

Data sheet

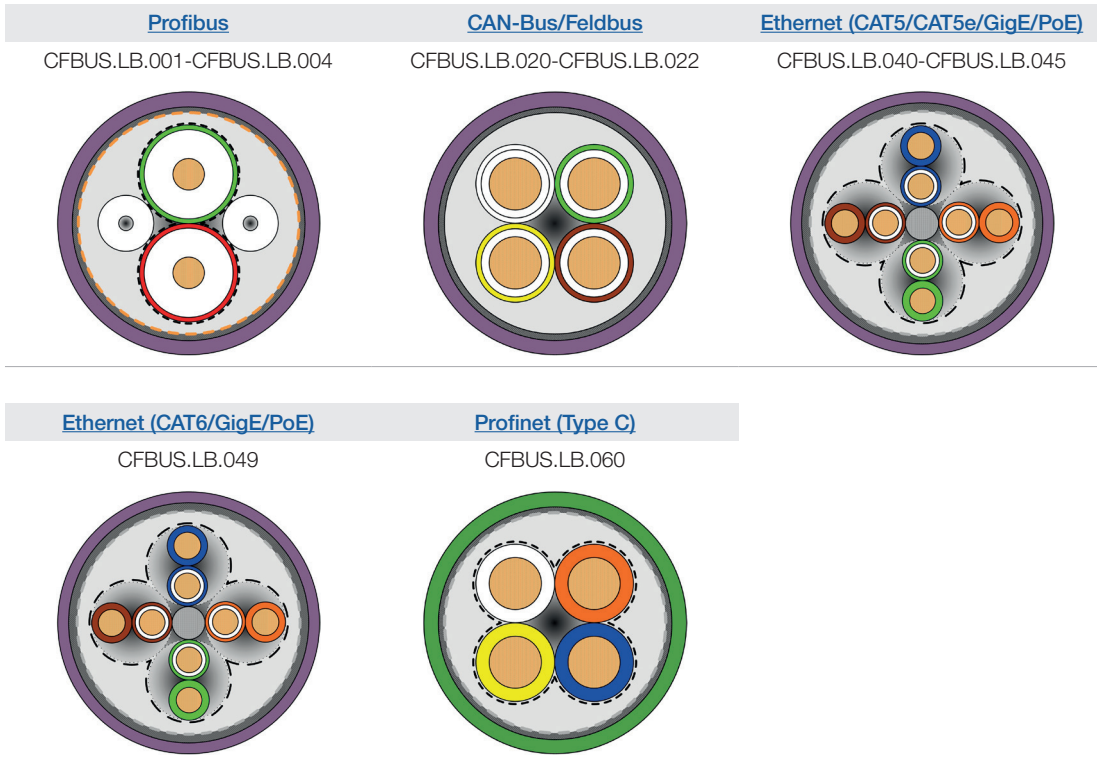
chainflex® CFBUS.LB



Bus cable (Class 7.6.4.1) ● For heaviest duty applications ● TPE outer jacket ● Shielded
 ● Oil and bio-oil resistant ● Low-temperature-flexible ● PVC and halogen-free ● Hydrolysis
 and microbe-resistant



Example image



igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year










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Cable structure

-  **Conductor** Stranded conductor in especially bending-resistant version consisting of bare copper wires (following DIN EN 60228).
-  **Core insulation** According to bus specification.
-  **Core structure** According to bus specification.
-  **Core identification** According to bus specification.
▶ Product range table
-  **Inner jacket** TPE mixture adapted to suit the requirements in e-chains®.
-  **Overall shield** Extremely bending-resistant braiding made of tinned copper wires.
Coverage approx. 70 % linear, approx. 90 % optical
-  **Outer jacket** Low-adhesion, extremely abrasion-resistant and highly flexible TPE mixture, adapted to suit the requirements in e-chains®.
Colour: Red lilac (similar to RAL 4001), Variants ▶ Product range table
Printing: black

„00000 m** igus chainflex CFBUS.LB---① -----② EAC CE ---③ conform
 www.igus.de +++ chainflex cable works +++

* **Length printing:** Not calibrated. Only intended as an orientation aid.
 ① / ② Cable identification according to Part No.(see technical table).
 ③ Printing according to bus specification (inclusive wave resistance).
 Example: ... chainflex ... CFBUS.LB.001 ... (2x0.25)C ... EAC ...

Guaranteed service life according to guarantee conditions

Double strokes	5 million		7.5 million		10 million	
	CFBUS.LB .001-.022	CFBUS.LB .040-.060	CFBUS.LB .001-.022	CFBUS.LB .040-.060	CFBUS.LB .001-.022	CFBUS.LB .040-.060
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-35/-25	12.5	10	13.5	11	14.5	12
-25/+60	10	7.5	11	8.5	12	9.5
+60/+70	12.5	10	13.5	11	14.5	12

Minimum guaranteed service life of the cable under the specified conditions.
 The installation of the cable is recommended within the middle temperature range.



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Properties and approvals

	UV resistance	Medium
	Oil resistance	Oil-resistant (following DIN EN 60811-404), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB tested by DEA), Class 4
	Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	Halogen-free	Following DIN EN 60754
	UL verified	Certificate No. B129699: „igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year“
	CLPA	CFBUS.LB.045: <i>CC-Link IE Field</i> , Reference no. 131 CFBUS.LB.049: <i>CC-Link IE Field</i> , Reference no. 138
	EAC	Certificate No. RU C-DE.ME77.B.02806 (TR ZU)
	REACH	In accordance with regulation (EC) No. 1907/2006 (REACH)
	Lead-free	Following 2011/65/EC (RoHS-II/RoHS-III)
	Cleanroom	According to ISO Class 1. The outer jacket material of this series complies with CF9.15.07 - tested by IPA according to standard DIN EN ISO 14644-1
	DESINA	According to VDW, DESINA standardisation
	CE	Following 2014/35/EU



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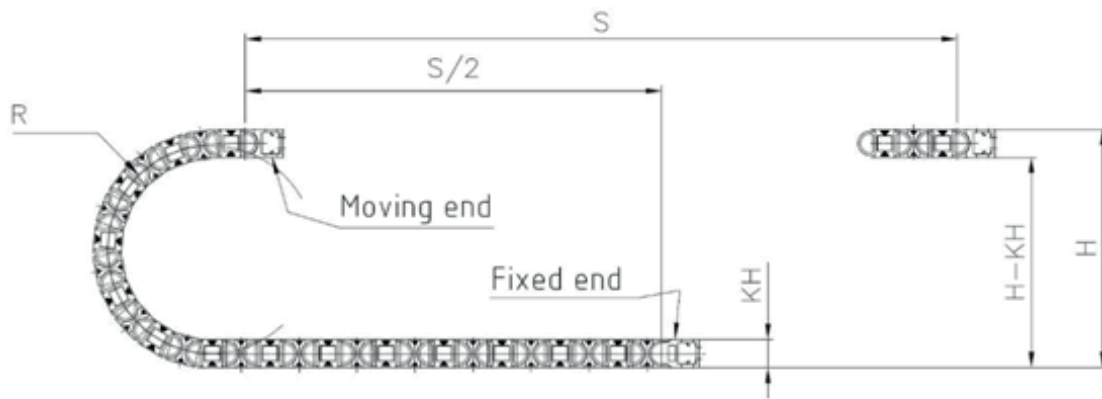
Dynamic information

	Bend radius	e-chain® linear flexible fixed	minimum 7.5 x d minimum 6 x d minimum 4 x d
	Temperature	e-chain® linear flexible fixed	-35 °C up to +70 °C -50 °C up to +70 °C (following DIN EN 60811-504) -55 °C up to +70 °C (following DIN EN 50305)
	v max.	unsupported gliding	10 m/s 6 m/s
	a max.		100 m/s ²
	Travel distance		Unsupported travel distances and up to 400 m for gliding applications, Class 6

These values are based on specific applications or tests. They do not represent the limit of what is technically feasible.

Typical lab test setup for this cable series

Test bend radius R	approx. 75 - 100 mm
Test travel S	approx. 1 - 15 m
Test duration	minimum 2 - 4 million double strokes
Test speed	approx. 0,5 - 2 m / s
Test acceleration	approx. 0.5 - 1.5 m / s ²



Typical application areas

- For heaviest duty applications, Class 7
- Unsupported travel distances and up to 400 m and more for gliding applications, Class 6
- Almost unlimited resistance to oil, also with bio-oils, Class 4
- No torsion, Class 1
- Indoor and outdoor applications without direct solar radiation
- Storage and retrieval units for high-bay warehouses, Machining units/machine tools, quick handling, Clean room, semiconductor insertion, indoor cranes, low temperature applications



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Technical tables:

Mechanical information

Part No.	Number of cores and conductor nominal cross section [mm ²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]
Profibus (1x2x0,64 mm)				
CFBUS.LB.001	(2x0.25)C	9.0	33	78
CAN-Bus				
CFBUS.LB.020 ²⁾	(4x0.25)C	6.5	28	49
CFBUS.LB.021	(2x0.5)C	8.0	39	67
CFBUS.LB.022 ²⁾	(4x0.5)C	8.0	43	78
Ethernet/CAT5				
CFBUS.LB.040 ²⁾	 (4x0.25)C	7.0	33	50
Ethernet/CAT5e				
CFBUS.LB.045	 (4x(2x0.15))C	8.5	42	71
Ethernet/CAT6				
CFBUS.LB.049	 (4x(2x0.15))C	8.5	42	71
Profinet				
CFBUS.LB.060 ^{2) 13)}	 (4x0.38)C	7.5	39	67

²⁾ The chainflex® types marked with 2) are cables designed as a star-quad.

¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)

G = with green-yellow earth core

x = without earth core

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.



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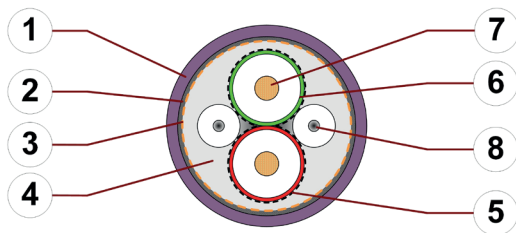
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Profibus

CFBUS.LB.001-CFBUS.LB.004

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded, halogen-free TPE mixture
2. Shield: Extremely bending-resistant braiding made of tinned copper wires
3. Shield foil: Kupfer kaschierte Kunststoffolie
4. Inner jacket: Pressure extruded, gusset-filling TPE mixture
5. Banding: Plastic foil
6. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
7. Conductor: Fine-wire strand in especially bending-stable version consisting of bare copper wires
8. Filling: Plastic dummy

Example image

For detailed overview please see design table

Design table

Part No.	Core group	Colour code	Core design
CFBUS.LB.001	(2x0.25)C	red, green	
CFBUS.LB.004	(4x0.25)C	green, yellow, red, brown (Starquad)	



Example image

igus® chainflex® CFBUS.LB.049



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Example image

Profibus

CFBUS.LB.001-CFBUS.LB.004

Electrical information

(Cable structure please see previous page)

Part No.	CFBUS.LB.001	CFBUS.LB.004
Nominal voltage		50 V
Testing voltage (following DIN EN 50289-1-3)		500 V
Characteristic wave impedance (following DIN EN 50289-1-11)		150 ± 15 Ω (at 20 MHz)

Line attenuation approx. [dB/100m]

Part No.	9.6 kHz	38.4 kHz	4 MHz	16 MHz
CFBUS.LB.001	0.3	0.4	2.6	5.5
CFBUS.LB.004	0.3	0.4	2.6	5.5

Conductor nominal cross section	Part No.	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2)	Maximum current rating at 30 °C (following DIN VDE 0298-4)
[mm ²]		[Ω/km]	[A]
0.25	CFBUS.LB.001	68	5
0.25	CFBUS.LB.004	82	5

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



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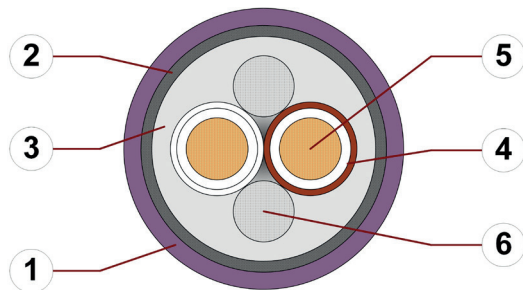
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CAN-Bus/Feldbus

CFBUS.LB.020-CFBUS.LB.022

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded, halogen-free TPE mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Inner jacket: Pressure extruded, gusset-filling TPE mixture
4. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
5. Conductor: Fine-wire strand in especially bending-stable version consisting of bare copper wires
6. Filling: Plastic yarn

Example image

For detailed overview please see design table

Design table

Part No.	Core group	Colour code	Core design
CFBUS.LB.020	(4x0.25)C	white, green, brown, yellow (Starquad)	
CFBUS.LB.021	(2x0.5)C	white, brown	
CFBUS.LB.022	(4x0.5)C	white, green, brown, yellow (Starquad)	



Example image

igus® chainflex® CFBUS.LB.049

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Example image

CAN-Bus/Feldbus

CFBUS.LB.020-CFBUS.LB.022

Electrical information

(Cable structure please see previous page)

Part No.	CFBUS.LB.020	CFBUS.LB.021	CFBUS.LB.022
Nominal voltage		50 V	
Testing voltage (following DIN EN 50289-1-3)		500 V	
Characteristic wave impedance (following DIN EN 50289-1-11)		120 ± 12 Ω (at 1 MHz)	

Conductor nominal cross section	Part No.	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2)	Maximum current rating at 30 °C (following DIN VDE 0298-4)
[mm ²]		[Ω/km]	[A]
0.25	CFBUS.LB.020	79	5
0.5	CFBUS.LB.021	41	10
0.5	CFBUS.LB.022	44.1	10

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



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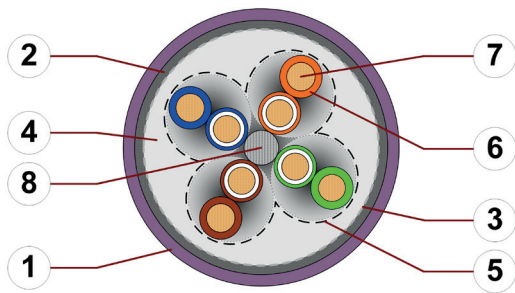


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Ethernet (CAT5/CAT5e/GigE/PoE) CFBUS.LB.040-CFBUS.LB.045

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded, halogen-free TPE mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Inner jacket: Pressure extruded, gusset-filling TPE mixture
5. Banding: Plastic fleece
6. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
7. Conductor: Fine-wire strand in especially bending-stable version consisting of bare copper wires
8. Strain relief: Tensile stress-resistant centre element

Example image

For detailed overview please see design table

Design table

Part No.	Core group	Colour code	Core design
CFBUS.LB.040	(4x0.25)C	white, green, brown, yellow (Starquad)	
CFBUS.LB.045	(4x(2x0.15))C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown	



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Example image

Ethernet (CAT5/CAT5e/GigE/PoE)

CFBUS.LB.040-CFBUS.LB.045

Electrical information

(Cable structure please see previous page)

Part No.	CFBUS.LB.040	CFBUS.LB.045
Nominal voltage	50 V	
Testing voltage (following DIN EN 50289-1-3)	500 V	
Operating capacity	50 pF/m	60 pF/m
Nominal Velocity of Propagation (NVP)	66 %	67 %
Characteristic wave impedance (following DIN EN 50289-1-11)	100 ± 25 Ω	

Line attenuation approx. [dB/100m]

Part No.	1 MHz	4 MHz	10 MHz	16 MHz	20 MHz	31.25 MHz	62.5 MHz	100 MHz
CFBUS.LB.040	3.2	6.0	9.5	12.1	13.6	17.1	24.8	32.0
CFBUS.LB.045	3.2	6.0	9.5	12.1	13.6	17.1	24.8	32.0

Conductor nominal cross section	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2)	Maximum current rating at 30 °C (following DIN VDE 0298-4)
[mm ²]	[Ω/km]	[A]
0.15	111	2.5
0.25	70	5

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.

Part No.	Bus type	Link class	Maximum transmission length
CFBUS.LB.040	Ethernet/CAT5	Class D - (Data applications up to 100 MHz)	60 m
CFBUS.LB.045	Ethernet/CAT5e	Class D - (Data applications up to 100 MHz)	60 m



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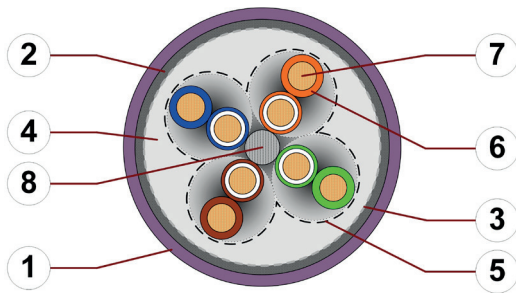


Ethernet (CAT6/GigE/PoE)

CFBUS.LB.049

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded, halogen-free TPE mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Inner jacket: Pressure extruded, gusset-filling TPE mixture
5. Banding: Plastic fleece
6. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
7. Conductor: Fine-wire strand in especially bending-stable version consisting of bare copper wires
8. Strain relief: Tensile stress-resistant centre element

Example image

For detailed overview please see design table

Design table

Part No.	Core group	Colour code	Core design
CFBUS.LB.049	(4x(2x0.15))C	white-blue/blue, white-orange/ orange, white-green/green, white-brown/brown	



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Example image

Ethernet (CAT6/GigE/PoE)

CFBUS.LB.049

Electrical information

(Cable structure please see previous page)

Part No.	CFBUS.LB.049
Nominal voltage	50 V
Testing voltage (following DIN EN 50289-1-3)	500 V
Operating capacity	60 pF/m
Nominal Velocity of Propagation (NVP)	67 %
Characteristic wave impedance (following DIN EN 50289-1-11)	100 ± 25 Ω

Line attenuation approx. [dB/100m]

Part No.	1 MHz	4 MHz	10 MHz	16 MHz	20 MHz	31.25 MHz	62.5 MHz	100 MHz	150 MHz	200 MHz	250 MHz
CFBUS.LB.049	3.2	6.0	9.5	12.1	13.6	17.1	24.8	32.0	40.0	47.5	55.0

Conductor nominal cross section	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2)	Maximum current rating at 30 °C (following DIN VDE 0298-4)
[mm ²]	[Ω/km]	[A]
0.15	111	2.5

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.

Part No.	Bus type	Link class	Maximum transmission length
CFBUS.LB.049	Ethernet/CAT6	Class E - (Data applications up to 250 MHz)	60 m



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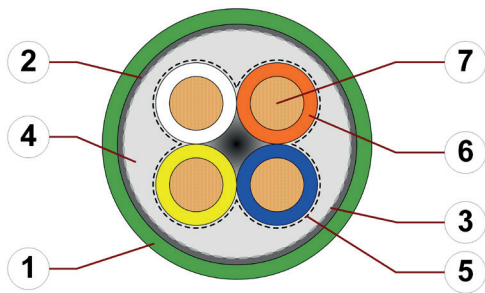


Example image

Profinet (Type C) CFBUS.LB.060

Cable structure

(Electrical information please see next page)



1. Outer jacket: Pressure extruded, halogen-free TPE mixture
2. Overall shield: Extremely bending-resistant braiding made of tinned copper wires
3. Shield foil: Aluminium clad plastic foil
4. Inner jacket: Pressure extruded, gusset-filling TPE mixture
5. Banding: Plastic foil
6. Core insulation: Mechanically high quality TPE mixture (according to bus specification)
7. Conductor: Fine-wire strand in especially bending-stable version consisting of bare copper wires

Example image

For detailed overview please see design table

Design table

Part No.	Core group	Colour code	Core design
CFBUS.LB.060	(4x0.38)C	white, orange, blue, yellow (Starquad)	



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Example image

Profinet (Type C) CFBUS.LB.060

Electrical information

(Cable structure please see previous page)

Part No.	CFBUS.LB.060
Nominal voltage	50 V
Testing voltage (following DIN EN 50289-1-3)	500 V
Operating capacity	50 pF/m
Nominal Velocity of Propagation (NVP)	66 %
Characteristic wave impedance (following DIN EN 50289-1-11)	100 ± 15 Ω

Line attenuation approx. [dB/100m]

Part No.	1 MHz	4 MHz	10 MHz	16 MHz	20 MHz	31.25 MHz	62.5 MHz	100 MHz
CFBUS.LB.060	2.4	4.8	7.6	9.6	10.7	13.4	19.0	24.0

Conductor nominal cross section	Maximum conductor resistance at 20 °C (following DIN EN 50289-1-2)	Maximum current rating at 30 °C (following DIN VDE 0298-4)
[mm ²]	[Ω/km]	[A]
0.38	51	7

The final maximum current rating depends among other things on the ambient conditions, the type of the installation and the number of loaded cores.



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