Modular Cabling System

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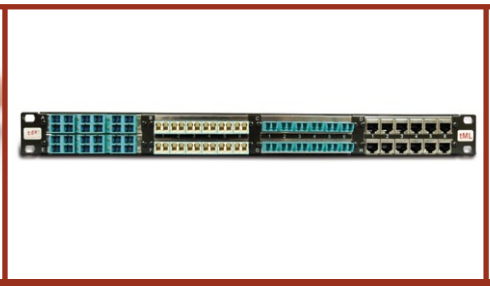
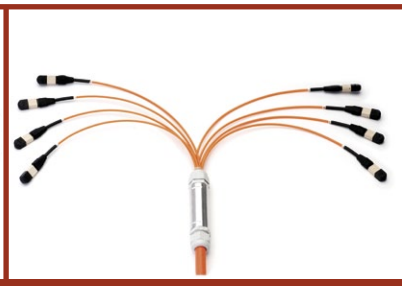




tML®

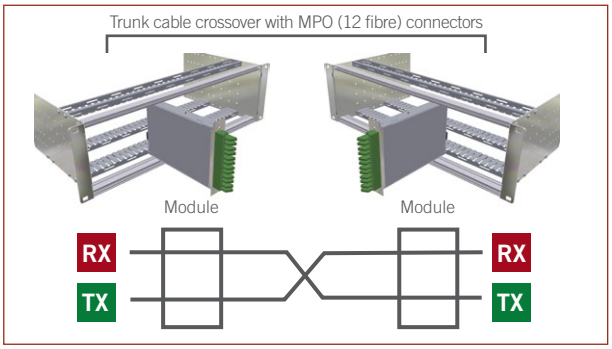
tde Modular Link System

Surpassing the potential of the possible

tML® – FO cabling plan

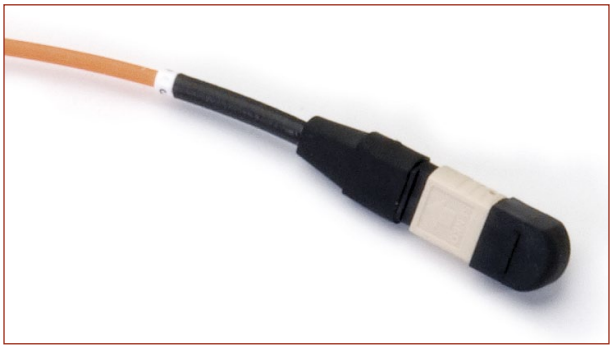
A crossover of both optical fibres is required for transmission between the transmitting and receiving diodes in any fibre-optic cabling system.

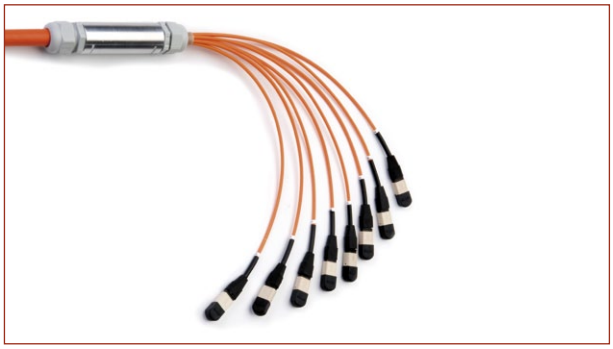
This is accomplished in a trunk cable in the tML system. A typical configuration therefore consists of an crossover MPO/MPO trunk cable and two standard modules.



TIA / EIA-568-B.1 Methode 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 great versatility in laying

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.

Fibre Round Cable	Part Number
50µ	**TML-MP/MP50I12G xxx** [1]
50µ OM3	**TML-MP/MP50I12G3- xxx** [1]
62,5µ	**TML-MP/MP62I12G xxx** [1]
9µ	**TML-MP/MP09I12E xxx** [1]

Universal Fibre Optical Cable	Part Number
50µ	**TML-MP/MP50B yy** [2] **G xxx** [1]
50µ OM3	**TML-MP/MP50B yy** [2] **G3- xxx** [1]
62,5µ	**TML-MP/MP62B yy** [2] **G xxx** [1]
9µ	**TML-MP/MP09B yy** [2] **E 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*

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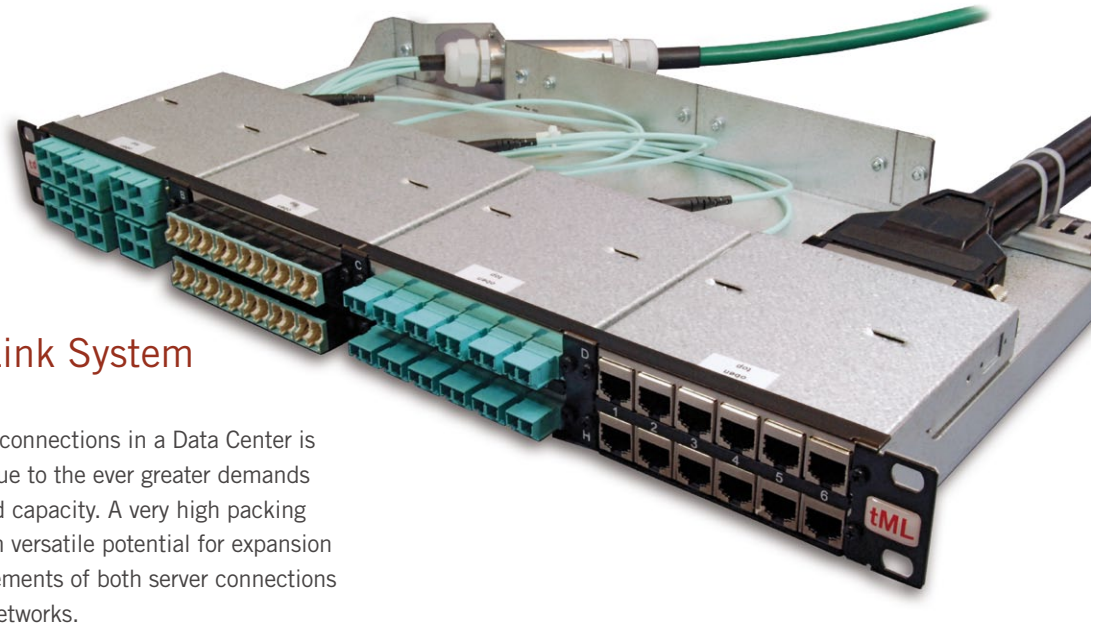
tML®

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 comparision to the standard

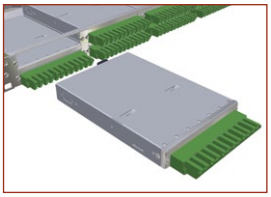
MPO for 6 x fibre-optic links

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 and OM3 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

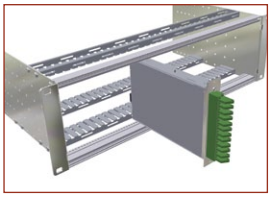
tML® - FO Modules MPO

MPO to 6 x E2000 Compact



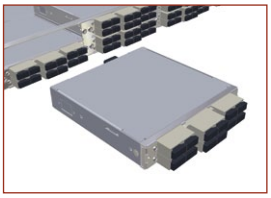
Fibre	Part Number
50/125µ	**TML-M06E2C/MPP50G**
50/125µ OM3	**TML-M06E2C/MPP50G3**
62,5/125µ	**TML-M06E2C/MPP62G**
9/125µ	**TML-M06E2C/MPP09E**
9/125µ	**TML-M06E2AC/MPP09E**

MPO to 6 x E2000 Compact 5HP



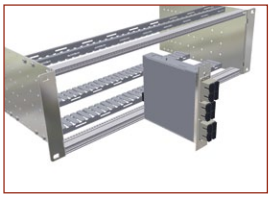
Fibre	Part Number
50/125µ	**TML-T06E2C/MPP50G** [5]
50/125µ OM3	**TML-T06E2C/MPP50G3** [5]
62,5/125µ	**TML-T06E2C/MPP62G** [5]
9/125µ	**TML-T06E2C/MPP09E** [5]
9/125µ	**TML-T06E2AC/MPP09E** [5]

MPO to 6 x SC Duplex



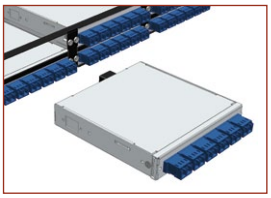
Fibre	Part Number
50/125µ	**TML-M06SCDK/MPP50G**
50/125µ OM3	**TML-M06SCDK/MPP50G3**
62,5/125µ	**TML-M06SCDK/MPP62G**
9/125µ	**TML-M06SCDK/MPP09E**
9/125µ	**TML-M06SCADK/MPP09E**

MPO to 6 x SC Duplex 5HP



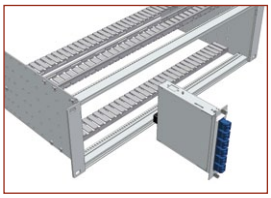
Fibre	Part Number
50/125µ	**TML-T06SCDK/MPP50G** [5]
50/125µ OM3	**TML-T06SCDK/MPP50G3** [5]
62,5/125µ	**TML-T06SCDK/MPP62G** [5]
9/125µ	**TML-T06SCDK/MPP09E** [5]
9/125µ	**TML-T06SCADK/MPP09E** [5]

MPO to 6 x LC Duplex



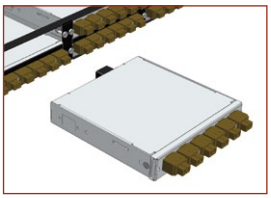
Fibre	Part Number
50/125µ	**TML-M06LCDKH/MPP50G**
50/125µ OM3	**TML-M06LCDKH/MPP50G3**
62,5/125µ	**TML-M06LCDKH/MPP62G**
9/125µ	**TML-M06LCDKH/MPP09E**
9/125µ	**TML-M06LCADKH/MPP09E**

MPO to 6 x LC Duplex 5HP



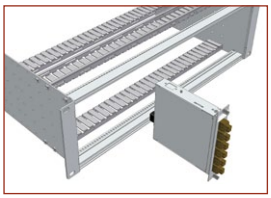
Fibre	Part Number
50/125µ	**TMLT06LCDKH/MPP50G** [5]
50/125µ OM3	**TMLT06LCDKH/MPP50G3** [5]
62,5/125µ	**TMLT06LCDKH/MPP62G** [5]
09/125µ	**TMLT06LCDKH/MPP09E** [5]
9/125µ	**TMLT06LCADKH/MPP09E** [5]

MPO to 6 x MU Duplex



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

MPO to 6 x MU Duplex 5HP



Fibre	Part Number
50/125µ	**TML-T06MUDK/MPP50G** [5]
50/125µ OM3	**TML-T06MUDK/MPP50G3** [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...)

	Description	Part Number
... TP Telco Modules:	Telco to Telco (180° back shell) shielded:	**TML-TELCO-FF- xx** [3]
... active Devices (Telco) & TP Modules:	2x Telco female (180°) to 1x Telco male (45°) shielded:	**TML-TELCO-2XF/1XM- xx** [3]

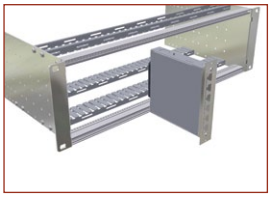
[3] *xx stands for the cable length in meters (max. length 60m)*

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**

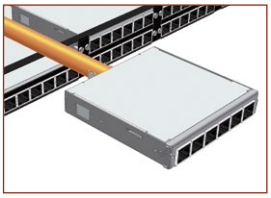
tML® – TP Module Telco to 6 x RJ45 GbE 5HP



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

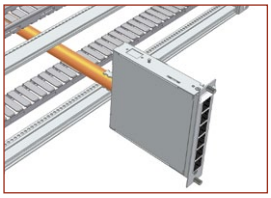
tML® – TP Trunk Cable on both ends preterminated 10GbE Modules

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



Description	Part Number
shielded for Rack Mount Enclosure 19“/ 10“ 1U	**TML-M06RJ45- xx** [4]

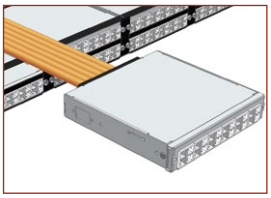
tML® – TP Trunk Cable on both ends 6xRJ45 10GbE 5HP



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

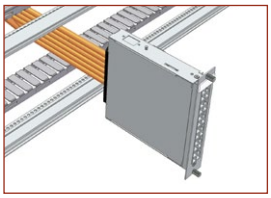
tML® - TP Trunk Cable on both ends preterminated EC7 Modules

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

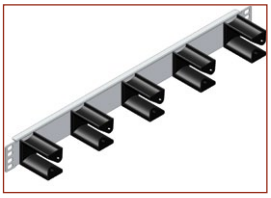


Description	Part Number
shielded for Rack Mount Enclosure 19“/ 3U	
stainless steel	**TML-T06EC7- xx** [4]
black	**TML-T06EC7-S- xx** [4]

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

tML® – Patch Cord Managment 19” Panels

tML®– Patch Cord Managment 19” 1U for FO

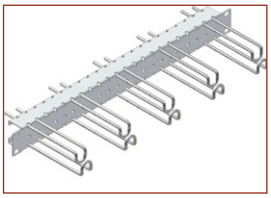


Description	Part Number
5 Rings 56mm	
stainless steel	**TML–RP–L–5**
black	**TML–RP–L–5–S**

tML®– Patch Cord Managment 19” 1U for TP

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

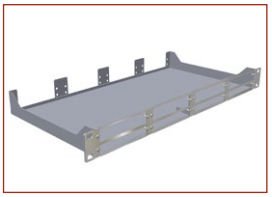
tML®– Patch Cord Managment 19” 1U for TP



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

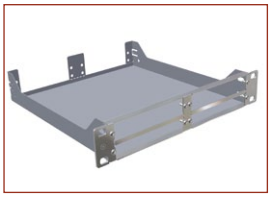
tML® – Rack Mount Enclosures + Accessories

tML® – Rack Mount 19" 1U



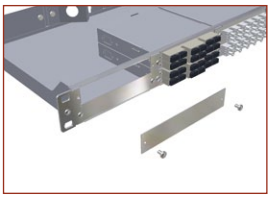
Description	Part Number
for 8x Modules	
stainless steel	**TML-19/1HE-8-M**
black	**TML-19/1HE-8-M-S**

tML® – Rack Mount 10" 1U



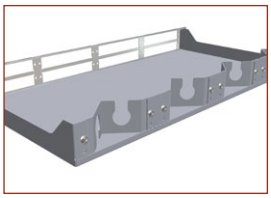
Description	Part Number
for 4x Modules	
stainless steel	**TML-10/1HE-4-M**
black	**TML-10/1HE-4-M-S**

tML® – Blind plate



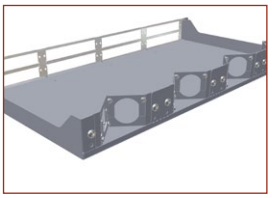
Description	Part Number
for Rack Mount Enclosure 19"/ 1U	
stainless steel	**TML-M-BLIND**
black	**TML-M-BLIND-S**

tML® Cable Mounting Bracket for PG13,5/16



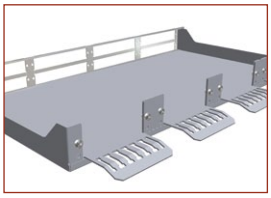
Description	Part Number
for Rack Mount Enclosure 19"/ 1U	**TML-K-P**
straight for Rack Mount Enclosure 19"/ 1U	**TML-K-P-G**

tML® – Cable Mounting Bracket for Fan-out Units



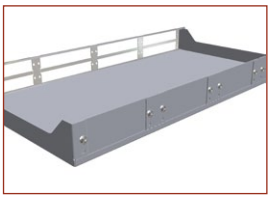
Description	Part Number
for Rack Mount Enclosure 19"/ 1U	**TML-K-A**
straight for Rack Mount Enclosure 19"/ 1U	**TML-K-A-G**

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**

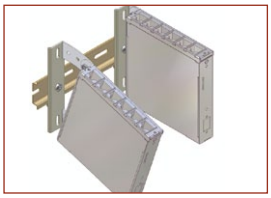
tML® – Rack Mount 19" 3U

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**

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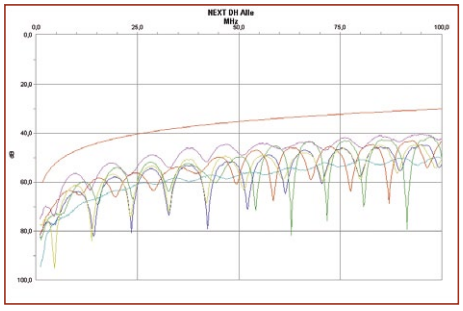
Technical Data

FO Connector Performance

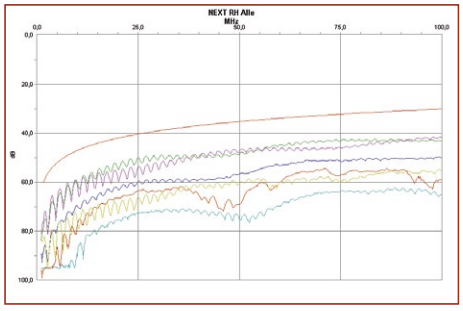
			insertion loss(dB)		return loss(dB)	
Fibre	**Type**	**wavelength**	**typical**	**max**	**typical**	**min**
50/125µ	**E2000**	**1300nm**	**≤ 0,25**	**0,45**	**> 35**	**35**
	LC	1300nm	≤ 0,25	0,45	> 35	35
	MPO	1300nm	≤ 0,35	0,45	> 35	35
	MU	1300nm	≤ 0,30	0,45	> 35	35
	SC	1300nm	≤ 0,30	0,45	> 35	35
	Module	850nm	≤ 0,48	0,90	> 35	35
50/125µ OM3	**E2000**	**1300nm**	**≤ 0,25**	**0,45**	**> 35**	**35**
	LC	1300nm	≤ 0,25	0,45	> 35	35
	MPO	1300nm	≤ 0,35	0,45	> 35	35
	MU	1300nm	≤ 0,3	0,45	> 35	35
	SC	1300nm	≤ 0,3	0,45	> 35	35
	Module	850nm	≤ 0,35	0,90	> 35	35
62,5/125µ	**E2000**	**1300nm**	**≤ 0,25**	**0,45**	**> 35**	**35**
	LC	1300nm	≤ 0,25	0,45	> 35	35
	MPO	1300nm	≤ 0,35	0,45	> 35	35
	MU	1300nm	≤ 0,30	0,45	> 35	35
	SC	1300nm	≤ 0,30	0,45	> 35	35
	Module	850nm	≤ 0,48	0,90	> 35	35
9/125µ	**E2000**	**1550nm**	**≤ 0,25**	**0,45**	**> 55**	**55**
	E2000 APC	1550nm	≤ 0,25	0,45	> 68	65
	LC	1550nm	≤ 0,25	0,45	> 55	55
	LC APC	1550nm	≤ 0,25	0,45	> 68	65
	MPO APC	1550nm	≤ 0,35	0,45	> 55	55
	MU	1550nm	≤ 0,30	0,45	> 55	55
	SC	1550nm	≤ 0,30	0,45	> 55	55
	SC APC	1550nm	≤ 0,25	0,45	> 68	65
	Module	1300nm	≤ 0,48	0,90	> 55	55

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.

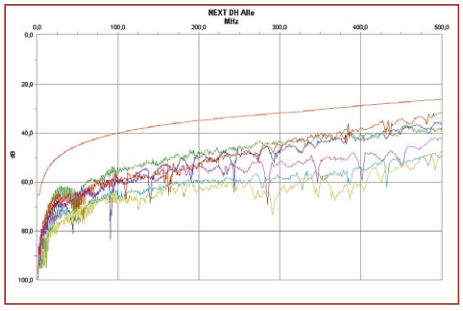
TP Link Performance



TP Trunk Cable GbE



TP Module GbE



TP Trunk Cable with Modules 10 GbE

All RJ45 Modules and Trunk Cables are tested regarding Cat 5e or Cat 6a.

trans data elektronik GmbH

tde

tde has been in business for more than 17 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 assemblies. 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.

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tde – trans data elektronik GmbH
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