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Section B – Electrical engineering

Part 6: Implementation specification for structured Ethernet cabling

The following delivery specifications of Wieland-Werke AG form part of the contract.
Any deviating specifications are to be agreed upon between the supplier/contractor and Wieland, and documented.

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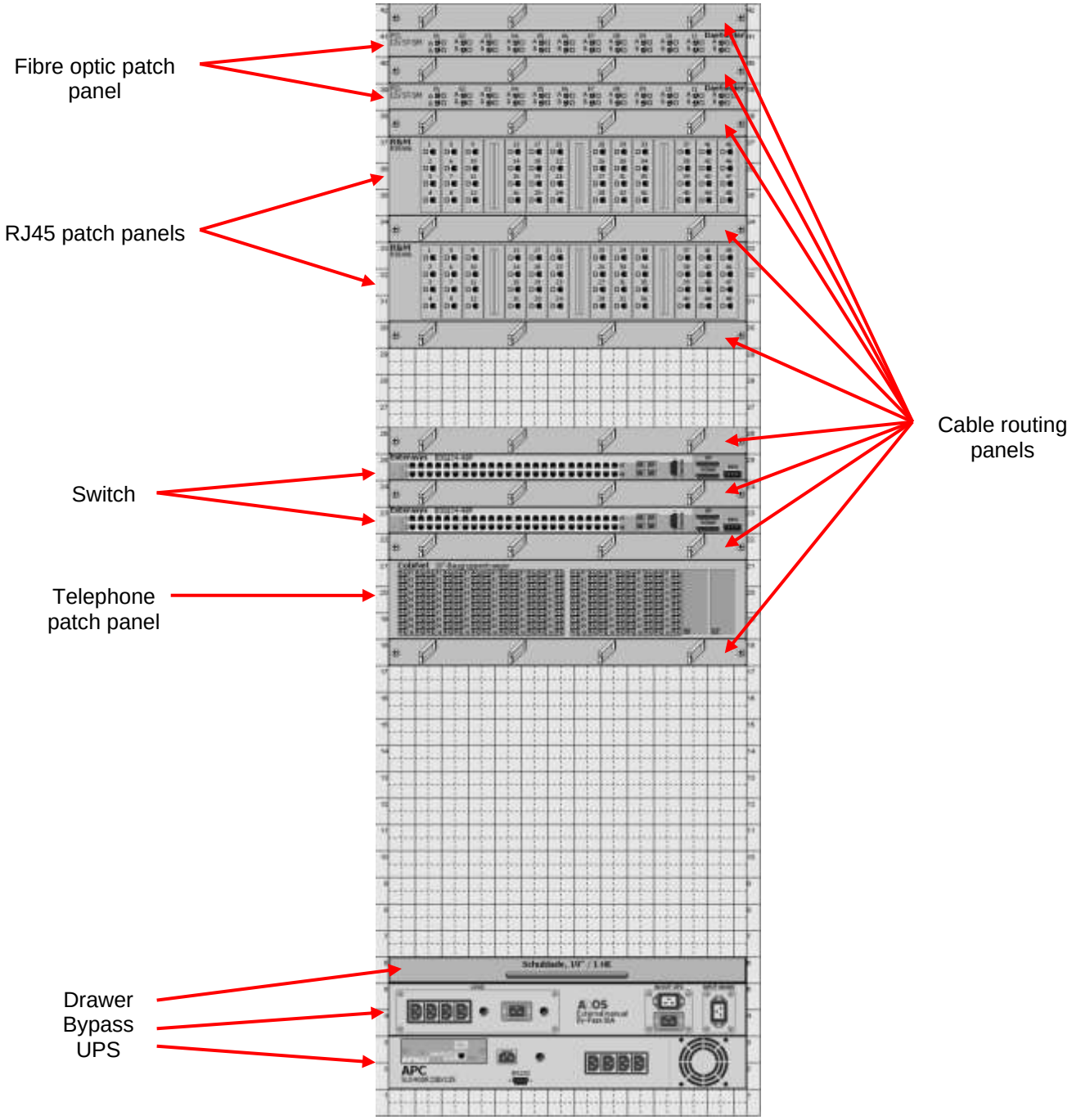
1 Components

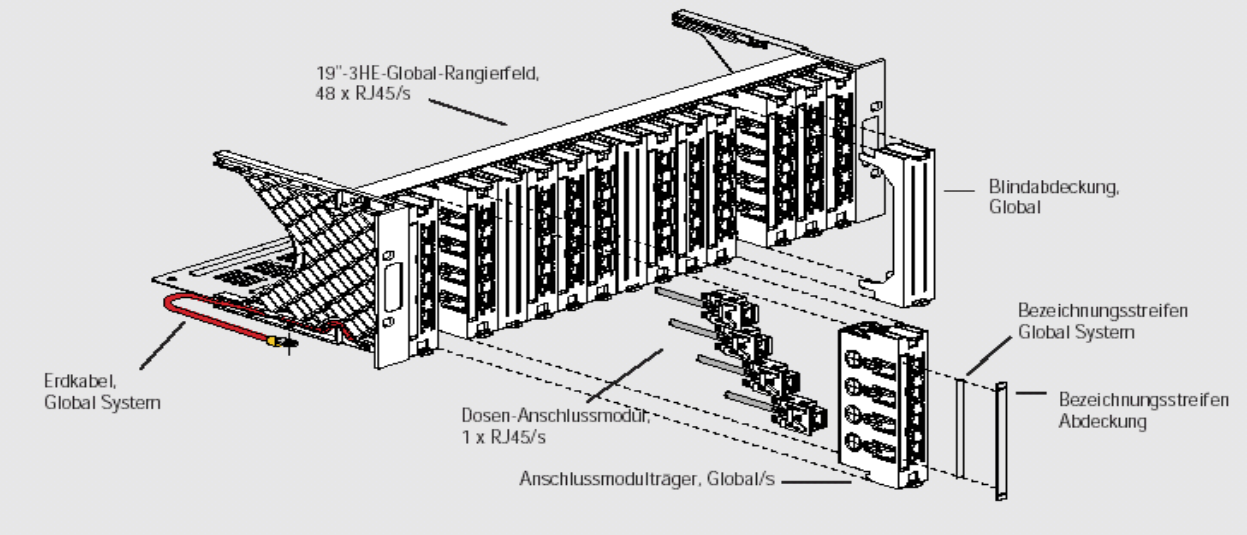
1.1 Data distributor

1.1.1 Layout



1.2 Patch panels (RJ45)

A patch panel with 48 RJ45 ports is standard.



Legend:

DE	**EN**
19"-3HE-Global-Rangierfeld, 48 x RJ45/s	19" 3U Global patch bay, 48 x RJ45/s
Erdkabel, Global System	Earth cable, Global system
Dosen-Anschlussmodule, 1 x RJ45/s	Socket connection modules, 1 x RJ45/s
Anschlussmodulträger, Global/s	Connection module carrier, Global/s
Blindabdeckung, Global	Blind cover, Global
Bezeichnungsstreifen Global System	Designation strips Global system
Bezeichnungsstreifen Abdeckung	Designation strips Cover

1.2.1 Patch panel assembly

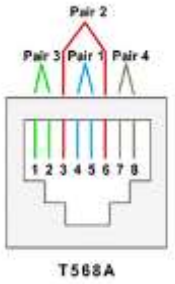
All items included in the kit must be used. The earthing kit is included. Connection module carriers and connection modules shall remain in the data distributor (cabinet).
All cables (duplex/simplex) shall be connected to connection modules and inserted into connection module carriers. Unused ports shall be provided with dust protection caps. The patch panel is always populated from left to right, consecutively from port 1 to port 48; no ports may be omitted.

1.2.2 Cable routing panels

Cable routing panels must be installed between the patch panels.

1.2.3 Patch panel pin assignment

Each connection module must be fully populated (with 8 wires).
Wiring according to EIA/TIA T568A standard.



Standard
EIA/TIA T568A

1 weiß/grün
2 grün/weiß
3 weiß/orange
4 blau/weiß
5 weiß/blau
6 orange/weiß
7 weiß/braun
8 braun/weiß

Legend:

DE	**EN**
weiß/grün	white/green
grün/weiß	green/white
weiß/orange	white/orange
blau/weiß	blue/white
weiß/blau	white/blue
orange/weiß	orange/white
weiß/braun	white/brown
braun/weiß	brown/white

1.3 Cables

1.3.1 Tertiary cabling

At Wieland, only 2 cable types are permitted for this cabling (see data sheets).
Preferably the duplex version of the EDF cable should be installed. The simplex version is used in difficult installation conditions (many corners).

In special cases, following consultation with the planning Wieland department, the 2nd cable type from R&M can be used.

1.3.2 Patch cables in the data distributor

The IT department is to be tasked with the patching.
Patch cables from Reichle & De-Massari must be used, see material list.
White patch cables shall be used.

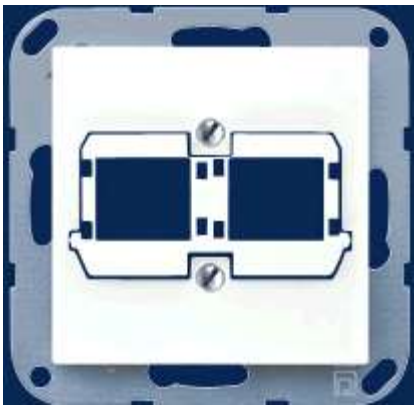
1.3.3 Device connection cables

For the device connection, the same patch cables are used as in the data distributor. If special cables are required (e.g. because the device requires special connectors), this must be agreed in advance with the IT department.

1.4 Device connection sockets / terminal outlets = TO
Only two types are permitted.

1.4.1 Socket with two 90°, RJ45 outlets

In the Ulm plant, the JUNG AS500 (alpine white) switch range is fitted:



In all other cases, unless agreed otherwise, the JUNG CD500 (white) switch range shall be fitted.

COVER PLATE JUNG 569-21 ACS (white)

1.4.2 Device connection sockets on top hat rail

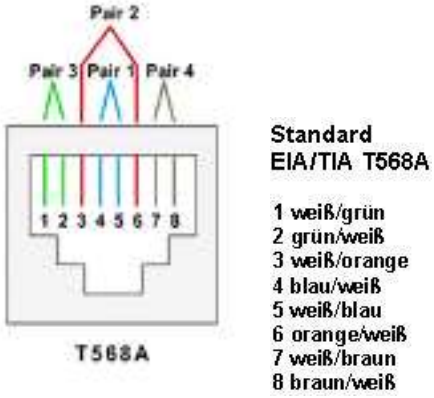
For top hat rail mounting, the DRM45 adapters from R&M (Reichle & De-Massari) are used.

As a network connection, the DRM45 adapter must always be used in pairs, as otherwise a gap has to be left at the patch panel.
However, each DRM45 adapter must be labelled individually.

A coloured hinged dust cover must always be fitted to each DRM45 adapter.
This indicates the intended use.
A white hinged dust cover must be used for network connections, and for other applications (see section 2.4.3) a brown hinged dust cover must be fitted.

1.4.3 Device socket pin assignment

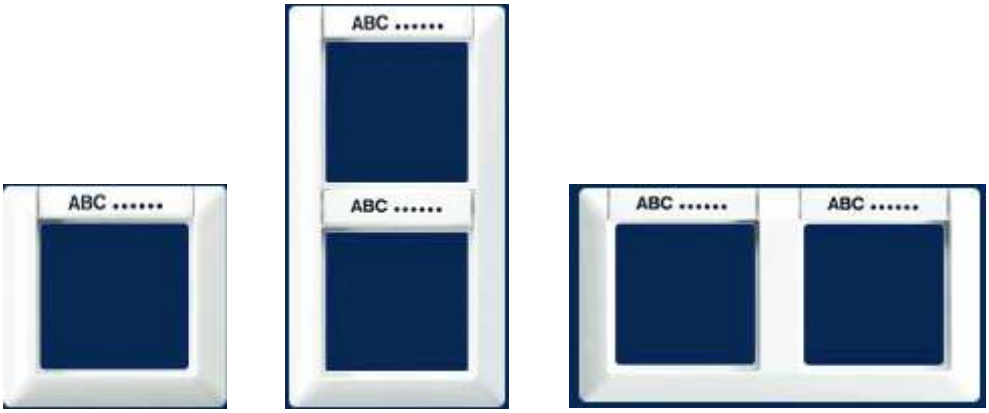
For each RJ45 outlet in a socket, the connection module must be fully populated (with 8 wires).
Wiring according to EIA/TIA T568A standard.



1.4.4 Additional components for the flush-mounted device connection sockets

Depending on the manner of installation, additional components are required.

1.4.4.1 Frames in the Ulm plant
In the Ulm plant, the JUNG AS500 (alpine white) switch range is fitted.
The matching frames with inscription field are to be used.



1.4.4.2 Frames outside the Ulm plant
In the other plants, unless agreed otherwise, the JUNG CD500 (white) switch range shall be fitted. The matching frames are to be used.

1.4.4.3 Duct installation and surface mounting

For installation in wall ducts, accessory mounting boxes are required, which depend on the duct used (see product group M773-10). For FB ducts, the BTR accessory box is used (see materials list).

For surface mounting, a surface-mounting box from Jung is used (see materials list).

2 Device labelling (device identifier)

Handwritten labels for device identifier labelling are **not** permitted.

2.1 Data distributor

2.1.1 The data distributor must be clearly marked as shown in the following example.
The Wieland standard label “cabinet (200 x 80 mm) plastic” shall be used.
For data distributor rooms, the access doors shall also be marked.

Legend:

DE	EN
Datenverteiler	Data distributor

2.2 Patch panels (RJ45)

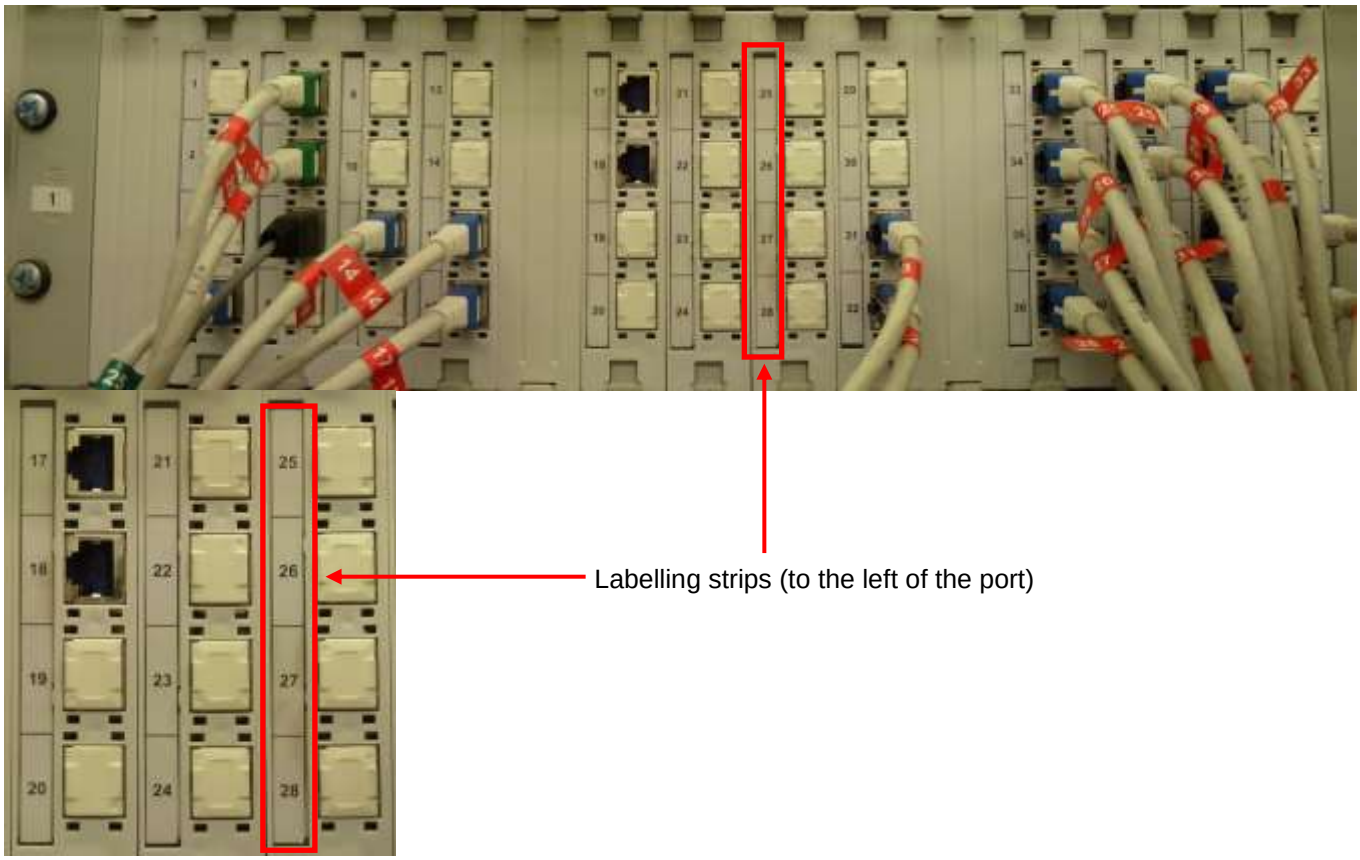
2.2.1 Identification of patch panels

Each patch panel in a data distributor is identified by a unique number.
The numbering starts at 1 with the top patch panel.

Patch panel numbering
(affix left and right)

2.2.2 Identification of ports of patch panels

The labelling is done via the labelling strips on the connection module carriers.
Wieland's labelling strips are to be used (these are available from IT).
The port numbering on the patch panel must be implemented as shown in the picture.



2.3 Cables

2.3.1 Identification of duplex and simplex cables

The permanent cabling from the data distributor to the terminal outlet shall be marked as follows: A cable tag is to be attached to each end of the cable. For duplex cables it is sufficient if the line that is connected to the odd-numbered port is provided with the cable tags.

2.3.1.1 The inscription on the cable tag at the terminal outlet consists only of the IT connection designation.

2.3.1.2 The inscription on the cable tag in the data distributor consists of the IT connection designation and the location designation of the terminal outlet.

1st line: IT connection designation: see socket designation
2nd line: Location designation

2.3.1.3 The location designation shall be in accordance with the following specification:

For office buildings: (**no** names of persons or department identifiers)

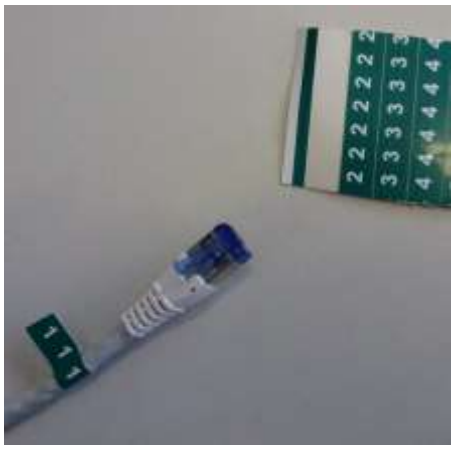
Building.Floor.Roomdesignation.Section

In the plant:

Building.Column[Switchroom/Field/Console/Plant]

2.3.2 Identification of patch cables

Patch cables inside the data distributor are provided with a connection label on both ends. This will be carried out by IT.



Patch cables that leave the data distributor (exceptional case) receive a device identifier like a simplex cable.

2.3.3 Identification of device connection cables

Patch cables for connecting devices (connection socket to device) receive – only if there is a risk of confusion – identical cable tags on both ends with the IT connection designation (see socket designation) and preceded by the network designation.

2.4 Device connection sockets / terminal outlets = TO

2.4.1 Terminal outlets always receive an IT device identifier in accordance with the IT designation system.

Patchpanel.port **Data distributor** **Patchpanel.port**

Examples:

2.4.2 For connections via the structured Ethernet cabling that are documented not only by IT but are also managed e.g. in a system documentation, and can only be identified there by a special device identifier, a plant device identifier is added to the IT device identifier.

Patchpanel.port Data distributor Patchpanel.port

Port: plant device identifier
Port: plant device identifier

2.4.3 **Please note:**
Connections that use Ethernet components but do not belong to the structured Ethernet cabling are marked separately. The connection sockets (socket to socket connection, e.g. keyboard cable extension) and cables are not intended for network technology and are not routed via data distributors. The connection sockets are given a brown frame to distinguish them from network technology or are fitted in brown surface-mounted enclosures. The connection sockets and cables must be assigned to a plant and labelled and documented in accordance with the plant-specific device identifier.

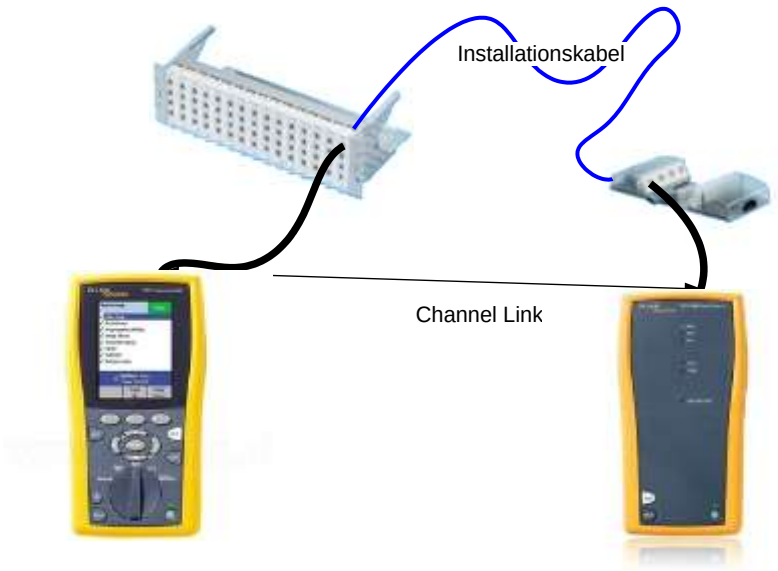
3 Acceptance measurements

An acceptance measurement must be carried out and documented for each permanently installed cable. The measurement reports are to be delivered in electronic form to the IT department.
IT releases the cable after checking the measurement reports and patches the cable according to requirements.

3.1 Measurement specifications copper

3.1.1 Measurement method

The measurement method to be used at Wieland-Werke AG is a standard-compliant channel link measurement. Compliance with class E (250 MHz) standard specifications according to DIN EN 50173-1 (ISO/IEC 11801 2nd edition) from 2003 has to be verified using this method.



Legend:

DE	**EN**
Installationskabel	Permanently installed cable
Channel Link	Channel link

3.1.2 Components for the channel link measurement

In addition to the components installed according to this code, two 5-metre patch cables are also required for the channel link measurement.
Our specified patch cables (R&M freenet realten Cat.6 S/STP) must be used for this purpose.

3.1.3 Measuring device

Wieland Werke AG accepts measurements with FLUKE measuring devices
(e.g. FLUKE DTX-1800), whose measurement results can be managed with the LinkWare™ Cable Test Management Software.

The measuring device determines the following parameters:

- Length (limit value ***90 m***)
- Propagation
- Resistance
- Next
- Attenuation
- ACR (attenuation to crosstalk loss ratio)
- Return loss
- Elfext
- Power sum next
- Power sum elfext
- Power sum ACR

The measurement results are to be saved with graph data.

3.1.4 Handover of measurement results

The measurement results are to be handed over in electronic form (.flw or .dat file) to the IT department. They shall be handed over using suitable data carriers (CD or DVD). A printout on paper is not required.

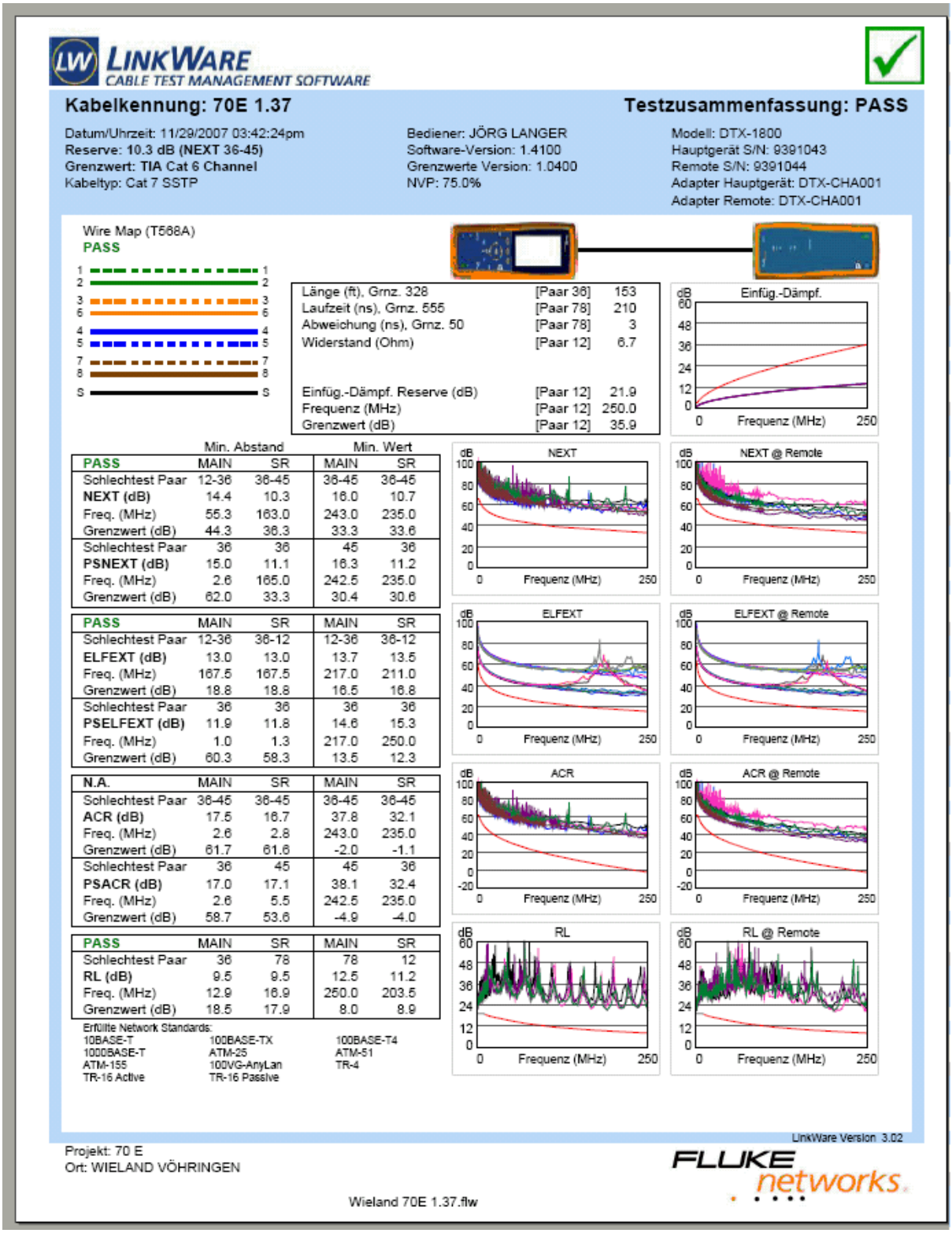
The measurement results can also be read out directly from the measuring device by our IT department.

3.2 Presentation of the measurement results

The measurement results shall be presented in the form of a test report that shall include the following information:

- As project name the data distributor designation (e.g. 70E)
- As cable identifier the cable name (e.g. 1.37 corresponds to patchpanel.port)
- The test summary
- The date and time of the measurement in European format
- The test limit value
- The cable type (alternatively the NVP value)
- The bandwidth of the measurement
- The operator name. **Note:** The operator name of the employee who appears on the test certificate is the one who assumes sole **responsibility** for the test, and therefore for all measurements that are documented on the certificate. This also applies in the event that it was not this employee who actually performed the stored measurements!
- The model of the measuring instrument
- The software version of the measuring instrument
- The serial numbers of the main and remote measuring device
- Details of the measuring adapters for the main and remote measuring device

3.2.1 Example of a test certificate



LINKWARE CABLE TEST MANAGEMENT SOFTWARE

Kabelkennung: 70E 1.37 **Testzusammenfassung: PASS**

Datum/Uhrzeit: 11/29/2007 03:42:24pm
Reserve: 10.3 dB (NEXT 36-45)
Grenzwert: TIA Cat 6 Channel
Kabeltyp: Cat 7 SSTP

Bediener: JÖRG LANGER
Software-Version: 1.4100
Grenzwerte Version: 1.0400
NVP: 75.0%

Modell: DTX-1800
Hauptgerät S/N: 9391043
Remote S/N: 9391044
Adapter Hauptgerät: DTX-CHA001
Adapter Remote: DTX-CHA001

Wire Map (T568A)
PASS

Länge (ft), Grnz. 328	[Paar 36]	153
Laufzeit (ns), Grnz. 555	[Paar 78]	210
Abweichung (ns), Grnz. 50	[Paar 78]	3
Widerstand (Ohm)	[Paar 12]	6.7
Einfüg.-Dämpf. Reserve (dB)	[Paar 12]	21.9
Frequenz (MHz)	[Paar 12]	250.0
Grenzwert (dB)	[Paar 12]	35.9

Einfüg.-Dämpf.

	Min. Abstand		Min. Wert	
PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	12-36	36-45	36-45	36-45
NEXT (dB)	14.4	10.3	16.0	10.7
Freq. (MHz)	55.3	163.0	243.0	235.0
Grenzwert (dB)	44.3	36.3	33.3	33.6
Schlechtest Paar	36	36	45	36
PSNEXT (dB)	15.0	11.1	16.3	11.2
Freq. (MHz)	2.6	165.0	242.5	235.0
Grenzwert (dB)	62.0	33.3	30.4	30.6

NEXT | NEXT @ Remote

PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	12-36	36-12	12-36	36-12
ELFEXT (dB)	13.0	13.0	13.7	13.5
Freq. (MHz)	167.5	167.5	217.0	211.0
Grenzwert (dB)	18.8	18.8	16.5	16.8
Schlechtest Paar	36	36	36	36
PSELFEXT (dB)	11.9	11.8	14.6	15.3
Freq. (MHz)	1.0	1.3	217.0	250.0
Grenzwert (dB)	60.3	58.3	13.5	12.3

ELFEXT | ELFEXT @ Remote

N.A.	MAIN	SR	MAIN	SR
Schlechtest Paar	36-45	36-45	36-45	36-45
ACR (dB)	17.5	16.7	37.8	32.1
Freq. (MHz)	2.6	2.8	243.0	235.0
Grenzwert (dB)	61.7	61.6	-2.0	-1.1
Schlechtest Paar	36	45	45	36
PSACR (dB)	17.0	17.1	38.1	32.4
Freq. (MHz)	2.6	5.5	242.5	235.0
Grenzwert (dB)	58.7	53.6	-4.9	-4.0

ACR | ACR @ Remote

PASS	MAIN	SR	MAIN	SR
Schlechtest Paar	36	78	78	12
RL (dB)	9.5	9.5	12.5	11.2
Freq. (MHz)	12.9	16.9	250.0	203.5
Grenzwert (dB)	18.5	17.9	8.0	8.9

RL | RL @ Remote

Erfüllte Network Standards:
10BASE-T, 100BASE-TX, 100BASE-T4, 1000BASE-T, ATM-25, ATM-51, ATM-155, 100VG-AnyLan, TR-4, TR-16 Active, TR-16 Passive

LinkWare Version 3.02

Projekt: 70 E
Ort: WIELAND VÖHRINGEN

FLUKE networks

Wieland 70E 1.37.flw

Legend:

DE	**EN**
Kabelkennung:	Cable ID:
Testzusammenfassung: PASS	Test Summary: PASS
Datum/Uhrzeit:	Date / Time:
Reserve:	Headroom:
Grenzwert:	Test Limit:
Kabeltyp:	Cable Type:
Bediener:	Operator:
Software-Version:	Software Version:
Grenzwerte-Version:	Limits Version:
NVP:	NVP:
Modell:	Model:
Hauptgerät:	Main S/N:
Remote S/N:	Remote S/N:
Adapter Hauptgerät:	Main Adapter:
Adapter Remote:	Remote Adapter:
Länge (ft), Grnz. 328	Length (ft), Limit 328
Paar 36	Pair 36
Laufzeit (ns), Grnz. 555	Prop. Delay (ns), Limit 555
Abweichung (ns), Grnz. 50	Delay Skew (ns), Limit 50
Widerstand (Ohm)	Resistance (ohms)
Einfüg.-Dämp. Reserve (dB)	Insertion Loss Margin (dB)
Frequenz (MHz)	Frequency (MHz)
Grenzwert (dB)	Limit (dB)
Einfüg.-Dämpf.	Insertion Loss (dB)
Frequenz (MHz)	Frequency (MHz)
Min. Abstand	Worst Case Margin
Min. Wert	Worst Case Value
PASS	PASS
MAIN	MAIN
SR	SR
Schlechtest Paar	Worst Pair
NEXT (dB)	NEXT (dB)
Freq. (MHz)	Freq. (MHz)
Grenzwert (dB)	Limit (dB)
PSNEXT (dB)	PS NEXT (dB)
ELFEXT (dB)	ACR-F (ELFEXT) (dB)
PSELFEXT (dB)	PS ACR-F (PS ELFEXT) (dB)
N.A.	N/A
ACR (dB)	ACR (dB)
PSACR (dB)	PS ACR (dB)
RL (dB)	RL (dB)
Erfüllte Network Standards:	Compliant Network Standards:

4 Installation notes

The companies or rather their employees who carry out work on the Reichle & De-Massari network cabling used by us must have a certification from Reichle & De-Massari. If this is not case, no work of any kind may be carried out on the system.

4.1 Points that must be observed when laying and connecting cables:

The aluminium foil shielding of the single pairs should be brought as close as possible to the connection point. This considerably improves the NEXT values.

Tight bending radii should be avoided as far as possible (higher attenuation values).

The port with the low (odd) number should be placed on the left-hand side of the device connection sockets.

When installing device connection sockets, make sure there is enough space to plug in device connection cables.

A power outlet / network socket combination is not permitted.

The shielding plate of the DRM45 top hat rail adapter must be removed if it is connected to a data distributor.

5 Cable data sheets

5.1 Data sheet for the EDF cable (duplex CAT7 copper)

	No.:05-08/07 SCH	
Technisches Datenblatt	page:	Seite 1 von 3
Technical Data sheet	Date: 27.05.08	

Datenkabel massiv

STP-C KAT. 7 1000 MHz 4x2xAWG 23/1 LSOH

Aufbau		**Construction**	
Leiter	Cu 0,57mm, blank	Conductor	Co 0,57mm, bare
Isolation	SFS-PE geschäumt	Insulation	SFS-PE
Aderdurchmesser	1,37 ± 0,02 mm	Diameter	1,37 ± 0,02 mm
Farbcode	IEC 708-1	Colour code	IEC 708-1
Paarschirmung	Aluverbundfolie	Shielding Pairs	Plastic laminated aluminium foil
Schirmung	Kupfergeflecht Mehrfachdraht 0,10 vz Bedeckung ca. 60%	Shielding	Copper Wire 0,10 ; optical coverage app. 60%
Außenmantel	halogenfreie Mischung (FRNC) gem. IEC 60332-3	Jacket	Halogen free compound
Mantelfarbe	gelb, RAL 1016	Colour	gelb, RAL 1016
Außendurchmesser	7,6 ± 0,2 mm	Diameter	7,6 ± 0,2 mm
Eigenschaften		**Data**	
Schleifenwiderstand	max. 150 Ohm / km nach VDE 0812	Loop resistance	max. 150 Ohm / km
Isolationswiderstand	min. 5 GOhm x km bei +20°C	Insulation resistance	min. 5 GOhm x km at +20°C
Betriebskapazität	nom. 45nF / km	Operating capacity	nom. 45nF / km
Prüfspannung	700 V / AC	Test voltage	700V / AC
Wellenwiderstand bei 100MHz	100 Ohm ± 5 Ohm	Char. Impedance at 100MHz	100 Ohm ± 5 Ohm
Ausbreitungs-geschwindigkeit	ca. 0,78 c	Velocity of propagation	app. 0,78 c
Schirmdämpfung bis 600 MHz	> 55 dB	Screening attenuation to 600 MHz	> 55 dB
Temperaturbereich		Temperature range	
ruhend	-20°C bis +60°C		-20°C to +60°C
bewegt	0°C bis +50°C		0°C to +50°C
Zul. Biegeradius	8 x Außendurchmesser bei Installation 4 x Außendurchmesser nach Installation	Bending radius	8 x diameter during installation 4 x diameter fixed
max. Zugkraft	110N	max. tractive force	110N

Legend:

DE	**EN**
Datenkabel massiv	Solid data cable

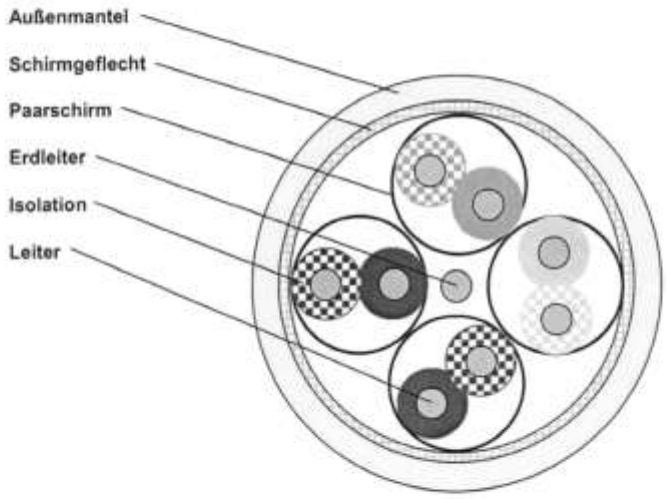
	No.: 05-08/07SCH	
Technisches Datenblatt	page:	Seite 2 von 3
Technical Data sheet	Date: 27.05.08	

Übertragungseigenschaften/ Transmission Performance:

f in MHz	Dämpfung/ Attenuation (dB/100m) nom.	NEXT (dB) nom.	ACR (dB/100m) nom.	ELFEXT (dB/100m) nom.	RL (dB) nom.
1	1,8	100	98,2	95	25
4	3,3	100	96,7	93	28
10	5,3	100	94,7	92	30
16	6,7	100	93,3	91	30
20	7,5	100	92,5	90	30
31,25	9,6	100	90,4	86	30
100	17,3	98	80,7	77	28
200	24,8	95	70,2	70	26
300	30,7	93	62,3	67	24
600	44,2	85	40,8	60	23
800	50,8	80	29,2	56	22
900	56,0	78	22,0	53	21
1000	59,0	75	16,0	50	20

Die angegebenen Werte sind typische Messwerte

Aufbau schematisch:



Legend:

DE	**EN**
Die angegebenen Werte sind typische Messwerte	The values indicated are typical measured values
Aufbau schematisch:	Schematic structure:
Außenmantel	Outer sheath
Schirmgeflecht	Braided shield
Paarschirm	Pair shield
Erdleiter	Earth conductor
Isolation	Insulation
Leiter	Conductor

	No.: 05-08/07SCH		
Technisches Datenblatt	page:	Seite 3 von 3	
Technical Data sheet	Date: 27.05.08		

Anwendungsgebiete:

IEEE 802.3: 10Base-T; 100Base-T; 1000Base-T; 10GBase-T
IEEE 802.5 : ISDN ; FDDI ; ATM

Normen:

EN 50288-4-1 ; EN 50173 ; ISO/IEC 11801 2. Ausgabe ; IEC 61156-5

Legend:

DE	**EN**
Anwendungsgebiete:	Application areas:
Normen:	Standards:

5.2 Data sheet for the R&M cable (Cat.7, copper)

R&M
Convincing cabling solutions

R35060 Installationskabel Real10 Kat.7, S/FTP, 4P, 1000 MHz, LSFRZH, 500 m

020.0983 Abbildung ähnlich

Beschreibung

Real10 Kat.7, S/FTP Kabel. Folienschirmung paarweise und verzinntes Kupfergeflecht. 100 Ohm Impedanz. Datenübertragungsfrequenz bis zu 1000 MHz.

Gewicht

64.334 G

Technische Daten

Standardisierung (Norm)	ISO/IEC 11801 Ausgabe 2.2; IEC 61156-5 2nd Ed.; EN 50173-1; EN 50288-4-1
Kategorie	Real10 Kat.7
Kabelklasse	Installationskabel
Cu Abschirmung Kabel	S/FTP
Faser- / Aderanzahl	8
Verseilung	4P
Kabel Aussendurchmesser	Ø 7.8 mm
Faser- / Aderdurchmesser	AWG23
Länge (Meter)	500
Kabelmantel Material	LSFRZH
Kabelmantel Eigenschaften	Kabel metallfrei
Kabelmantel Eigenschaften	Halogenfrei
Kabelmantel Eigenschaften	Flammwidrig
Kabelschutz	kein Schutz
Farbencode RAL	7035
Farbe	lichtgrau
Versandgewicht	64.334
Versandgewicht Einheit	G

Ausschreibungstext

Installationskabel, S/FTP, 4P, LSFRZH, Real10 Kat.7, bis 1000 MHz
Paargeschirmtes 100 Ohm Installationskabel mit Gesamtgeflechtschirm, geeignet für Übertragungsfrequenzen bis zu 1000 MHz, (AWG 23). Erfüllt die Normen ISO/IEC 11801 Ausgabe 2.2, EN 50173-1: Mai 2011 (DIN EN 50173-1), IEC 61156-5 2nd Ed., EN 50288-4-1, 10GBase T nach IEEE 802.3an: Juni 2006, geprüft und zertifiziert durch unabhängiges Labor. Geprüft im Rahmen der dauerhaften Qualitätskontrolle des "GHMT PREMIUM Verification Program" mit Zertifikat und Prüfbericht in deutscher Schrift nach DIN EN ISO/IEC 17025. Raucharm nach IEC 61034, flammwidrig nach IEC 60332-3 und halogenfrei nach IEC 60754-2. Aussenmantel Farbe Grau RAL 7035.

Legend:

DE	**EN**
Installationskabel Real10 Kat.7, S/FTP, 4P, 1000 MHz, LSFRZH, 500m	Installation cable Real10 Cat.7, S/FTP, 4P, 1000 MHz, LSFRZH, 500 m
Abbildung ähnlich	Similar to picture
Beschreibung	Description
Real10 Kat.7, S/FTP Kabel. Folienschirmung paarweise und verzinntes Kupfergeflecht. 100 Ohm Impedanz. Datenübertragungsfrequenz bis zu 1000 MHz.	Real10 Cat.7, S/FTP cable. Foil shielding in pairs and tinned copper braid. 100 ohms impedance. Data transmission frequency up to 1000 MHz.
Gewicht 64.334 G	Weight 64.334 g
Technische Daten	Specifications
Standardisierung (Norm)	Standard
ISO/IEC 11801 Ausgabe 2.2; IEC 61156-5 2nd Ed.; EN 50173-1; EN 50288-4-1	ISO/IEC 11801 edition 2.2; IEC 61156-5 2nd ed.; EN 50173-1; EN 50288-4-1
Kategorie	Category
Real10 Kat.7	Real10 Cat.7
Kabelklasse	Cable class
Installationskabel	Installation cable
Cu Abschirmung Kabel	Cu shielding cable
S/FTP	S/FTP
Faser- / Aderanzahl	Number of fibres/cores
Verseilung	Stranding
4P	4P
Länge (Meter)	Length (metres)
Kabelmantel Material	Cable jacket material
LSFRZH	LSFRZH
Kabelmantel Eigenschaften	Cable jacket characteristics
Kabel metallfrei	Cable metal-free
Halogenfrei	Zero-halogen
Flammwidrig	Flame retardant
Kabelschutz	Armour
kein Schutz	No protection
Farbencode RAL	RAL colour code
Farbe	Colour
Versandgewicht	Shipping weight
64.334	64,334
Versandgewicht Einheit	Shipping weight unit
G	g
Ausschreibungstext	Tender text
Installationskabel, S/FTP, 4P, LSFRZH, Real10 Kat.7, bis 1000 MHz	Installation cable, S/FTP, 4P, LSFRZH, Real10 Cat.7, up to 1000 MHz
Paargeschirmtes 100 Ohm Installationskabel mit Gesamtgeflechtschirm, geeignet für Übertragunsfrequenzen bis zu 1000 MHz, (AWG 23). Erfüllt die Normen ISO/IEC 11801 Ausgabe 2.2, EN 50173-1: Mai 2011 (DIN EN 50173-1), IEC 61156-5 2nd Ed., EN 50288-4-1, 10GBast T nach IEEE 802.3an: Juni 2006, geprüft und zertifiziert durch unabhängiges Labor. Geprüft im Rahmen der dauerhaften Qualitätskontrolle des „GHMT PREMIUM Verification Program“ mit Zertifikat und Prüfbericht in deutscher Schrift nach DIN EN ISO/IEC 17025. Raucharm nach IEC 60134, flammwidirg nach IEC 60332-3 und halogenfrei nach IEC 60754-2. Aussenmantel Farbe Grau RAL 7035.	Pair-shielded 100 Ohm installation cable with overall braided screen, suitable for transmission frequencies of up to 1000 MHz, (AWG 23). Compliant with standards ISO/IEC 11801 ed. 2.2, EN 50173-1: May 2011 (DIN EN 50173-1), IEC 61156-5 2nd ed., EN 50288-4-1, 10GBASE-T in acc. with IEEE 802.3an: June 2006, tested and certified by independent laboratory. Tested with permanent quality control under the “GHMT PREMIUM Verification Program” with certificate and test report in German in accordance with DIN EN ISO/IEC 17025. Low-smoke in acc. with IEC 61034, flame-retardant in acc. with IEC 60332-3 and halogen-free in acc. with IEC 60754-2. Outer jacket colour grey, RAL 7035.
Technische Änderungen vorbehalten.	Subject to technical changes.

6 Materials list

Wieland Article no.	Description	Manufacturer Article no.
	Patch panels	
176320013	Patch panel R&M 19" 48xRJ45S CAT6	R302360
173705057	Cable routing panel R&M 1U chrome steel	RD-924007-01
	Cable for fixed installation	
173707020	Data cable duplex CAT7 2x 4x2x0.6	EDF
173707030	Data cable simplex CAT7 4x2x0.6	EDF
	Installation cable Real10 Cat.7	R35060
	Patch cable (R&M freenet realten Cat.6 S/STP)	
176320011	Patch cable R&M 2xRJ45 CAT6 1.5m	R302333
176320023	Patch cable R&M 2xRJ45 CAT6 2.0m	R302334
176320037	Patch cable R&M 2xRJ45 CAT6 3.0m	R302335
176320042	Patch cable R&M 2xRJ45 CAT6 5.0m	R302336
176320056	Patch cable R&M 2xRJ45 CAT6 7.5m	R302337
176320068	Patch cable R&M 2xRJ45 CAT6 10.0m	R302338
	Device connection socket 2x90° RJ45	
176320099	Single module R&M 1xRJ45 CAT6E	R302372
176320065	Module holder R&M 2xRJ	R7310
	Device connection socket on top hat rail	
176320100	Adapter R&M DRM45 for top hat rail	R314000
176320099	Single module R&M 1xRJ45 CAT6E	R302372
176320020	Hinged dust cover R&M brown	R305687
176320025	Hinged dust cover R&M white	R305693

Wieland Article no.	Description	Manufacturer Article no.
	Switch range for ULM	
176320017	Cover plate Jung A569-21ACS WW 2xRJ45R&M	
176320180	Frame single Jung AS581NAWW with inscription field.	
176320125	Frame double Jung AS582NAWW, with inscription field.	
176320145	Frame double Jung AS5820NAWW horizontal, with inscription field.	
176320017	Cover plate Jung A569-21ACS WW 2xRJ45R&M	
	Switch range outside ULM	
176320010	Frame single Jung CD581W	
176315200	Frame double Jung CD582W	
176315300	Frame triple Jung CD583W	
173705059	Frame single Jung CD581BR (brown)	
	Duct installation	
078625850	Device installation socket BTR for data connection socket	
	Surface mounting	
173705051	Surface-mounting box single Jung CD581A-W	