 1U	
stainless steel	TML-M-BLIND
black	TML-M-BLIND-S

tML® Cable Mounting Bracket for PG13,5/16



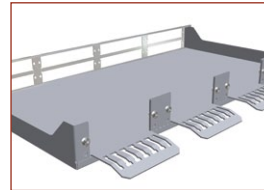
Description	Part Number
for Rack Mount Enclosure 19"/ 1U	TML-K-P
straight for Rack Mount Enclosure 19"/ 1U	TML-K-P-G

tML® – Cable Mounting Bracket for Fan-out Units



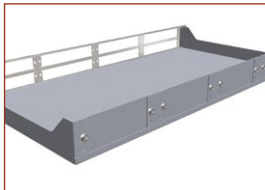
Description	Part Number
for Rack Mount Enclosure 19"/ 1U	TML-K-A
straight for Rack Mount Enclosure 19"/ 1U	TML-K-A-G

tML® – Cable Mounting Bracket



Description	Part Number
for Rack Mount Enclosure 19"/ 1U	TML-K-B-6

tML® – Cable Mounting Blind plate



Description	Part Number
for Rack Mount Enclosure 19"/ 10" 1U	TML-K-BLIND

tML® – Rack Mount 19" 3U



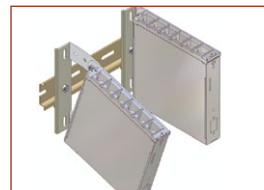
Description	Part Number
for 17x Modules 5HP	
stainless steel	TML-19/3HE-17
black	TML-19/3HE-17-S

tML® – Blind plate



Description	Part Number
for Rack Mount Enclosure 19"/ 3U	
stainless steel	TML-T-BLIND
black	TML-T-BLIND-S

tML® – DIN Rail Mounting kit



Description	Part Number
adjustable angle (without Module)	TML-HU-AD-W

Technical Data

FO Connector Performance

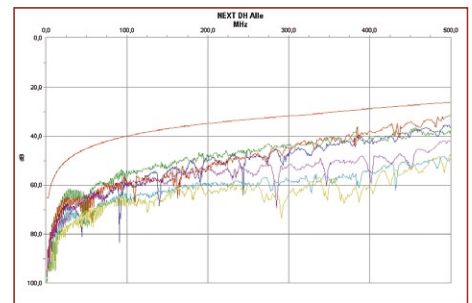
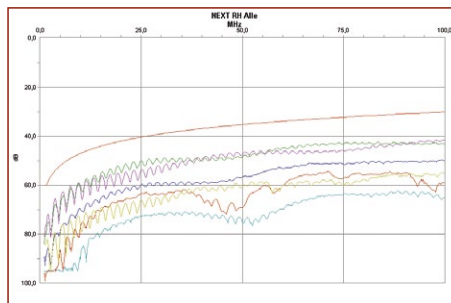
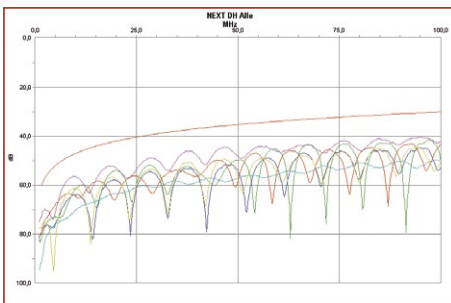
Fibre	Type	wavelength	insertion loss(dB)		return loss(dB)
			typical	max	min
50/125μ	E2000	850nm	\leq 0,25	0,45	30
	LC	850nm	\leq 0,25	0,45	30
	MPO	850nm	\leq 0,35	0,45	20
	MU	850nm	\leq 0,25	0,45	30
	SC	850nm	\leq 0,25	0,45	30
	Modul	850nm	\leq 0,48	0,70	20
50/125μ OM3	E2000	850nm	\leq 0,20	0,40	30
	LC	850nm	\leq 0,20	0,40	30
	MPO	850nm	\leq 0,30	0,45	20
	MU	850nm	\leq 0,20	0,40	30
	SC	850nm	\leq 0,20	0,40	30
	Modul	850nm	\leq 0,35	0,45	20
50/125μ OM4	E2000	850nm	\leq 0,10	0,25	35
	LC	850nm	\leq 0,10	0,25	35
	MPO	850nm	\leq 0,17	0,35	25
	MU	850nm	\leq 0,10	0,25	35
	SC	850nm	\leq 0,10	0,25	35
	Modul	850nm	\leq 0,20	0,35	25
62,5/125μ	E2000	850nm	\leq 0,25	0,45	30
	LC	850nm	\leq 0,25	0,45	30
	MPO	850nm	\leq 0,35	0,45	20
	MU	850nm	\leq 0,25	0,45	30
	SC	850nm	\leq 0,25	0,45	30
	Modul	850nm	\leq 0,48	0,70	20
9/125μ	E2000	1550nm	\leq 0,10	0,30	55
	E2000 APC	1550nm	\leq 0,10	0,30	72
	LC	1550nm	\leq 0,10	0,30	55
	LC APC	1550nm	\leq 0,10	0,30	72
	MPO APC	1550nm	\leq 0,10	0,45	65
	MU	1550nm	\leq 0,10	0,30	55
	SC	1550nm	\leq 0,10	0,30	55
	SC APC	1550nm	\leq 0,10	0,30	72
	Modul	1550nm	\leq 0,30	0,50	65

The given value for module-attenuation is the value for a complete tML-Module in the link (connection of four plugs) and does not represent Insertion Loss or Return Loss of a single plug.

Every module is 100% tested

- FO connector geometry according to IEC and better.

- 100% inspection MPO/MTP and SM connectors using interferometers.



tde

tde has been in business for more than 20 years and involved in fibre optics from the start.

In the meantime, numerous in-house developments and continuous improvements to manufacturing processes have made tde one of the most up-to-date ready-made fibre-optic suppliers in Europe. tde not only stocks standard equipment such as polishing machines and interferometers, but also laser cleavers, adhesive robots and fully-automatic Machines for preparing optical fibres. tde regularly exchanges information with its numerous „assembly house“ partners, including Tyco, AMP, R & M and Stratos, making a crucial contribution to quality assurance and optimisation.

tde's principal objective was and will always remain to guarantee the highest possible standard of quality for the customer. This means, for example, that the grinding geometry of every ready-fitted connector is inspected by interferometer and that no finished assembly leaves the production line without a test certificate.

Numerous renowned businesses have already learned to value this. It is also what led the CERN research center in Switzerland to choose tde. tde has equipped almost the entire CERN project with ready-to-use fibre-optic as-

semblies. The project uses more than 4,000 MPO connectors. tde's MPO applications are also in use at the new S'Oliver and Airport Cologne data centers. Performance of the MPO connector, now standard for data center cabling, is outstanding, thanks to tde's specially optimised laser cleaving manufacturing process, which makes it even more attractive in a field in which very high availability is the top priority.

Of course, tde is also involved in twisted pair development and solutions. One of the largest projects was the development of a Telco-based mobile cabling system for the German armed forces. Now in use for several years at various locations where German forces are deployed, such as Afghanistan, the system was also used as a basis for the development of the new tML system.

It could be said that tML is the result of years of experience of and improvements to copper and fibre-optic cables.

tde not only takes after-sales service very seriously, but implements it with skilled specialists working in sales and manufacturing. You have the question and we have the right answer.

net. work. solution.

ISO 9001, ISO 14001 and TL 9000 certified

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