

Bus cables



chainflex [®] cable	Jacket	Shield	Bend radius e-chain [®] [factor x dj]	Temperature e-chain [®] from/to [°C]	Approvals and standards	Oil-resistant	Torsion-resistant v max. [m/s] unsupported	v max. [m/s] gliding a max.	Page
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Bus cables

Selection chart for chainflex[®] bus cables 176

Selection chart for chainflex[®] Ethernet cables 179

CF888	PVC	✓	15	+5/+70			3	20	180
CFBUS.PVC	PVC	✓	12.5	+5/+70		✓	3	2 30	184
CF898	iguPUR	✓	15	-20/+70		✓	3	20	188 New
CFBUS.PUR	PUR	✓	12.5	-20/+70		✓	3	2 30	192
CFBUS	TPE	✓	10-12.5	-35/+70		✓	10	6 100	196
CFBUS.LB	TPE	✓	7.5	-35/+70		✓	10	6 100	202 New

Twistable bus cables (twistable cables chapter ► Page 370)

CFROBOT8	PUR	✓	10	-25/+70		✓ ✓			398
CFROBOT8. PLUS	PUR	✓	10	-25/+70		✓ ✓			402

36-month chainflex[®] guarantee
Guaranteed service life for predictable reliability
► Selection table page 174

With the help of the chainflex[®] service life calculator, you can quickly and easily calculate the expected service life of chainflex[®] cables specifically for your application:

www.igus.eu/chainflexlife

Guarantee
igus chainflex

36

up to 36 months guarantee

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

UL-verified chainflex[®] guarantee ... www.igus.eu/ul-verified

chainflex® guarantee

▶▶

Guaranteed service life ⁽¹⁾

	chainflex® cables	Temperature, from/to [°C]	v max. [m/s]		a max. [m/s²]	Travel distance [m]		Minimum bend radius [factor x d]		Minimum bend radius [factor x d]		Minimum bend radius [factor x d]	Page
			unsupported	gliding									
Bus cables							5 million (1 million) double strokes *		7.5 million (3 million) double strokes *		10 million (5 million) double strokes *		
	CF888	+5 / +15	3	-	20	≤ 10		17.5		18.5		19.5	180
		+15 / +60						15		16		17	
		+60 / +70						17.5		18.5		19.5	
	CFBUS.PVC	+5 / +15	3	2	30	≤ 20		15		16		17	184
		+15 / +60						12.5		13.5		14.5	
		+60 / +70						15		16		17	
	CF898 New!	-20 / -10	3	-	20	≤ 10		17.5		18.5		19.5	188
		-10 / +60						15		16		17	
		+60 / +70						17.5		18.5		19.5	
	CFBUS.PUR	-20 / -10	3	2	30	≤ 20		15		16		17	192
		-10 / +60						12.5		13.5		14.5	
		+60 / +70						15		16		17	
	CFBUS.001-.049 CFBUS.060	-35 / -25	10	6	100	≤ 400		12.5		13.5		14.5	196
		-25 / +60						10		11		12	
		+60 / +70						12.5		13.5		14.5	
	CFBUS.050-.055 CFBUS.065-.070	-35 / -25	10	6	100	≤ 400		15		16		17	196
		-25 / +60						12.5		13.5		14.5	
		+60 / +70						15		16		17	
							5 million		7.5 million		12.5 million		
	CFBUS.LB .001-.022 New!	-35 / -25	10	6	100	≤ 400		12.5		13.5		14.5	202
		-25 / +60						10		11		12	
		+60 / +70						12.5		13.5		14.5	
	CFBUS.LB .040-.060 New!	-35 / -25	10	6	100	≤ 400		10		11		12	202
		-25 / +60						7.5		8.5		9.5	
		+60 / +70						10		11		12	

⁽¹⁾ Guaranteed service life for these series (details ▶ see page 28-29)

* Higher number of double strokes? Calculate service life online: ▶ www.igus.eu/chainflexlife
Figures in brackets refer to series CF888 and CF898



Guarantee
igus chainflex

36

up to 36 months guarantee

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





The right cable for every bus system ...
The chainflex® bus cables product range at a glance

Bus types									
DVI					chainflex® CFBUS Page 196				
CC-Link		chainflex® CFBUS.PVC Page 184		chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196				
SPE				chainflex® CFBUS.PUR Page 192					
Ethercat*	chainflex® CF888 Page 180	chainflex® CFBUS.PVC Page 184	chainflex® CF898 Page 188	chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196	NEW chainflex® CFBUS.LB Page 202	chainflex® CFROBOT8 Page 398		
Ethernet*	chainflex® CF888 Page 180	chainflex® CFBUS.PVC Page 184	chainflex® CF898 Page 188	chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196	NEW chainflex® CFBUS.LB Page 202	CFROBOT8 Page 398 CFROBOT8.PLUS Page 402	CFSPECIAL.182 Page 416 CFSPECIAL.484 Page 429	
Profinet*	chainflex® CF888 Page 180	chainflex® CFBUS.PVC Page 184	NEW chainflex® CF898 Page 188	chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196	NEW chainflex® CFBUS.LB Page 202	CFROBOT8 Page 398 CFROBOT8.PLUS Page 402	chainflex® CFSPECIAL.182 Page 416	
USB		chainflex® CFBUS.PVC Page 184		chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196				
FireWire		chainflex® CFBUS.PVC Page 184		chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196				
CAN-Bus	chainflex® CF888 Page 180	chainflex® CFBUS.PVC Page 184	chainflex® CF898 Page 188	chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196	NEW chainflex® CFBUS.LB Page 202	chainflex® CFROBOT8 Page 398		
ASI			chainflex® CF898 Page 188						
Device Net					chainflex® CFBUS Page 196				
Interbus					chainflex® CFBUS Page 196				
Profibus	chainflex® CF888 Page 180	chainflex® CFBUS.PVC Page 184	chainflex® CF898 Page 188	chainflex® CFBUS.PUR Page 192	chainflex® CFBUS Page 196		CFROBOT8 Page 398 CFROBOT8.PLUS Page 402	chainflex® CFSPE- CIAL.182 Page 416	
		PVC 15 x d	PVC oil-re- sistant 12.5 x d	iguPUR 15 x d	PUR 12.5 x d	TPE UL 10-12.5 x d	TPE 7.5 x d	Torsion 10 x d	Special applications high tensile strain (.182) for rail vehicles (.414)
		Mechanical performance							

* Details of the chainflex® Ethernet cables can be found on page 179!

Bus system/ chainflex® type	Jacket	Number of cores and conductor nominal cross section[mm²]	Page
Profibus (1x2x0.64mm)		150Ohm	
CF888.001	PVC	(2x0.25)C	182
CFBUS.PVC.001	PVC	(2x0.25)C	186
CF898.001	iguPUR	(2x0.25)C	190
CFBUS.PUR.001	PUR	(2x0.25)C	194
CFBUS.001	TPE	(2x0.25)C	198
CFBUS.002	TPE	(2x0.25)C+4x1.5	198
CFBUS.003	TPE	(2x0.25)C+3G0.75	198
NEW CFBUS.LB.001	TPE	(2x0.25)C	204
CFROBOT8.001	PUR	(2x0.35)C	400
CFROBOT8.PLUS.001	PUR	(2x0.25)C	404
CFSPECIAL.182.001	PUR	(2x0.25)C	416
Interbus		100Ohm	
CFBUS.010	TPE	(3x(2x0.25))C	198
CFBUS.011	TPE	(3x(2x0.25)+(3G1.0))C	198
CAN-Bus		120Ohm	
CF888.021	PVC	(2x0.5)C	182
CFBUS.PVC.020	PVC	(4x0.25)C	186
CFBUS.PVC.021	PVC	(2x0.5)C	186
CFBUS.PVC.022	PVC	(4x0.5)C	186
CF898.021	iguPUR	(2x0.5)C	186
CFBUS.PUR.020	PUR	(4x0.25)C	194
CFBUS.PUR.021	PUR	(2x0.5)C	194
CFBUS.PUR.022	PUR	(4x0.5)C	194
CFBUS.020	TPE	(4x0.25)C	198
CFBUS.021	TPE	(2x0.5)C	198
CFBUS.022	TPE	(4x0.5)C	198
NEW CFBUS.LB.020	TPE	(4x0.25)C	204
NEW CFBUS.LB.021	TPE	(2x0.5)C	204
NEW CFBUS.LB.022	TPE	(4x0.5)C	204
CFROBOT8.022	PUR	(4x0.5)C	400
Device Net		120Ohm	
CFBUS.030	TPE	((2xAWG24)C+2xAWG22)C	198
CFBUS.031	TPE	((2xAWG18)C+2xAWG15)C	198
CC-Link		110Ohm	
CFBUS.PVC.035	PVC	(3x0.5)C	186
CFBUS.PUR.035	PUR	(3x0.5)C	196
CFBUS.035	TPE	(3xAWG20)C	198
Ethernet/CAT5		100Ohm	
CFBUS.PVC.040	PVC	(4x0.25)C	186
CFBUS.PUR.040	PUR	(4x0.25)C	194
CFBUS.040	TPE	(4x0.25)C	200
CFBUS.044	TPE	(4x(2x0.15))C	200
NEW CFBUS.LB.040	TPE	(4x(0.25)C	204
Single Pair Ethernet		100Ohm	
CFBUS.PUR.042	PUR	(2x0.15)C	194
Ethernet/CAT5e		100Ohm	
CF888.045	PVC	(4x(2x0.14))C	182
CFBUS.PVC.045	PVC	(4x(2x0.15))C	186
CF898.045	iguPUR	(4x(2x0.14))C	190

Bus system/ chainflex® type	Jacket	Number of cores and conductor nominal cross section[mm²]	Page
Ethernet/CAT5e		100Ohm	
CFBUS.PUR.045	PUR	(4x(2x0.15))C	194
CFBUS.045	TPE	(4x(2x0.15))C	200
NEW CFBUS.LB.045	TPE	(4x(2x0.15))C	204
CFROBOT8.045	PUR	4x(2x0.14)C	400
CFROBOT8.PLUS.045	PUR	(4x(2x0.15))C	404
CFSPECIAL.182.045	PUR	(4x(2x0.15))C	416
Ethernet/CAT6		100Ohm	
CFBUS.PVC.049	PVC	(4x(2x0.15))C	186
CFBUS.PUR.049	PUR	(4x(2x0.15))C	194
CFBUS.PUR.H01.049	PUR	(4x(2x0.15))C+4x1.5	194
CFBUS.049	TPE	(4x(2x0.15))C	200
NEW CFBUS.LB.049	TPE	(4x(2x0.15))C	204
CFROBOT8.049	PUR	4x(2x0.14)C	400
CFSPECIAL.484.049	-	(4x(2x0.15))C	420
Ethernet/CAT6a		100Ohm	
CFBUS.PVC.050	PVC	4x(2x0.20)C	186
CFBUS.PUR.050	PUR	4x(2x0.20)C	194
CFBUS.050	TPE	(4x(2x0.15)C)C	200
Ethernet/CAT7		100Ohm	
CFBUS.PVC.052	PVC	(4x(2x0.15)C)C	186
CFBUS.PUR.052	PUR	(4x(2x0.15)C)C	194
CFBUS.052	TPE	(4x(2x0.15)C)C	200
FireWire IEEE 1394a/b		100Ohm	
CFBUS.PVC.056	PVC	(2x(2x0.15)C+2x0.38)C	186
CFBUS.PUR.056	PUR	(2x(2x0.15)C+2x0.38)C	194
CFBUS.055	TPE	2x(2x0.15)C+2x(0.34)C	200
Profinet		100Ohm	
CF888.060	PVC	(4x0.38)C	182
CFBUS.PVC.060	PVC	(4x0.38)C	186
CF898.060	iguPUR	(4x0.34)C	190
NEW CFBUS.LB.060	TPE	(4x0.38)C	204
CFROBOT8.060	PUR	(2x(2x0.34))C	198
CFROBOT8.PLUS.060	PUR	(4x0.38)C	404
USB		90Ohm	
CFBUS.065	TPE	((2xAWG28)+2xAWG20)C	200
CFBUS.066	TPE	((2xAWG24)+2xAWG20)C	200
USB 3.0		90Ohm	
CFBUS.PVC.068	PVC	(2x(2xAWG28)+2x(2xAWG28)C)C	186
CFBUS.PUR.068	PUR	(2x(2xAWG28)+2x(2xAWG28)C)C	194
DVI		100Ohm	
CFBUS.070	TPE	(4x(2xAWG28)C +(2xAWG28)+3xAWG28)C	200
ASI BUS (flat cables)			
CF898.082 (yellow)	iguPUR	2x2.5	190
CF898.083 (black)	iguPUR	2x2.5	190

176 36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges



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For all data rates and types of movement ...
Networking your machine with chainflex® Ethernet cables

In our catalogue range you will find the right Ethernet solution for every type of motion. We have prepared a wide range of products both sold by the metre and also a wide variety of ready-to-connect cables with connectors. All chainflex® cables come with a **36-month guarantee** and up to 10 million double strokes as standard, giving you peace-of-mind and confidence.

We support you in three aspects of machine networking with Ethernet cables for moving applications that have been developed, manufactured and tested for high quality:

For your system, we offer Ethernet cables from **CAT5 to CAT7** so that you have the right solution for all data volumes. With that you can safely use Bus systems such as Ethernet/IP, Profinet, EtherCAT, Sercos and many other derivatives. The different quality levels of cable mean that there are opportunities for very large savings or future-proofing.

With the new **Single Pair Ethernet (SPE)** bus technology, it is now possible to create Ethernet connections all the way from the control cabinet to each machine element and thus connect the entire machine with one single bus system. Due to the construction using only one pair of wires, the cable can be manufactured with a considerable weight decrease and a 25% smaller outer diameter. For this pioneering development, we are a member in the Industrial Partner Network for SPE.

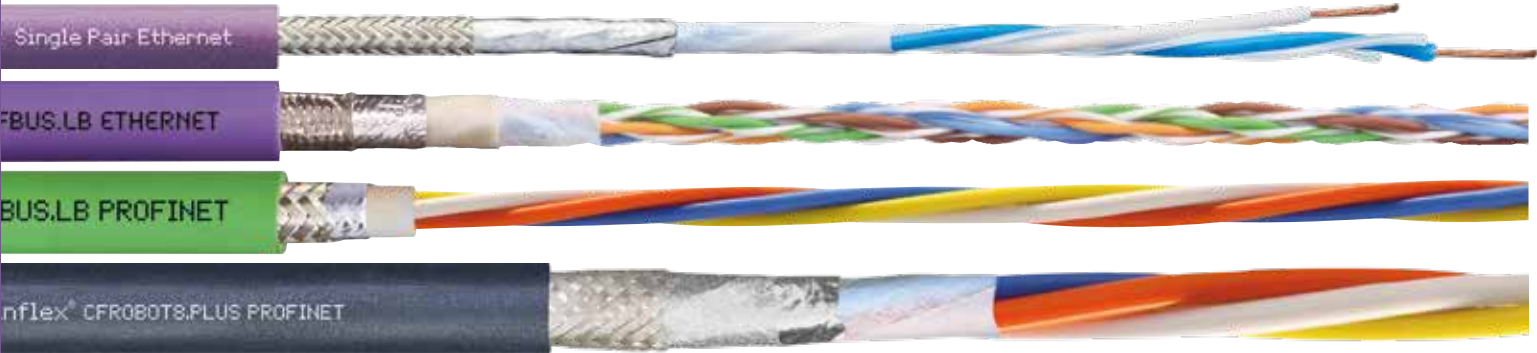
By taking into account the individual mechanical requirements in your application, we can offer more customised solutions. There are cables for large and small bend radii for linear movements in energy chains or torsional movements on robots. We can offer you a reasonably priced PVC solution, an oil-resistant PUR cable or a solution with highly abrasion-resistant TPE. Also, **special solutions** for long travels or high tensile strength versions for hanging applications or rolling solutions are standard products for us.

Our **online tools** also enable you to reduce process costs and help you to find the right cable with just a few clicks.

Also visit our Ethernet website:



All common Bus types in different cable quality levels for your diverse applications. From stock. Tested. With a guarantee.



Always find the Ethernet cable that works, for less.
Selection table for the largest range of flexible Ethernet cables

Electrical performance

CAT7 10Gbit 600MHz	chainflex® CFBUS.PVC.052 Page 186	chainflex® CFBUS.PUR.052 Page 194	chainflex® CFBUS.052 Page 200	chainflex® CFROBOT8.052 Page 400				
CAT6A 10Gbit 500MHz	chainflex® CFBUS.PVC.050 Page 186	chainflex® CFBUS.PUR.050 Page 194	chainflex® CFBUS.050 Page 200	chainflex® CFROBOT8.050 Page 400				
CAT6 1Gbit 250MHz	chainflex® CFBUS.PVC.049 Page 186	chainflex® CFBUS.PUR.049 Page 194	chainflex® CFBUS.049 Page 200	chainflex® CFROBOT8.049 Page 400	chainflex® CFBUS.LB.049 Page 204	chainflex® CFROBOT8.049 Page 400		chainflex® CFSPECIAL. 182.045 P. 416 Page 420
CAT5e 1Gbit 100MHz	chainflex® CF888.045 Page 182	chainflex® CFBUS.PVC.045 Page 186	chainflex® CF898.045 Page 190	chainflex® CFBUS.PUR.045 Page 194	chainflex® CFBUS.045 Page 200	chainflex® CFBUS.LB.045 Page 204	chainflex® CFROBOT8.045 Page 400	chainflex® CFROBOT8. PLUS.045 Page 404
SPE 1Gbit 600MHz			chainflex® CFBUS.PUR.042 Page 194					
Profinet 100Mbit 100MHz	chainflex® CF888.060 Page 182	chainflex® CFBUS.PVC.060 Page 186	CF898.060 Page 190	chainflex® CFBUS.PUR.060 Page 194	chainflex® CFBUS.060 Page 200	chainflex® CFBUS.LB.060 Page 204	chainflex® CFROBOT8.060 Page 400	chainflex® CFROBOT8. PLUS.060 Page 404
CAT5 100Mbit 100MHz		chainflex® CFBUS.PVC.040 Page 186		chainflex® CFBUS.PUR.040 Page 194	chainflex® CFBUS.040 Page 200	chainflex® CFBUS.LB.040 Page 204		
	CF888 PVC 15 x d	CFBUS.PVC PVC, oil-resistant 12.5 x d	CF898 iguPUR 15 x d	CFBUS.PUR PUR 12.5 x d	CFBUS TPE UL 10 x d	CFBUS.LB TPE Hal 7.5 x d	CFROBOT8 PUR ± 180°/m	CFROBOT8.PLUS PUR ± 360°/m
								Special cables

Mechanical performance

SPE Single Pair Ethernet (SPE) ...
... the key to smart industrial automation

In the area of mechanical engineering, a strong trend in recent years has been a continuous increase in the need for more and faster data. Fieldbuses such as Profibus and CC-Link in Ethernet derivatives such as Profinet and CC-Link IE have been developed further in order to enable improved performance in machines. The situation is similar in the case of the Ethernet types. Whereas CAT5 used to be the standard and a quantum leap was achieved with CAT5e, everyone is now talking about CAT6A and CAT7 for the future. This is not only true with regard to building infrastructure but is also in the case of machine and robot cabling.

However, all products end at the last "intelligent" component of the machine. Due to the sheer size of the cable and the connector solutions, connections extending as far as the smallest sensor had not yet been possible. This is where we and our partners of the Industrial Partner Network e.V. are now breaking new ground with the Single Pair Ethernet (SPE). The idea is to reduce to one data pair in order to keep connector and cable small.

This is most evident in the case of the connector. It is now the size of an M8 round connector and is therefore considerably smaller than the normal RJ45. As regards the cable, we have reduced the diameter by 25% and have now also arrived in the range of a proximity switch cable. This allows smaller installation spaces and energy chains, which will be welcome in the field of machine design.

As a clear service life together with a guarantee is always given for all cables in the igus® catalogue; thorough testing is what allows us to do it. This also applies to the new member of the family, of course: CFBUS.PUR.042 is guaranteed to last for 10 million double strokes or 36 months.

Bus cable | PVC | chainflex® CF888

36 5 million
Double strokes guaranteed

15 x d
Bend radius, e-chain®

10m
Travel distance, e-chain®

- For flexing applications
- PVC outer jacket
- Shielded
- Flame-retardant

Dynamic information

	Bend radius	e-chain® linear	minimum 15 x d
		flexible	minimum 12 x d
		fixed	minimum 8 x d
	Temperature	e-chain® linear	+5°C up to +70°C
		flexible	-5°C up to +70°C (following DIN EN 60811-504)
		fixed	-15°C up to +70°C (following DIN EN 50305)
	v max.	unsupported	3m/s
	a max.		20m/s²
	Travel distance		Unsupported travels up to 10m, Class 1

Cable structure

	Conductor	Conductor consisting of bare copper wires (according to DIN EN 60228).
	Core insulation	According to bus specification.
	Core structure	According to bus specification.
	Core identification	According to bus specification. ► Product range table
	Overall shield	Braiding made of tinned copper wires. Coverage approx. 60% optical
	Outer jacket	Low-adhesion PVC mixture, adapted to suit the requirements in e-chains®. Colour: Red lilac (similar to RAL 4001) Variants ► Product range table

Electrical information

	Nominal voltage	50V 300V (following UL), except CF888.001 : 30V (following UL)
	Testing voltage	500V

Basic requirements
Travel distance
Oil resistance
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 400m	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

Class 3.1.1.1

Properties and approvals

	Flame-retardant	According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame
	Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	UL verified	Certificate No. B129699: "igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year"
	UL/CSA AWM	See data sheet for details ► www.igus.eu/CF888
	NFPA	Following NFPA 79-2018, chapter 12.9
	EAC	Certificate No. RU C-DE.ME77.B.00295/19
	REACH	In accordance with regulation (EC) No. 1907/2006 (REACH)
	Lead-free	Following 2011/65/EC (RoHS-II/RoHS-III)
	CE	Following 2014/35/EU
	UKCA	In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Guaranteed service life (details see page 28-29)

Double strokes*	1 million	3 million	5 million
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
+5/+15	17.5	18.5	19.5
+15/+60	15	16	17
+60/+70	17.5	18.5	19.5

* Higher number of double strokes? Service life calculation online ► www.igus.eu/chainflexlife

Typical application areas

- For flexing applications, Class 3
- Especially for unsupported travels, Class 1
- Without influence of oil, Class 1
- No torsion, Class 1
- Preferably indoor applications
- Wood/stone processing, packaging industry, feeding, handling, adjusting devices

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igus 36-month
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on 2 billion test
cycles per year

CFRIP

UL US

UL US

nec

NFPA

CIPA

DNV

EAC

REACH

RoHS

clean-room

igus

igus

CE
UK
CA

Guarantee
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36
up to 36 months guarantee

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guarantee and
service life
calculator based
on 2 billion test
cycles per year

UL

EPLAN download, configurators ► www.igus.eu/CF888

36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges

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UL-verified chainflex® guarantee ... www.igus.eu/ul-verified



Example image

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)								
CF888.001	(2x0.25)C	8.0	18	59	CF888.001	150	2x0.25	red, green
CAN-Bus								
CF888.021	(2x0.5)C	8.5	24	73	CF888.021	120	2x0.5	white, brown
Ethernet/CAT5e								
CF888.045	(4x(2x0.14))C	7.0	25	62	CF888.045	100	4x(2x0.14)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Profinet								
CF888.060 ^{2) 13)}	(4x0.34)C	7.0	25	59	CF888.060 ^{2) 13)}	100	4x0.34	white, orange, blue, yellow (star-quad)

The chainflex® types marked with ²⁾ are cables designed as a star-quad.
¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.
G = with green-yellow earth core x = without earth core



Cables available in the chainflex® CASE

Simple savings on delivery, storage space and re-ordering with the chainflex® CASE - ship'n store by igus®.

More on this on page 24/25 and online: www.igus.eu/cfcase



Technical note on bus cables

chainflex® bus cables have been specially developed and tested for continuously moving use in e-chains®. Depending on the material used for the outer jacket and on the underlying construction principle, the bus cables are designed for different mechanical requirements and resistance to diverse media. The cables have been electrically designed in such a way that, on the one hand, the electrical requirements of the respective bus specification are reliably met and, on the other, that greater value is placed on a high degree of EMC reliability. It is also ensured that the electrical values remain stable over the long term in spite of permanent movement. The overall quality of transmission in a complete bus communication system, however, is not solely dependent on the cable used. What is also essential is that all components (electronic parts, connecting system and cable) are precisely matched to each other and that the maximum transmission lengths, which are dependent on the respective system, are adhered to with regard to the data transmission rates needed. A cable is thus not solely responsible for the reliable transmission of signals. igus® advises you when you are designing your bus system to take all these factors into account and, with extensive tests, helps you to ensure the process reliability of your system from the very beginning.



chainflex® CF888 bus cables in a handling application

EPLAN download, configurators ► www.igus.eu/CF888

182 36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges



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UL-verified chainflex® guarantee ... www.igus.eu/ul-verified



183

Bus cable | PVC | chainflex® CFBUS.PVC

36 10 million
Double strokes guaranteed

12.5 x d
Bend radius, e-chain®

20m
Travel distance, e-chain®

- For medium duty applications
- PVC outer jacket
- Shielded
- Oil-resistant
- Flame-retardant

Dynamic information

	Bend radius	e-chain® linear	minimum 12.5 x d
		flexible	minimum 10 x d
		fixed	minimum 7 x d
	Temperature	e-chain® linear	+5°C up to +70°C
		flexible	-5°C up to +70°C (following DIN EN 60811-504)
		fixed	-15°C up to +70°C (following DIN EN 50305)
	v max.	unsupported	3m/s
	a max.	gliding	2m/s
			30m/s²
	Travel distance	Unsupported travels and up to 20m for gliding applications, Class 3	

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
	Overall shield	Bending-resistant braiding made of tinned copper wires. Coverage linear approx. 55%, optical approx. 80%
	Outer jacket	Low-adhesion, oil-resistant PVC mixture, adapted to suit the requirements in e-chains® (following DIN EN 50363-4-1). Colour: Red lilac (similar to RAL 4001) Variants ► Product range table

Electrical information

	Nominal voltage	50V 300V (following UL), except CFBUS.PVC.020 : 30V (following UL)
	Testing voltage	500V

EPLAN download, configurators ► www.igus.eu/CFBUS.PVC

36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges



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UL-verified chainflex® guarantee ... www.igus.eu/ul-verified

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Basic requirements
Travel distance
Oil resistance
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 400m	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

Class 4.3.2.1

Properties and approvals

	UV resistance	Medium
	Oil resistance	Oil-resistant (following DIN EN 50363-4-1), Class 2
	Flame-retardant	According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame
	Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	UL verified	Certificate No. B129699: "igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year"
	UL listed	CMX, 75°C (except CFBUS.PVC.068)
	UL/CSA AWM	See data sheet for details ► www.igus.eu/CFBUS.PVC
	NFPA	Following NFPA 79-2018, chapter 12.9
	CLPA	CFBUS.PVC.045 : CC-Link IE Field , Reference no. 153 CFBUS.PVC.049 : CC-Link IE Field , Reference no. 154 Certificate No. RU C-DE.ME77.B.00295/19
	EAC	
	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 CF240.02.24 - tested by IPA according to standard DIN EN ISO 14644-1 Following 2014/35/EU
	CE	
	UKCA	In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Guaranteed service life (details see page 28-29)

Double strokes*	5 million	7.5 million	10 million
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
+5/+15	15	16	17
+15/+60	12.5	13.5	14.5
+60/+70	15	16	17

* Higher number of double strokes? Service life calculation online ► www.igus.eu/chainflexlife

Typical application areas

- For medium duty applications, Class 4
- Unsupported travels and up to 20m for gliding applications, Class 3
- Light oil influence, Class 2
- No torsion, Class 1
- Preferably indoor applications, but also outdoor ones at temperatures > 5 °C
- Machining units/package machines, handling, indoor cranes



Example image

Bus cable | PVC | chainflex® CFBUS.PVC

Class 4.3.2.1



Example image

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)								
CFBUS.PVC.001	(2x0.25)C	8.5	25	77	CFBUS.PVC.001	150	2x0.25	red, green
CAN-Bus								
CFBUS.PVC.020 ²⁾	(4x0.25)C	7.0	23	57	CFBUS.PVC.020 ²⁾	120	4x0.25	white, green, brown, yellow (star-quad)
CFBUS.PVC.021	(2x0.5)C	8.5	32	86	CFBUS.PVC.021	120	2x0.5	white, brown
CFBUS.PVC.022 ²⁾	(4x0.5)C	8.5	43	94	CFBUS.PVC.022 ²⁾	120	4x0.5	white, green, brown, yellow (star-quad)
CC-Link								
CFBUS.PVC.035	(3x0.5)C	8.0	40	82	CFBUS.PVC.035	110	3x0.5	white, blue, yellow
Ethernet/CAT5								
CFBUS.PVC.040 ²⁾	(4x0.25)C	6.5	29	70	CFBUS.PVC.040 ²⁾	100	4x0.25	white, green, brown, yellow (star-quad)
Ethernet/CAT5e								
CFBUS.PVC.045	(4x(2x0.15))C	7.5	33	67	CFBUS.PVC.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6								
CFBUS.PVC.049	(4x(2x0.15))C	7.5	33	67	CFBUS.PVC.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6a								
CFBUS.PVC.050	4x(2x0.20)C	10.0	65	123	CFBUS.PVC.050	100	4x(2x0.20)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT7								
CFBUS.PVC.052	(4x(2x0.15)C)C	9.5	89	136	CFBUS.PVC.052	100	4x(2x0.15)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
FireWire IEEE 1394b								
CFBUS.PVC.056 ¹¹⁾	(2x(2x0.15)C+2x0.38)C	9.0	59	96	CFBUS.PVC.056 ¹¹⁾	110	2x(2x0.15)C 2x0.38	orange/blue, blue/red black, white
Profinet								
CFBUS.PVC.060 ^{2) 13)}	(4x0.38)C	7.0	33	67	CFBUS.PVC.060 ^{2) 13)}	100	4x0.38	white, orange, blue, yellow (star-quad)
USB 3.0								
CFBUS.PVC.068	(2x(2xAWG28) +2x(2xAWG28)C)C	7.0	39	68	CFBUS.PVC.068	90	2x(2xAWG28) 2x(2xAWG28)C	red/black, green/white-green blue/yellow, orange/violet

The chainflex® types marked with ²⁾ are cables designed as a star-quad.
¹¹⁾ Phase-out model
¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.
G = with green-yellow earth core **x** = without earth core



Cables available in the chainflex® CASE

Simple savings on delivery, storage space and re-ordering with the chainflex® CASE - ship'n store by igus®.

More on this on page 24/25 and online: www.igus.eu/cfcase



Technical note on bus cables

chainflex® bus cables have been specially developed and tested for continuously moving use in e-chains®. Depending on the material used for the outer jacket and on the underlying construction principle, the bus cables are designed for different mechanical requirements and resistance to diverse media.

The cables have been electrically designed in such a way that, on the one hand, the electrical requirements of the respective bus specification are reliably met and, on the other, that greater value is placed on a high degree of EMC reliability.

It is also ensured that the electrical values remain stable over the long term in spite of permanent movement.

The overall quality of transmission in a complete bus communication system, however, is not solely dependent on the cable used. What is also essential is that all components (electronic parts, connecting system and cable) are precisely matched to each other and that the maximum transmission lengths, which are dependent on the respective system, are adhered to with regard to the data transmission rates needed. A cable is thus not solely responsible for the reliable transmission of signals.

igus® advises you when you are designing your bus system to take all these factors into account and, with extensive tests, helps you to ensure the process reliability of your system from the very beginning.



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



Bus cable | iguPUR | chainflex® CF898



36 5 million
Double strokes guaranteed



15 x d
Bend radius, e-chain®



10m
Travel distance, e-chain®

- For flexing applications
- iguPUR outer jacket
- Oil-resistant
- Shielded
- Flame-retardant

PROFINET
suitable for
FastConnect

Dynamic information

	Bend radius	e-chain® linear	minimum 15 x d
		flexible	minimum 12 x d
		fixed	minimum 8 x d
	Temperature	e-chain® linear	-20°C up to +70°C
		flexible	-40°C up to +70°C (following DIN EN 60811-504)
		fixed	-50°C up to +70°C (following DIN EN 50305)
	v max.	unsupported	3m/s
	a max.		20m/s²
	Travel distance		Unsupported travels up to 10m, Class 1

Cable structure

	Conductor	Conductor consisting of bare copper wires (according to DIN EN 60228).
	Core insulation	According to bus specification.
	Core structure	According to bus specification.
	Core identification	According to bus specification. ► Product range table
	Overall shield	Braiding made of tinned copper wires. Coverage approx. 60% optical
	Outer jacket	Low-adhesion iguPUR mixture, adapted to suit the requirements in e-chains®. Colour: Red lilac (similar to RAL 4001) Variants ► Product range table

Electrical information

	Nominal voltage	50V 300V (following UL), except CF898.001 : 30V (following UL)
	Testing voltage	500V

Basic requirements
Travel distance
Oil resistance
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 400m	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

Class 3.1.3.1

Properties and approvals

	UV resistance	Medium
	Oil resistance	Oil-resistant (following DIN EN 50363-10-2), Class 3
	Flame-retardant	According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame CF898.082-CF898.083 : According to IEC 60332-1-2, FT2
	Silicone-free	Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
	UL verified	Certificate No. B129699: "igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year"
	UL/CSA AWM	See data sheet for details ► www.igus.eu/CF898
	NFPA	CF898.001-CF898.060 : Following NFPA 79-2018, Kapitel 12.9
	EAC	Certificate No. RU C-DE.ME77.B.00295/19
	REACH	In accordance with regulation (EC) No. 1907/2006 (REACH)
	Lead-free	Following 2011/65/EC (RoHS-II/RoHS-III)
	CE	Following 2014/35/EU
	UK CA	In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Guaranteed service life (details see page 28-29)

Double strokes*	1 million	3 million	5 million
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-20/-10	17.5	18.5	19.5
-10/+60	15	16	17
+60/+70	17.5	18.5	19.5

* Higher number of double strokes? Service life calculation online ► www.igus.eu/chainflexlife

Typical application areas

- For flexing applications, Class 3
- Especially for unsupported travels, Class 1
- With influence of oil, Class 3
- No torsion, Class 1
- Indoor and outdoor applications without direct sun radiation
- Machining units/machine tools, low temperature applications

CF898
iguPUR
15 x d

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

igus® chainflex® CF898.045

Example image

EPLAN download, configurators ► www.igus.eu/CF898

36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges

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UL-verified chainflex® guarantee ... www.igus.eu/ul-verified

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Bus cable | iguPUR | chainflex® CF898

Class 3.1.3.1



Example image

ETHERNET
New

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)								
CF898.001	(2x0.25)C	8.0	18	56	CF898.001	150	2x0.25	red, green
CAN-Bus								
CF898.021	(2x0.5)C	8.5	24	80	CF898.021	120	2x0.5	white, brown
Ethernet/CAT5e								
CF898.045	(4x(2x0.14))C	7.0	25	54	CF898.045	100	4x(2x0.14)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Profinet								
CF898.060 ¹³⁾	(4x0.34)C	7.0	25	58	CF898.060 ¹³⁾	100	4x0.34	white, orange, blue, yellow (star-quad)
CF898.061.FC	(4x0.34)C	7.0	25	72	CF898.061.FC	100	4x0.34	white, orange, blue, yellow (star-quad)
ASI BUS (flat cables)								
CF898.082 ¹⁴⁾	According to ASI	4.0	50	82	CF898.082 ¹⁴⁾	According to ASI	2x2.5	blue, brown
CF898.083 ¹⁵⁾	According to ASI	4.0	50	79	CF898.083 ¹⁵⁾	According to ASI	2x2.5	blue, brown

¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)
¹⁴⁾ Colour outer jacket: Yellow (RAL 1021)
¹⁵⁾ Colour outer jacket: Jet black (RAL 9005)

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.
G = with green-yellow earth core x = without earth core



Cables available in the chainflex® CASE

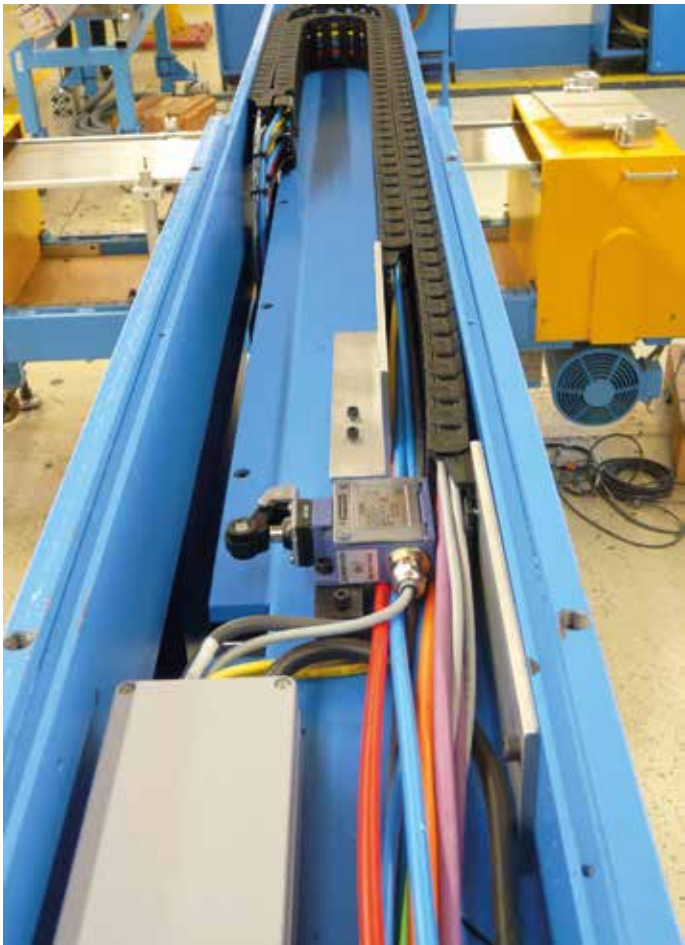
Simple savings on delivery, storage space and re-ordering with the chainflex® CASE - ship'n store by igus®.

More on this on page 24/25 and online: www.igus.eu/cfcase



Technical note on bus cables

chainflex® bus cables have been specially developed and tested for continuously moving use in e-chains®. Depending on the material used for the outer jacket and on the underlying construction principle, the bus cables are designed for different mechanical requirements and resistance to diverse media. The cables have been electrically designed in such a way that, on the one hand, the electrical requirements of the respective bus specification are reliably met and, on the other, that greater value is placed on a high degree of EMC reliability. It is also ensured that the electrical values remain stable over the long term in spite of permanent movement. The overall quality of transmission in a complete bus communication system, however, is not solely dependent on the cable used. What is also essential is that all components (electronic parts, connecting system and cable) are precisely matched to each other and that the maximum transmission lengths, which are dependent on the respective system, are adhered to with regard to the data transmission rates needed. A cable is thus not solely responsible for the reliable transmission of signals. igus® advises you when you are designing your bus system to take all these factors into account and, with extensive tests, helps you to ensure the process reliability of your system from the very beginning.



Adjustment device with chainflex® CF898 bus cables

EPLAN download, configurators ► www.igus.eu/CF898

190 36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges



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UL-verified chainflex® guarantee ... www.igus.eu/ul-verified

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



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



Bus cable | PUR | chainflex® CFBUS.PUR

36 10 million Double strokes guaranteed

12.5 x d Bend radius, e-chain®

20m Travel distance, e-chain®

- For medium duty applications
- PUR outer jacket
- Shielded
- Oil-resistant and coolant-resistant
- Flame-retardant
- PVC and halogen-free
- Notch-resistant
- Hydrolysis and microbe-resistant

Single Pair
Ethernet for
e-chains®



Dynamic information

	Bend radius	e-chain® linear	minimum 12.5 x d
		flexible	minimum 10 x d
		fixed	minimum 7 x d
	Temperature	e-chain® linear	-20°C up to +70°C
		flexible	-40°C up to +70°C (following DIN EN 60811-504)
		fixed	-50°C up to +70°C (following DIN EN 50305)
	v max.	unsupported	3m/s
	a max.	gliding	2m/s
	Travel distance	Unsupported travels and up to 20m for gliding applications, Class 3	

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
	Overall shield	Bending-resistant braiding made of tinned copper wires. Coverage linear approx. 55%, optical approx. 80%
	Outer jacket	Low-adhesion, halogen-free, highly abrasion resistant PUR mixture, adapted to suit the requirements in e-chains® (following DIN EN 50363-10-2) Colour: Red lilac (similar to RAL 4001) Variants ► Product range table

Electrical information

	Nominal voltage	50V 300V (following UL), except CFBUS.PUR.020 : 30V (following UL)
	Testing voltage	500V

Properties and approvals

	UV resistance	Medium
--	---------------	--------

EPLAN download, configurators ► www.igus.eu/CFBUS.PUR

36-month guarantee ... more than 1,350 cable types from stock ... no cutting charges



Class 4.3.3.1

	Oil resistance	Oil-resistant (following DIN EN 50363-10-2), Class 3
	Offshore	MUD-resistant following NEK 606 - status 2009
	Flame-retardant	According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame
	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"
	UL listed	CMX, 75°C (except CFBUS.PUR.068)
	UL/CSA AWM	See data sheet for details ► www.igus.eu/CFBUS.PUR
	NFPA	Following NFPA 79-2018, chapter 12.9
	CLPA	CFBUS.PUR.045: CC-Link IE Field , Reference no. 151 CFBUS.PUR.049: CC-Link IE Field , Reference no. 152 Type Approval Certificate TAE00003X6 CFBUS.PUR.040-.052 : Type Approval Certificate TAE00003X8 Certificate No. RU C-DE.ME77.B.00295/19
	DNV	
	EAC	
	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 CF77.UL.05.12.D - tested by IPA according to standard DIN EN ISO 14644-1
	DESINA	According to VDW, DESINA standardisation
	CE	Following 2014/35/EU
	UK CA	In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Guaranteed service life (details see page 28-29)

Double strokes*	5 million	7.5 million	10 million
Temperature, from/to [°C]	R min. [factor x d]	R min. [factor x d]	R min. [factor x d]
-20/-10	15	16	17
-10/+60	12.5	13.5	14.5
+60/+70	15	16	17

* Higher number of double strokes? Service life calculation online ► www.igus.eu/chainflexlife

Typical application areas

- For medium duty applications, Class 4
- Unsupported travels and up to 20m for gliding applications, Class 3
- Almost unlimited resistance to oil, Class 3
- No torsion, Class 1
- Indoor and outdoor applications without direct sun radiation
- Machining units/machine tools, low temperature applications

Basic requirements
Travel distance
Oil resistance
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	7	≥ 400m
none	1	2	3	4	5	6	7	highest
none	1	2	3	4	5	6	7	±360°



Example image

EU2022

EU2022



Example image

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)								
CFBUS.PUR.001	(2x0.25)C	8.5	25	75	CFBUS.PUR.001	150	2x0.25	red, green
CAN-Bus								
CFBUS.PUR.020 ²⁾	(4x0.25)C	7.5	23	64	CFBUS.PUR.020 ²⁾	120	4x0.25	white, green, brown, yellow (star-quad)
CFBUS.PUR.021	(2x0.5)C	8.5	32	82	CFBUS.PUR.021	120	2x0.5	white, brown
CFBUS.PUR.022 ²⁾	(4x0.5)C	8.5	43	91	CFBUS.PUR.022 ²⁾	120	4x0.5	white, green, brown, yellow (star-quad)
CC-Link								
CFBUS.PUR.035	(3x0.5)C	8.0	40	76	CFBUS.PUR.035	110	3x0.5	white, blue, yellow
Ethernet/CAT5								
CFBUS.PUR.040 ²⁾	(4x0.25)C	6.5	29	69	CFBUS.PUR.040 ²⁾	100	4x0.25	white, green, brown, yellow (star-quad)
Single Pair Ethernet/CAT5e								
CFBUS.PUR.042	(2x0.15)C	5.5	12	33	CFBUS.PUR.042		2x0.15	white/blue
Ethernet/CAT5e								
CFBUS.PUR.045	(4x(2x0.15))C	7.5	33	66	CFBUS.PUR.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6								
CFBUS.PUR.049	(4x(2x0.15))C	7.5	33	66	CFBUS.PUR.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
CFBUS.PUR.H01.049	((4x(2x0.15))C+4x1.5)C	12.5	125	202	CFBUS.PUR.H01.049	100	(4x(2x0.15))C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
							4x1.5	black, brown, grey, blue
Ethernet/CAT6a								
CFBUS.PUR.050	4x(2x0.20)C	10.0	65	120	CFBUS.PUR.050	100	4x(2x0.20)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT7								
CFBUS.PUR.052	(4x(2x0.15)C)C	9.5	89	129	CFBUS.PUR.052	110	(4x(2x0.15))C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
FireWire IEEE 1394b								
CFBUS.PUR.056	(2x(2x0.15)C+2x0.38)C	9.0	59	91	CFBUS.PUR.056	110	2x(2x0.15)C 2x0.38	orange/blue, blue/red black, white
Profinet								
CFBUS.PUR.060 ^{2) 13)}	(4x0.38)C	7.0	33	64	CFBUS.PUR.060 ^{2) 13)}	100	4x0.38	white, orange, blue, yellow (star-quad)
CFBUS.PUR.H01.060	((4x0.38)C+4x1.5)C	11.5	120	196	CFBUS.PUR.H01.060	100	(4x0.38)C	white, orange, blue, yellow (star-quad)
							4x1.5	black, brown, grey, blue
USB 3.0								
CFBUS.PUR.068	(2x(2xAWG28) +2x(2xAWG28)C)C	7.0	39	64	CFBUS.PUR.068	90	2x(2xAWG28) 2x(2xAWG28)C	red/black, green/white-green blue/yellow, orange/violet

The chainflex® types marked with ²⁾ are cables designed as a star-quad.
¹³⁾ Colour outer jacket: Yellow-green (RAL 6018)
Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.
G = with green-yellow earth core **x** = without earth core

EPLAN download, configurators ► www.igus.eu/CFBUS.PUR

Bus cable | TPE | chainflex® CFBUS

36 10 million Double strokes guaranteed

10 x d Bend radius, e-chain®

400m Travel distance, e-chain®

- For extremely heavy duty applications
- TPE outer jacket
- Shielded
- Oil and bio-oil-resistant
- Flame-retardant
- Hydrolysis and microbe-resistant

Dynamic information

	Bend radius	e-chain® linear	minimum 10 x d (CFBUS.001-.049 and CFBUS.060) minimum 12.5 x d (CFBUS.050-.055 and CFBUS.070)
		flexible	minimum 8 x d
		fixed	minimum 5 x d
	Temperature	e-chain® linear	-35°C up to +70°C
		flexible	-45°C up to +70°C (following DIN EN 60811-504)
		fixed	-50°C up to +70°C (following DIN EN 50305)
	v max.	unsupported	10m/s
		gliding	6m/s
	a max.		100m/s ²
	Travel distance		Unsupported travels and up to 400m and more for gliding applications, Class 6

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 linear approx. 70%, optical approx. 90%
	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

Electrical information

	Nominal voltage	50V 600V (following UL), except CFBUS.065/.066 : 30V (following UL)
	Testing voltage	500V (following DIN EN 50289-1-3)

Properties and approvals

	UV resistance	Medium
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Class 6.6.4.1



Basic requirements
Travel distance
Oil resistance
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 400m	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

Oil-resistant (following DIN EN 60811-404), bio-oil-resistant (following VDMA 24568 with Plantocut 8 S-MB tested by DEA), Class 4
According to IEC 60332-1-2, Cable Flame, VW-1, FT1, FT2 / Horizontal Flame
CFBUS.030/CFBUS.065/CFBUS.066: According to IEC 60332-1-2, FT2
Free from silicone which can affect paint adhesion (following PV 3.10.7 – status 1992)
Certificate No. B129699: "igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year"
See data sheet for details ► www.igus.eu/CFBUS

Following NFPA 79-2018, chapter 12.9

CFBUS.045: **CC-Link IE field**, Reference no. 130
CFBUS.049: **CC-Link IE field**, Reference no. 137
Type Approval Certificate TAE00003X5
CFBUS.040-.052: Type Approval Certificate TAE00003X7
Certificate No. RU C-DE.ME77.B.00295/19

In accordance with regulation (EC) No. 1907/2006 (REACH)

Following 2011/65/EC (RoHS-II/RoHS-III)

According to ISO Class 1. The outer jacket material of this series complies with CF34.UL.25.04.D - tested by IPA according to standard DIN EN ISO 14644-1
According to VDW, DESINA standardisation

Following 2014/35/EU

In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Guaranteed service life (details see page 28-29)

Double strokes*	5 million		7.5 million		10 million	
	CFBUS .001-.049	CFBUS .050-.070	CFBUS .001-.049	CFBUS .050-.070	CFBUS .001-.049	CFBUS .050-.070
	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	15	13.5	16	14.5	17
-25/+60	10	12.5	11	13.5	12	14.5
+60/+70	12.5	15	13.5	16	14.5	17

* Higher number of double strokes? Service life calculation online ► www.igus.eu/chainflexlife

Typical application areas

- For heavy-duty applications, Class 6
- Unsupported travels and up to 400m 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 sun radiation
- Storage and retrieval units for high-bay warehouses, machining units/machine tools, quick handling, cleanroom, semiconductor insertion, indoor cranes, low temperature applications

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Example image

igus® chainflex® CFBUS.049

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Example image

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)								
CFBUS.001	(2x0.25)C	9.0	33	92	CFBUS.001	150	2x0.25	red, green
CFBUS.002	(2x0.25)C+4x1.5	12.5	94	191	CFBUS.002	150	(2x0.25)C 4x1.5	red/green black with white numbers 1-4
CFBUS.003	(2x0.25)C+3G0.75	11.5	55	145	CFBUS.003	150	(2x0.25)C 3G0.75	red/green black, blue, green-yellow
Interbus								
CFBUS.010	(3x(2x0.25))C	9.0	47	91	CFBUS.010	100	3x(3x0.25)	white/brown, green/yellow, grey/pink
CFBUS.011	(3x(2x0.25)+(3G1.0))C	10.5	87	152	CFBUS.011	100	3x(2x0.25) (3G1.0)	white/brown, green/yellow, grey/pink red, blue, green-yellow
CAN-Bus								
CFBUS.020 ²⁾	(4x0.25)C	6.5	28	58	CFBUS.020 ²⁾	120	4x0.25	white, green, brown, yellow (star-quad)
CFBUS.021	(2x0.5)C	8.0	39	81	CFBUS.021	120	2x0.5	white, brown
CFBUS.022 ²⁾	(4x0.5)C	8.0	43	87	CFBUS.022 ²⁾	120	4x0.5	white, green, brown, yellow (star-quad)
DeviceNet								
CFBUS.030 ⁴⁾	((2xAWG24)C+2xAWG22)C	7.0	36	57	CFBUS.030 ⁴⁾	120	(2xAWG24)C 2xAWG22	white/blue red, black
CFBUS.031 ⁴⁾	((2xAWG18)C+2xAWG15)C	11.5	103	174	CFBUS.031 ⁴⁾	120	(2xAWG18)C 2xAWG15	white/blue red, black
CC-Link								
CFBUS.035	(3xAWG20)C	8.5	43	96	CFBUS.035	110	3xAWG20	white, blue, yellow

The chainflex® types marked with ²⁾ are cables designed as a star-quad.
⁴⁾ Manufactured without inner jacket

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.
G = with green-yellow earth core x = without earth core



Cables available in the chainflex® CASE

Simple savings on delivery, storage space and re-ordering with the chainflex® CASE - ship'n store by igus®.

More on this on page 24/25 and online: www.igus.eu/cfcase



Technical note on bus cables

chainflex® bus cables have been specially developed and tested for continuously moving use in e-chains®. Depending on the material used for the outer jacket and on the underlying construction principle, the bus cables are designed for different mechanical requirements and resistance to diverse media.

The cables have been electrically designed in such a way that, on the one hand, the electrical requirements of the respective bus specification are reliably met and, on the other, that greater value is placed on a high degree of EMC reliability.

It is also ensured that the electrical values remain stable over the long term in spite of permanent movement.

The overall quality of transmission in a complete bus communication system, however, is not solely dependent on the cable used. What is also essential is that all components (electronic parts, connecting system and cable) are precisely matched to each other and that the maximum transmission lengths, which are dependent on the respective system, are adhered to with regard to the data transmission rates needed. A cable is thus not solely responsible for the reliable transmission of signals.

igus® advises you when you are designing your bus system to take all these factors into account and, with extensive tests, helps you to ensure the process reliability of your system from the very beginning.

EPLAN download, configurators ► www.igus.eu/CFBUS

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Example image

	Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
EtherCAT ¹⁾	Ethernet/CAT5I								
	CFBUS.040	(4x0.25)C	7.0	33	59	CFBUS.040	100	4x0.25	white, green, brown, yellow (star-quad)
	Ethernet/CAT5e								
CC-Link IE Field	CFBUS.045	(4x(2x0.15))C	8.5	42	84	CFBUS.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Ethernet/CAT6								
CC-Link IE Field	CFBUS.049	(4x(2x0.15))C	8.5	42	84	CFBUS.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Ethernet/CAT6a								
PROFINET ²⁾ EtherCAT ¹⁾	CFBUS.050 ⁴⁾	(4x(2x0.15)C)C	10.5	83	134	CFBUS.050 ⁴⁾	100	4x(2x0.15)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Ethernet/CAT7								
	CFBUS.052 ⁴⁾	(4x(2x0.15)C)C	10.5	89	133	CFBUS.052 ⁴⁾	100	4x(2x0.15)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	FireWire 1394a								
	CFBUS.055	2x(2x0.15)C+2x(0.34)C	8.0	39	76	CFBUS.055	100	2x(2x0.15)C 2x(0.34)C	orange/blue, green/red white, black
PROFINET ²⁾ EtherCAT ¹⁾	Profinet								
	CFBUS.060 ^{2) 13)}	(4x0.38)C	7.5	39	74	CFBUS.060 ^{2) 13)}	100	4x0.38	white, orange, blue, yellow (star-quad)
	USB								
	CFBUS.065	((2xAWG28)+2xAWG20)C	5.5	28	45	CFBUS.065	90	(2xAWG28) 2xAWG20	white/green red, black
	CFBUS.066	((2xAWG24)+2xAWG20)C	6.5	32	51	CFBUS.066	90	(2xAWG24) 2xAWG20	white/green red, black
	DVI								
	CFBUS.070 ^{4) 6)}	(4x(2xAWG28)C +(2xAWG28)+3xAWG28)C	9.0	35	95	CFBUS.070 ^{4) 6)}	100	4x(2xAWG28)C (2xAWG28) 3xAWG28)C	4 x white/yellow with element-shield in blue, black, red, white white/brown green, yellow, grey

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

⁴⁾ Manufactured without inner jacket

⁶⁾ without cULus

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

Note: The given outer diameters are maximum values and may tend toward lower tolerance limits.
G = with green-yellow earth core **x** = without earth core

Technical note on bus cables

chainflex® bus cables have been specially developed and tested for continuously moving use in e-chains®. Depending on the material used for the outer jacket and on the underlying construction principle, the bus cables are designed for different mechanical requirements and resistance to diverse media.

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The overall quality of transmission in a complete bus communication system, however, is not solely dependent on the cable used. What is also essential is that all components (electronic parts, connecting system and cable) are precisely matched to each other and that the maximum transmission lengths, which are dependent on the respective system, are adhered to with regard to the data transmission rates needed. A cable is thus not solely responsible for the reliable transmission of signals.

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



Bus cable | TPE | chainflex® CFBUS.LB

**12.5 million**
Double strokes guaranteed**7.5 x d**
Bend radius, e-chain®**400m**
Travel distance, e-chain®

- For heaviest duty applications
- TPE outer jacket
- Shielded
- Oil and bio-oil-resistant
- Low-temperature-flexible
- PVC and halogen-free
- Hydrolysis and microbe-resistant

Now available
with UL approval
& 25% longer
service life

Dynamic information



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



Travel distance Unsupported travels and up to 400m and more for gliding applications, Class 6

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.**Inner jacket** TPE mixture adapted to suit the requirements in e-chains®.**Overall shield** Extremely bending-resistant braiding made of tinned copper wires.
Coverage linear approx. 70%, optical approx. 90%**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**

Electrical information

**Nominal voltage** 50V
600V (following UL)**Testing voltage** 500V (following DIN EN 50289-1-3)EPLAN download, configurators ► www.igus.eu/CFBUS.LB

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Basic requirements
Travel distance
Oil resistance
Torsion

low	1	2	3	4	5	6	7	highest
unsupported	1	2	3	4	5	6	≥ 400m	
none	1	2	3	4	highest			
none	1	2	3	4	±360°			

Class 7.6.4.1

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****UL AWM****CLPA****EAC****REACH****Lead-free****Cleanroom****DESINA****CE****UKCA**

Certificate No. B129699: "igus 36-month chainflex cable guarantee and service life calculator based on 2 billion test cycles per year"

See data sheet for details ► www.igus.eu/CFBUS.LB

(from production date 01/2022)

CFBUS.LB.045: CC-Link IE Field, Reference no. 131**CFBUS.LB.049: CC-Link IE Field**, Reference no. 138

Certificate No. RU C-DE.ME77.B.02806 (TR ZU)

In accordance with regulation (EC) No. 1907/2006 (REACH)

Following 2011/65/EC (RoHS-II/RoHS-III)

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

According to VDW, DESINA standardisation

Following 2014/35/EU

In accordance with the valid regulations of the United Kingdom (as at 08/2021)

Guaranteed service life (details see page 28-29)

Double strokes*	5 million		7.5 million		12.5 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
	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

* Higher number of double strokes? Service life calculation online ► www.igus.eu/chainflexlife

Typical application areas

- For heavy-duty applications, Class 7
- Unsupported travels and up to 400m 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 sun radiation
- Storage and retrieval units for high-bay warehouses, machining units/machine tools, quick handling, cleanroom, semiconductor insertion, indoor cranes, low temperature applications



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igus® chainflex® CFBUS.LB.049

Example image

Part No.	Number of cores and conductor nominal cross section [mm²]	Outer diameter (d) max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)								
New CFBUS.LB.001	(2x0.25)C	9.0	33	78	CFBUS.LB.001	150	2x0.25	red, green
CAN-Bus/Feldbus								
New CFBUS.LB.020 ²⁾	(4x0.25)C	6.5	28	49	CFBUS.LB.020 ²⁾	120	4x0.25	white, green, brown, yellow (star-quad)
New CFBUS.LB.021	(2x0.5)C	8.0	39	67	CFBUS.LB.021	120	2x0.5	white, brown
New CFBUS.LB.022 ²⁾	(4x0.5)C	8.0	43	78	CFBUS.LB.022 ²⁾	120	4x0.5	white, green, brown, yellow (star-quad)
EtherCAT Ethernet/CAT5I								
New CFBUS.LB.040 ²⁾	(4x0.25)C	7.0	33	50	CFBUS.LB.040 ²⁾	100	4x0.25	white, green, brown, yellow (star-quad)
CC-Link IE Field Ethernet/CAT5e								
New CFBUS.LB.045	(4x(2x0.15))C	8.5	42	71	CFBUS.LB.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6								
New CFBUS.LB.049	(4x(2x0.15))C	8.5	42	71	CFBUS.LB.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Profinet								
New CFBUS.LB.060 ^{2) 13)}	(4x0.38)C	7.5	39	67	CFBUS.LB.060 ^{2) 13)}	100	4x0.38	white, orange, blue, yellow (star-quad)

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

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

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

G = with green-yellow earth core **x** = without earth core



Cables available in the chainflex® CASE

Simple savings on delivery, storage space and re-ordering with the chainflex® CASE - ship'n store by igus®.

More on this on page 24/25 and online: www.igus.eu/cfcase



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igus® advises you when you are designing your bus system to take all these factors into account and, with extensive tests, helps you to ensure the process reliability of your system from the very beginning.

cost down...



...life up

Reduce cost, improve technology, now!

Do the chainflex® price check ...

www.igus.eu/cf-price-check

... for example: **reduce cost with CFBUS.PUR ...**