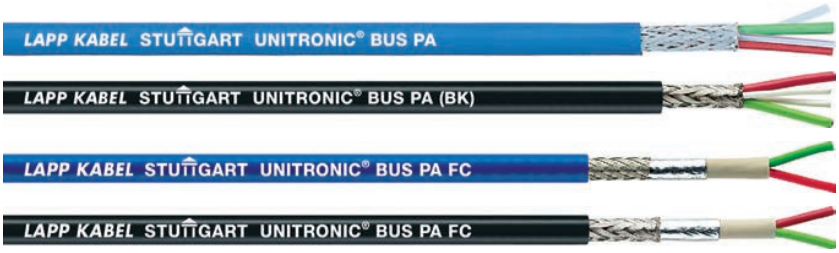
# UNITRONIC® BUS PA

PROFIBUS cables for applications in manufacturing and process automation




**Info**

- PA = Process Automation
- Variant with UL/CSA CMG

## Benefits

- FC (Fast Connect) version is oil and UV-resistant

## Application range

- Process-automation application for connecting sensors and actuators - including areas with risks of explosion.
- Fixed Installation

## Product features

- Bit rate = 31.25 kbit/s. Transmission technology RS485 also possible but bit rate is limited to 1.5 Mbit/s
- Maximum cable length is dependent on several factors (e.g. supply voltage, current demand).
- Technical Data: refer to the overview on “UNITRONIC® Bus Cables”
- Flame-retardant according IEC 60332-1-2

## Norm references / Approvals

- PROFIBUS® PA is standardised in EN 50170 as PROFIBUS® DP and PROFIBUS® FMS
- Transmission technology for PROFIBUS-PA in accordance with international standard IEC 61158-2
- FC variant with UL/CSA certification (CMG / PLTC)

## Product Make-up

- UNITRONIC® BUS PA
  Stranded conductor
  Copper braiding
  Outer sheath: PVC, blue, (RAL 5015)
  intrinsically safe area, black (RAL 9005)
- UNITRONIC® BUS PA FC
  Bare copper wire
  Fast Connect inner sheath
  Cu-Geflecht
  Puter sheath: PVC, blue (RAL 5015),
  black (RAL 9005)

## Technical data

**Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

**Peak operating voltage**
(not for power applications) 250 V

**Conductor resistance**
(loop): max. 44 Ω/km

**Minimum bending radius**
Fixed installation: 10 x outer diameter

**Test voltage**
Core/core: 1500 V rms

**Characteristic impedance**
100 ± 20 Ω

**Temperature range**
Fixed installation: -30 °C to +80 °C
During installation: -5 °C to +50 °C

| Article number | Article designation | Number of pairs and cable diameter per conductor in mm | Outer diameter [mm] | Copper index (kg/km) | Weight (kg/km) |
|---|---|---|---|---|---|
| **Conventional cable makeup** | | | | | |
| 2170234 | UNITRONIC® BUS PA (BU) | 1 x 2 x 1,3 | 8 | 45 | 84 |
| 2170235 | UNITRONIC® BUS PA (BK) | 1 x 2 x 1,3 | 8 | 45 | 84 |
| **Fast Connect cable makeup - UL/CSA CMG certification** | | | | | |
| 2170334 | UNITRONIC® BUS PA FC (BU) | 1 x 2 x 1.00 | 8 | 45.5 | 103 |
| 2170335 | UNITRONIC® BUS PA FC (BK) | 1 x 2 x 1.00 | 8 | 45.5 | 103 |

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
SIMATIC® is a registered trademark of Siemens AG
Armoured
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

## Accessories

- Multipurpose shears A and B
- STAR STRIP stripping tool refer to page 985
- FC STRIP stripping tool refer to page 986

# UNITRONIC® DeviceNet THICK + THIN

DeviceNet Buscable based on the CAN technology


## Application range

- Fixed Installation
- DeviceNet™ connects industrial devices e.g. limit switches, photoelectric switches, valve islands, motor starters, drives, PLCs, etc.

## Product features

- Resistant to oils
- Based on proven CAN (Controller Area Network) technology.
- Permissible cable lengths vary with the data rate and the cable thickness
- FRNC Version: Halogene free and flame retardant
- Refer to data sheet for more details

## Norm references / Approvals

- CMG UL/CSA certification 75°C or PLTC, Sun Res
- FRNC variant additionally with Germanischer Lloyd certification

## Product Make-up

- Tinned copper wire
- Core insulation: foam skin
- Tinned-copper braiding with drain wire
- Outer sheath: FRNC or PVC

## Technical data

**Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

**Core identification code**
Data pair: light blue + white
Power supply: red + black

**Mutual capacitance**
(800 Hz): max. 39.8 nF/km

**Peak operating voltage**
300 V (not for power applications)

**Conductor resistance**
Thick (loop): max. 45 Ω/km
Thin (loop): max. 180 Ω/km

**Minimum bending radius**
Fixed installation: 15 x outer diameter

**Test voltage**
Core/core: 2000 V

**Characteristic impedance**
120 Ω

**Temperature range**
Fixed installation: -25°C to +80°C

| Article number | Article designation | Number of pairs and AWG size | Outer diameter [mm] | Copper index [kg/km] | Weight [kg/km] |
|---|---|---|---|---|---|
| **Halogen-free** | | | | | |
| 2170340 | UNITRONIC® BUS DN THICK FRNC | 1x2xAWG18 + 1x2xAWG15 | 12.2 | 82.8 | 195 |
| 2170341 | UNITRONIC® BUS DN THIN FRNC | 1x2xAWG24 + 1x2xAWG22 | 6.9 | 33.4 | 69.5 |
| **PVC** | | | | | |
| 2170342 | UNITRONIC® BUS DN THICK Y | 1x2xAWG18 + 1x2xAWG15 | 12.2 | 88.4 | 192 |
| 2170343 | UNITRONIC® BUS DN THIN Y | 1x2xAWG24 + 1x2xAWG22 | 6.9 | 33.4 | 66.9 |

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Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
FRNC means Flame-Retardant, Non-Corrosive; and DeviceNet is a registered trademark of ODVA.
Lapp Kabel is a member of the PROFIBUS user organisation (PNO)
ECO is the cost-efficient version of article no. 2170342 and 2170343, with a slight modification to the outer sheath and UL/CSA-approved (CMG).
Photographs and graphics are not to scale and do not represent detailed images of the respective products.

# UNITRONIC® DeviceNet FD THICK+THIN

High flexible DeviceNet Buscable based on the CAN technology


## Application range

- For highly flexible applications
- DeviceNet™ connects industrial devices e.g. limit switches, photoelectric switches, valve islands, motor starters, drives, PLCs, etc.

## Product features

- Based on proven CAN (Controller Area Network) technology.
- Permissible cable lengths vary with the data rate and the cable thickness
- Refer to data sheet for more details
- PUR (P) Version: Halogene free
  PVC (Y) Version: Flame retardant (UL FT4)
- UV-resistant (but colour may change after some time)

## Norm references / Approvals

- PUR: UL/CSA-certified (CMX)
- PVC: UL/CSA CMG 75°C FT4 Sun Res Oil Res, at 2170346 also PLTC

## Product Make-up

- Core insulation: PE
- Outer sheath of Polyurethan (PUR) or Polyvinylchlorid (PVC)

## Technical data

**Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

**Core identification code**
Data pair: light blue + white
Power supply: red + black

**Mutual capacitance**
(800 Hz): max. 39.8 nF/km

**Peak operating voltage**
300 V (not for power applications)

**Conductor resistance**
Thick (loop): max. 45 Ω/km
Thin (loop): max. 180 Ω/km

**Minimum bending radius**
Fixed installation: 7.5 x outer diameter
Flexing: 15 x outer diameter

**Test voltage**
Core/core: 2000 V

**Characteristic impedance**
120 Ω

**Temperature range**
PUR: -40°C to +80°C
PVC: -10°C to +80°C

| Article number | Article designation | Number of pairs and AWG size | Outer diameter [mm] | Copper index [kg/km] | Weight [kg/km] |
|---|---|---|---|---|---|
| **PUR** | | | | | |
| 2170344 | UNITRONIC® BUS DN THICK FD P | 1x2xAWG18 + 1x2xAWG15 | 12.2 | 94 | 184 |
| 2170345 | UNITRONIC® BUS DN THIN FD P | 1x2xAWG24 + 1x2xAWG22 | 6.9 | 33.4 | 67.7 |
| **PVC** | | | | | |
| 2170346 | UNITRONIC® BUS DN THICK FD Y | 1x2xAWG18 + 1x2xAWG15 | 12.2 | 94 | 195 |
| 2170347 | UNITRONIC® BUS DN THIN FD Y | 1x2xAWG24 + 1x 2xAWG22 | 6.9 | 33.4 | 69.8 |

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Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
DeviceNet is a registered trademark of ODVA
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## Accessories

- SMART STRIP stripping tool

# UNITRONIC® BUS CAN

CAN Buscables for fixed installation - UL/SCA certified


## Info

- CAN = Controller Area Network

## Technical data

**Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

**Mutual capacitance**
**UNITRONIC® BUS CAN**
(800 Hz) max. 40 nF/km
**UNITRONIC® BUS CAN FD P**
Flexible use: 10 x outer diameter

**Peak operating voltage**
**UNITRONIC® BUS CAN**
(not for power applications) 250 V
**UNITRONIC® BUS CAN FD P**
250 V (not for power transmission)

**Conductor resistance**
**UNITRONIC® BUS CAN**
(loop): max. 186 Ω/km
**UNITRONIC® BUS CAN FD P**
(loop): max. 159.8 Ω/km

**Minimum bending radius**
**UNITRONIC® BUS CAN**
Fixed installation: 8 x outer diameter
**UNITRONIC® BUS CAN FD P**
Flexing: 15 x outer diameter

**Test voltage**
Core/core: 1500 V rms

**Characteristic impedance**
120 Ω

**Temperature range**
**UNITRONIC® BUS CAN**
Fixed installation: -30°C to +80°C
Flexing: -5°C to +70°C
**UNITRONIC® BUS CAN FD P**
Fixed installation: -40°C to +80°C
Flexing: -30°C to +70°C

# UNITRONIC® BUS CAN FD P

CAN Buscables for high flexible application - UL/SCA certified


## Application range

**UNITRONIC® BUS CAN**
- Fixed Installation

**UNITRONIC® BUS CAN FD P**
- For highly flexible applications

## Product features

**UNITRONIC® BUS CAN**
- Maximum bit rate: 1 Mbit/s for 40 m segment length
- Larger conductor cross-section is necessary with increasing length. Refer to the table below (reference values from ISO 11898).
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- Flame-retardant according IEC 60332-1-2

**UNITRONIC® BUS CAN FD P**
- Halogen-free
- Maximum bit rate: 1 Mbit/s for 40 m segment length
- Larger conductor cross-section is necessary with increasing length. Refer to the table below (reference values from ISO 11898).
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- Flame-retardant according IEC 60332-1-2

## Norm references / Approvals

- Standardised internationally in ISO 11898
- UL/CSA type CMX (UL 444)

## Product Make-up

**UNITRONIC® BUS CAN**
- 0.22 + 0.34 + 0.5: bare stranded conductor, 7-wire
  0.75: bare stranded conductor, fine-wire
- Core insulation: foam skin
- Colour-coded in accordance with DIN 47100
- Copper braid
- Outer sheath: PVC, violet (RAL 4001)

**UNITRONIC® BUS CAN FD P**
- Stranded bare conductor
- Core insulation: foam skin
- Screening: wrapped with braided copper wires
- Outer sheath: PUR, violet (RAL 4001)
- UV-resistant (but colour may change after some time)

| Article number | Article designation | Number of pairs/ conductor cross section (mm²) | Outer diameter [mm] | Conductor resistance | Copper index (kg/km) | Weight (kg/km) |
|---|---|---|---|---|---|---|
| **for fixed installation** | | | | | | |
| 2170260 | UNITRONIC® BUS CAN | 1 x 2 x 0,22 | 5.7 | 186 | 16.7 | 42 |
| 2170261 | UNITRONIC® BUS CAN | 2 x 2 x 0,22 | 7.6 | 186 | 34.8 | 68 |
| 2170263 | UNITRONIC® BUS CAN | 1 x 2 x 0,34 | 6.8 | 115 | 25 | 55 |
| 2170264 | UNITRONIC® BUS CAN | 2 x 2 x 0,34 | 8.5 | 115 | 46.4 | 88 |
| 2170266 | UNITRONIC® BUS CAN | 1 x 2 x 0,5 | 7.5 | 78 | 41.6 | 90 |
| 2170267 | UNITRONIC® BUS CAN | 2 x 2 x 0,5 | 9.6 | 78 | 59.4 | 106 |
| 2170269 | UNITRONIC® BUS CAN | 1 x 2 x 0,75 | 8.7 | 52 | 52.7 | 108 |
| 2170270 | UNITRONIC® BUS CAN | 2 x 2 x 0,75 | 11.5 | 52 | 80.6 | 142 |
| **For highly flexible applications (power chains, moving machine parts)** | | | | | | |
| 2170272 | UNITRONIC® BUS CAN FD P | 1 x 2 x 0,25 | 6.4 | 159.8 | 24 | 40 |
| 2170273 | UNITRONIC® BUS CAN FD P | 2 x 2 x 0,25 | 8.4 | 159.8 | 33 | 65 |
| 2170275 | UNITRONIC® BUS CAN FD P | 1 x 2 x 0,34 | 6.8 | 122 | 32.8 | 60 |
| 2170276 | UNITRONIC® BUS CAN FD P | 2 x 2 x 0,34 | 9.6 | 122 | 52.4 | 88 |
| 2170278 | UNITRONIC® BUS CAN FD P | 1 x 2 x 0,5 | 8 | 72.8 | 41.9 | 74 |
| 2170279 | UNITRONIC® BUS CAN FD P | 2 x 2 x 0,5 | 10.8 | 72.8 | 59.4 | 100 |

Unless specified otherwise, the shown product values are nominal values. Detailed values (e.g. tolerances) are available upon request.
Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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## Accessories

- Multipurpose shears A and B
- SMART STRIP stripping tool
- SENSOR STRIP stripping tool refer to page 987

# UNITRONIC® BUS CAN TRAY

CAN Bus cable with PLTC-ER approval - for open wiring between cable trays and industrial machines


**Info**

- CAN = Controller Area Network

## Benefits

- PLTC-ER approval for open wiring between cable tray and industrial machines/plants acc. to NEC 725.154 (D)
- No additional protection of the cable needed

## Application range

- Fixed Installation

## Product features

- Maximum bit rate: 1 Mbit/s for 40 m segment length
- ISO 11898 makes recommendations for the segment length, cable cross section and bit rate
- UV-resistant UL SUN RES
- Oil-resistant according to UL OIL RES I
- Flame-retardant according to CSA FT4 UL Vertical-Tray Flame Test

## Norm references / Approvals

- Standardised internationally in ISO 11898
- c(UL)us Typ CMG (75°C) acc.to UL 444 / CSA 22.2
- UL Type PLTC-ER acc. to UL 13

## Product Make-up

- 7-wire bare stranded copper conductor
- Core insulation: foam skin
- Inner sheath: PVC
- Copper braid
- Outer sheath: PVC, violet (RAL 4001)

## Technical data

**Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

**Mutual capacitance**
(800 Hz) max. 40 nF/km

**Peak operating voltage**
(not for power applications) 250 V
Rated voltage: 600 V (UL)

**Conductor resistance**
(loop): max. 110,8 Ω/km

**Minimum bending radius**
Fixed installation: 8 x outer diameter
Flexing: 15 x outer diameter

**Test voltage**
Core/core: 2000 V

**Characteristic impedance**
120 Ω

**Temperature range**
Fixed installation: -40°C to +80°C
Flexing: -10°C to +70°C

| Article number | Article designation | Number of cores and mm² per conductor | Outer diameter [mm] | Copper index [kg/km] | Weight [kg/km] |
|---|---|---|---|---|---|
| **UNITRONIC® BUS CAN TRAY** | | | | | |
| 2170857 | UNITRONIC® BUS CAN TRAY | 2 x 2 x 0,34 | 7.5 | 35 | 81 |

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Copper price basis: EUR 150/100 kg. Refer to catalogue appendix T17 for the definition and calculation of copper-related surcharges.
Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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## Accessories

- Multipurpose shears A and B
- SMART STRIP stripping tool

# UNITRONIC® BUS CAN BURIAL

CAN bus cable with double outer sheath for outdoor/direct burial use

**Info**

- Suitable for direct burial


## Benefits

- Suitable for CAN communication according to ISO 11898
- Double-sheathed version, extremely tough, for installation without corrugated tubing
- Rugged, UV-resistant and weatherproof
- Diameter of inner sheath suitable for common connectors

## Application range

- Useable for CAN based communication systems like CANopen
- Suitable for direct burial
- For outdoor applications
- For fixed installation or applications with occasional movements

## Product Make-up

- Copper stranded 7x0,32
- Core insulation: PE
- Overall screening of braided tinned-copper strands
- Inner sheath: PVC, violet RAL (4001), outer diameter: 7.1 mm
- Outer sheath: PE, black RAL (9005), outer diameter: 9.0 mm

## Technical data

**Classification ETIM 5/6**
ETIM 5.0/6.0 Class-ID: EC000830
ETIM 5.0/6.0 Class-Description: Data cable

**Mutual capacitance**
(1 kHz): max. 40 nF/km

**Peak operating voltage**
300 V (not for power applications)

**Conductor resistance**
(Loop): max. 74 Ω /km

**Minimum bending radius**
Flexible use: 8 x Outer Diameter
Fixed Installation: 4 x Outer Diameter

**Test voltage**
Core/core: 1500 V rms

**Characteristic impedance**
120 Ω

**Temperature range**
Fixed installation: -40°C to +80°C

| Article number | Number of cores and mm² per conductor | Outer diameter [mm] | Copper index [kg/km] | Weight [kg/km] |
|---|---|---|---|---|
| **UNITRONIC® BUS CAN BURIAL** | | | | |
| 2170500 | 4 x 1 x 0,5 | 9 | 41.8 | 91 |

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Please find our standard lengths at: www.lappkabel.de/en/cable-standardlengths
Packaging size: coil ≤ 30 kg or ≤ 250 m, otherwise drum
Please specify the preferred type of packaging (e.g. 1 x 500 m drum or 5 x 100 m coils).
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## Accessories

- Sub-D Bus-Connectors