HELUKABEL®

CUSTOMIZED PRODUCTS

DATA, NETWORK & BUS TECHNOLOGY

HELUCOM®

HELUKAT®

helukabel-group.com

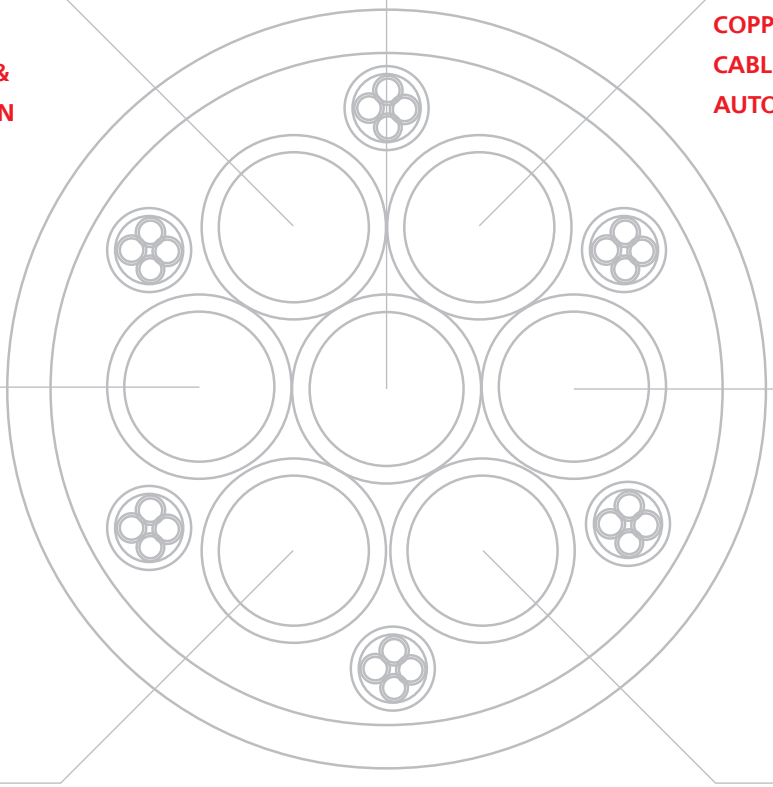
DNB Edition 11 (published 01.10.2015)

HELUKABEL® DATA, NETWORK & BUS TECHNOLOGY

COPPER LAN CABLES FOR BUILDING NETWORKING

GOF /HCS/ POF-CABLES BUILDING NETWORKING & INDUSTRIAL AUTOMATION

COPPER BUS/ETHERNET CABLES FOR INDUSTRIAL AUTOMATION



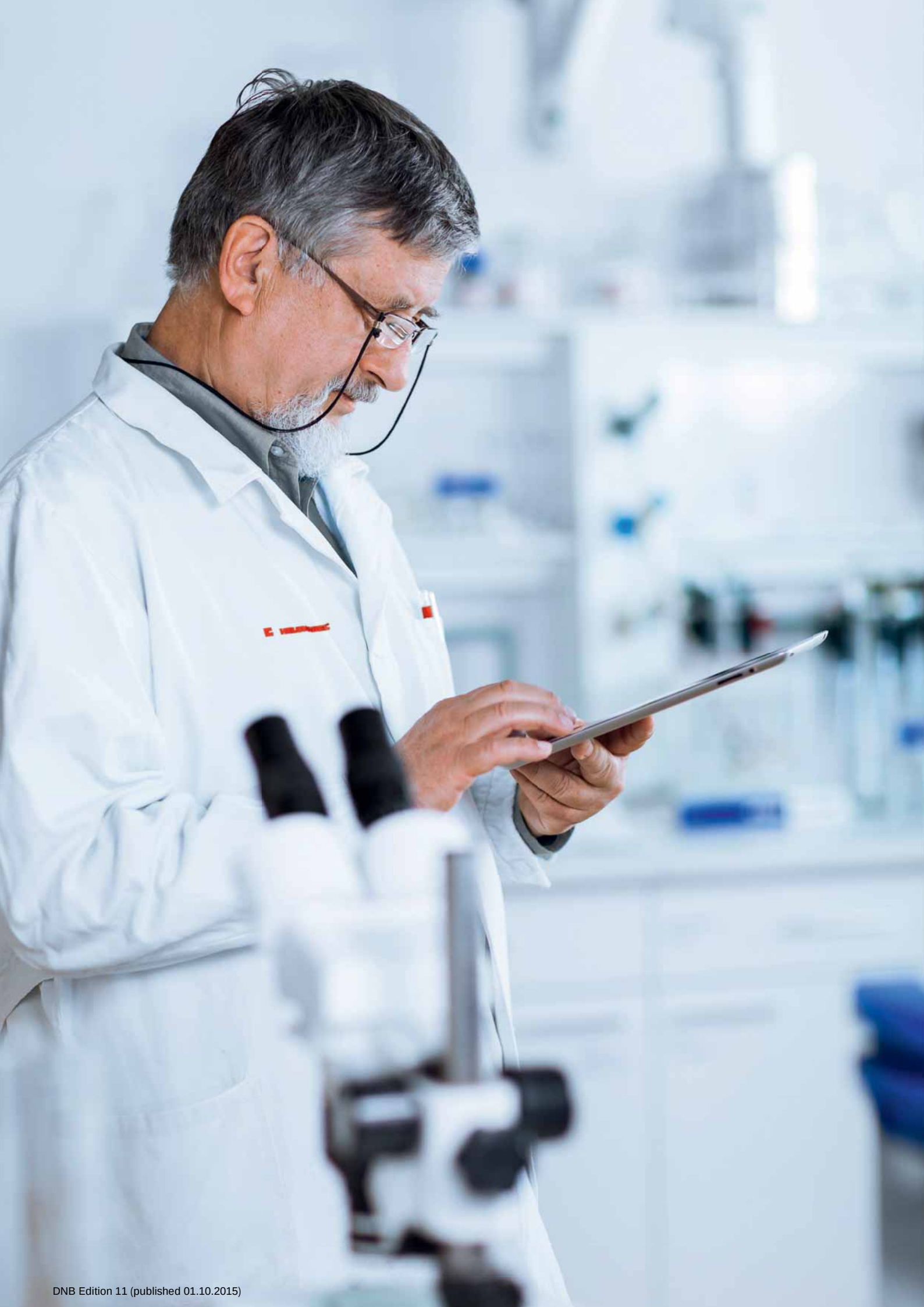
PASSIVE ACCESSORIES

- Distribution panels
- UP/AP-Outlet
- Patch-cables
- Cabinets

PLUG CONNECTOR COPPER + GOF/HCS/POF

MEASURING EQUIPMENT

PROCESSING TOOLS



RESEARCH & DEVELOPMENT

We develop optimal, tailored cable solutions for our customers.

Torsion test apparatus

Our test facilities:

- Test systems for bending and torsion requirements
- Drag chain test systems with movement distances of 1 m, 3 m, 5 m, 6 m, 18 m, and 40 m
- Fire testing systems
- Abrasion testing systems
- Torsion test tower for wind turbine cables
- Aging ovens in accordance with UL, VDE, CSA, HAR, TÜV & CCC

Research and development are the foundation of our work and are an important engine for growth. In interdisciplinary teams we continuously push the boundaries to enhance our products and develop solutions to meet the latest technological demands. Moreover, we value our customer interactions and partnerships with regional colleges and research institutes to stay on top of emerging technologies.

The materials that we use are an important starting point of our work. In this regard, we place as much emphasis on searching for and utilizing new materials, as we do on manufacturing our plastic mixtures (granulates) ourselves, and influencing the improvement of technical characteristics, such as oil-resistance, temperature range or chemical compatibility. Moreover, we are capable of pulling a majority of the copper ourselves, thus ensuring a uniform, high-quality product relative to properties and workmanship.

With continuous optimization of our manufacturing processes and systems we take into consideration both efficient and economical production, and the complex requirements of various applications (such as cables for industrial robots or for applications under cleanroom conditions) into account.

A crucial stage in the development process of our products is the work done at our Test Center. For example, cables suitable for drag chain implementation, can be tested using equipment that accelerates cables up to 10 g.

Temperature ranges from -50° to +250° are simulated in a special climate-controlled environment so that drag chain cables can be tested for series production readiness in applications such as refrigerated warehouses or steel mills.

Drag chain test system

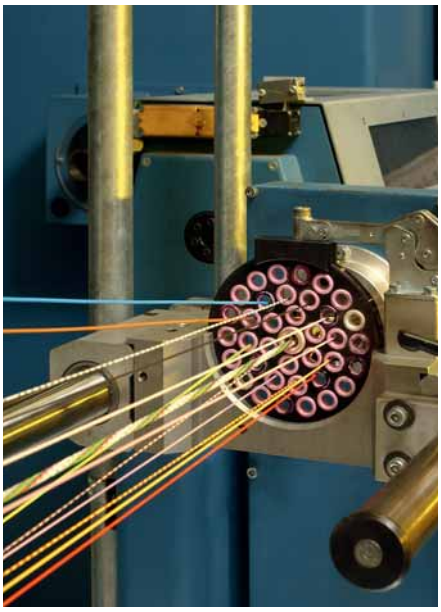
PRODUCTION

We specialize in the production of high-quality cables and wires.

Using the latest production methods, our two German plants manufacture approximately one million kilometers of conductors each year (= 77 times around the world). More than 300 qualified employees are specialized in the production of high-quality standard and custom cables. Through the use of the latest materials and collaboration with international test institutes, we drive innovation in the areas of automation, data technology, building system technology, and renewable energy.

Since 2014, in a 7,000 m² facility in the Chinese city of Taicang (approx. 50 km northwest of Shanghai) HELUKABEL® has been producing cable and wires, primarily for the Asian market. As is with our German plants, the focus is on high-quality, flexible and highly-flexible cables and wires that are manufactured in accordance with Chinese and international standards. The use of flexible manufacturing cells enable short delivery times.

Braiding machine



Stranding machine

Our production in numbers:

- 40,000 m² production area
- 23 extruder systems
- 19 stranding machines
- 50 braiding machines
- Cables & wires from 0.05 to 1,000 mm² (30 AWG to 2,000 kcmil)
- Manufacturing in accordance with: VDE, EAC (GOST-R), UL, CSA, HAR, CCC, Germanischer Lloyd, TÜV or customer specification

DNB Edition 11 (published 01.10.2015)

LOGISTICS

Redefining logistics in the cable industry.

INDUSTRIAL CABLE
Our logistics center – Hemmingen/Stuttgart

- 40,500 Euro-pallet racks
  16 aisles with 16 storage and retrieval devices
- 35,900 bin locations in the automatic small parts warehouse with a capacity of 1,000 bins per hour
- 670 storage spaces in the heavy load warehouse with max. reels of 4,000 kg and 2.20 m diameter
- 2 km conveyor line for pallets
- Conveyer connects direct to the cable-cutting machines
- Manual processes reduced to merely packing

INFRASTRUCTURE CABLES
Our logistics center – Neuenhagen/Berlin

- 11,000 cable reels in stock
- Automatic processing of reels up to 2.80 m Ø and 10 t
- 10 rewinding machines
- Cut to length with state-of-the-art 1,200 mm² cutting tools
- 24-hr delivery is possible

At its corporate headquarters in the Swabian town of Hemmingen/Stuttgart, HELUKABEL® operates Europe's largest distribution center for cables and wires. Here a majority of the more than 33,000 products are located in a storage area of 160,000 m². Through the use of state-of-the-art conveyor and control technology, more than 1,000 orders can be picked and dispatched daily to destinations around the world.

Neuenhagen/Berlin is the central warehouse location for underground, medium-voltage, and other infrastructure cables. Storage capacities of more than 5,000 m² (indoor) and 50,000 m² (outdoor) enable fast delivery of cable, configured from 1 – 30 kV, to construction sites and major projects. The patented heavy-load cable-cutting machines with a load capacity of more than 10 tons are the largest of their kind in Germany.

The new logistics center at the Taicang (Shanghai, China) production facility serves as a product distribution hub for the Asian market, and offers incredible advantages, particularly for servicing time- and volume-critical customer projects.

Heavy-load, cable-cutting facility

Small parts warehouse

DNB Edition 11 (published 01.10.2015)

HELUKABEL®

HELUKAT®

HELUCOM®

HELUKAT® CONNECTING SYSTEMS

HELUCOM® CONNECTING SYSTEMS

HELUKAT® CONNECTING SYSTEMS INDUSTRY

HELUCOM® CONNECTING SYSTEMS INDUSTRY

DNB Edition 11 (published 01.10.2015)

CERTIFIED PRODUCTS ARE PRODUCTS YOU CAN TRUST

Independently and continuously audited quality.

The certification of our products is proof of their superior quality. Product certificates for our products are issued by independent institutions on the basis of applicable performance tests. The certificates are required for use of the product in certain markets or areas of application.


CERTIFICATE

HELUKABEL

HELUKABEL GmbH
Neusaeser Weg 11
91575 Windsbach
Germany

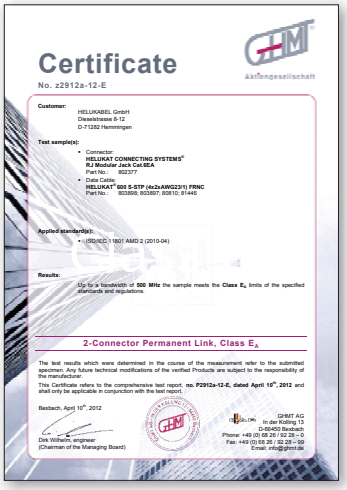
DIN EN ISO 9001:2008

Development, design and manufacture of cables and wires

VDE INSTITUT


Zertifikat

HELUKABEL GmbH
Dieselstr. 8-12
D-71282 Hemmingen


Certificate

No. z2912a-12-E

Customer:
HELUKABEL GmbH
Dieselstrasse 8-12
D-71282 Hemmingen

Test sample(s):
- Connector: HELUKAT CONNECTING SYSTEMS® RJ Modular Jack Cat.6EA Part No.: 802377
- Data Cable: HELUKAT® 600 S-STP (4x2xAWG23/1) FRNC Part No.: 803898; 803897; 80810; 81446

Applied standard(s):
- ISO/IEC 11801 AMD 2 (2010-04)

Results:
Up to a bandwidth of 500 MHz the sample meets the Class E_A limits of the specified standards and regulations.

2-Connector Permanent Link, Class E_A

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the verified Products are subject to the responsibility of the manufacturer.
This Certificate refers to the comprehensive test report, no. P2912a-12-E, dated April 10th, 2012 and shall only be applicable in conjunction with the test report.

Bexbach, April 10th, 2012

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Phone: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
Email: info@ghmt.de


CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH certifies that

HELUKABEL

HELUKABEL GmbH
Dieselstr. 8-12
D-71282 Hemmingen

has established and applies a Quality and Environmental Management System for the following scope of application:

Distribution of Cables - Wires - Accessories.

Performance of audits (Report-No. 70023520) has furnished proof that the requirements under:

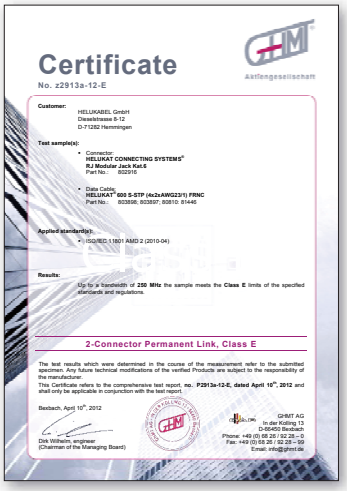
ISO 9001:2008
ISO 14001:2004

are fulfilled. This certificate is valid until 2016-01-25
Certificate Registration No. 12 100/104 20588 TMS

Munich, 2013-02-14


Zertifikat

HELUKABEL GmbH
Dieselstr. 8-12
D-71282 Hemmingen


Certificate

No. z2913a-12-E

Customer:
HELUKABEL GmbH
Dieselstrasse 8-12
D-71282 Hemmingen

Test sample(s):
- Connector: HELUKAT CONNECTING SYSTEMS® RJ Modular Jack Kat.6 Part No.: 802916
- Data Cable: HELUKAT® 600 S-STP (4x2xAWG23/1) FRNC Part No.: 803898; 803897; 80810; 81446

Applied standard(s):
- ISO/IEC 11801 AMD 2 (2010-04)

Results:
Up to a bandwidth of 250 MHz the sample meets the Class E limits of the specified standards and regulations.

2-Connector Permanent Link, Class E

The test results which were determined in the course of the measurement refer to the submitted specimen. Any future technical modifications of the verified Products are subject to the responsibility of the manufacturer.
This Certificate refers to the comprehensive test report, no. P2913a-12-E, dated April 10th, 2012 and shall only be applicable in conjunction with the test report.

Bexbach, April 10th, 2012

Dirk Wilhelm, engineer
(Chairman of the Managing Board)

GHMT AG
In der Kolling 13
D-66450 Bexbach
Phone: +49 (0) 68 26 / 92 28 – 0
Fax: +49 (0) 68 26 / 92 28 – 99
Email: info@ghmt.de


CC-Link

Certificate

This is to certify that the following product of HELUKABEL GmbH has passed a CC-Link Conformance Test

Description of product: CC Link Bus
Type: 800497
Ver. : CC-Link: 1.10

Date of Issue May 9, 2014
Reference Number 901

Chairman
CC-Link Partner Association


Manufacturers Declaration

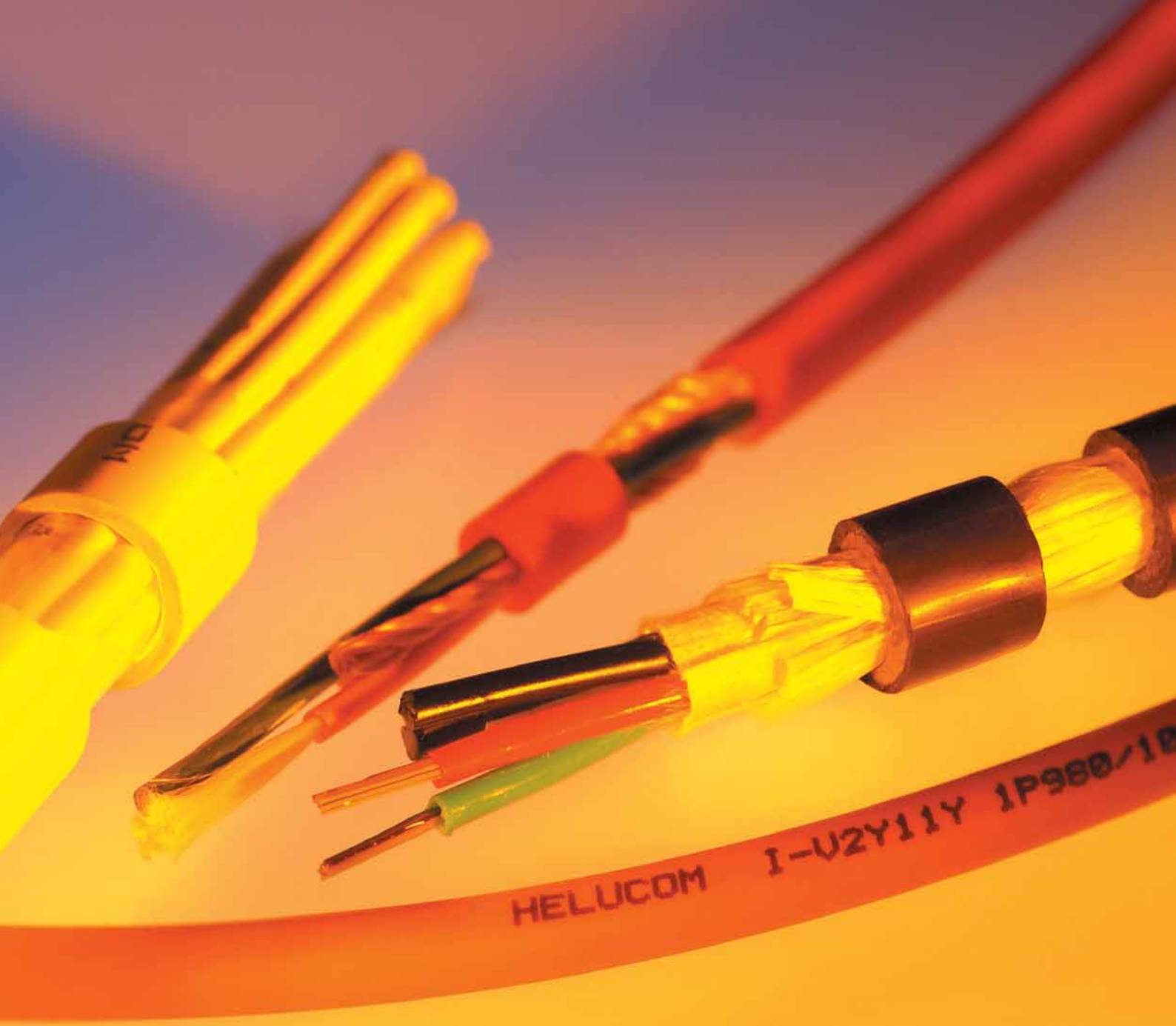
HELUKABEL GmbH

Dieselstr. 8-12 71282 Hemmingen - Germany

PROFINET Cabling and Interconnection Technology
Version 3.1 March 2014


РОССИЙСКАЯ ФЕДЕРАЦИЯ
СЕРТИФИКАТ СООТВЕТСТВИЯ

DNB Edition 11 (published 01.10.2015)



HELUCOM pact fibre-optic universal cables A/I-DQ(ZN)BH

Plastic-fibre cables industry I-V4Y(ZN)11Y

Fibre-optic installation cables I-VH

Fibre-optic cables with functional integrity A-DQ(ZN)BH E30

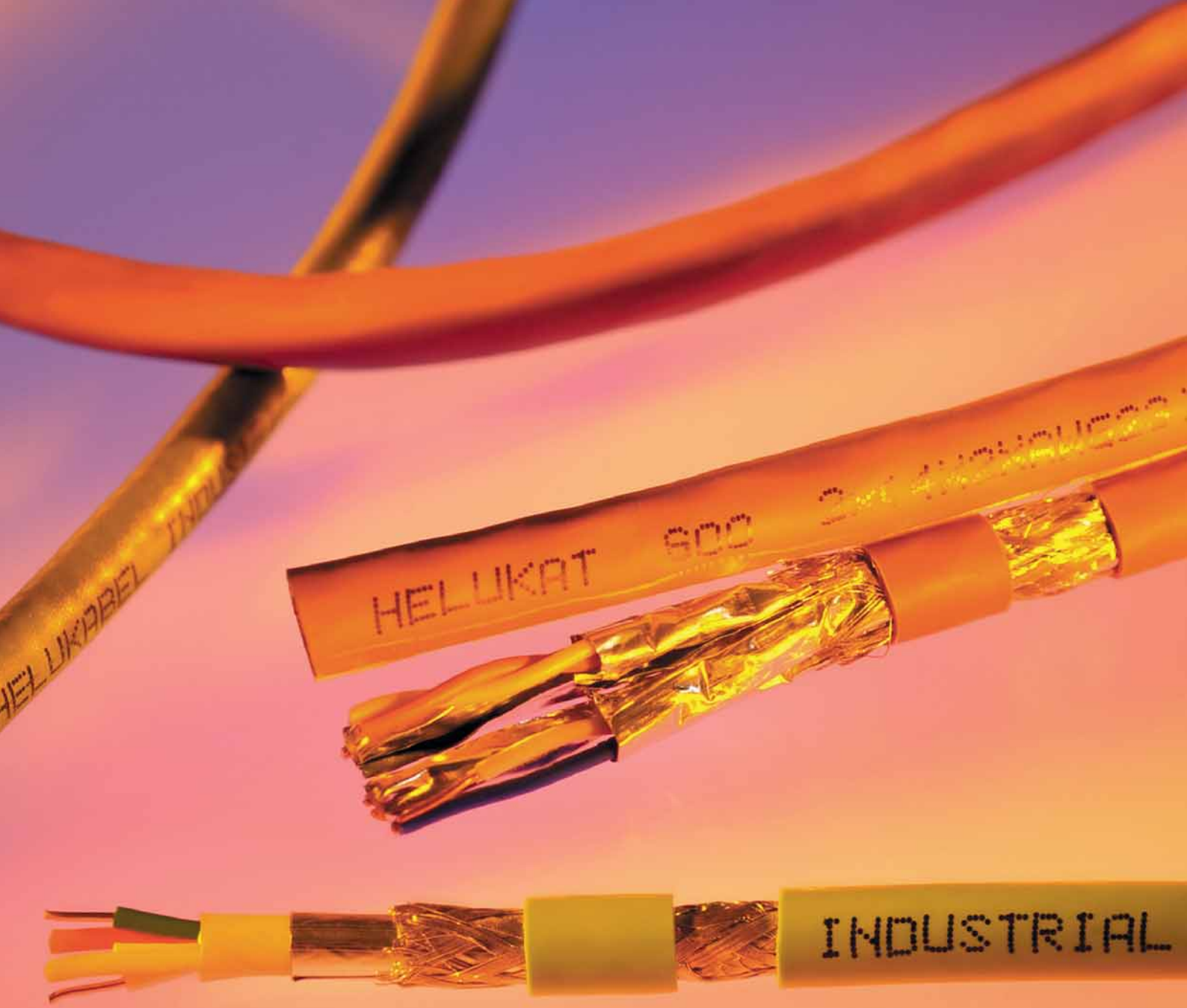
Fibre-optic breakout cables I-V(ZN)HH

Fibre-optic universal mini breakout cables A/I-VQ(ZN)BH

Fibre-optic aerial cables metal-free ADSS

Fibre-optic outdoor cables A-DQ(ZN)2Y, stranded

DNB Edition 11 (published 01.10.2015)



LAN Cable 300 U/UTP UL

LAN Cable 155 U/UTP

LAN Cable 100 U/UTP flex

LAN Cable 450 F/FTP

LAN Cable 1000 S/FTP duplex

LAN Cable 200 SF/UTP flex

Multimedia cable 1500 S/FTP

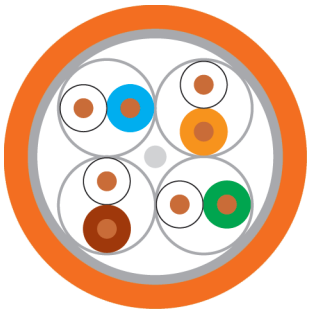
DNB Edition 11 (published 01.10.2015)

LAN Cable

Category 6_A

HELUKAT® 500

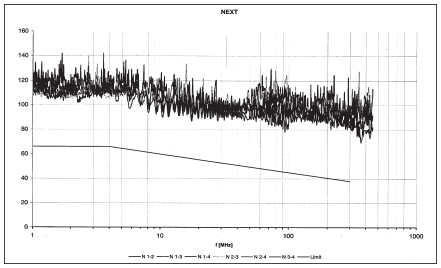
F/FTP



Cable structure

F/FTP 4x2xAWG 23/1 LSZH

Conductor material:	Copper, bare
Core insulation:	Foam-skin-PE
Core colours:	wh/bu, wh/og, wh/gn, wh/bn
Separator:	-
Screen over stranding element:	Al-Foil
Screen 1 over stranding:	Al-Foil
Screen 2 over stranding:	-
Drain wire:	yes
Outer sheath material:	LSZH
Outer diameter:	app. 7,5 mm
Outer sheath colour:	orange similar to RAL 2003



Electrical data

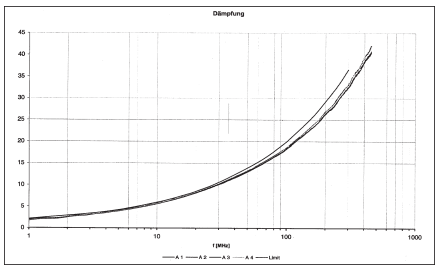
Characteristic impedance:	100 Ohm ± 15 Ohm at 1 to 100 MHz 100 Ohm ± 20 Ohm at 101 to 500 MHz
Loop resistance:	160 Ohm/km max.
Mutual capacitance:	45 nF/km nom.
Rel. propagation velocity:	79%

Typical values

Frequency	(MHz)	10	16	62,5	100	250	500
Attenuation	(dB/100m)	5,3	6,8	13,6	17,3	27,7	41,9
Next	(dB)	>100,0	>100,0	97	95	90	83,0
ACR	(dB)	94,7	92,8	83,4	77,7	62,3	41,1

Technical data

Weight:	app. 53 kg/km
bending radius, repeated:	60 mm
Operating temperature range min.:	-20°C
Operating temperature range max.:	+60°C
Caloric load, approx. value:	0,55 MJ/m
Copper weight:	26,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-B-2-10, Category 6_A , IEC 61156-5, Flame-retardant acc.to IEC 60332-3-24, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2

Application

HELUKAT® 500 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as 10Gigabit Ethernet, Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, token ring 4/16 Mbit/s or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

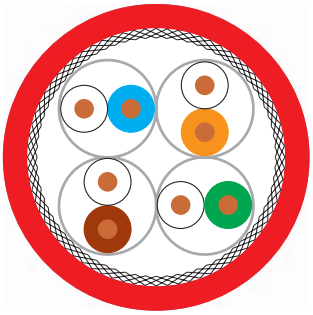
805258, F/FTP 4x2xAWG 23/1 LSZH

Dimensions and specifications may be changed without prior notice.

LAN Cable

Category 6

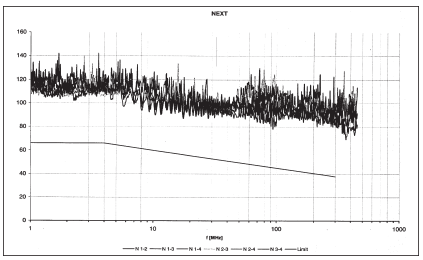
HELUKAT®300
S/FTP



Cable structure

S/FTP 4x2xAWG 24/1 FRNC

Conductor material:	Copper, bare
Core insulation:	Foam-skin-PE
Core colours:	wh/bu, wh/og, wh/gn, wh/bn
Separator:	-
Screen over stranding element:	Alu-Foil
Screen 1 over stranding:	Cu braid
Screen 2 over stranding:	-
Outer sheath material:	FRNC
Outer diameter:	approx 7,0 mm
Outer sheath colour:	red, similar to RAL 3000



Electrical data

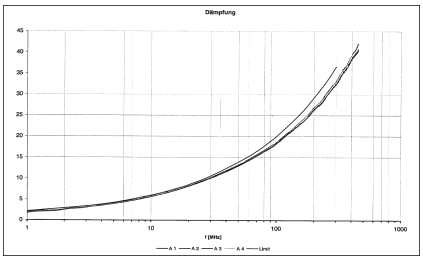
Characteristic impedance:	100 Ohm ± 15 ohm at 1 to 100 MHz 100 Ohm ± 20 ohm at 101 to 500 MHz
Loop resistance:	165 Ohm/km max.
Mutual capacitance:	43 nF/km nom.
Rel. propagation velocity:	79 %

Typical values

Frequency	(MHz)	10	16	62,5	100	250	500
Attenuation	(dB/100m)	5,3	6,8	13,6	17,3	27,7	41,9
Next	(dB)	>100	>100	97	95	90	83,0
ACR	(dB/100m)	94,7	93,2	83,4	77,7	62,3	41,1

Technical data

Weight:	approx. 53 kg/km
bending radius, repeated:	60 mm
Operating temperature range min.:	-20°C
Operating temperature range max.:	+60°C
Caloric load, approx. value:	0,50 MJ/m
Copper weight:	23,00 kg/km



Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc.to IEC 60332-3, Smoke density acc. to IEC 61034, Halogen-free acc. to 60754-2, Corrosiveness acc. to EN50267-2-3.

Anwendung

HELUKAT®300 data cables are used in the tertiary, but also in the secondary level of a network. They are characterized by large performance reserves and outstanding performance. They can be used to implement services such as Gigabit Ethernet, Fast Ethernet, Ethernet, TM155, FDDI, token ring 4/16 Mbit/s, or ISDN absolutely trouble-free. Likewise, the mechanical characteristics are perfectly suited for the application in tight cable channels and platforms due to their optimized construction.

Part no.

805640, S/FTP 4x2xAWG24/1 FRNC (S-STP)

Dimensions and specifications may be changed without prior notice.

BUS-Cables USB 3.0 Bus

BUS-Cables Profibus SHIPLINE

BUS-Cables E-Bus

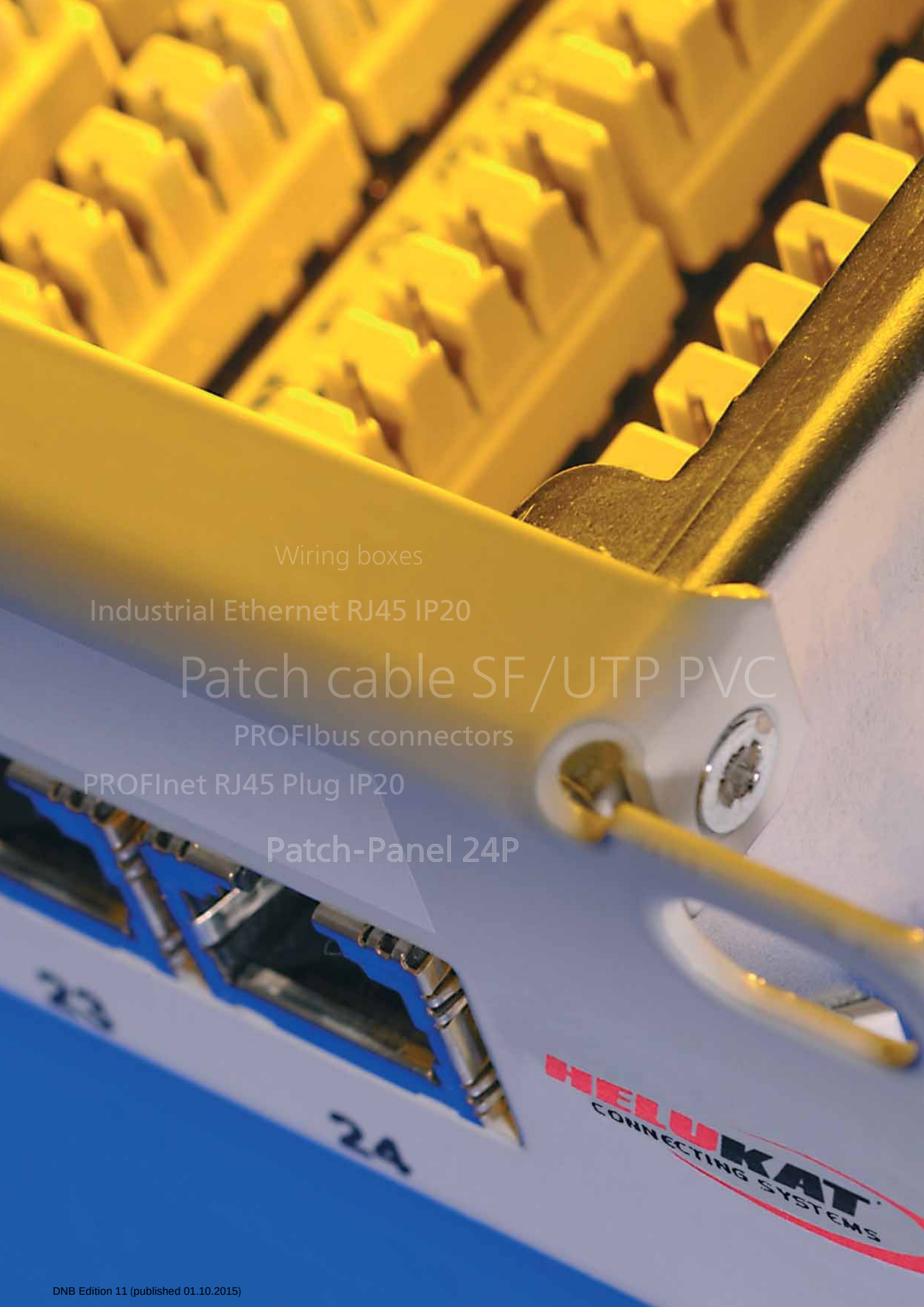
BUS-Cables CAN Bus

Industrial Ethernet PROFInet type A

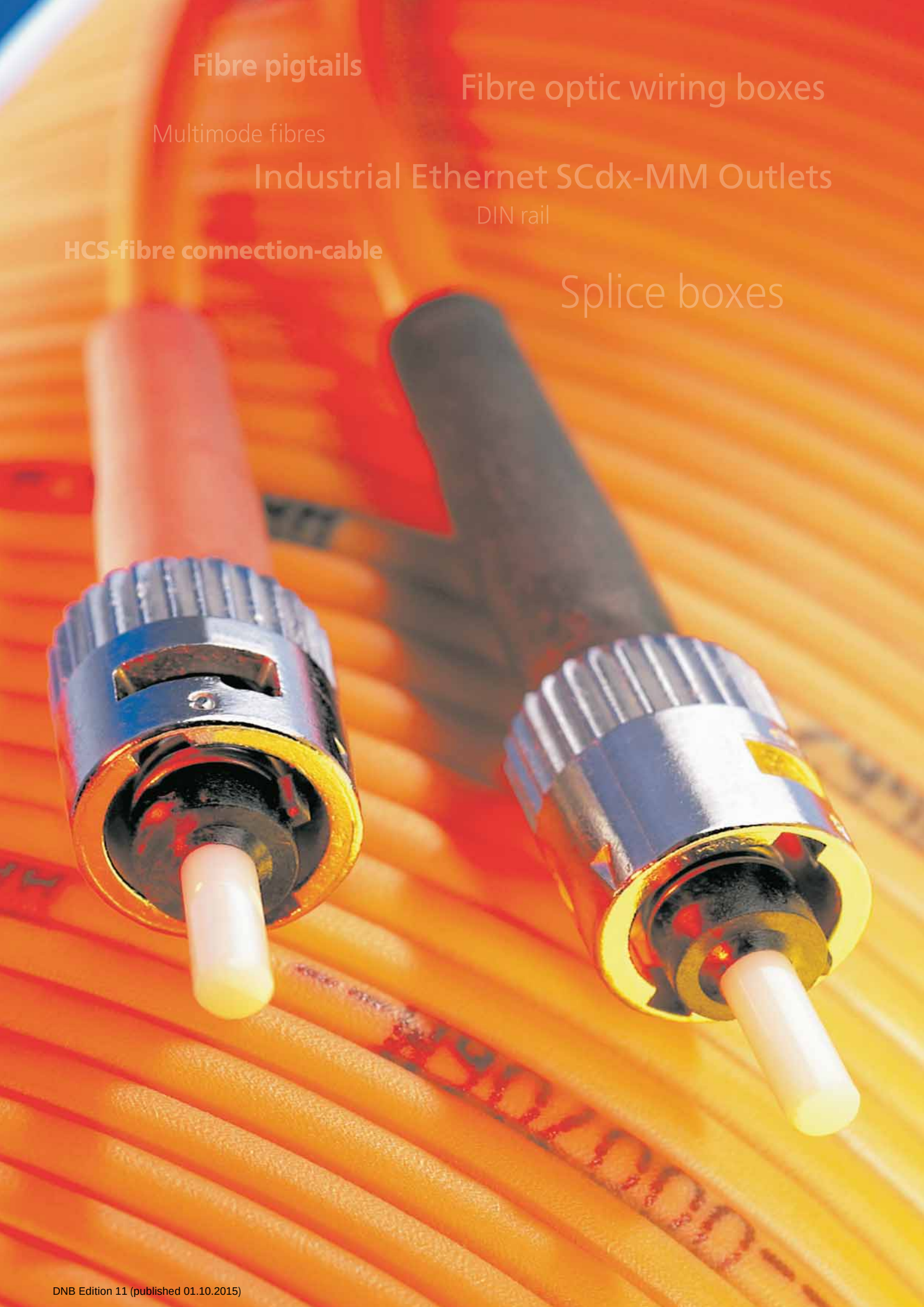
Industrial Ethernet 200IND SF/UTP ROBUSTFLEX

Industrial Ethernet PROFInet C Torsion

DNB Edition 11 (published 01.10.2015)



DNB Edition 11 (published 01.10.2015)



DNB Edition 11 (published 01.10.2015)

HELUKABEL®

FIBER DENSITY

Data, Network and Bus Technology

Data-Center-Solutions MTP® Systems

Trunk-, Patch- , Fanout and Direct Splitter Cables

HELUCOM® CONNECTING SYSTEMS

MTP® / MPO – PLUG AND PLAY IN THE DATA PROCESSING CENTRE OF THE FUTURE

In data processing centres, height units in the rack as well as space along the cable routes are highly valuable. For fibre optic connections, the MTP® system (see IEC61754-7 and TIA/EIA 604-5) is an attractive option. With trunk cables, which bundle 12 to 24 fibres in a single connector, it is possible to implement a cabling structure that is flexible and future-proof.
(Refer to standard ISO11801 as well as EN50173-5). The trunk cable, which has a nominal diameter of 3.5 mm (4.5 mm in the case of 24 fibres), connects two modular inserts stowed in a 1 HE carrier frame. With push-pull technology, the plug of the trunk cable is quickly and reliably connected with the module.

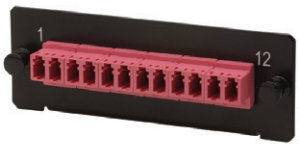
The MTP® system from HELUKABEL® can be used to implement up to 96 fibres in a single height unit. In theory, this means that with 48 height units available, it is possible to manage up to 4608 fibres. With LC, SC, and ST connectivity, almost every connector preference can be met. MTP® products are factory pre-assembled and can be manufactured to order in any length. The fibre types OS1, OS2, and OM1 through 4 can be used for this system. Time-consuming, costly splicing work is a thing of the past with this plug and play system.

MPO/MTP® module patch panel

- Carrier completely extractable
- 3 or 4 module slots
- up to 96 fibres per 1 HU possible
- 19" design, 1HU, 255 mm depth
- Colour RAL 9005

MPO/MTP® cassette

- Available in 1HU or ½ HU.
- Lightweight aluminium housing
- with 12/24 LC, 12 SC, or 6 MTP® connections
- High packing density up to 12 LC duplex (24 fibres)
- Fibre types OS1(+APC), OM2, OM3, OM4



Front panel 6x MPO/MTP®

- Lightweight aluminium front
- Painted in RAL 9005
- Push-Pull locking
- Fitted with 6 MTP® pass-thru connectors

MPO/MTP® blanking plates

- for covering module slots not in use
- in 1 or ½ HU
- Fast push-pull locking

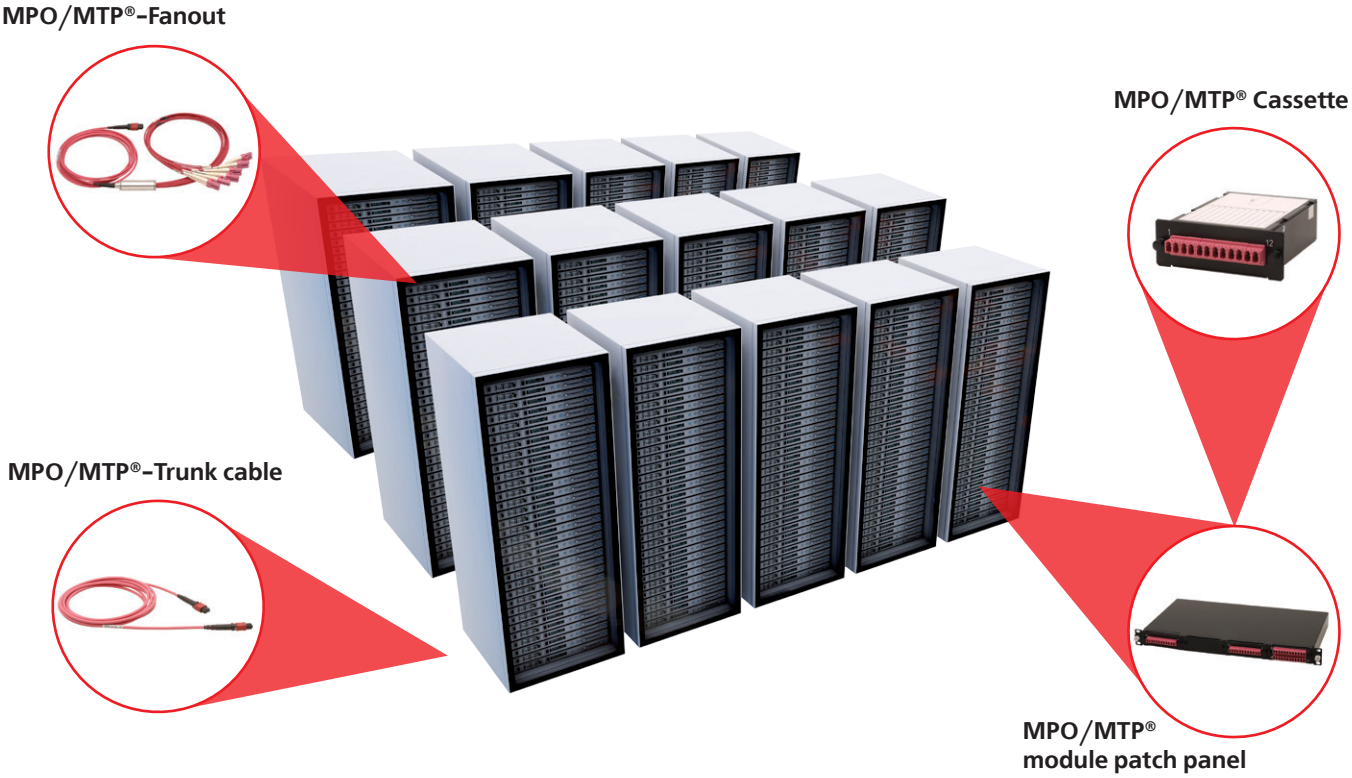
PRE-ASSEMBLED FIBRE OPTIC CABLES

MPO/MTP®-trunk cables

- 12 or 24 fibres•Length to order
- Maximum performance due to factory quality assurance
- Diameter approx. 4.5mm (reinforced) or approx. 3.5mm
- Halogen-free
- Available as SM and OM3/4
- Fast, reliable push-pull locking
- MTP® male/female connectors possible

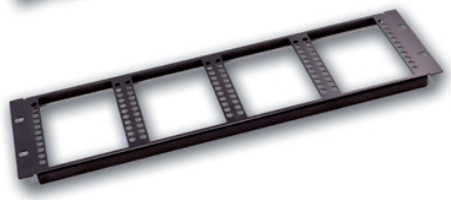
MPO/MTP®-Fanout

- MTP® to LC/SC trunk cable
- •12 or 24 fibres•Pigtails and total lengths to order
- Pigtail available as wire (0.9mm) or cable (2.0mm)
- Duplex clip possible
- Diameter 4.5 mm (reinforced) or 3.0 mm
- Halogen-free
- MTP® male/female connectors possible
- Fibre types OS1(+APC), OM2, OM3, OM4



This is only a small excerpt from our product range in order to serve as a basis for planning. We will be happy to work with you to put together an offer based on your requirements.

MTP® PATCH PANEL / FRAME HOLDER



MTP® patch panel sliding 19", empty width: 19", height: 1 U, depth: 251 mm colour: black, similar to RAL 9005
1 U (4 x 1 U / 8 x ½ U modules)

MTP® frame holder 19", empty colour: black, similar to RAL 9005
1 U (4 x 1 U / 8 x ½ U modules)
2 U (8 x 1 U / 16 x ½ U modules)
3 U (12 x 1 HE / 24 x ½ U modules)

Accessories

MTP® blind dummy for frame holder 19" colour: black, similar to RAL 9005
1 U
½ U

MTP® plate for subrack 19" 3 U (8 SU), for ½ U MTP® modules colour: black, similar to RAL 9005
1 U (4 x 1 U / 8 x ½ U modules)

MTP® MODULES

MTP® module LC duplex ½ U

Type MTP®-m 12-fibres colour: black, similar to RAL 9005	**Fibre**
1 x MTP®-m / 6 x LC duplex	OS2
1 x MTP®-m / 6 x LC APC 8° dx	OS2
1 x MTP®-m / 6 x LC duplex	OM3
1 x MTP®-m / 6 x LC duplex	OM4
1 x MTP®-m / 6 x LC duplex	OM5

MTP® module LC duplex 1 U

Type MTP®-m 12-fibres colour: black, similar to RAL 9005	**Fibre**
1 x MTP®-m / 6 x LC duplex	OS2
2 x MTP®-m / 12 x LC duplex	OS2
1 x MTP®-m / 6 x LC APC 8° dx	OS2
2 x MTP®-m / 12 x LC APC 8° dx	OS2
1 x MTP®-m / 6 x LC duplex	OM3
2 x MTP®-m / 12 x LC duplex	OM3
1 x MTP®-m / 6 x LC duplex	OM4
2 x MTP®-m / 12 x LC duplex	OM4

MTP® module LC duplex 1 U	
Type MTP®-m 24-fibres colour: black, similar to RAL 9005	**Fibre**
1 x MTP®-m / 12 x LC duplex	OS2
1 x MTP®-m / 12 x LC APC 8° dx	OS2
1 x MTP®-m / 12 x LC duplex	OM3
1 x MTP®-m / 12 x LC duplex	OM4

MTP® module SC duplex 1 U	
Type MTP®-m 12-fibres colour: black, similar to RAL 9005	**Fibre**
1 x MTP®-m / 6 x SC duplex	OS2
1 x MTP®-m / 6 x SC APC 8° dx	OS2
1 x MTP®-m / 6 x SC duplex	OM3
1 x MTP®-m / 6 x SC duplex	OM4

MTP® module MTP® 1 U	
Type MTP®-m 12-fibres colour: black, similar to RAL 9005	**Fibre**
6 x LC APC duplex (green)	OS2
6 x LC duplex (blue)	OS2
6 x MTP® (green)	OS2
6 x MTP® (schwarz)	OS2
6 x SC APC duplex (green)	OS2
6 x SC duplex (blue)	OS2
6 x SC duplex (aqua)	OM3
6 x LC duplex (aqua)	OM3
6 x MTP® (aqua)	OM3
6 x LC duplex (erika-purple)	OM4
6 x MTP® (erika-purple)	OM4

MTP® converter module 1 U	
Type MTP®-m 24-/ 8-fibres for 40 and 100 GBit applications	**Fibre**
1 x MTP®-m / 3 x MTP®-m	OS3
1 x MTP®-m / 3x MTP®-m	OS4
1 x MTP®-m / 3x MTP®-m	OS5
Type MTP®-m 12-/ 8-fibres for 40 and 100 GBit applications	**Fibre**
2 x MTP®-m / 3 x MTP®-m	OS3
2 x MTP®-m / 3x MTP®-m	OS4
2 x MTP®-m / 3x MTP®-m	OS5

MTP® TRUNK CABLE

Type MTP® 12-fibres cable length: 2,0 m xxx=002 standard fanout length: 1,0 m	**Fibre quality**
1 x MTP®-f / 1 x MTP®-f	12 x OS2 E9
4 x MTP®-f / 4 x MTP®-f	48 x OS2 E9
8 x MTP®-f / 8 x MTP®-f	96 x OS2 E9
12 x MTP®-f / 12 x MTP®-f	144 x OS2 E9
1 x MTP®-f / 1 x MTP®-f	12 x OM3 G50
4 x MTP®-f / 4 x MTP®-f	48 x OM3 G50
8 x MTP®-f / 8 x MTP®-f	96 x OM3 G50
12 x MTP®-f / 12 x MTP®-f	144 x OM3 G50
1 x MTP®-f / 1 x MTP®-f	12 x OM4 G50
4 x MTP®-f / 4 x MTP®-f	48 x OM4 G50
8 x MTP®-f / 8 x MTP®-f	96 x OM4 G50
12 x MTP®-f / 12 x MTP®-f	144 x OM4 G50
1 x MTP®-f / 1 x MTP®-f	12 x OM5 G50
4 x MTP®-f / 4 x MTP®-f	48 x OM5 G50
8 x MTP®-f / 8 x MTP®-f	96 x OM5 G50
12 x MTP®-f / 12 x MTP®-f	144 x OM5 G50

Characteristics & Versions
- Maximum performance due to factory quality assurance
- Push-Pull locking
- 12 - 144 Fibres
- halogen-free and flame-retardant
- MTP® male connector available
- Temperature range: - 10°C to + 70°C

Type MTP® 24-fibres	**Fibre quality**
MTP®-f / MTP®-f	24 x OS2 E9
MTP®-f / MTP®-f	24 x OM3 G50
MTP®-f / MTP®-f	24 x OM4 G50
MTP®-f / MTP®-f	24 x OM5 G50

MTP® PATCHCORD

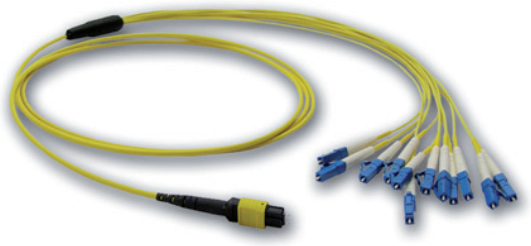
Characteristics & Versions
- Maximum performance due to factory quality assurance
- Push-Pull locking
- External diameter: 3,0 mm / 4,5 mm possible (12 Fibres)
  3,8 mm (24 Fibres)
- halogen-free and flame-retardant
- Temperature range: - 10°C to + 70°C

Type MTP® 12-fibres cable length: 2,0 m xxx=002 standard fanout length: 1,0 m	**Fibre quality**
MTP®-f / MTP®-f	12 x OS2 E9
MTP®-f / MTP®-m	12 x OS2 E9
MTP®-m / MTP®-m	12 x OS2 E9
MTP®-f / MTP®-f	12 x OM3 G50
MTP®-f / MTP®-m	12 x OM3 G50
MTP®-m / MTP®-m	12 x OM3 G50
MTP®-f / MTP®-f	12 x OM4 G50
MTP®-f / MTP®-m	12 x OM4 G50
MTP®-m / MTP®-m	12 x OM4 G50
MTP®-f / MTP®-f	12 x OM5 G50
MTP®-f / MTP®-m	12 x OM5 G50
MTP®-m / MTP®-m	12 x OM5 G50

Type MTP® 24-fibres cable length: 2,0 m xxx=002 standard fanout length: 1,0 m	**Fibre quality**
MTP®-f / MTP®-f	24 x OS2 E9
MTP®-f / MTP®-m	24x OS2 E9
MTP®-m / MTP®-m	24 x OS2 E9
MTP®-f / MTP®-f	24 x OM3 G50
MTP®-f / MTP®-m	24 x OM3 G50
MTP®-m / MTP®-m	24 x OM3 G50
MTP®-f / MTP®-f	24 x OM4 G50
MTP®-f / MTP®-m	24 x OM4 G50
MTP®-m / MTP®-m	24 x OM4 G50
MTP®-f / MTP®-f	24 x OM5 G50
MTP®-f / MTP®-m	24 x OM5 G50
MTP®-m / MTP®-m	24 x OM5 G50

MTP® FANOUT

Characteristics & Versions
- Maximum performance due to factory quality assurance
- Push-Pull locking
- External diameter: 3,0 mm / 4,5 mm possible (12 Fibres)
  3,8 mm (24 Fibres)
- halogen-free and flame-retardant
- Temperature range: - 10°C to + 70°C

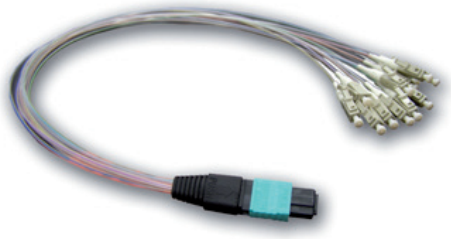


Type MTP® 12-fibres cable length: 1 m xxx=001 min. cable length: 1 m standard fanout length: 0,5 m	**Fibre quality**
MTP®-m / LC	12 x OS2 E9
MTP®-m / LC APC 8°	12 x OS2 E9
MTP®-m / SC	12 x OS2 E9
MTP®-m / SC APC 8°	12 x OS2 E9
MTP®-m / LC (40GBit)	8 x OM3 G50
MTP®-m / LC	12 x OM3 G50
MTP®-m / SC	12 x OM3 G50
MTP®-m / LC (40GBit)	8 x OM4 G50
MTP®-m / LC	12 x OM4 G50
MTP®-m / SC	12 x OM4 G50
MTP®-m / LC (40GBit)	8 x OM5 G50
MTP®-m / LC	12 x OM5 G50
MTP®-m / SC	12 x OM5 G50

Type MTP® 24-fibres cable length: 1 m xxx=001 min. cable length: 1 m standard fanout length: 0,5 m	**Fibre quality**
MTP®-m / LC	24 x OS2 E9
MTP®-m / LC APC 8°	24 x OS2 E9
MTP®-m / SC	24 x OS2 E9
MTP®-m / SC APC 8°	24 x OS2 E9
MTP®-m / LC	24 x OM3 G50
MTP®-m / SC	24 x OM3 G50
MTP®-m / LC	24 x OM4 G50
MTP®-m / SC	24 x OM4 G50
MTP®-m / LC	24 x OM5 G50
MTP®-m / SC	24 x OM5 G50

MTP® DIRECT SPLITTER

Characteristics & Versions
- Maximum performance due to factory quality assurance
- Push-Pull locking
- External diameter: 3,0 mm / 4,5 mm possible (12 Fibres)
  3,8 mm (24 Fibres)
- halogen-free and flame-retardant
- Temperature range: - 10°C to + 70°C



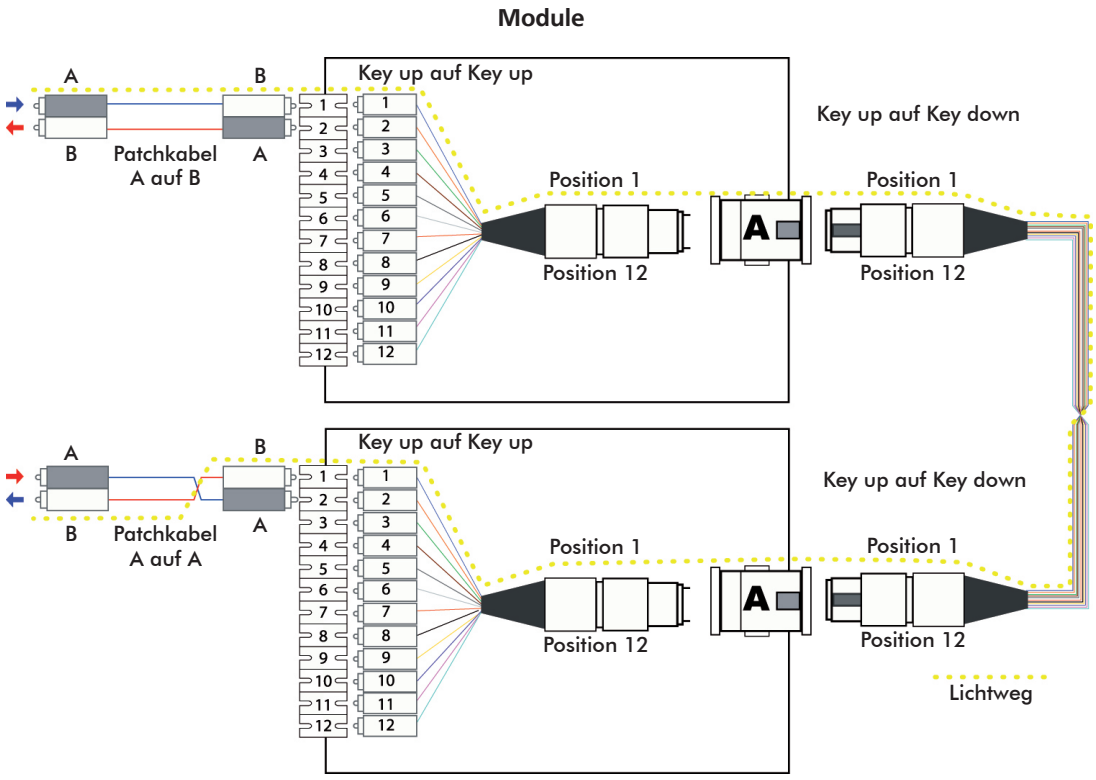
Type MTP® 12-fibres min. cable length: 0,34 m	**Fibre quality**
MTP®-m / LC	12 x OS2 E9
MTP®-m / LC APC 8°	12 x OS2 E9
MTP®-m / SC	12 x OS2 E9
MTP®-m / SC APC 8°	12 x OS2 E9
MTP®-m / LC	12 x OM3 G50
MTP®-m / SC	12 x OM3 G50
MTP®-m / LC	12 x OM4 G50
MTP®-m / SC	12 x OM4 G50
MTP®-m / LC	12 x OM5 G50
MTP®-m / SC	12 x OM5 G50

Type MTP® 24-fibres cable length: 0,5 m	**Fibre quality**
MTP®-m / LC	24 x OS2 E9
MTP®-m / LC APC 8°	24 x OS2 E9
MTP®-m / SC	24 x OS2 E9
MTP®-m / SC APC 8°	24 x OS2 E9
MTP®-m / LC	24 x OM3 G50
MTP®-m / SC	24 x OM3 G50
MTP®-m / LC	24 x OM4 G50
MTP®-m / SC	24 x OM4 G50
MTP®-m / LC	24 x OM5 G50
MTP®-m / SC	24 x OM5 G50

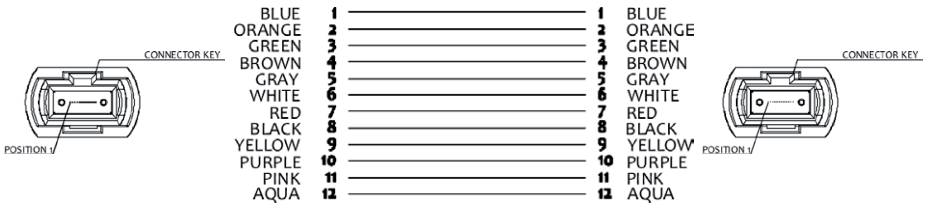
MTP® POLARITY „METHOD A“

Method A uses a “straight-through” configuration and two different patchcords. All components in tU channel are mated key-up to key-down (Standard). On one side of tU channel tUre must be an „A to B“ Patchcord on tU otUr an „A to A“ Patchcord (crossed). Both modules are similar.

- For both singlemode and multimode (APC and PC)
- Trunk Cable assignment: 1-1, 2-2, ..., 12-12
- Similar modules
- Diffrent Patchcords
- Compatible with 40Gbps standard



Trunk cable configuration 12 fibres



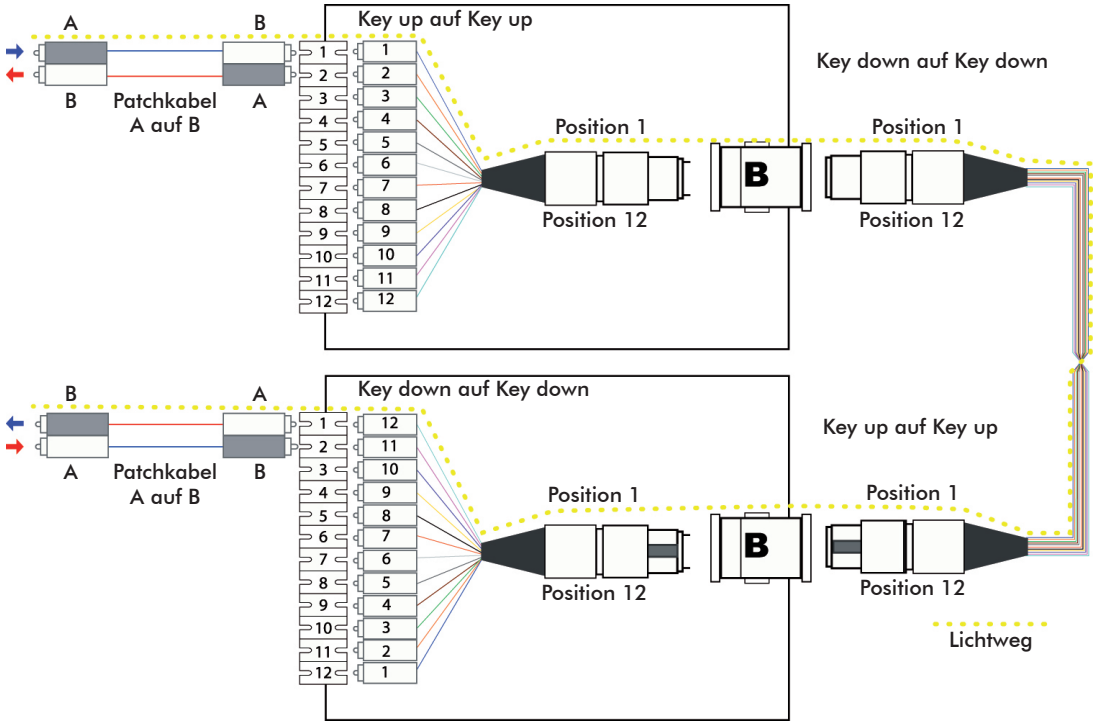
Trunk cable configuration 24 fibres

MTP® POLARITY „METHOD B“

Method B uses a “straight-through” configuration and stan-dard „A to B“ patchcords on both ends. All components in tU channel are mated key-up to key-up. A module on one end is inverted.

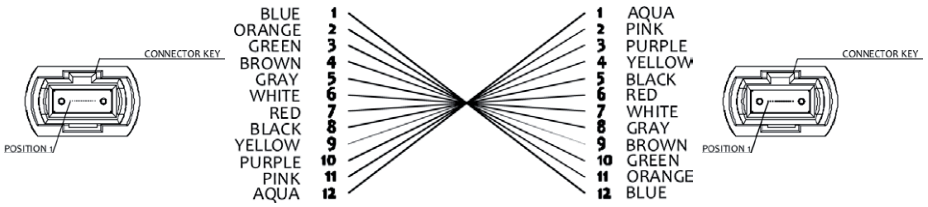
- For multimode applications (only PC)
- Trunk Cable assignment: 1-12, 2-11, ..., 12-1
- Diffrent modules
- Similar Patchcords
- Compatible with 40Gbps standard

Module

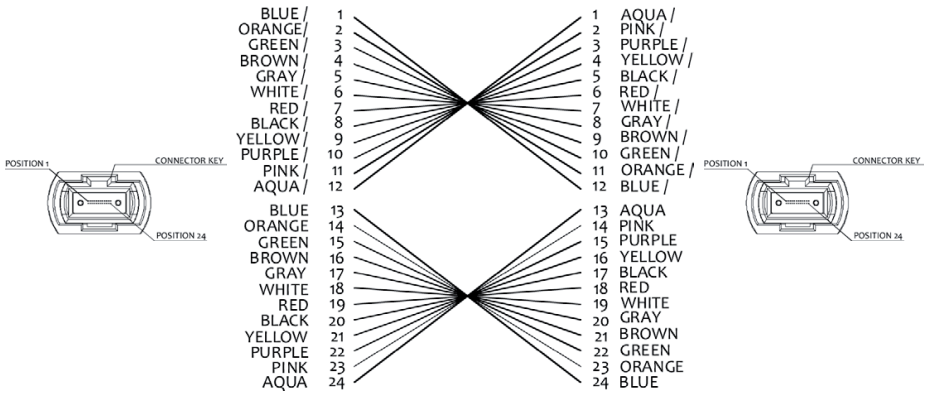


Module

Trunk cable configuration 12 fibres



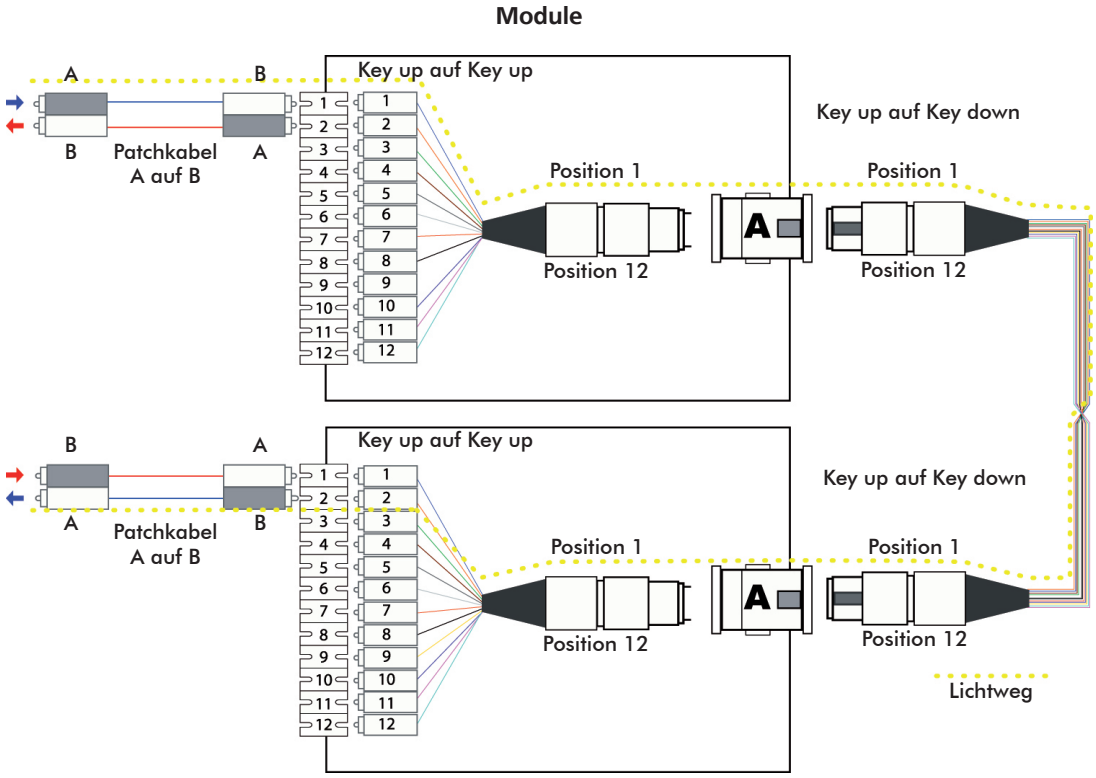
Trunk cable configuration 24 fibres



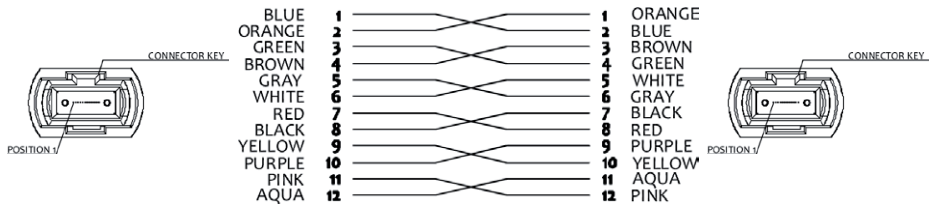
MTP® POLARITY „METHOD C“

Method C uses a pair-wise flip configuration and standard „A to B“ patchcords on both ends. All components in tU channel are mated key-up to key-down (Standard).

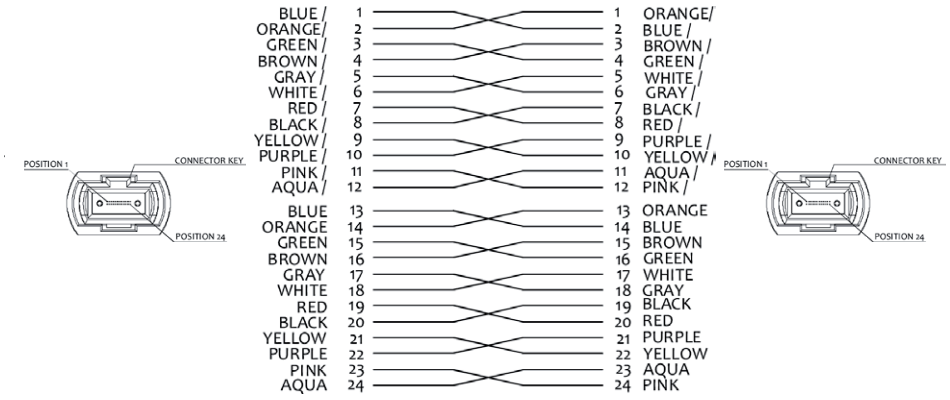
- For both singlemode and multimode (APC and PC)
- Trunk Cable assignment: 1-2, 2-1, ...,11-12, 12-11
- Similar modules
- Similar Patchcords
- Compatible with 40Gbps standard



Trunk cable configuration 12 fibres

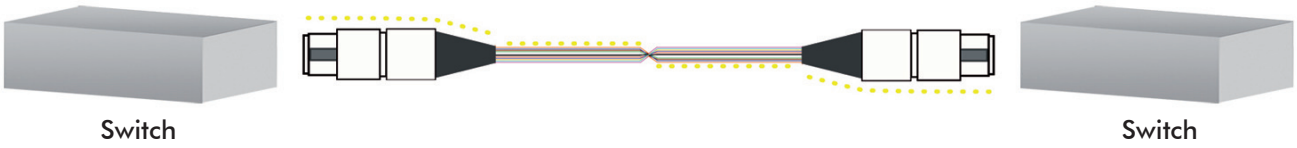


Trunk cable configuration 24 fibres

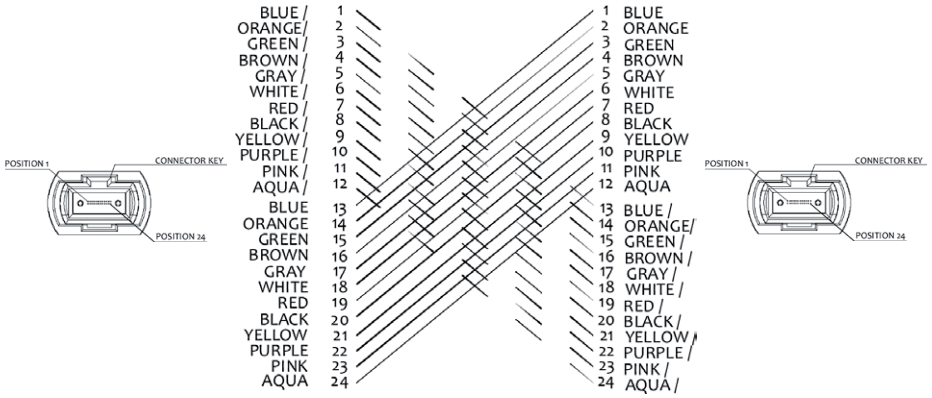


MTP® POLARITY „METHOD X“

Method X will be used for the direct connection of active devices. Recently increased demand of bandwidth in data centers contain CFP/CXP modules with data transmission rates from up to 100 Gbits. MTP® CXP / CFP trunk cables offer easy and comfortable solutions for direct connection of active devices. This leads to the reduction of total costs for the operative business (COPEX).



Trunk cable configuration 24 fibres



MTP® – OPTICAL PROPERTIES

	MTP® 12-fibres		MTP® 24-fibres	
	Standard	Low Loss	Standard	Low Loss
IL Singlemode APC	< 0,5 dB	< 0,35 dB	< 0,75 dB	-
RL Singlemode APC	> 50 dB	> 60 dB	> 50 dB	-
IL Multimode	< 0,5 dB	< 0,35 dB	< 0,60 dB	< 0,35 dB
RL Multimode	> 20 dB	> 25 dB	> 20 dB	> 20 dB

	LC		SC	
	Standard	Low Loss	Standard	Low Loss
IL Singlemode	< 0,35 dB	< 0,20 dB	< 0,35 dB	< 0,20 dB
RL Singlemode	> 45 dB	> 50 dB	> 45 dB	> 50 dB
IL Singlemode APC	< 0,35 dB	< 0,20 dB	< 0,35 dB	< 0,20 dB
RL Singlemode APC	> 60 dB	> 60 dB	> 60 dB	> 60 dB
IL Multimode	< 0,35 dB	< 0,15 dB	< 0,35 dB	< 0,15 dB
RL Multimode	> 30 dB	> 30 dB	> 30 dB	> 30 dB

All modules are manufactured according to MTP® polarity method C.
All MTP® plugs are “male” (with guide pins).
Further article additions -B = method, -LL = low loss, -SLL = super low loss.
Please keep in mind that not all variants are possible due to technical reasons.

HELUKABEL®

Answer by Fax: +49 7150 970819

What can we do for you?

- ☐ Data, Network & Bus Technology Catalogue
- ☐ Cables & Wires Catalogue
- ☐ Cable Accessories Catalogue
- ☐ Media Technology Catalogue
- ☐ Wind Turbine Cables Catalogue
- ☐ Aluminium Catalogue
- ☐ Call back
- ☐ Sales representative visit

Company

Contact

Customer No.

Street, No.

Postal Code, City, Country

Telephone / Fax

E-mail

Your message

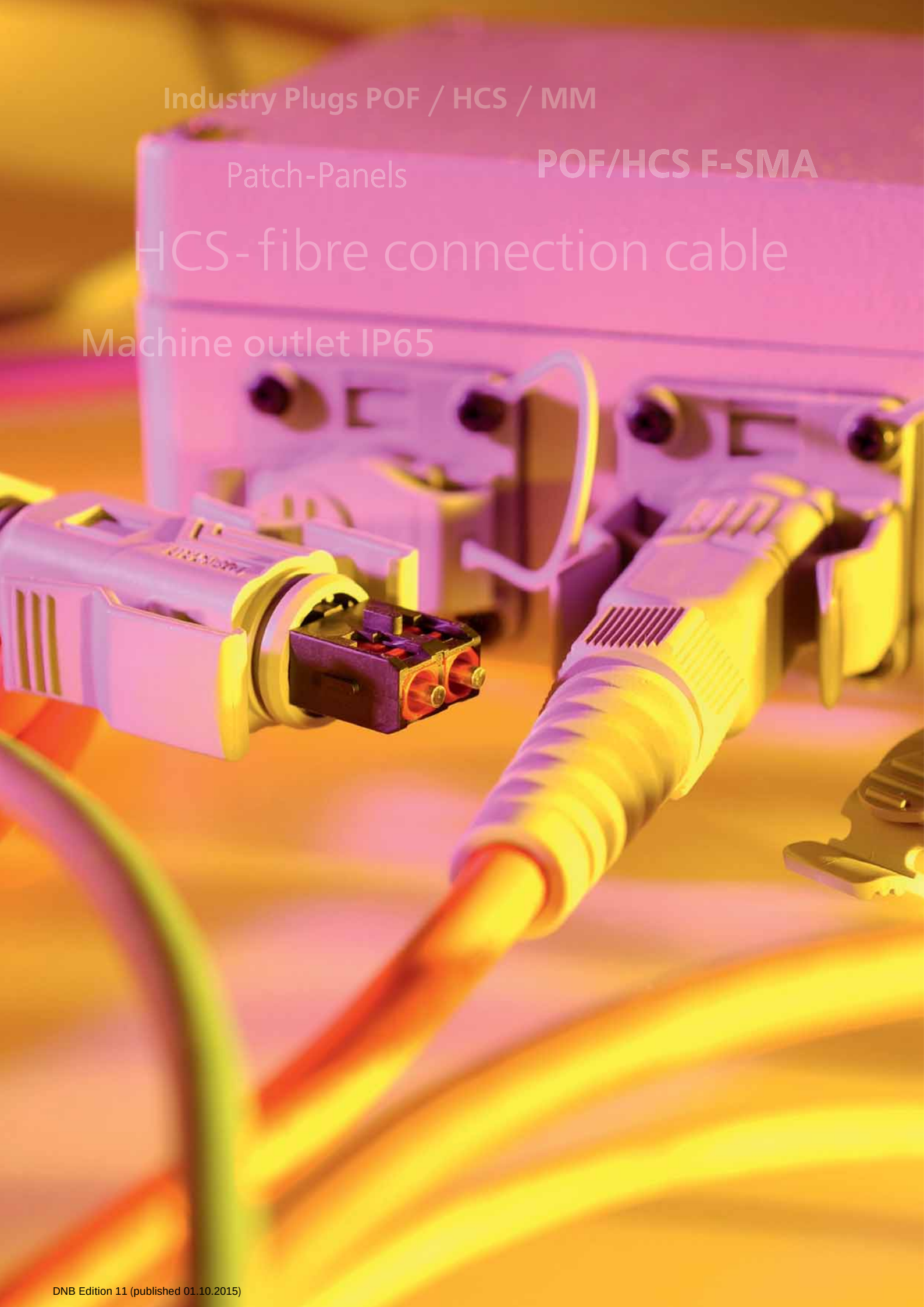
☐ **Yes**, please add my e-mail address to the HELUKABEL® mailing list.
(please check)

Want to order catalogues online?
Simply go to:
www.helukabel.de/publication-order

MTP® Systems/10.2017/2500/CP

helukabel.com

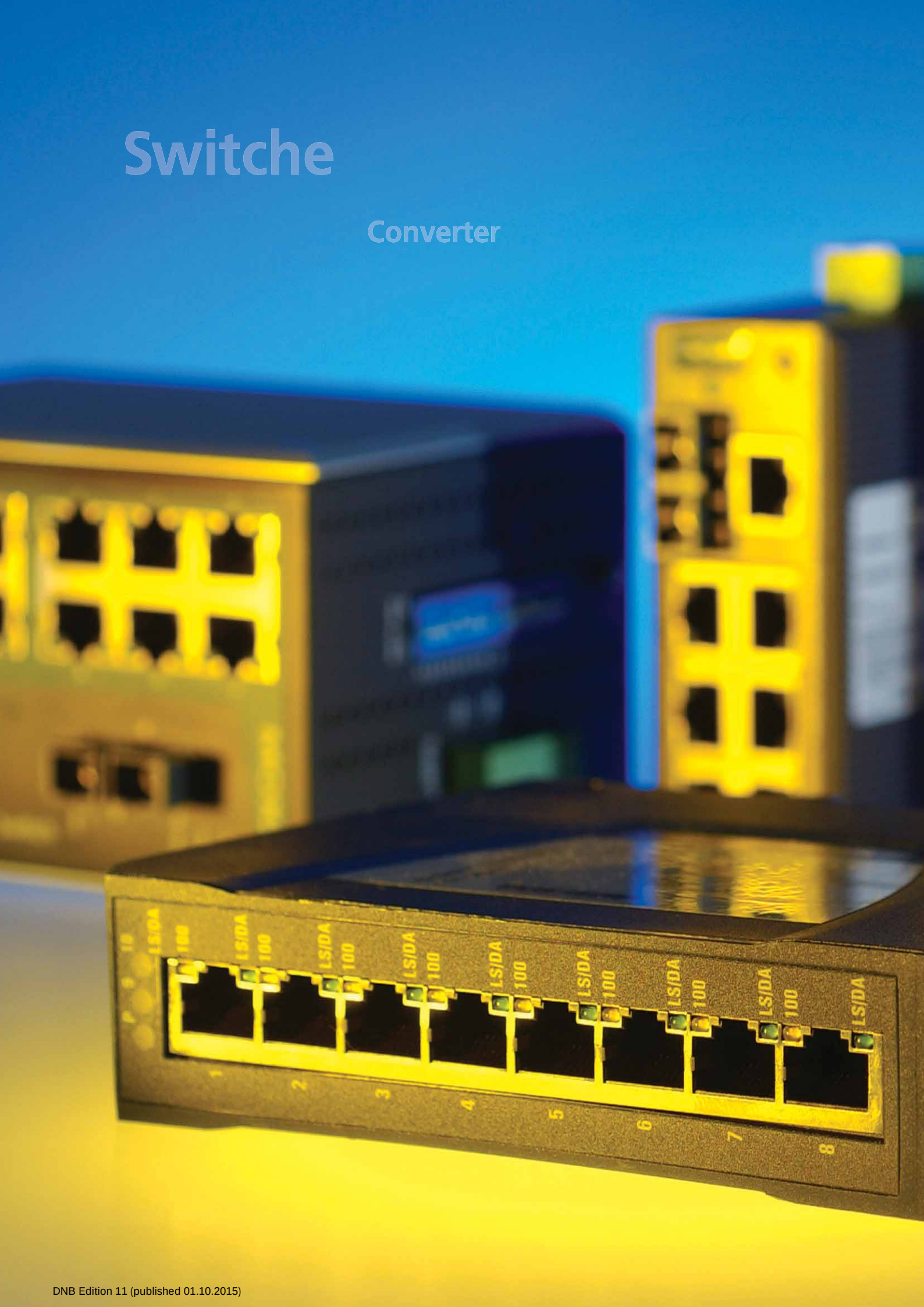
HELUKABEL® · **Headquarters** · Dieselstraße 8-12 · 71282 Hemmingen · Germany · Phone +49 7150 9209-0 · info@helukabel.de



DNB Edition 11 (published 01.10.2015)

Switche

Converter



DNB Edition 11 (published 01.10.2015)

NOTES

Technical modifications

Specifications have been carefully checked and are believed to be correct; however, no responsibility is assumed for inaccuracies. Subject to technical modifications. Consequently all illustrations, numerical data, etc. are provided without guarantee. Color deviations between photos and delivered goods cannot be avoided. Reproduction or duplication of the text and illustrations, in whole or in part, remain reserved. The transfer of copyrights always requires the written consent of HELUKABEL® GmbH. Our General Terms of Delivery and Payment, which can be viewed at www.helukabel-group.com, apply.

Length markings

The length marking, which cannot be calibrated, is an aid, e.g. for easy material allowance determination or for determination of the length remaining on the drum. Deviation of the line length shown by the marking is up to 1%. Incomplete length markings or length markings missing on sections, deviations of the cable length shown by the length marking do not substantiate any legal obligation whatsoever. Only use calibrated measurement devices to determine line length.

Safety notice

The cables and wires described in the catalog are produced in accordance with national and international standards, as well as plant standards; application safety, as stipulated in the safety directives, standards, and statutory regulations, as amended, is provided. With the prerequisite of proper and professional installation and use, the possibility of product-specific dangers can be excluded. For each product this catalog describes general information for use. Independent of the above, the applicable DIN VDE specifications apply. However, installation and processing must only be executed by qualified electricians.

Our General Terms of Delivery and Payment, which can be viewed at www.helukabel-group.com, apply

DNB Edition 11 (published 01.10.2015)

HELUKABEL®

SDZeCOM/0915/5GB/CM

HELUKABEL® GmbH · Headquarters · Dieselstrasse 8-12 · 71282 Hemmingen · Germany · Phone: +49 (0)7150 9209-0 · info@helukabel.de

DNB Edition 11 (published 01.10.2015)