



## ■ Data, Network & Bustechnology

# HELUKABEL CC-Link Certified Cables

The HELUKABEL GmbH provides you with all cable types for your CC-Link network, approved by the CLPA organization. In addition to the classical red 3-cored CC-Link cable, there are now various approved versions for CC-Link IE available. Different application areas are:

### CC-Link

Type	Part no.	Application
HELUKABEL CC-Link BUS	800497	fixed installed, random movement

### CC-Link IE

Type	Part no.	Application
HELUKAT 200 4x2xAWG24/1 PVC	81610	fixed installed, Cat5e
HELUKAT 500IND 4x2xAWG22/1 PVC	803693	fixed installed, Cat6A
HELUKAT 600 4x2xAWG23/1 FRNC	80810	halogen-free, fixed installed, Cat7e
HELUKAT 600IND 4x2xAWG23/1 PUR	801197	oil-resistand, halogen-free, fixed installed, Cat7e
HELUKAT 600S PUR	805614	dragchain, oil-resistand, halogen-free, Cat7

For further technical information, please read the following data sheets. We look forward to your request and remain available for any further questions.

Your contact partner:

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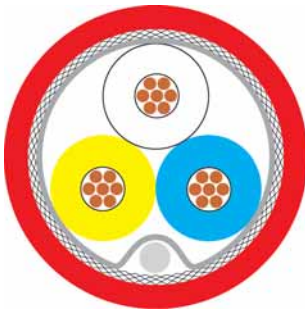


# BUS Cables

CC-Link BUS fixed installed

**HELUKABEL®**

PVC



## Type

### Cable structure

Inner conductor diameter:  
Core insulation:  
Core colours:  
Stranding element:  
Separator:  
Shielding 1:  
Total shielding:  
Drain wire:  
Outer sheath material:  
Cable external diameter:  
Outer sheath colour:

## Fixed installation, indoor

### 3x0.5 mm<sup>2</sup>

Copper, bare (AWG 20/7)  
Foam-skin-PE  
wh, bu, ye  
Triple core  
Polyester foil over stranded bundle  
Al-Foil  
Cu braid, tinned  
yes  
PVC  
app. 7,7 mm ± 0,3 mm  
Red

## Electrical data

Characteristic impedance: 110 Ohm ± 15 Ohm  
Conductor resistance, max.: 37,8 Ohm/km  
Insulation resistance, min.: 10 GOhm x km  
Loop resistance: 75 Ohm/km max.  
Mutual capacitance: 60 nF/km nom.  
Test voltage: 2 kV  
Attenuation: 1 MHz < 16,0 dB/100m  
5 MHz < 35,0 dB/100m

## Technical data

Weight: app. 77 kg/km  
bending radius, repeated: 120 mm  
Operating temperature range min.: -40°C  
Operating temperature range max.: +75°C  
Caloric load, approx. value: 1,10 MJ/m  
Copper weight: 40,00 kg/km

## Norms

Applicable standards: CC-Link Specification 1.10  
Flame-retardant acc. to EN 50265-2-1  
UL Style: CM 75°C or PLTC  
CSA standard: CSA FT 4

## Application

HELUKABEL® CC-Link Bus PVC for fixed installation. The primary market is Asia, but the USA and the United Kingdom are using CC-Link increasingly. The cable has the appropriate approvals for these markets. A version with power supply conductors is optionally available. It is used particularly in channels.

## Part no.

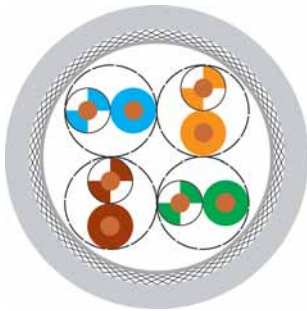
**800497**, CC-Link communications cable

Dimensions and specifications may be changed without prior notice.

# LAN Cable

Category 5e

**HELUKAT® 200**  
SF/UTP



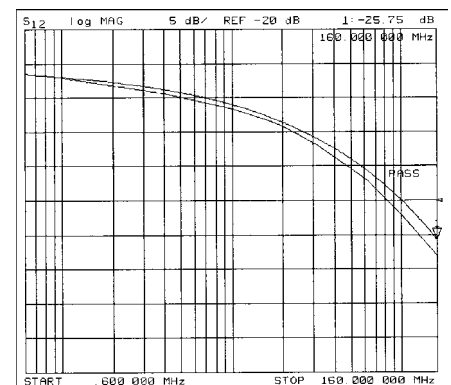
## Cable structure

Inner conductor Ø: 0,51 mm  
 Conductor material: Copper, bare  
 Core insulation: Foam-skin-PE  
 Core colours: whbu/bu, whog/og, whgn/gn, whbn/bn  
 Separator: -  
 Screen over stranding element: -  
 Screen 1 over stranding: Al-Foil  
 Screen 2 over stranding: Cu braid  
 Outer sheath material: PVC / FRNC  
 Outer diameter: app. 6,0 mm / app. 6,0 mm  
 Outer sheath colour: Grey similar to RAL 7035

## SF/UTP 4x2xAWG 24/1 PVC

## Electrical data

Characteristic impedance: 100 Ohm ± 15 Ohm at 1 to 100 MHz  
 100 Ohm ± 20 Ohm at 101 to 200 MHz  
 Loop resistance: 185 Ohm/km max.  
 Mutual capacitance: 48 nF/km nom.  
 Rel. propagation velocity: 74 %



## Typical values

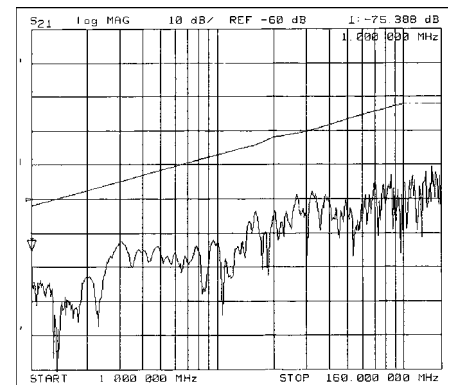
Frequency (MHz)	10	16	62,5	100	200
Attenuation (dB/100m)	5,6	7,2	14,4	18,2	25,9
Next (dB)	62,0	59,0	50,0	46,0	40,0
ACR (dB)	56,4	51,8	35,6	27,8	14,6

## Technical data

Weight: app. 50 kg/km  
 bending radius, repeated: 52 mm  
 Operating temperature range min.: -20°C  
 Operating temperature range max.: +60°C  
 Caloric load, approx. value: 0,60 MJ/m / 0,48 MJ/m  
 Copper weight: 28,00 kg/km

## Norms

81610:  
 Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e  
 81609:  
 Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 5e, 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



## Application

HELUKAT®200 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, 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.

**81610**, SF/UTP 4x2xAWG 24/1 PVC (S-FTP)

**81609**, SF/UTP 4x2xAWG 24/1 FRNC (S-FTP)

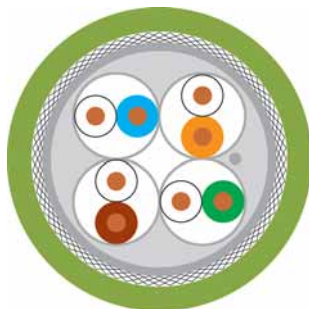
Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

10GIG

**HELUKAT® 500IND**

S/FTP, Category 6A



## Type

### Cable structure

Inner conductor diameter:  
Core insulation:  
Core colours:  
Stranding element:  
Separator:  
Inner sheath material:  
Shielding 1:  
Total shielding:  
Drain wire:  
Outer sheath material:  
Cable external diameter:  
Outer sheath colour:

## Industrial Area

### S/FTP 4x2xAWG 22/1

Copper, bare (AWG 22/1)  
Foam-skin-PE  
wh/bu, wh/og, wh/gn, wh/bn  
Double core  
-  
FRNC  
Al-Foil  
AL-Foil + braid  
yes  
PVC  
app. 9,6 mm ± 0,3 mm  
Green similar to RAL 6018

## Electrical data

Characteristic impedance:  
Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Mutual capacitance:  
Test voltage:  
Relative propagation velocity:

100 Ohm ± 15 Ohm at 1 to 100 MHz  
100 Ohm ± 20 Ohm at 101 to 500 MHz  
59 Ohm/km  
0,5 GOhm x km  
118 Ohm/km max.  
72 nF/km nom.  
0,7 kV  
62 %

## Typical values

Frequency (MHz)	10	16	62,5	100	250	500
Attenuation (dB/100m)	5,9	7,5	15,0	19,1	31,1	45,3
Next (dB)	60,3	57,2	48,4	45,3	39,3	34,8
PSNext (dB)	57,3	54,2	45,4	42,3	36,3	31,8

## Technical data

Weight: app. 115 kg/km  
bending radius, repeated: 80 mm  
Operating temperature range min.: -20°C  
Operating temperature range max.: +60°C  
Caloric load, approx. value: 1,63 MJ/m  
Copper weight: 44,00 kg/km

## Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6A, CMG FT4

## Application

HELUKAT® 500IND was designed specially for extreme industrial applications for fixed installation. The copper data cable is especially well-suited for **Category 6A 10 Gigabit/500MHz (IEC 61156-5)** Ethernet applications. It guarantees excellent transmission characteristics and may be used even under the harshest conditions.

## Part no.

**803693**, INDUSTRIAL ETHERNET KAT.6A 10GIG PVC

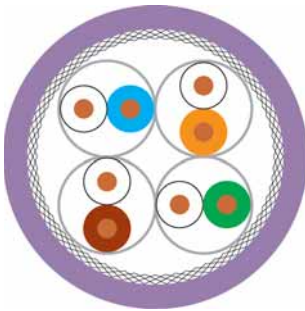
Dimensions and specifications may be changed without prior notice.

# LAN Cable

Category 7e

**HELUKAT®** 600

S/FTP



## Cable structure

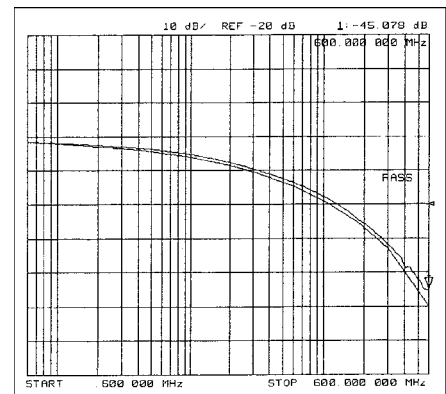
Inner conductor Ø:  
Conductor material:  
Core insulation:  
Core colours:  
Separator:  
Screen over stranding element:  
Screen 1 over stranding:  
Screen 2 over stranding:  
Outer sheath material:  
Outer diameter:  
Outer sheath colour:

## S/FTP 4x2xAWG 23/1 FRNC

0,57 mm  
Copper, bare  
Foam-skin-PE  
wh/bu, wh/og, wh/gn, wh/bn  
-  
Al-Foil  
Cu braid  
-  
FRNC  
app. 7,5 mm  
Blue Lilac similar to RAL 4005

## Electrical data

Characteristic impedance: 100 Ohm ± 15 Ohm at 1 to 100 MHz  
100 Ohm ± 20 Ohm at 101 to 1000 MHz  
Loop resistance: 169 Ohm/km max.  
Mutual capacitance: 43 nF/km nom.  
Rel. propagation velocity: 79 %



## Typical values

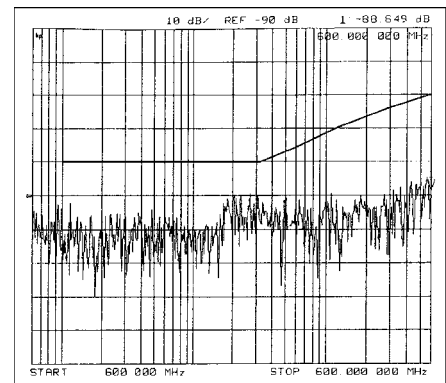
Frequency (MHz)	10	16	62,5	100	200	300	600	900	1000
Attenuation (dB/100m)	5,6	7,1	13,9	17,5	25,2	32,1	44,9	55,0	58,0
Next (dB)	100,0	100,0	96,0	94,0	88,0	84,0	73,0	71,0	69,0
ACR (dB)	94,4	92,9	82,1	76,5	62,8	51,9	28,1	16,0	9,0

## Technical data

Weight: app. 60 kg/km  
bending radius, repeated: 60 mm  
Operating temperature range min.: -20°C  
Operating temperature range max.: +60°C  
Caloric load, approx. value: 0,60 MJ/m  
Copper weight: 28,00 kg/km

## Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e, 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



## Application

HELUKAT®600 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, 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.

**80810**, S/FTP 4x2xAWG 23/1 FRNC (S-STP)

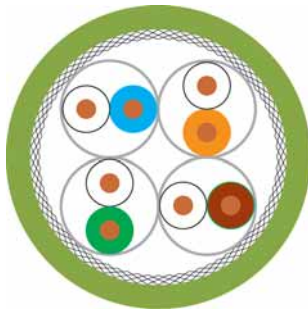
Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

**ROBUST**

**HELUKAT® 600IND**

S/FTP, Category 7e



## Type

### Cable structure

Inner conductor diameter:  
Core insulation:  
Core colours:  
Stranding element:  
Separator:  
Shielding 1:  
Screen 1 over stranding:  
Screen 2 over stranding:  
Outer sheath material:  
Cable external diameter:  
Outer sheath colour:

## Industrial Area

### S/FTP 4x2xAWG 23/1 PUR

Copper, bare (AWG 23/1)  
Foam-skin-PE  
wh/bu, wh/og, wh/gn, wh/bn  
Double core  
-  
Al-Foil  
Cu braid  
-  
PUR  
app. 7,8 mm  
Green similar to RAL 6018

## Electrical data

Characteristic impedance: 100 Ohm  $\pm$  15 Ohm at 1 to 100 MHz  
100 Ohm  $\pm$  20 Ohm at 101 to 1200 MHz  
Loop resistance: 149 Ohm/km max.  
Mutual capacitance: 43 nF/km nom.  
Relative propagation velocity: 77 %

## Typical values

frequency (MHz)	10	16	62,5	100	250	350	600	900	1000	1200
attenuation (db/100m)	5,6	7,0	13,8	17,6	28,3	34,0	45,2	57,1	60,8	66,0
next (db)	95,0	95,0	89,0	87,0	82,0	79,0	74,0	70,0	66,0	63,0
ACR (db)	89,4	88,0	75,2	69,4	53,7	43,0	27,8	13,9	5,2	-3,0

## Technical data

Weight: app. 68 kg/km  
bending radius, repeated: 78 mm  
Operating temperature range min.: -40°C  
Operating temperature range max.: +80°C  
Caloric load, approx. value: 0,74 MJ/m  
Copper weight: 34,00 kg/km

## Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 7e, Flame-retardant acc. to IEC 60332-1-2, Halogen-free acc. to 60754-2, Oil-resistant

## Application

HELUKAT® 600IND Category 7e Robust is used for harsh industrial environments. Mechanically, this product exhibits excellent resistance to mineral oils, greases and cooling lubricants and has good microbe and hydrolysis resistance. Electrically, this cable is characterized by high reserve capacity and outstanding performance. This allows you to create services such as Gigabit Ethernet, Fast Ethernet, Ethernet, ATM155, FDDI, Token Ring 4/16 Mbit/s or ISDN without difficulty. These cables considerably exceed the requirement for compliance with Class B interference emission to EN55022, as well as interference immunity to EN55024. This gives the series outstanding EMC characteristics.

## Part no.

**801197**, S/FTP 4x2xAWG 23/1 PUR (S-STP)

Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

Drag Chain

**HELUKAT® 600S**

SF/FTP, Category 7

NEW



## Cable structure

Inner conductor Ø:	0,6 mm
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:	Cu braid
Outer sheath material:	PUR
Outer diameter:	app. 8,7 mm
Outer sheath colour:	Green similar to RAL 6018

## SF/FTP 4x2xAWG 24/7 (stranded) PUR

## Electrical data

Characteristic impedance:	100 Ohm ± 15 Ohm at 1 to 100 MHz 100 Ohm ± 20 Ohm at 101 to 600 MHz
Loop resistance:	175 Ohm/km max.

## Typical values

frequency (MHz)	10	16	62,5	100	200	300	600
attenuation (db/100m)	6,7	8,5	17,4	22,1	31,6	39,2	57,4
next (db)	78	78	75,5	72,4	67,9	65,2	60,7
ACR (db)	71,3	69,5	58,1	50,3	36,3	26	3,3

## Technical data

Weight:	app. 95 kg/km
bending radius, repeated:	131 mm
Operating temperature range min.:	-30°C
Operating temperature range max.:	+70°C
Copper weight:	46,00 kg/km

## Norms

Acc. to ISO/IEC 11801, Acc. to EIA/TIA 568-A, Category 7, Flame-retardant acc. to IEC 60332-1-2, Halogen-free acc. to 60754-2, Oil-resistant, CMX 75°C (shielded)

## Application

HELUKAT® 600S Category 7 Trailing Cable is designed for use in cable carriers and the recurring loads caused by moving machine components. It provides excellent transmission characteristics under extremely difficult conditions.

## Part no.

**805614**, SF/FTP 4x2xAWG 24/7 PUR

Dimensions and specifications may be changed without prior notice.