

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 flexible | minimum 10 x d (CFBUS.001-.049 and CFBUS.060) |
| | fixed | minimum 8 x d |
| | e-chain® linear flexible | -35°C up to +70°C |
| | fixed | -45°C up to +70°C (following DIN EN 60811-504) |
| Temperature | e-chain® linear flexible | -35°C up to +70°C |
| | 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 |
|----------------------|--------|

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

Class 6.6.4.1

| | |
|------------------------|---|
| 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 |
| Silicone-free | 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) |
| UL verified | 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 |
| UL/CSA AWM | |
| 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 |
| EAC | CFBUS.040-.052 : Type Approval Certificate TAE00003X7 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 | |
|---------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | CFBUS .001-.049 | CFBUS .050-.070 | CFBUS .001-.049 | CFBUS .050-.070 | CFBUS .001-.049 | CFBUS .050-.070 |
| Temperature, from/to [°C] | R min. [factor x d] | R min. [factor x d] | R min. [factor x d] | R min. [factor x d] | R min. [factor x d] | R min. [factor x d] |
| -35/-25 | 12.5 | 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







igus® chainflex® CFBUS.049

Example image

igus® chainflex® CFBUS.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] |
|--|---|------------------------------|----------------------|----------------|
| 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 |

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



Class 6.6.4.1

| 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 4x1.5 | red/green black with white numbers 1-4 |
| CFBUS.003 | 150 | (2x0.25)C 3G0.75 | red/green black, blue, green-yellow |
| Interbus | | | |
| CFBUS.010 | 100 | 3x(3x0.25) | white/brown, green/yellow, grey/pink |
| CFBUS.011 | 100 | 3x(2x0.25) (3G1.0) | white/brown, green/yellow, grey/pink 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 2xAWG22 | white/blue red, black |
| CFBUS.031 ⁴⁾ | 120 | (2xAWG18)C 2xAWG15 | white/blue red, black |
| CC-Link | | | |
| CFBUS.035 | 110 | 3xAWG20 | white, blue, yellow |

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



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

igus® chainflex® CFBUS.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] |
|------------------------------------|---|------------------------------|----------------------|----------------|
| Ethernet/CAT5I | | | | |
| CFBUS.040 | (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 |

Class 6.6.4.1

| Part No. | Characteristic wave impedance approx. [Ω] | Core group | Colour code |
|------------------------------------|---|--|---|
| Ethernet/CAT5I | | | |
| CFBUS.040 | 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 2x(0.34)C | orange/blue, green/red white, black |
| Profinet | | | |
| CFBUS.060 ^{2) 13)} | 100 | 4x0.38 | white, orange, blue, yellow (star-quad) |
| USB | | | |
| CFBUS.065 | 90 | (2xAWG28) 2xAWG20 | white/green red, black |
| CFBUS.066 | 90 | (2xAWG24) 2xAWG20 | white/green red, black |
| DVI | | | |
| 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.

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.

