Bus cables

chainflex® cable	Jacket	Shield	Bend radius e-chain® [factor x d]	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
Bus cables											
Selection chart for chainflex® bus cables											184
Selection chart for chainflex® Ethernet cables											187
CF888	PVC	✓	15	+5/+70				3		20	188
CFBUS.PVC	PVC	✓	12.5	+5/+70		✓		3	2	30	192
CF898	iguPUR	✓	15	-20/+70		✓		3		20	196
CFBUS.PUR	PUR	✓	12.5	-20/+70		✓		3	2	30	200
CFBUS	TPE	✓	10	-35/+70		✓		10	6	100	204
CFBUS.LB	TPE	✓	7.5	-35/+70		✓		10	6	100	210
Twistable bus cables (twistable cables chapter ▶ Page 378)											
CFROBOT8	PUR	✓	10	-25/+70		✓	✓				406
CFROBOT8.PLUS	PUR	✓	10	-25/+70		✓	✓				410 New

36-month chainflex® guarantee

Guaranteed service life for predictable reliability

▶ Selection table page 182

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

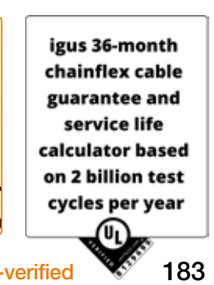
chainflex® guarantee

Guaranteed service life (1)

	chainflex® cables	Temperature, from/to [°C]	v max. [m/s] unsupported	v max. [m/s] gliding	a max. [m/s²]	Travel distance [m]	Minimum bend radius [factor x d] 5 million (1 million) double strokes *	Minimum bend radius [factor x d] 7.5 million (3 million) double strokes *	Minimum bend radius [factor x d] 10 million (5 million) double strokes *	Page
Bus cables										
	CF888	+5 / +15	3	-	20	≤ 10	17.5	18.5	19.5	188
		+15 / +60					15	16	17	
		+60 / +70					17.5	18.5	19.5	
	CFBUS.PVC	+5 / +15	3	2	30	≤ 20	15	16	17	192
		+15 / +60					12.5	13.5	14.5	
		+60 / +70					15	16	17	
	CF898	-20 / -10	3	-	20	≤ 10	17.5	18.5	19.5	196
		-10 / +60					15	16	17	
		+60 / +70					17.5	18.5	19.5	
	CFBUS.PUR	-20 / -10	3	2	30	≤ 20	15	16	17	200
		-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	204
		-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	204
		-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	-35 / -25	10	6	100	≤ 400	12.5	13.5	14.5	210
		-25 / +60					10	11	12	
		+60 / +70					12.5	13.5	14.5	
	CFBUS.LB. .040-.060	-35 / -25	10	6	100	≤ 400	10	11	12	210
		-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



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

Bus types

	PVC 15 x d	PVC oil-resistant 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
DVI					chainflex® CFBUS Page 204			
CC-Link		chainflex® CFBUS.PVC Page 192		chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204			
SPE				chainflex® CFBUS.PUR Page 200				
Ethercat*	chainflex® CF888 Page 188	chainflex® CFBUS.PVC Page 192	chainflex® CF898 Page 196	chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204	chainflex® CFBUS.LB Page 210	chainflex® CFROBOT8 Page 406	
Ethernet*	chainflex® CF888 Page 188	chainflex® CFBUS.PVC Page 192	chainflex® CF898 Page 196	chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204	chainflex® CFBUS.LB Page 210	CFROBOT8 Page 406 CFROBOT8.PLUS Page 410 NEW	CFSPECIAL.182 Page 424 CFSPECIAL.484 Page 430
Profinet*	chainflex® CF888 Page 188	chainflex® CFBUS.PVC Page 192	chainflex® CF898 Page 196	chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204	chainflex® CFBUS.LB Page 210	CFROBOT8 Page 406 CFROBOT8.PLUS Page 410	chainflex® CFSPECIAL.182 Page 424
USB		chainflex® CFBUS.PVC Page 192		chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204			
FireWire		chainflex® CFBUS.PVC Page 192		chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204			
CAN-Bus	chainflex® CF888 Page 188	chainflex® CFBUS.PVC Page 192	chainflex® CF898 Page 196	chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204		CFROBOT8 Page 406 CFROBOT8.PLUS Page 410 NEW	
ASI			chainflex® CF898 Page 196					
Device Net					chainflex® CFBUS Page 204			
Interbus					chainflex® CFBUS Page 204			
Profibus	chainflex® CF888 Page 188	chainflex® CFBUS.PVC Page 192	chainflex® CF898 Page 196	chainflex® CFBUS.PUR Page 200	chainflex® CFBUS Page 204		CFROBOT8 Page 406 CFROBOT8.PLUS Page 410	chainflex® CFSPECIAL.182 Page 424

Mechanical performance

* Detailed selection for Ethernet cables can be found on page 187

*** Details of the chainflex® Ethernet cables can be found on page 187!**

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	190
CFBUS.PVC.001	PVC	(2x0.25)C	194
CF898.001	iguPUR	(2x0.25)C	198
CFBUS.PUR.001	PUR	(2x0.25)C	202
CFBUS.001	TPE	(2x0.25)C	206
CFBUS.002	TPE	(2x0.25)C+4x1.5	206
CFBUS.003	TPE	(2x0.25)C+3G0.75	206
CFBUS.LB.001	TPE	(2x0.25)C	212
CFROBOT8.001	PUR	(2x0.35)C	408
CFROBOT8.PLUS.001	PUR	(2x0.25)C	412
CFSPECIAL.182.001	PUR	(2x0.25)C	424
Interbus 100Ohm			
CFBUS.010	TPE	(3x(2x0.25))C	206
CFBUS.011	TPE	(3x(2x0.25)+(3G1.0))C	206
CAN-Bus 120Ohm			
CF888.021	PVC	(2x0.5)C	190
CFBUS.PVC.020	PVC	(4x0.25)C	194
CFBUS.PVC.021	PVC	(2x0.5)C	194
CFBUS.PVC.022	PVC	(4x0.5)C	194
CF898.021	iguPUR	(2x0.5)C	198
CFBUS.PUR.020	PUR	(4x0.25)C	202
CFBUS.PUR.021	PUR	(2x0.5)C	202
CFBUS.PUR.022	PUR	(4x0.5)C	202
CFBUS.020	TPE	(4x0.25)C	206
CFBUS.021	TPE	(2x0.5)C	206
CFBUS.022	TPE	(4x0.5)C	206
CFBUS.LB.020	TPE	(4x0.25)C	212
CFBUS.LB.021	TPE	(2x0.5)C	212
CFBUS.LB.022	TPE	(4x0.5)C	212
CFROBOT8.022	PUR	(4x0.5)C	408
CFROBOT8.PLUS.022 New	PUR	(4x0.5)C	412
Device Net 120Ohm			
CFBUS.030	TPE	((2xAWG24)C+2xAWG22)C	206
CFBUS.031	TPE	((2xAWG18)C+2xAWG15)C	206
CC-Link 110Ohm			
CFBUS.PVC.035	PVC	(3x0.5)C	194
CFBUS.PUR.035	PUR	(3x0.5)C	204
CFBUS.035	TPE	(3xAWG20)C	206
Ethernet/CAT5I 100Ohm			
CFBUS.PVC.040	PVC	(4x0.25)C	194
CFBUS.PUR.040	PUR	(4x0.25)C	202
CFBUS.040	TPE	(4x0.25)C	208
CFBUS.LB.040	TPE	(4x(0.25)C	212
Single Pair Ethernet 100Ohm			
CFBUS.PUR.042	PUR	(2x0.15)C	202
Ethernet/CAT5e 100Ohm			
CF888.045	PVC	(4x(2x0.14))C	190
CFBUS.PVC.045	PVC	(4x(2x0.15))C	194
CF898.045	iguPUR	(4x(2x0.14))C	198

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	202
CFBUS.045	TPE	(4x(2x0.15))C	208
CFBUS.LB.045	TPE	(4x(2x0.15))C	212
CFROBOT8.045	PUR	4x(2x0.15)C	408
CFROBOT8.PLUS.045	PUR	(4x(2x0.15))C	412
CFSPECIAL.182.045	PUR	(4x(2x0.15))C	424
Ethernet/CAT6 100Ohm			
CFBUS.PVC.049	PVC	(4x(2x0.15))C	194
CFBUS.PUR.049	PUR	(4x(2x0.15))C	202
CFBUS.PUR.H01.049	PUR	(4x(2x0.15))C+4x1.5	202
CFBUS.049	TPE	(4x(2x0.15))C	208
CFBUS.LB.049	TPE	(4x(2x0.15))C	212
CFROBOT8.049	PUR	4x(2x0.15)C	408
CFROBOT8.PLUS.049 New	PUR	(4x(2x0.15))C	412
CFSPECIAL.484.049	-	(4x(2x0.15))C	424
Ethernet/CAT6A 100Ohm			
CFBUS.PVC.050	PVC	4x(2x0.20)C	194
CFBUS.PUR.050	PUR	4x(2x0.20)C	202
CFBUS.050	TPE	(4x(2x0.15)C)C	208
CFROBOT8.050	PUR	4x(2x0.15)C	408
CFROBOT8.PLUS.050 New	PUR	(4x(2x0.15)C)C	412
Ethernet/CAT7 100Ohm			
CFBUS.PVC.052	PVC	(4x(2x0.15)C)C	192
CFBUS.PUR.052	PUR	(4x(2x0.15)C)C	200
CFBUS.052	TPE	(4x(2x0.15)C)C	206
FireWire IEEE 1394a/b 100Ohm			
CFBUS.PUR.056	PUR	(2x(2x0.15)C+2x0.38)C	202
CFBUS.055	TPE	2x(2x0.15)C+2x(0.34)C	208
Profinet 100Ohm			
CF888.060	PVC	(4x0.38)C	190
CFBUS.PVC.060	PVC	(4x0.38)C	194
CF898.060	iguPUR	(4x0.34)C	198
CF898.061.FC	iguPUR	(4x0.34)C	198
CFBUS.PUR.060	PUR	(4x0.38)C	202
CFBUS.PUR.H01.060	PUR	(4x0.38)C+4x1.5	202
CFBUS.060	TPE	(4x0.38)C	208
CFBUS.LB.060	TPE	(4x0.38)C	212
CFROBOT8.060	PUR	(2x(2x0.34))C	408
CFROBOT8.PLUS.060	PUR	(4x0.38)C	412
USB 90Ohm			
CFBUS.065	TPE	((2xAWG28)+2xAWG20)C	208
CFBUS.066	TPE	((2xAWG24)+2xAWG20)C	208
USB 3.0 90Ohm			
CFBUS.PVC.068	PVC	(2x(2xAWG28)+2x(2xAWG28)C)C	194
CFBUS.PUR.068	PUR	(2x(2xAWG28)+2x(2xAWG28)C)C	202
DVI 100Ohm			
CFBUS.070	TPE	(4x(2xAWG28)C +(2xAWG28)+3xAWG28)C	208
ASI BUS (flat cables)			
CF898.082 (yellow)	iguPUR	2x2.5	198
CF898.083 (black)	iguPUR	2x2.5	198

chainflex® bus cables

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:

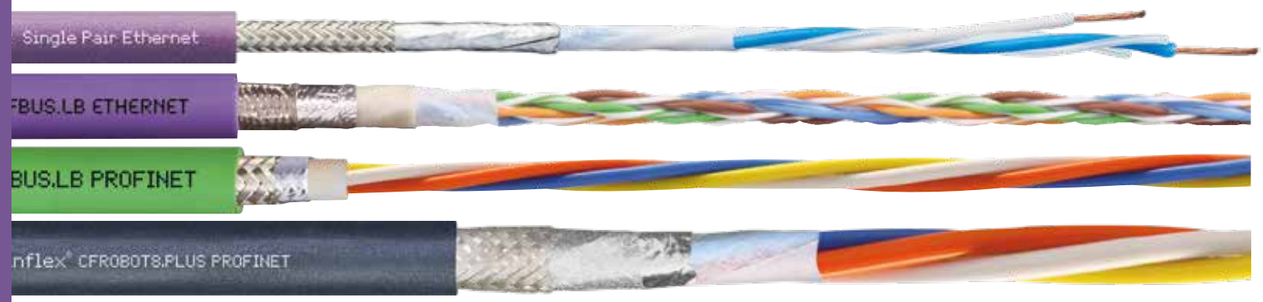
www.chainflex.eu/ethernet

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

EtherCAT®

CC-Link IE Field

PROFINET®



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

Electrical performance

	CF888 PVC 15 x d	CFBUS.PVC PVC, oil-res. 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
CAT7 10GBit 600MHz		chainflex® CFBUS.PVC.052 Page 194		chainflex® CFBUS.PUR.052 Page 202	chainflex® CFBUS.052 Page 208		chainflex® CFROBOT8.052 Page 408		
CAT6A 10GBit 500MHz		chainflex® CFBUS.PVC.050 Page 194		chainflex® CFBUS.PUR.050 Page 202	chainflex® CFBUS.050 Page 208		chainflex® CFROBOT8.050 Page 408	NEW chainflex® CFROBOT8.PLUS.050 Page 412	
CAT6 1GBit 250MHz		chainflex® CFBUS.PVC.049 Page 194		chainflex® CFBUS.PUR.049 Page 202	chainflex® CFBUS.049 Page 208	chainflex® CFBUS.LB.049 Page 212	chainflex® CFROBOT8.049 Page 408	NEW chainflex® CFROBOT8.PLUS.049 Page 412	chainflex® CFSPECIAL.484.049 Page 430
CAT5e 1GBit 100MHz	chainflex® CF888.045 Page 190	chainflex® CFBUS.PVC.045 Page 194	chainflex® CF898.045 Page 198	chainflex® CFBUS.PUR.045 Page 202	chainflex® CFBUS.045 Page 208	chainflex® CFBUS.LB.045 Page 212	chainflex® CFROBOT8.045 Page 408	chainflex® CFROBOT8.PLUS.045 Page 412	CFSPECIAL.182.045 p. 424; CFCLEAN8.045 Page 460
SPE 1GBit 600MHz				chainflex® CFBUS.PUR.042 Page 202					
Profinet 100MBit 100MHz	chainflex® CF888.060 Page 190	chainflex® CFBUS.PVC.060 Page 194	CF898.060 Page 198; CF898.061.FC Page 198	chainflex® CFBUS.PUR.060 Page 202	chainflex® CFBUS.060 Page 208	chainflex® CFBUS.LB.060 Page 212	chainflex® CFROBOT8.060 Page 408	chainflex® CFROBOT8.PLUS.060 Page 412	
CAT5 100MBit 100MHz		chainflex® CFBUS.PVC.040 Page 194		chainflex® CFBUS.PUR.040 Page 202	chainflex® CFBUS.040 Page 208	chainflex® CFBUS.LB.040 Page 212			

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 derivates 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

Example image

5,000,000 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

Class 3.1.1.1

Basic requirements	low	1	2	**3**	4	5	6	7	highest
Travel distance	unsupported	**1**	2	3	4	5	6	≥ 400m	
Oil resistance	none	**1**	2	3	4	highest			
Torsion	none	**1**	2	3	4	±360°			

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

CF888
PVC
15 x d

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

Bus cable | PVC | chainflex® CF888

Class 3.1.1.1

Basic requirements	low	1	2	**3**	4	5	6	7 highest
Travel distance	unsupported	**1**	2	3	4	5	6	≥ 400m
Oil resistance	none	**1**	2	3	4	highest		
Torsion	none	**1**	2	3	4	±360°		

CF888
PVC
15 x d

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]
Profibus (1x2x0.64mm)				
CF888.001	(2x0.25)C	8.0	18	59
CAN-Bus				
CF888.021	(2x0.5)C	8.5	24	73
Ethernet/CAT5e				
CF888.045	(4x(2x0.14))C	7.0	25	62
Profinet				
CF888.060 [2) 13)]	(4x0.34)C	7.0	25	59

Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)			
CF888.001	150	2x0.25	red, green
CAN-Bus			
CF888.021	120	2x0.5	white, brown
Ethernet/CAT5e			
CF888.045	100	4x(2x0.14)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Profinet			
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/cf-case

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

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

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

Bus cable | PVC | chainflex® CFBUS.PVC

Example image

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
	gliding	2m/s
a max.		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/CFBUSPVC

Class 4.3.2.1

Basic requirements	low	1	2	3	**4**	5	6	7	highest
Travel distance	unsupported	1	2	**3**	4	5	6		≥ 400m
Oil resistance	none	1	**2**	3	4				highest
Torsion	none	**1**	2	3	4				±360°

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/CFBUSPVC
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
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)
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
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*	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/packaging machines, handling, indoor cranes

CFBUS.PVC
PVC
12.5 x d

Bus cable | PVC | chainflex® CFBUS.PVC

Class 4.3.2.1

Basic requirements	low	1	2	3	**4**	5	6	7	highest
Travel distance	unsupported	1	2	**3**	4	5	6		≥ 400m
Oil resistance	none	1	**2**	3	4				highest
Torsion	none	**1**	2	3	4				±360°

CFBUS.PVC
PVC
12.5 x d

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]
Profibus (1x2x0.64mm)				
CFBUS.PVC.001	(2x0.25)C	8.5	25	77
CAN-Bus				
CFBUS.PVC.020 2)	(4x0.25)C	7.0	23	57
CFBUS.PVC.021	(2x0.5)C	8.5	32	86
CFBUS.PVC.022 2)	(4x0.5)C	8.5	43	94
CC-Link				
CFBUS.PVC.035	(3x0.5)C	8.0	40	82
Ethernet/CAT5I				
CFBUS.PVC.040 2)	(4x0.25)C	6.5	29	70
Ethernet/CAT5e				
CFBUS.PVC.045	(4x(2x0.15))C	7.5	33	67
Ethernet/CAT6				
CFBUS.PVC.049	(4x(2x0.15))C	7.5	33	67
Ethernet/CAT6A				
CFBUS.PVC.050	4x(2x0.20)C	10.0	65	123
Ethernet/CAT7				
CFBUS.PVC.052	(4x(2x0.15)C)C	9.5	89	136
Profinet				
CFBUS.PVC.060 2) 13)	(4x0.38)C	7.0	33	67
USB 3.0				
CFBUS.PVC.068	(2x(2xAWG28) +2x(2xAWG28)C)C	7.0	39	68

Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)			
CFBUS.PVC.001	150	2x0.25	red, green
CAN-Bus			
CFBUS.PVC.020 2)	120	4x0.25	white, green, brown, yellow (star-quad)
CFBUS.PVC.021	120	2x0.5	white, brown
CFBUS.PVC.022 2)	120	4x0.5	white, green, brown, yellow (star-quad)
CC-Link			
CFBUS.PVC.035	110	3x0.5	white, blue, yellow
Ethernet/CAT5I			
CFBUS.PVC.040 2)	100	4x0.25	white, green, brown, yellow (star-quad)
Ethernet/CAT5e			
CFBUS.PVC.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6			
CFBUS.PVC.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6A			
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	100	4x(2x0.15)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Profinet			
CFBUS.PVC.060 2) 13)	100	4x0.38	white, orange, blue, yellow (star-quad)
USB 3.0			
CFBUS.PVC.068	90	2x(2xAWG28)	red/black, green/white-green
		2x(2xAWG28)C	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

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/cf-case

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.

Bus cable | iguPUR | chainflex® CF898

Example image

5,000,000 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

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

Class 3.1.3.1

Basic requirements	low 1 2 **3** 4 5 6 7 highest
Travel distance	unsupported **1** 2 3 4 5 6 ≥ 400m
Oil resistance	none 1 2 **3** 4 highest
Torsion	none **1** 2 3 4 ±360°

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
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]
-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

Bus cable | iguPUR | chainflex® CF898

Class 3.1.3.1

Basic requirements	low	1	2	**3**	4	5	6	7 highest
Travel distance	unsupported	**1**	2	3	4	5	6	≥ 400m
Oil resistance	none	1	2	**3**	4	highest		
Torsion	none	**1**	2	3	4	±360°		

CF898 iguPUR 15 x d

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]
Profibus (1x2x0.64mm)				
CF898.001	(2x0.25)C	8.0	18	56
CAN-Bus				
CF898.021	(2x0.5)C	8.5	24	80
Ethernet/CAT5e				
CF898.045	(4x(2x0.14))C	7.0	25	54
Profinet				
CF898.060 [13]	(4x0.34)C	7.0	25	58
CF898.061.FC	(4x0.34)C	7.0	25	72
ASI BUS (flat cables)				
CF898.082 [14]	According to ASI	4.0	50	82
CF898.083 [15]	According to ASI	4.0	50	79

Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)			
CF898.001	150	2x0.25	red, green
CAN-Bus			
CF898.021	120	2x0.5	white, brown
Ethernet/CAT5e			
CF898.045	100	4x(2x0.14)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Profinet			
CF898.060 [13]	100	4x0.34	white, orange, blue, yellow (star-quad)
CF898.061.FC	100	4x0.34	white, orange, blue, yellow (star-quad)
ASI BUS (flat cables)			
CF898.082 [14]	According to ASI	2x2.5	blue, brown
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

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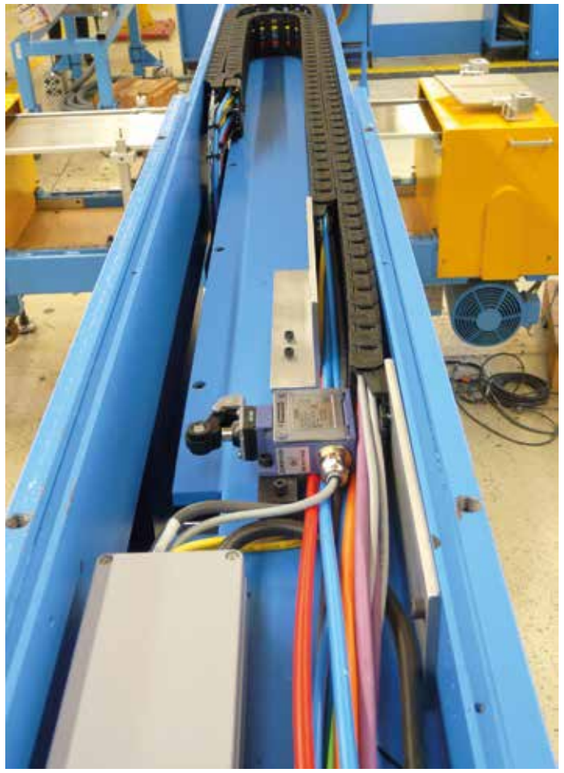
Technical note on bus cables
chainflex® bus cables have been specially developed and tested for continuously moving use in e-chains®. Depending on the material used for the outer jacket and on the underlying construction principle, the bus cables are designed for different mechanical requirements and 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/CF898



Adjustment device with chainflex® CF898 bus cables

Bus cable | PUR | chainflex® CFBUS.PUR

Example image

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®

SPE

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
	gliding	2m/s
a max.		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, 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/CFBUSPUR

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

igus

EU2023

Class 4.3.3.1

Basic requirements	low 1 2 3 **4** 5 6 7 highest
Travel distance	unsupported 1 2 **3** 4 5 6 ≥ 400m
Oil resistance	none 1 2 **3** 4 highest
Torsion	none **1** 2 3 4 ±360°

Oil resistance	Oil-resistant (following DIN EN 50363-10-2), Class 3
Offshore	MUD-resistant following NEK 606 - status 2016
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/CFBUSPUR
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
DNV	Type Approval Certificate TAE00003X6 **CFBUS.PUR.040-.052:** Type Approval Certificate TAE00003X8
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)
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
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]
-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

CFBUS.PUR
PUR
12.5 x d

Bus cable | PUR | chainflex® CFBUS.PUR

Class 4.3.3.1

Basic requirements	low	1	2	3	**4**	5	6	7	highest
Travel distance	unsupported	1	2	**3**	4	5	6		≥ 400m
Oil resistance	none	1	2	**3**	4	highest			
Torsion	none	**1**	2	3	4	±360°			

CFBUS.PUR
PUR
12.5 x d

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]
	Profibus (1x2x0.64mm)				
PROFIBUS	**CFBUS.PUR.001**	(2x0.25)C	8.5	25	75
	CAN-Bus				
	CFBUS.PUR.020 [2]	(4x0.25)C	7.5	23	64
	CFBUS.PUR.021	(2x0.5)C	8.5	32	82
	CFBUS.PUR.022 [2]	(4x0.5)C	8.5	43	91
	CC-Link				
	CFBUS.PUR.035	(3x0.5)C	8.0	40	76
	Ethernet/CAT5I				
EtherCAT	**CFBUS.PUR.040** [2]	(4x0.25)C	6.5	29	69
	Single Pair Ethernet/CAT5e				
SPE	**CFBUS.PUR.042**	(2x0.15)C	5.5	12	33
	Ethernet/CAT5e				
CC-Link IE Field	**CFBUS.PUR.045**	(4x(2x0.15))C	7.5	33	66
	Ethernet/CAT6				
CC-Link IE Field	**CFBUS.PUR.049**	(4x(2x0.15))C	7.5	33	66
	CFBUS.PUR.H01.049	((4x(2x0.15))C+4x1.5)C	12.5	125	202
	Ethernet/CAT6A				
	CFBUS.PUR.050	4x(2x0.20)C	10.0	65	120
	Ethernet/CAT7				
	CFBUS.PUR.052	(4x(2x0.15)C)C	9.5	89	129
	FireWire IEEE 1394b				
	CFBUS.PUR.056	(2x(2x0.15)C+2x0.38)C	9.0	59	91
	Profinet				
PROFINET EtherCAT	**CFBUS.PUR.060** [2) 13)]	(4x0.38)C	7.0	33	64
	CFBUS.PUR.H01.060	((4x0.38)C+4x1.5)C	11.5	120	196
	USB 3.0				
	CFBUS.PUR.068	(2x(2xAWG28) +2x(2xAWG28)C)C	7.0	39	64

	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
	Profibus (1x2x0.64mm)			
	CFBUS.PUR.001	150	2x0.25	red, green
	CAN-Bus			
	CFBUS.PUR.020 [2]	120	4x0.25	white, green, brown, yellow (star-quad)
	CFBUS.PUR.021	120	2x0.5	white, brown
	CFBUS.PUR.022 [2]	120	4x0.5	white, green, brown, yellow (star-quad)
	CC-Link			
	CFBUS.PUR.035	110	3x0.5	white, blue, yellow
	Ethernet/CAT5I			
	CFBUS.PUR.040 [2]	100	4x0.25	white, green, brown, yellow (star-quad)
	Single Pair Ethernet/CAT5e			
	CFBUS.PUR.042		2x0.15	white/blue
	Ethernet/CAT5e			
	CFBUS.PUR.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Ethernet/CAT6			
	CFBUS.PUR.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	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	100	4x(2x0.20)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Ethernet/CAT7			
	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	110	2x(2x0.15)C	orange/blue, blue/red
			2x0.38	black, white
	Profinet			
	CFBUS.PUR.060 [2) 13)]	100	4x0.38	white, orange, blue, yellow (star-quad)
	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	90	2x(2xAWG28)	red/black, green/white-green
			2x(2xAWG28)C	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/CFBUSPUR

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Bus cable | TPE | chainflex® CFBUS

Example image

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)
	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/s²	
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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igus

CFBUS
TPE
10 x d

Class 6.6.4.1

Basic requirements	low 1 2 3 4 5 **6** 7 highest
Travel distance	unsupported 1 2 3 4 5 **6** ≥ 400m
Oil resistance	none 1 2 3 **4** highest
Torsion	none **1** 2 3 4 ±360°

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
Flame-retardant	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
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/CFBUS
NFPA	Following NFPA 79-2018, chapter 12.9
CLPA	**CFBUS.045:** CC-Link IE Field, Reference no. 130 **CFBUS.049:** CC-Link IE Field, Reference no. 137
DNV	Type Approval Certificate TAE00003X5 **CFBUS.040-.052:** Type Approval Certificate TAE00003X7
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)
Cleanroom	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
DESINA	According to VDW, DESINA standardisation
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*	5 million		7.5 million		10 million	
Temperature, from/to [°C]	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

Bus cable | TPE | chainflex® CFBUS

Class 6.6.4.1

Basic requirements: low 1 2 3 4 5 **6** 7 highest
Travel distance: unsupported 1 2 3 4 5 **6** ≥ 400m
Oil resistance: none 1 2 3 **4** highest
Torsion: none **1** 2 3 4 ±360°

CFBUS TPE 10 x d

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]
Profibus (1x2x0.64mm)				
CFBUS.001	(2x0.25)C	9.0	33	92
CFBUS.002	(2x0.25)C+4x1.5	12.5	94	191
CFBUS.003	(2x0.25)C+3G0.75	11.5	55	145
Interbus				
CFBUS.010	(3x(2x0.25))C	9.0	47	91
CFBUS.011	(3x(2x0.25)+(3G1.0))C	10.5	87	152
CAN-Bus				
CFBUS.020 [2]	(4x0.25)C	6.5	28	58
CFBUS.021	(2x0.5)C	8.0	39	81
CFBUS.022 [2]	(4x0.5)C	8.0	43	87
DeviceNet				
CFBUS.030 [4]	((2xAWG24)C +2xAWG22)C	7.0	36	57
CFBUS.031 [4]	((2xAWG18)C +2xAWG15)C	11.5	103	174
CC-Link				
CFBUS.035	(3xAWG20)C	8.5	43	96

Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Profibus (1x2x0.64mm)			
CFBUS.001	150	2x0.25	red, green
CFBUS.002	150	(2x0.25)C	red/green
		4x1.5	black with white numbers 1-4
CFBUS.003	150	(2x0.25)C	red/green
		3G0.75	black, blue, green-yellow
Interbus			
CFBUS.010	100	3x(3x0.25)	white/brown, green/yellow, grey/pink
CFBUS.011	100	3x(2x0.25)	white/brown, green/yellow, grey/pink
		(3G1.0)	red, blue, green-yellow
CAN-Bus			
CFBUS.020 [2]	120	4x0.25	white, green, brown, yellow (star-quad)
CFBUS.021	120	2x0.5	white, brown
CFBUS.022 [2]	120	4x0.5	white, green, brown, yellow (star-quad)
DeviceNet			
CFBUS.030 [4]	120	(2xAWG24)C	white/blue
		2xAWG22	red, black
CFBUS.031 [4]	120	(2xAWG18)C	white/blue
		2xAWG15	red, black
CC-Link			
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/cf-case

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

Bus cable | TPE | chainflex® CFBUS

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°

CFBUS
TPE
10 x d

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]
Ethernet/CAT5I				
CFBUS.040 2)	(4x0.25)C	7.0	33	59
Ethernet/CAT5e				
CFBUS.045	(4x(2x0.15))C	8.5	42	84
Ethernet/CAT6				
CFBUS.049	(4x(2x0.15))C	8.5	42	84
Ethernet/CAT6A				
CFBUS.050 4)	(4x(2x0.15)C)C	10.5	83	134
Ethernet/CAT7				
CFBUS.052 4)	(4x(2x0.15)C)C	10.5	89	133
FireWire 1394a				
CFBUS.055	2x(2x0.15)C+2x(0.34)C	8.0	39	76
Profinet				
CFBUS.060 2) 13)	(4x0.38)C	7.5	39	74
USB				
CFBUS.065	((2xAWG28)+2xAWG20)C	5.5	28	45
CFBUS.066	((2xAWG24)+2xAWG20)C	6.5	32	51
DVI				
CFBUS.070 4) 6)	(4x(2xAWG28)C +(2xAWG28)+3xAWG28)C	9.0	35	95

Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
Ethernet/CAT5I			
CFBUS.040 2)	100	4x0.25	white, green, brown, yellow (star-quad)
Ethernet/CAT5e			
CFBUS.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6			
CFBUS.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
Ethernet/CAT6A			
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)	100	4x(2x0.15)C	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
FireWire 1394a			
CFBUS.055	100	2x(2x0.15)C	orange/blue, green/red
		2x(0.34)C	white, black
Profinet			
CFBUS.060 2) 13)	100	4x0.38	white, orange, blue, yellow (star-quad)
USB			
CFBUS.065	90	(2xAWG28)	white/green
		2xAWG20	red, black
CFBUS.066	90	(2xAWG24)	white/green
		2xAWG20	red, black
DVI			
CFBUS.070 4) 6)	100	4x(2xAWG28)C	4 x white/yellow with element-shield in blue, black, red, white
		(2xAWG28)	white/brown
		3xAWG28)C	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.
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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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

Example image

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/s²	
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)
Testing voltage	500V (following DIN EN 50289-1-3)

EPLAN download, configurators ▶ www.igus.eu/CFBUSLB

EU2023

Class 7.6.4.1

Basic requirements	low	1	2	3	4	5	6	**7**	highest
Travel distance	unsupported	1	2	3	4	5	**6**	≥ 400m	
Oil resistance	none	1	2	3	**4**	highest			
Torsion	none	**1**	2	3	4	±360°			

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"
UL AWM	See data sheet for details ▶ www.igus.eu/CFBUSLB (from production date 01/2022)
CLPA	**CFBUS.LB.045:** CC-Link IE Field, Reference no. 131 **CFBUS.LB.049:** CC-Link IE Field, Reference no. 138
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
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		12.5 million	
Temperature, from/to [°C]	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

CFBUS.LB
TPE
7.5 x d

Bus cable | TPE | chainflex® CFBUS.LB

Class 7.6.4.1

Basic requirements	low	1	2	3	4	5	6	**7**	highest
Travel distance	unsupported	1	2	3	4	5	**6**		≥ 400m
Oil resistance	none	1	2	3	**4**				highest
Torsion	none	**1**	2	3	4				±360°

CFBUS.LB
TPE
7.5 x d

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]
	Profibus (1x2x0.64mm)				
PROFIBUS	**CFBUS.LB.001**	(2x0.25)C	9.0	33	78
	CAN-Bus/Feldbus				
	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/CAT5I				
EtherCAT	**CFBUS.LB.040** [2]	(4x0.25)C	7.0	33	50
	Ethernet/CAT5e				
CC-Link IE Field	**CFBUS.LB.045**	(4x(2x0.15))C	8.5	42	71
	Ethernet/CAT6				
CC-Link IE Field	**CFBUS.LB.049**	(4x(2x0.15))C	8.5	42	71
	Profinet				
PROFINET EtherCAT	**CFBUS.LB.060** [2] [13]	(4x0.38)C	7.5	39	67

	Part No.	Characteristic wave impedance approx. [Ω]	Core group	Colour code
	Profibus (1x2x0.64mm)			
	CFBUS.LB.001	150	2x0.25	red, green
	CAN-Bus/Feldbus			
	CFBUS.LB.020 [2]	120	4x0.25	white, green, brown, yellow (star-quad)
	CFBUS.LB.021	120	2x0.5	white, brown
	CFBUS.LB.022 [2]	120	4x0.5	white, green, brown, yellow (star-quad)
	Ethernet/CAT5I			
	CFBUS.LB.040 [2]	100	4x0.25	white, green, brown, yellow (star-quad)
	Ethernet/CAT5e			
	CFBUS.LB.045	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Ethernet/CAT6			
	CFBUS.LB.049	100	4x(2x0.15)	white-blue/blue, white-orange/orange, white-green/green, white-brown/brown
	Profinet			
	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

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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.

Reduce cost, improve technology, now!

Do the chainflex® price check ...
www.igus.eu/cf-price-check

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