CEAM®
CAVI SPECIALI

INDUSTRIAL DATA LAND

The best solution for the industrial automation

www.ceamcavi.it

CEAM CAVI SPECIALI 40° 1971 - 2011

There is a quality,
in CEAM's production,
that goes beyond the features
of each single cable,
a value which involves all the
company processes and turns
the product into a solution:
the most efficient one.

CEAM CAVI DNA

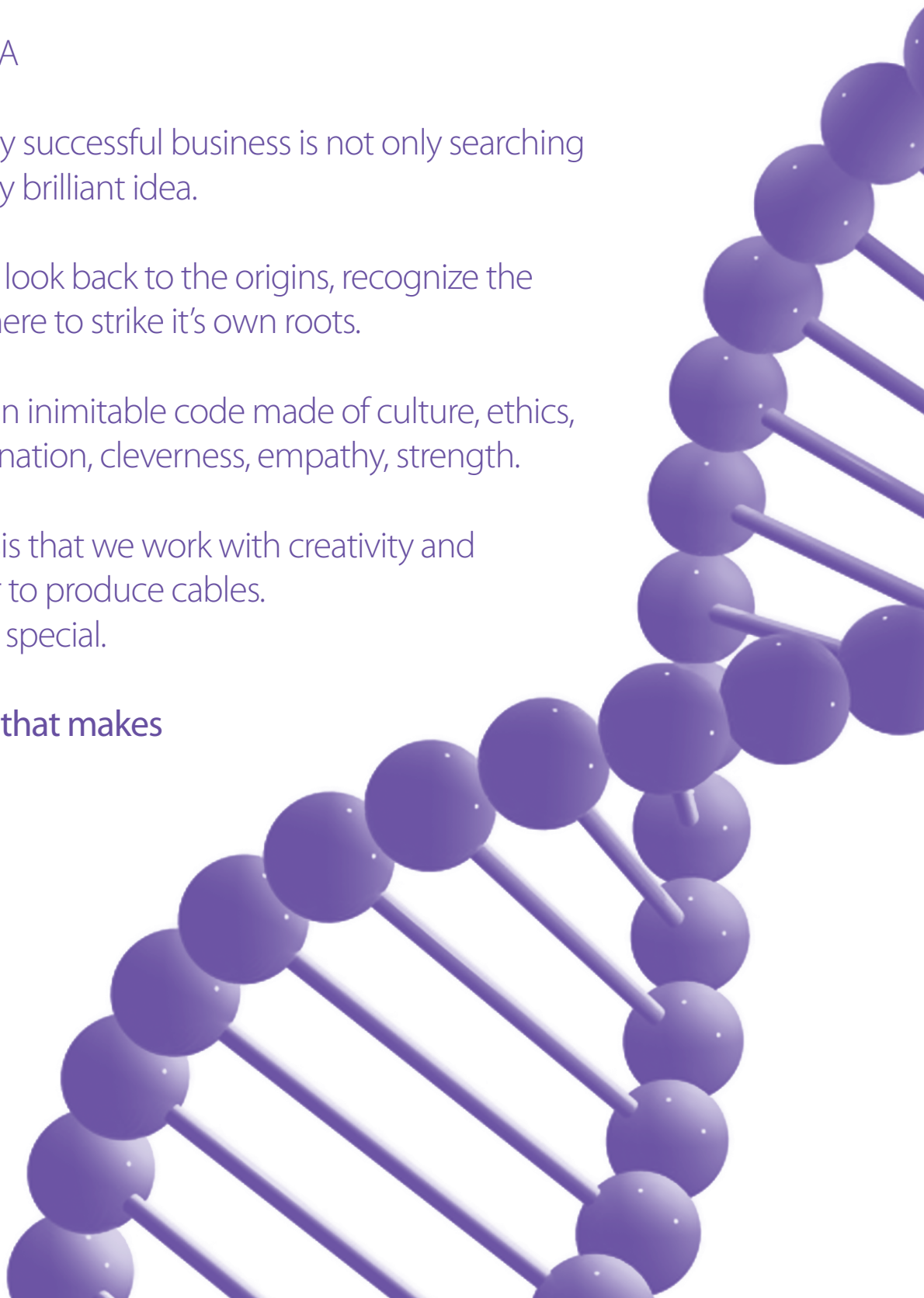
The secret of any successful business is not only searching for a momentary brilliant idea.

It's necessary to look back to the origins, recognize the background where to strike it's own roots.

Ceam reaches an inimitable code made of culture, ethics, genius, determination, cleverness, empathy, strength.

It's on these basis that we work with creativity and passion in order to produce cables.
More and more special.

It's the passion that makes the difference.



CEAM CAVI SPECIALI

The ideal partner for companies oriented to the future

Over more than 40 years experience allow Ceam Cavi Speciali Spa to be one of the top three indipendents family companies in Europe manufacturing industrial automation data cables. Furthermore the range of products includes multi-media, safety, environment and residential applications copper cables. The company invest every year the 10% of the total turnover for new technologies, R&D of new products and approvals, service to the market. Know-how, technology, laboratories, service, high skill of employees are the basis of the company DNA.

The passion for our job make the difference.

- 5000 hours/year spent on internal training.
- 200 brand new articles produced every year.
- More than 2000 certified products according to national and international standards.
- 4000 tons of raw material processed yearly.
- Over 1800 articles always available in stock.
- 16000 sqm. Plants over an area of 36.000 sqm.
- 10% of employees work in the technical department.
- Export in more than 30 countries worldwide.
- Compliant to RoHS - REACH - M.I.C.E.

The products range includes: halogen free, operating temperature between -100 and +280 Celsius degrees, fire retardant, fire resistant, dynamic applications up to 10 millions cycles.

INDUSTRIAL DATA LAND
The best solution for industrial automation

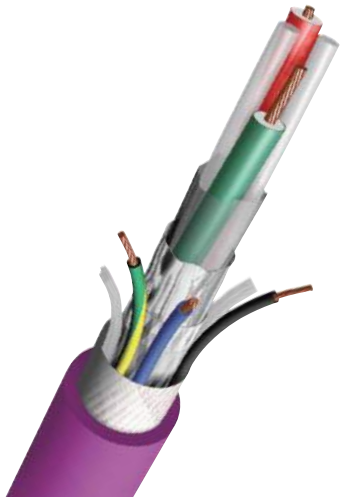
FIELDBUS CABLES

Digital communication systems based on serial binary signals between field devices (sensors and actuators) and/or between automatic control system devices (PLC) are defined by the "fieldbus".

Fieldbus is essentially a distribution system, supported by a local network which guarantees communication between the interconnected devices. In the industrial field, the structure of an automation system is very complex, as a great number of command devices - all connected in the network - work using different transmission protocols.

For this reason, the structure is usually divided into different command levels, which differ from each other in terms of reaction times, protection level, type and use of transmitted data. Therefore, many Fieldbus systems ("open" or "proprietary") have been designed, developed and released as technical specifications, which differences lie in the control and command level, volume of transmitted data, reaction times and protection level.

Manufacturers and users have founded some associations which use their own "Fieldbus" systems to direct final users, according to their requirements and needs, in the industrial automation and communication world.



The most common applications fields are:

PROFIBUS™
PROFINET™
INDUSTRIAL ETHERNET
INTERBUS™
CAN Open™
LON Works™
P-NET™
DeviceNet™
Fieldbus FOUNDATION™
HART™
MODBUS™
BAC NET™
MeterBUS
EIB-KONNEX™
SAFETY BUS-P™
CC-LINK™
USB™
FIREWIRE™

In the industrial automation field, CEAM CAVI SPECIALI daily designs, develops and checks cables with advanced technologies for all Fieldbus applications, in accordance with the existing standards.
CEAM's NETBUS series of cables are the right answer to all these needs, since they are available in many versions, including: high temperature, oil and abrasion resistant, ultra-flexible for mobile installations on cable chains, buried installation, low smoke/zero halogen (LSZH) and fire resistant data cables.

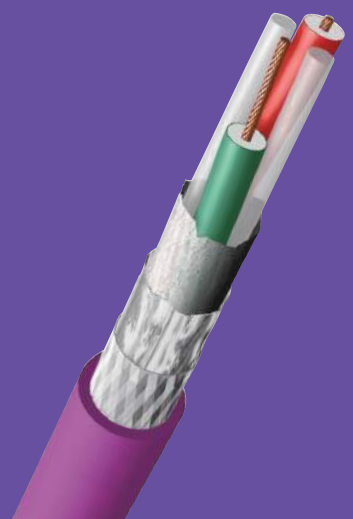
PROFIBUS™ DP - FMS

PROFIBUS standard was released in 1990 and then recognized by German (DIN), European (EN 50170) and international (IEC 61158 and IEC 61784) standards. PROFIBUS DP and FMS are linear systems with two connections based on the RS 485 serial communication. The advantage of PROFIBUS is the possibility to have two different level variations (DP and FMS) in the same transmission technology. A shielded copper twisted pair is used as the means of transmission. With a transmission rate of up to 12 Mbps it can cover a distance of 100 metres.

PROFIBUS DP
(Decentralized Periphery): aimed at high-speed performances to ensure short transmission times to decentralized units (actuators, sensors, etc.)

PROFIBUS FMS
(Fieldbus Message Specifications): aimed at ICT performances to ensure a high switch capacity between intelligent devices (PC, PLC)

(PROFIBUS is a registered trademark of PNO – PROFIBUS NETWORK ORGANIZATION)



12 **NETBUS L2/FIP YFC22 1x2x0,64 AWM2571 - P/N 0502890**
PROFIBUS DP cable for fixed installations - OR PVC jacket - FAST CONNECT

13 **NETBUS L2/FIP Y22 1x2x0,64 AWM2571 - P/N 0502891**
PROFIBUS DP cable for fixed installations - OR PVC jacket

14 **NETBUS L2/FIP Y22/7 1x2x22/7AWG AWM2571 - P/N 0502930**
PROFIBUS DP cable for fixed and flexible applications - OR PVC jacket

15 **NETBUS L2/FIP Y24 1x2x24/7AWG AWM2571 - P/N 0502906**
PROFIBUS DP cable for fixed and flexible applications - OR PVC jacket

16 **NETBUS L2/FIP P22M 1x2x22/19AWG AWM20233 - P/N 0502453**
PROFIBUS DP cable for fixed and dynamic applications - HF PUR jacket

17 **NETBUS L2/FIP P24M 1x2x24/19AWG AWM20233 - P/N 0502903**
PROFIBUS DP cable for fixed and dynamic applications - HF PUR jacket

18 **NETBUS L2/FIP P24S LONG LIFE 1x2x24/32AWG - P/N 0502466**
PROFIBUS DP cable for fixed and dynamic applications - HF PUR jacket

19 **NETBUS L2/FIP P24MHF LONG LIFE 1x2x24/65AWG AWM20233 - P/N 0505781F**
PROFIBUS DP cable for fixed and dynamic applications - HF PUR jacket - FAST CONNECT

20 **NETBUS L2/FIP PFC24M 1x2x24/19AWG AWM20233 - P/N 0502902**
PROFIBUS DP cable for fixed and dynamic applications - HF PUR jacket - FAST CONNECT

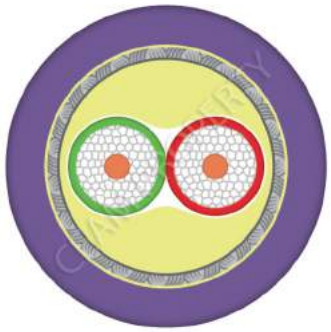
21 **NETBUS L2/FIP FESTOON P23F 1x2x23/19AWG AWM2571 - P/N 0505776F**
PROFIBUS DP cable for fixed and dynamic applications - OR PVC jacket

22 **NETBUS L2/FIP TORSION P23T 1x2x23/19AWG AWM20233 - P/N 0502940**
PROFIBUS DP cable for fixed and torsional applications - HF PUR jacket

23 **NETBUS L2/FIP 2G23-HT HIGH TEMPERATURE 1x2x23/1AWG - P/N 0507021**
PROFIBUS DP cable for fixed high temperature applications - silicone jacket

24 **NETBUS L2/FIP PCB22M-375 1x2x22/19AWG + 3x0,75 mm² AWM20233 - P/N 0502509**
PROFIBUS DP combi cable for fixed and dynamic applications - HF PUR jacket

25 **NETBUS L2/FIP PROFYBRID 1x2x24/19AWG + 1x1,50 mm² - P/N 0502505**
PROFIBUS DP combi cable for fixed and dynamic applications - HF PUR jacket



PROFIBUS™ DP - FMS

NETBUS L2/FIP YFC22 AWM2571

1x2x0,64 (22/1AWG) S/FTP

CODE 0502890

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Fieldbus cable for fixed application, FAST CONNECT type, with oil resistant PVC sheath. The item offers excellent electrical-transmissive performances, which are necessary in PROFIBUS DP-FMS applications operating up to 20 MHz frequencies. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Heat release
1585 MJ/km (0,439 kWh/m)

OTHER VERSIONS

Not UL/CSA recognized - NETBUS L2/FIP YFC22 (P/N 0502490)
PE jacket - NETBUS L2/FIP PEFC22 (P/N 0502323)
FRNC-LSZH - NETBUS L2/FIP HFC22 (P/N 0502489)

CONSTRUCTION

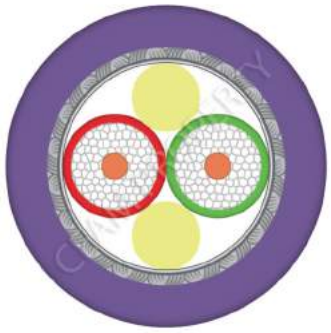
Inner conductor	Solid bare copper wire ø 0,64 mm (22/1AWG - 0,34 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair
Separation	Polyester tape
Inner jacket	FR PVC ø 5,5 mm
Overall shield	AL/PET tape + tinned copper braid 65% coverage
Outer jacket	FR-PVC • Violet RAL4001
Outer ø	7,90 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	54,0 Ω/km
Capacitance @ 800 Hz	29 nF/km
NVP @ 10MHz	78%
Characteristic impedance	185 Ω (±10%) @ 31,25 kHz • 150 Ω (±10%) (1÷20 MHz)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 200 kHz 2,1 dB/100m @ 4 MHz • 4,0 dB/100m @ 16 MHz 4,4 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 4 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 5 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	79 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	90 N
Operating temperature range	-40°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ DP - FMS

NETBUS L2/FIP Y22 AWM2571

1x2x0,64 (22/1AWG) S/FTP

CODE 0502891

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Fieldbus cable for fixed application with oil resistant PVC sheath. The item offers high shielding efficiency and excellent electrical-transmissive performances, specific for PROFIBUS DP-FMS type applications. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
1202 MJ/km (0,333 kWh/m)

OTHER VERSIONS

Not UL/CSA recognized - NETBUS L2/FIP Y22 (P/N 0502491)
PE jacket - NETBUS L2/FIP PE22 (P/N 0502492)
FRNC-LSZH - NETBUS L2/FIP H22 (P/N 0502485)
Double jacket PVC/PE - NETBUS L2/FIP YPE22 (P/N 0502501)

CONSTRUCTION

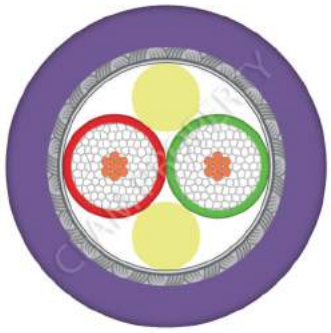
Inner conductor	Solid bare copper wire ø 0,64 mm (22/1AWG - 0,34 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Violet RAL4001
Outer ø	7,80 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	54,0 Ω/km
Capacitance @ 800 Hz	29 nF/km
NVP @ 10MHz	78%
Characteristic impedance	185 Ω (±10%) @ 31,25 kHz • 150 Ω (±10%) (1÷20 MHz)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,4 dB/100m @ 38,4 kHz 0,5 dB/100m @ 200 kHz • 2,1 dB/100m @ 4 MHz 4,0 dB/100m @ 16 MHz • 4,4 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	7 mΩ/m @ 100 kHz • 3 mΩ/m @ 1 MHz • 0,6 mΩ/m @ 10 MHz 2 mΩ/m @ 30 MHz • 8 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	79 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (Static)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ DP - FMS

NETBUS L2/FIP Y22/7 AWM2571

1x2x22/7AWG S/FTP

CODE 0502930

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. The high shielding efficiency and its electrical performances make it particularly suitable for PROFIBUS DP-FMS type applications in vibrating devices or at non continuous movements. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
1289 MJ/km (0,357 kWh/m)

OTHER VERSIONS

Not UL/CSA recognized - NETBUS L2/FIP Y22/7 (P/N 0502488)
FRNC-LSZH - NETBUS L2/FIP H22/7 (P/N 0502482)

CONSTRUCTION

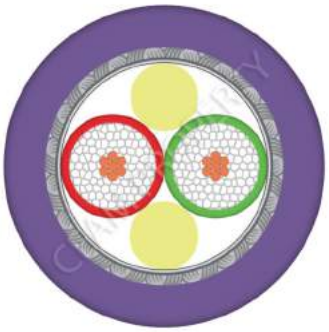
Inner conductor	Stranded bare copper wire ø - 0,75 mm (22/7AWG - 0,35 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,6 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 65% coverage
Outer jacket	Oil and UV resistant FR-PVC • Violet RAL4001
Outer ø	7,80 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	54,0 Ω/km
Capacitance @ 800 Hz	29 nF/km
Characteristic impedance	185 Ω (±10%) @ 31,25 kHz • 150 Ω (±10%) (1÷20 MHz)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,4 dB/100m @ 38,4 kHz 0,6 dB/100m @ 200 kHz • 2,1 dB/100m @ 4 MHz 4,0 dB/100m @ 16 MHz • 4,4 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	12 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 12 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	65 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	80 N
Operating temperature range	-40°C/+80°C
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ DP - FMS

NETBUS L2/FIP Y24 AWM2571

1x2x24/7AWG S/FTP

CODE 0502906

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. The item offers high shielding efficiency and good electrical-transmissive performances, which are fundamental in PROFIBUS DP-FMS type applications used in vibrating devices or at non continuous movements. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
1356 MJ/km (0,376 kWh/m)

OTHER VERSIONS

Not UL/CSA recognized - NETBUS L2/FIP Y24 (P/N 0502496)
FRNC-LSZH - NETBUS L2/FIP H24 (P/N 0502495)

CONSTRUCTION

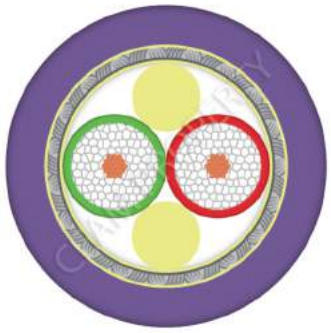
Inner conductor	Stranded bare copper wire - 0,60 mm ø (24/7AWG - 0,22 mm²)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Violet RAL4001 colour
Outer ø	7,80 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	68,0 Ω/km
Capacitance @ 800 Hz	29 nF/km
NVP @ 10MHz	78%
Characteristic impedance	185Ω (±10%) @ 31,25 kHz • 150Ω (±10%) (1÷20 MHz)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 38,4 kHz 0,6 dB/100m @ 200 kHz • 2,3 dB/100m @ 4 MHz 4,8 dB/100m @ 16 MHz • 5,2 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	65 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (installation)
Max pulling strenght	80 N
Operating temperature range	-40°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ DP - FMS

NETBUS L2/FIP P22M AWM20233

1x2x0,8 (22/19AWG) S/FTP

CODE 0502453

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application in drag chain, with PUR sheath. The item is particularly suitable for PROFIBUS DP-FMS application. The experience in the choice of materials and in the building development allows this cable to offer excellent electrical-transmissive performances, also under heavy movement conditions. UL/CSA approved in accordance with AWM Style 20233 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158

EN50170-2

DIN 19245

EIA RS485

COMPLIANCE

2011/65 EC RoHS

2006/95/EC LVD

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1) CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release

1259 MJ/km (0,349 kWh/m)

OTHER VERSIONS

CONSTRUCTION

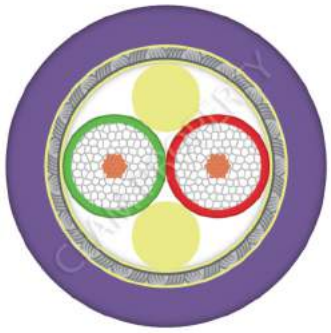
Inner conductor	Stranded bare copper wire - 0,80 mm ø (22/19AWG - 0,38 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,8 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Non-woven tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,1 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	59,4 Ω/km
Capacitance @ 800 Hz	30 nF/km
NVP @ 10MHz	78%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 38,4 kHz 0,6 dB/100m @ 200 kHz • 2,2 dB/100m @ 4 MHz 4,4 dB/100m @ 16 MHz • 4,9 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	65 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec
Acceleration (drag chain)	≤ 3,0 m/sec^2
Torsional use	Not recommended



PROFIBUS™ DP - FMS

NETBUS L2/FIP P24M AWM20233

1x2x0,64 (24/19AWG) S/FTP

CODE 0502903

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application in drag chain, with PUR sheath. The item is particularly suitable for PROFIBUS DP-FMS applications. The experience in the choice of materials and in the constructive development allows this cable to offer excellent electrical- transmissive performances, also under heavy movement conditions. UL/CSA approved in accordance with AWM Style 20233 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1140 MJ/km (0,316 kWh/m)

OTHER VERSIONS

Not UL/CSA recognized - NETBUS L2/FIP P24M (P/N 0502503)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 0,64 mm ø (24/19AWG - 0,25 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Non-woven tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	7,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	74,0 Ω/km
Capacitance @ 800 Hz	30 nF/km
NVP @ 10MHz	78%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 38,4 kHz 0,7 dB/100m @ 200 kHz • 2,5 dB/100m @ 4 MHz 4,4 dB/100m @ 16 MHz • 4,9 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	65 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec
Acceleration (drag chain)	≤ 3,0 m/sec^2
Torsional use	Not recommended

PROFIBUS™ DP - FMS

NETBUS L2/FIP P24S LONG LIFE

1x2x0,64 (24/32AWG) S/FTP

CODE 0502466

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application in drag chain, with PUR sheath. The item is particularly suitable for PROFIBUS DP-FMS applications. The study dedicated to the choice of materials and to the construction development allows this item to offer high electrical-transmissive performances for an increased time compared to common trailing cables. UL/CSA approved in accordance with AWM Style 20233 and DESINA approved.

APPROVALS

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1528 MJ/km (0,423 kWh/m)

OTHER VERSIONS

CONSTRUCTION

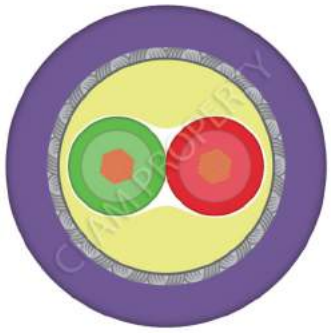
Inner conductor	Stranded bare copper wire 24/32AWG (0,25 mm^2)
Insulation	Solid polypropylene
Insulation ø	2,8 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	75,0 Ω/km
Capacitance @ 800 Hz	30 nF/km
NVP @ 10MHz	67%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 38,4 kHz 0,7 dB/100m @ 200 kHz • 2,8 dB/100m @ 4 MHz 5,6 dB/100m @ 16 MHz • 6,5 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance @ 10 MHz	30 mΩ/m

OTHER PROPERTIES

Weight	78 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec
Acceleration (drag chain)	≤ 10,0 m/sec^2
Torsional use	Not recommended



PROFIBUS™ DP - FMS

NETBUS L2/FIP PFC24MHF AWM20233 LONG LIFE

1x2x0,64 (24/65AWG) S/FTP

CODE 0505781F

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application in drag chain, FAST CONNECT type, with PUR sheath. The item is suitable for PROFIBUS DP-FMS applications and has been designed in order to guarantee high duration - especially under movement conditions in cable chains. UL/CSA approved in accordance with AWM Style 20233 and DESINA approved.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1839 MJ/km (0,510 kWh/m)

OTHER VERSIONS

CONSTRUCTION

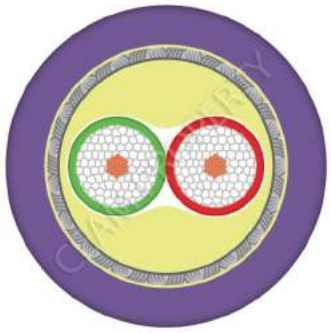
Inner conductor	Stranded bare copper wire - 0,64 mm ø (24/65AWG - 0,25 mm^2)
Insulation	Solid polypropylene
Insulation colours	Red, green
Assembly of cores	Twisted pair
Inner jacket	Halogen free compound - ø 6,5 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	89,2 Ω/km
Capacitance @ 800 Hz	30 nF/km
NVP @ 10MHz	67%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,5 dB/100m @ 9,6 kHz • 0,6 dB/100m @ 38,4 kHz 2,8 dB/100m @ 4 MHz • 5,2 dB/100m @ 16 MHz 6,0 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 50 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	89 kg/km
Max operating voltage	300 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 5,0 m/sec
Acceleration (drag chain)	≤ 10,0 m/sec^2
Torsional use	Not recommended



PROFIBUS™ DP - FMS

NETBUS L2/FIP PFC24M AWM20233

1x2x0,64 (24/19AWG) S/FTP

CODE 0502902

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

For drag chain application (axial movements)

APPLICATION

Fieldbus Cable, FAST CONNECT type, for fixed or dynamic application in drag chain, with PUR sheath. The item is particularly suitable for PROFIBUS and FMS applications working up to 20 MHz frequencies, and has been designed in order to guarantee long duration under movement conditions in cable chains. UL/CSA approved in accordance with AWM Style 20236 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158

EN50170-2

DIN 19245

EIA RS485

COMPLIANCE

2011/65 EC RoHS

2006/95/EC LVD

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1) CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release

1782 MJ/km (0,295 kWh/m)

OTHER VERSIONS

Not UL/CSA recognized - NETBUS L2/FIP PFC24M (P/N 0502467)

CONSTRUCTION

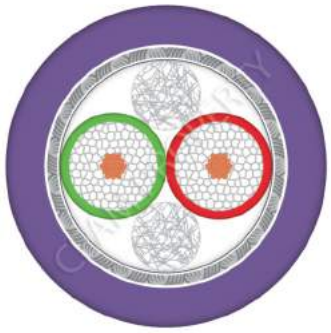
Inner conductor	Stranded bare copper wire - 0,64 mm ø (24/19AWG - 0,25 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair
Separation	Polyester tape
Inner jacket	FR PVC ø 5,5 mm
Overall shield	AL/PET tape + tinned copper braid 70% coverage
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	72,5 Ω/km
Capacitance @ 800 Hz	29 nF/km
NVP @ 10MHz	78%
Characteristic impedance	185 Ω (±10%) @ 31,25 kHz • 150 Ω (±10%) (1÷20 MHz)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,4 dB/100m @ 38,4 kHz 0,5 dB/100m @ 200 kHz • 2,5 dB/100m @ 4 MHz 4,4 dB/100m @ 16 MHz • 4,9 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	91 kg/km
Max operating voltage	300 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec
Acceleration (drag chain)	≤ 3,0 m/sec^2
Torsional use	Not recommended



PROFIBUS™ DP - FMS

NETBUS L2/FIP Y23F AWM2571 FESTOON

1x2x0,64 (23/19AWG) S/FTP

CODE 0505776F

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application, FESTOON type, with PVC sheath. The item is suitable for PROFIBUS DP-FMS applications and has been designed and produced in order to guarantee excellent transmissive performances and high flexibility in particular conditions, such as measured fixing with suspension - generally used in dynamic installations (for example, cranes). UL/CSA approved in accordance with AWM Style 2571 and DESINA approved.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
1453 MJ/km (0,403 kWh/m)

OTHER VERSIONS

CONSTRUCTION

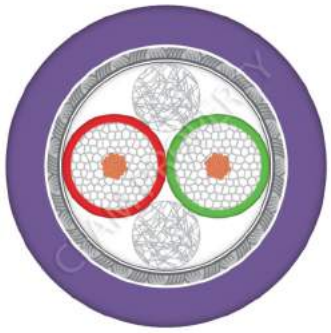
Inner conductor	Stranded bare copper wire - 0,64 mm ø (23/19AWG - 0,30 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	PTFE tape
Overall shield	AL/PET tape + tinned copper braid 70% coverage
Separation	PTFE tape
Outer jacket	FR-PVC • Violet RAL4001 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	66,5 Ω/km
Capacitance @ 800 Hz	30 nF/km
NVP @ 10MHz	78%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,4 dB/100m @ 38,4 kHz 0,6 dB/100m @ 200 kHz • 2,4 dB/100m @ 4 MHz 4,5 dB/100m @ 16 MHz • 5,0 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	70 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (festoon)
Max pulling strenght	100 N
Operating temperature range	-30°C/+80°C (static) • -5°C / +50°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Torsional use	Up to +/-30°



PROFIBUS™ DP - FMS

NETBUS L2/FIP P23T AWM20233 TORSION

1x2x0,64 (23/19AWG) S/FTP

CODE 0502940

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For torsional movements

APPLICATION

Fieldbus cable for fixed or dynamic application, TORSION type, with PUR sheath. The item is suitable for PROFIBUS DP-FMS applications and has been designed and produced in order to guarantee excellent transmissive performances and a high torsion capabiltiy in particular conditions - such as usage in movable rotating devices (for example, robots). The article has also been tested for 360°/m torsion movements at more than 10mln of cycles. UL/CSA approved in accordance with AWM Style 2023 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
1428 MJ/km (0,396 kWh/m)

OTHER VERSIONS

CONSTRUCTION

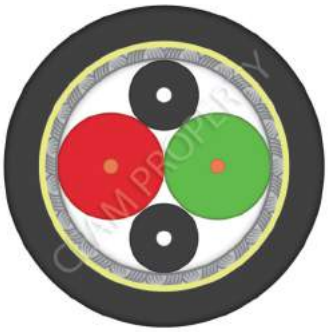
Inner conductor	Stranded bare copper wire - 0,64 mm ø (23/19AWG - 0,30 mm²)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Aluminized non-woven tape
Overall shield	AL/PET tape + tinned copper special braid 95% coverage
Separation	PTFE tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	66,5 Ω/km
Capacitance @ 800 Hz	30 nF/km
NVP @ 10MHz	78%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,4 dB/100m @ 38,4 kHz 0,6 dB/100m @ 200 kHz • 2,4 dB/100m @ 4 MHz 4,5 dB/100m @ 16 MHz • 5,0 dB/100m @ 20 MHz
Inductance @ 31,25 kHz	0,8 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	20 mΩ/m @ 1 MHz • 50 mΩ/m @ 10 MHz 100 mΩ/m @ 30 MHz

OTHER PROPERTIES

Weight	72 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Torsional use	Up to +/-180°



PROFIBUS™ DP - FMS

NETBUS L2/FIP 2G23-HT HIGH TEMPERATURE

1x2x23/1AWG S/FTP

CODE 0507021

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation

APPLICATION

Fieldbus cable for fixed application with silicone sheath. The item is particularly suitable for PROFIBUS DP - FMS applications. This innovative product has been designed to be used in all those situations where working conditions result particularly heavy due to high temperatures. The choice of suitable materials allows good transmissive performances up to +200°C.

APPROVALS

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1460 MJ/km (0,405 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Bare copper wire ø 0,57 mm (23/1AWG - 0,26 mm^2)
Insulation	Special halogen free compound
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Shield	AL/PET tape + tinned copper braid 85% coverage
Inner jacket	PA ø 6,7 mm
Outer jacket	Silicone rubber • Black colour
Outer ø	8,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	74,5 Ω/km
Capacitance @ 800 Hz	32 nF/km
NVP @ 10MHz	65%
Characteristic impedance	185Ω (±10%) @ 31,25 kHz • 150Ω (±10%) (1÷20 MHz)
Attenuation	0,4 dB/100m @ 9,6 kHz • 0,6 dB/100m @ 38,4 kHz 1,6 dB/100m @ 1 MHz • 2,9 dB/100m @ 4 MHz 6,3 dB/100m @ 16 MHz • 7,2 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 1 MHz • 20 mΩ/m @ 10 MHz • 50 mΩ/m @ 30 MHz

OTHER PROPERTIES

Weight	88 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	100 N
Operating temperature range	-50°C/+200°C

PROFIBUS™ DP - FMS

NETBUS L2/FIP PCB22M-375 AWM20233

1x2x22/19AWG + 3x0,75mm² S/FTP

CODE 0502509

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Hybrid fieldbus cable for fixed or dynamic application with PUR sheath. Next to the traditional PROFIBUS DP cable is placed an energy line with 3 conductors, dedicated to the feeding of devices. The item is generally used for dynamic application in devices such as ET200X SIEMENS™. UL/CSA approved in accordance with AWM Style 20233 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
2571 MJ/km (0,712 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,8 mm ø (22/19AWG - 0,38 mm²)
Insulation	Foam-skin polyethylene
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Shield	AL/PET tape + tinned copper braid 85% coverage
Inner conductors	Stranded bare copper wire 19/42AWG - 0,75 mm²
Insulation	Solid polypropylene
Insulation colours	Brown, blue, yellow-green
Assembly of elements	Shielded data pair and power conductor stranded together with fillers
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	10,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	59,4 Ω/km (22AWG) - 26,0 Ω/km (19AWG)
Capacitance @ 800 Hz	30 nF/km (data pair)
NVP @ 10MHz	78%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 38,4 kHz 0,7 dB/100m @ 200 kHz • 2,3 dB/100m @ 4 MHz 4,4 dB/100m @ 16 MHz • 4,8 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	2,5 kVac/5 min
Dielectric strenght (cond./shield)	2,5 kVac/5 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	125 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] (axial drag chain)
Max pulling strenght	170 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec
Acceleration (drag chain)	≤ 3,0 m/sec²
Torsional use	Not recommended

PROFIBUS™ DP - FMS

NETBUS L2/FIP PROFYBRID

1x2x24/19AWG + 4x1,50mm² S/FTP

CODE 0502505

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Hybrid fieldbus cable for fixed or dynamic application, with PUR sheath. Next to the traditional PROFIBUS DP cable are disposed 4 conductors (section 1,500mm2) dedicated to signaling. DESINA compliant.

APPROVALS

STANDARD REFERENCE

IEC61158
EN50170-2
DIN 19245
EIA RS485

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
2549 MJ/km (0,706 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,65 mm ø (24/19AWG - 0,25 mm²)
Insulation	Foam-skin polyethylene
Insulation ø	2,5 mm
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Shield	AL/PET tape + tinned copper braid 85% coverage
Inner conductors	Stranded bare copper wire 15/84AWG - 1,50 mm²
Insulation	Solid polyethylene
Insulation colours	Black numbered
Assembly of elements	Shielded data pair and power conductor stranded together with fillers
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	11,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	84,0 Ω/km (24AWG) • 13,3 Ω/km (15AWG)
Capacitance @ 800 Hz	30 nF/km (data pair)
NVP @ 10MHz	78%
Characteristic impedance (1÷20 MHz)	150 Ω (±10%)
Attenuation	0,3 dB/100m @ 9,6 kHz • 0,5 dB/100m @ 38,4 kHz 0,7 dB/100m @ 200 kHz • 2,5 dB/100m @ 4 MHz 4,9 dB/100m @ 16 MHz • 5,7 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	2,5 kVac/5 min
Dielectric strenght (cond./shield)	2,5 kVac/5 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 8 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	160 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] (axial drag chain)
Max pulling strenght	350 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant VDE 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec
Acceleration (drag chain)	≤ 3,0 m/sec²
Torsional use	Not recommended

Data pairs
Power elements

PROFIBUS™ PA

PROFIBUS standard was released in 1990 and then recognized by German (DIN), European (EN 50170) and international (IEC 61158 and IEC 61784) standards.

PROFIBUS PA is a linear system with two connections based on the RS 485 serial communication. With a transmission rate of up to 31.25 kbps (Manchester signal coding)and a distance of up to 1900 metres.

PROFIBUS PA gives functional support to all applications with the risk of explosion in the process industry (hazardous areas).

(PROFIBUS is a registered trademark of PNO – PROFIBUS NETWORK ORGANIZATION)

CEAM Cavi Speciali is a menber of PROFIBUS International

28 **NETBUS PA Y18 1x2x18/1AWG AWM2571 - P/N 0502335**
PROFIBUS PA cable for fixed installations - PVC jacket

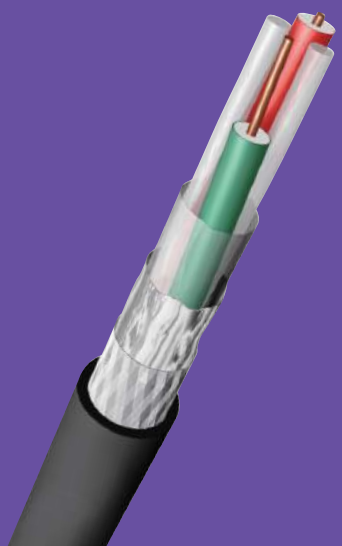
29 **NETBUS PA YFC18 1x2x18/1AWG AWM2571 - P/N 0505745F**
PROFIBUS PA cable for fixed installations - PVC jacket - FAST CONNECT

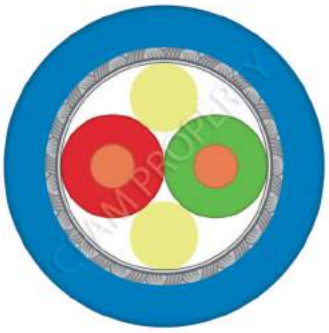
30 **NETBUS PA Y1 1x2x1,00MM2 - P/N 0502515**
PROFIBUS PA cable for fixed installations - PVC jacket

31 **NETBUS PA Y18/19E 1x2x18/19AWG AWM2571 - P/N 0505740**
PROFIBUS PA cable for fixed installations - PVC jacket

32 **NETBUS PA YFC16 LONG DISTANCE 1x2x16/7AWG - P/N 0505747F**
PROFIBUS PA cable for fixed installations - PVC jacket - FAST CONNECT

33 **NETBUS PA YFC14 LONG DISTANCE 1x2x14/7AWG - P/N 0505749F**
PROFIBUS PA cable for fixed installations - PVC jacket - FAST CONNECT





PROFIBUS™ PA

NETBUS PA Y18 AWM2571

1x2x1,00mm (18/1AWG) S/FTP

CODE 0502335

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Fieldbus cable for fixed application with oil resistant PVC sheath. Specifically designed for data trasnmission and to guarantee low inductance values, it is mostly applied in intrinsic safety systems with PROFIBUS PA (Process Automation) technology. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 300V/80°C

STANDARD REFERENCE

IEC61158

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061 • CSA FT1
IEC60332-1 Std.
Heat release
1341 MJ/km (0,372 kWh/m)

OTHER VERSIONS

Flexible 18/7AWG version - NETBUS PA Y18/7 (P/N 0502337)

CONSTRUCTION

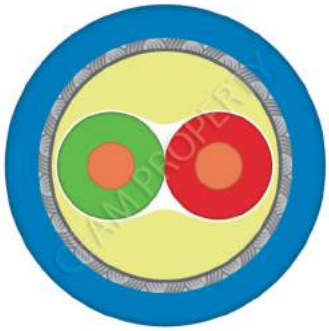
Inner conductor	Solid bare copper wire - 1,0 mm ø (18/1AWG - 0,8 mm²)
Insulation	Solid polyethylene
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Blue RAL5015 colour
Outer ø	7,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	22,0 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω (±15%) @ 31,25 kHz • 80 Ω @ 1MHz
Attenuation	0,3 dB/100m @ 39 kHz • 0,4 dB/100m @ 100 kHz 1,4 dB/100m @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz

OTHER PROPERTIES

Weight	82 kg/km
Max operating voltage	300 V
Min bending radius	10 x outer ø [mm]
Max pulling strenght	120 N
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ PA

NETBUS PA YFC18 AWM2571

1x2x1,00mm (18/1AWG) S/FTP

CODE 0505745F

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Fieldbus cable for fixed application, FAST CONNECT type, with oil resistant PVC sheath. Specifically designed for data transmission and to guarantee low inductance values, it is mostly applied in intrinsic safety systems with PROFIBUS PA (Process Automation) technology. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 300V/80°C

STANDARD REFERENCE

IEC61158

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061 • CSA FT1
IEC60332-1 Std.
Heat release
1081 MJ/km (0,300 kWh/m)

OTHER VERSIONS

CONSTRUCTION

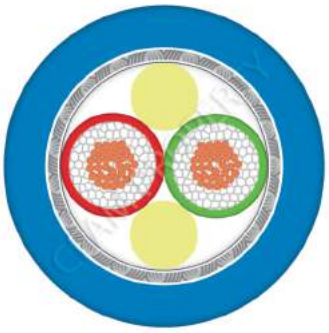
Inner conductor	Solid bare copper wire - 1,0 mm ø (18/1AWG - 0,8 mm²)
Insulation	Solid polyethylene
Insulation colours	Red, green
Assembly of cores	Twisted pair
Separation	Polyester tape
Inner jacket	FR PVC ø 5,5 mm
Overall shield	AL/PET tape + tinned copper braid 60% coverage
Outer jacket	FR-PVC • Blue RAL5015 colour
Outer ø	7,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	22,0 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω (±20%) @ 31,25 kHz • 80 Ω @ 1MHz
Attenuation	0,3 dB/100m @ 39 kHz • 0,4 dB/100m @ 100 kHz 1,4 dB/100m @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz

OTHER PROPERTIES

Weight	91 kg/km
Max operating voltage	300 V
Min bending radius	10 x outer ø [mm]
Max pulling strenght	120 N
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ PA

NETBUS PA Y1

1x2x1,00mm² (18/32AWG) S/UTP

CODE 0502515

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Fieldbus cable for fixed and dynamic (non continuous) application, with PVC sheath. Characterized by low inductance values, it is mostly used in intrinsic safety systems with PROFIBUS PA (Process Automation) technology.

APPROVALS

STANDARD REFERENCE

IEC61158

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

1601 MJ/km (0,444 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS PA H1 LSZH (P/N 0502516)

CONSTRUCTION

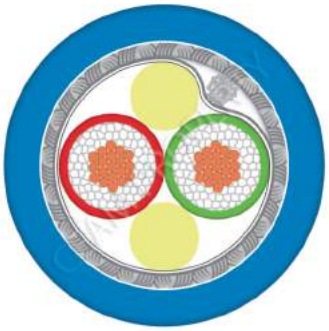
Inner conductor	Stranded bare copper wire - 1,3 mm ø (18/32AWG - 1,00 mm²)
Insulation	Foam-skin polyethylene
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Polyester tape
Overall shield	Tinned copper braid 85% coverage
Outer jacket	FR-PVC ø Blue RAL5015 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	19,5 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω (±20%) @ 31,25 kHz • 80 Ω @ 1MHz
Attenuation	0,3 dB/100m @ 39 kHz • 0,4 dB/100m @ 100 kHz 1,5 dB/100m @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 18 mΩ/m @ 1 MHz

OTHER PROPERTIES

Weight	97 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	130N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	compliant EN 50396 Std.



PROFIBUS™ PA

NETBUS PA Y18/19e AWM2571

1x2x1,0mm^2 (18/19AWG) S/FTP

CODE 0505740

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation

APPLICATION

Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. Suitable for data transmission in intrinsic safety systems with PROFIBUS PA (Process Automation) technology. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 300V/80°C

STANDARD REFERENCE

IEC61158

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061 • CSA FT1 IEC60332-1 Std.
Heat release
1253 MJ/km (0,347 kWh/m)

OTHER VERSIONS

CONSTRUCTION

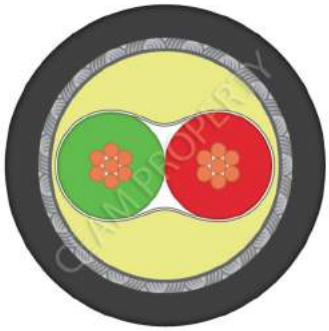
Inner conductor	Stranded bare copper wire - 1,2 mm ø (18/19 AWG - 1,00 mm^2)
Insulation	Foam-skin polyethylene
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire 21WG + tinned copper braid 85% coverage
Outer jacket	FR-PVC ø Blue RAL5015 colour
Outer ø	7,8 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	20 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω (±15%) @ 31,25 kHz • 80 Ω @ 1MHz
Attenuation	0,3 dB/100m @ 39 kHz • 0,4 dB/100m @ 100 kHz 1,5 dB/100m @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz

OTHER PROPERTIES

Weight	90 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	170 N
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.



PROFIBUS™ PA

NETBUS PA YFC16 LONG DISTANCE

1x2x16/7AWG S/FTP

CODE 0505747F

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Fieldbus cable for fixed and dynamic (non continuous) application, FAST CONNECT type, with PVC sheath. The high section of the conductors allows to cover longer transmission distances compared to traditional cables; this article is then mostly used in intrinsic safety systems with PROFIBUS PA (Process Automation) technology.

APPROVALS

STANDARD REFERENCE

IEC61158-2

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

2373 MJ/km (0,657 kWh/m)

OTHER VERSIONS

CONSTRUCTION

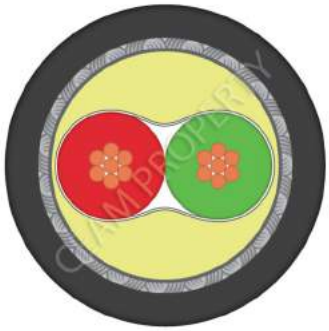
Inner conductor	Stranded bare copper wire - 1,5 mm ø (16/7 AWG - 1,50 mm^2)
Insulation	Solid polyethylene
Insulation colours	Red, green
Assembly of cores	Twisted pair with fillers
Separation	Polyester tape
Inner jacket	FR PVC ø 7,3 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Black colour
Outer ø	9,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	14,6 Ω/km
Capacitance @ 800 Hz	60 pF/m
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance @ 31,25 kHz	100 Ω (±20%)
Attenuation	0,25 dB/100m @ 39 kHz • 0,35 dB/100m @ 100 kHz 1,1 dB/100m @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz

OTHER PROPERTIES

Weight	150 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	230 N
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	compliant EN 50396 Std.



PROFIBUS™ PA

NETBUS PA YFC14/7 LONG DISTANCE

1x2x14/7AWG S/FTP

CODE 0505749F

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Fieldbus cable for fixed and dynamic (non continuous) application, FAST CONNECT type, with PVC sheath. The high section of the conductors allows to perform long connections, guaranteeing excellent eletrical-transmissive values; the article is then mostly used in intrinsic safety systems with PROFIBUS PA (Process Automation) technology.

APPROVALS

STANDARD REFERENCE

IEC61158-2

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

3648 MJ/km (1,011 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 2,0 mm ø (14/7 AWG - 2,30 mm^2)
Insulation	Solid polyethylene
Insulation colours	Red, green
Assembly of cores	Stranded to a pair
Separation	Polyester tape
Inner jacket	FR PVC ø 9,2 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Black colour
Outer ø	11,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	8,9 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100Ω (±20%) @ 31,25 kHz • 80Ω @ 1MHz
Attenuation	0,2 dB/100m @ 39 kHz • 0,3 dB/100m @ 100 kHz 0,8 dB/100m @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz

OTHER PROPERTIES

Weight	212 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

Fieldbus FOUNDATION™

In 1994 the ISP (Interoperable Systems Project) Association and the French organization FIP (Flux Information Processus) then called WorldFIP, merged to create the Fieldbus Foundation. This fieldbus uses some elements of the WorldFIP and PROFIBUS- PA protocols. Fieldbus Foundation uses a twisted pair cable for communication at 31.25 kbps over a maximum distance of 1900 metres and for communication at 2.5 Mbps over a maximum distance of 500 metres. Data Transmission speed rate and length of the sections are also correlated by the number of devices connected in the network (32 max.) The connection made with the copper cables allows the transfer of data at the same time as supplying power to the interconnected equipment. They are used for process automation in intrinsic safety systems.

(FOUNDATION is a registered trademark of Fiedlbus FOUNDATION Association)

36 **NETBUS FF-2 Y18/19 1x2x18/19AWG AWM2571 - P/N 0502855F**
Fieldbus FONDATION cable for fixed installations - OR PVC jacket

37 **NETBUS FF-3 Y18/19 1x2x18/19AWG + 1X18/19AWG AWM2571 - P/N 0502857F**
Fieldbus FONDATION cable for fixed installations - OR PVC jacket

38 **NETBUS FF Y180 1x2x18/7AWG - P/N 095295**
Pro multiFieldbus FONDATION cable for fixed installations - PVC jacket

39 **NETBUS FF YAY18/7 1x2x18/7AWG - P/N 050860**
Fieldbus FONDATION armoured cable for fixed installations - OR PVC jacket

Fieldbus FOUNDATION™

NETBUS FF-2 Y18/19 AWM2571

1x2x1,0mm^2 (18/19AWG) U/FTP

CODE 0502855F

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed or dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for FOUNDATION™ applications. Thanks to its low inductance value, this article is mostly used for data transmission and feeding in intrinsic safety systems. UL/CSA homologated accordance with AWM style 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-4

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std
Heat release
1640 MJ/km (0,454 kWh/m)

OTHER VERSIONS

Armoured cable version - NETBUS NETBUS FF-2 YAY 1x2x18/19AWG (P/N 0502856F)

CONSTRUCTION

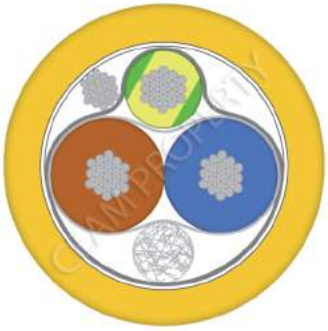
Inner conductor	Stranded tinned copper wire - 1,25 mm ø (18/19 AWG - 1,00 mm^2)
Insulation	Solid polyethylene
Insulation coluors	Brown, blue
Assembly of cores	Twisted pair with fillers
Overall shield	AL/PET tape + tinned copper drain wire 18/19AWG
Separation	Non-woven tape
Outer jacket	FR-PVC • Yellow colour RAL1003
Outer ø	7,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	23,2 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max capacitance unbalance @ 800Hz	2,0 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω @ 31,25 kHz • 80 Ω @ 1 MHz ≤ 3,0 dB/km @ 39 kHz • 4,0 dB/km @ 100 kHz
Attenuation	15,0 dB/km @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	150 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	230 N
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	compliant EN 50396 Std.



Fieldbus FOUNDATION™

NETBUS FF-3 Y18/19 AWM2571

1x2x1,0mm² (18/19AWG) + 1x1,0mm² (18/19AWG) U/FTP

CODE 0502857F

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Flexible fieldbus cable for fixed or dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for FOUNDATION™ applications. The article is composed of a data transmission pair with low inductance value and a peripheric earth conductor; it is used in data transmission and in intrinsic safety systems feeding. UL/CSA approved in accordance with AWM syle 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61158
EN50170-4

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std
Heat release
1621 MJ/km (0,449 kWh/m)

OTHER VERSIONS

Armoured cable version - NETBUS NETBUS FF-3s YAY18/19 (P/N 0502858F)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 1,25 mm ø (18/19 AWG - 1,00 mm²)
Insulation	Solid polyethylene
Insulation coluors	Brown, blue
Assembly of cores	Twisted pair
Shield	AL/PET tape
Inner conductors	Stranded bare copper wire - 18/19 AWG
Insulation	Solid polyethylene
Insulation colours	Yellow-green
Assembly of elements	Shielded pair and ground conductor stranded together
Overall shield	AL/PET tape + tinned copper drain wire 18/19AWG
Separation	Non-woven tape
Outer jacket	FR-PVC • Yellow colour RAL1003
Outer ø	7,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	23,2 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max capacitance unbalance @ 800Hz	2,0 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω @ 31,25 kHz • 80 Ω @ 1 MHz
Attenuation	≤ 3,0 dB/km @ 39 kHz • 4,0 dB/km @ 100 kHz 15,0 dB/km @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac / 1 min
Dielectric strenght (cond./shield)	2,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	80 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	150 N
Operating temperature range	-30°C / +80°C (static)
Oil resistance	In compliance with IEC608011-2-1 and ICEA S-82-552 Std. requirements
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

Fieldbus FOUNDATION™

NETBUS FF Y180

1x2x18/7AWG U/FTP

CODE 0925295

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed or dynamic (non continuous) application. The item is particularly suitable for FOUNDATIONTM applications. It represents an excellent compromise for all those who are looking for an economical product that can be also enough electrically performing to be used in intrinsic safety systems.

APPROVALS

STANDARD REFERENCE

IEC61158
EN50170-4

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std
Heat release
1041 MJ/km (0,289 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS FF H180 LSZH (P/N 0502866)
Halogen free PUR jacketed - NETBUS FF P180 LSZH (P/N 0502693)

CONSTRUCTION

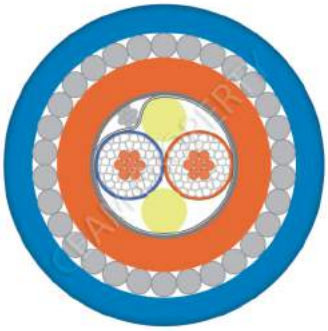
Inner conductor	Stranded tinned copper wire - 1,20 mm ø (18/7 AWG - 0,90 mm^2)
Insulation	Solid polyethylene
Insulation coluors	White, black
Assembly of cores	Twisted pair
Overall shield	AL/PET tape + tinned copper drain wire 18/7AWG
Outer jacket	FR-PVC • Orange colour RAL2003
Outer ø	6,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	22,0 Ω/km
Capacitance @ 800 Hz	75 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω @ 31,25 kHz • 80 Ω @ 1 MHz
Attenuation	≤ 3,0 dB/km @ 39 kHz • 6,0 dB/km @ 100 kHz 29,0 dB/km @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	64 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	130 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.



Fieldbus FOUNDATION™

NETBUS FF YAY 18/7 ARMOURED

1x2x18/7AWG U/FTP

CODE 0502860

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Shielded Fieldbus cable for fixed or dynamic (non continuous) application, protected by a double oil resistant PVC sheath. The item is particularly suitable for FOUNDATIONTM applications. Specifically designed and produced to be used in oil plants, this article offers considerable mechanic protection and excellent electrical performances. Thanks to its low inductance values, it is particularly suitable for usage in intrinsic safety systems.

APPROVALS

STANDARD REFERENCE

IEC61158
EN50170-4

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std
Heat release
3257 MJ/km (0,902 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 1,20 mm ø (18/7 AWG - 0,90 mm^2)
Insulation	Foam-skin polyethylene
Insulation coluors	Blue, orange
Assembly of cores	Twisted to pair with fillers
Separation	PET tape
Overall shield	AL/PET tape + tinned copper drain wire 18/7AWG
Separation	PET tape
Jacket	FR-PVC • orange colour RAL2003 • ø 8,0 mm
Armouring	Spiral of galvanized steel wires with 90% coverage
Outer jacket	FR-PVC • Blue colour RAL5015
Outer ø	12,4 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	22,0 Ω/km
Capacitance @ 800 Hz	60 nF/km
Max propagation delay skew change (7,9÷39 kHz)	1,7 µsec/km
Characteristic impedance	100 Ω @ 31,25 kHz • 80 Ω @ 1 MHz
Attenuation	≤ 3,0 dB/km @ 39 kHz • 6,0 dB/km @ 100 kHz 29,0 dB/km @ 1 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	270 kg/km
Max operating voltage	300 V
Min bending radius	15 x outer ø [mm] (static) 20 x outer ø [mm] (installation)
Max pulling strenght	1000 N
Operating temperature range	-30°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

DeviceNet™

Developed by Allen Bradley, the DeviceNet specifications are now managed by the Open DeviceNet Vendor Association (ODVA) which includes a wide range of devices. DeviceNet is a two connection system based on CAN that works with a data transmission speed rate in the range between 125 and 500 kbps. The RS 485 standard is used as transmission protocol. The DeviceNet specification recommends two cable types: the first one for the execution of the back-bones (trunk/thick) and the second one for the derivation connections to the devices (drop/thin). Both are flexible cables composed of two individually shielded twisted pairs, dedicated respectively to data transportation and power supply to the devices.

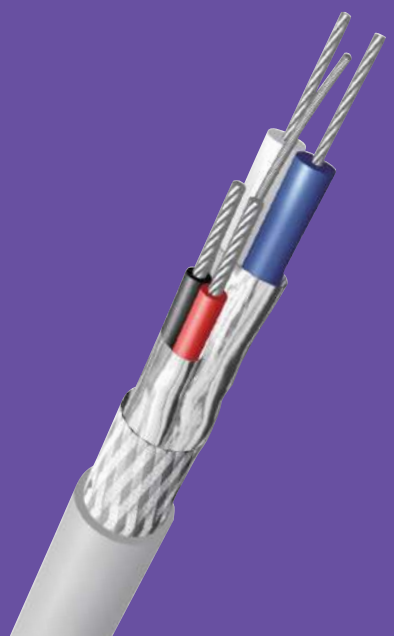
(DeviceNET is a registered trademark of ODVA – Open DeviceNet Vendor Association)

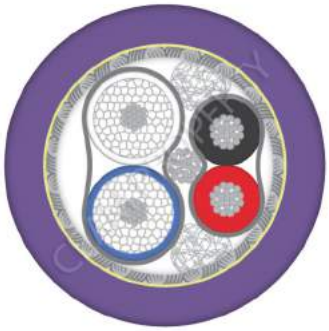
42 **NETBUS DN P2422M 1x2x24AWG + 1x2x22AWG AWM20233 - P/N 0502688**
DeviceNet thin (drop) cable for fixed and dynamic applications - HF PUR jacket

43 **NETBUS DN P1815M 1x2x18AWG + 1x2x15AWG AWM20233 - P/N 0505655F**
DeviceNet thick (trunk) cable for fixed and dynamic applications - HF PUR jacket

44 **NETBUS DN Y2422 1x2x24AWG + 1x2x22AWG - P/N 0502581**
DeviceNet thin (drop) cable for fixed and flexible applications - PVC jacket

45 **NETBUS DN Y1815 1x2x18AWG + 1x2x15AWG - P/N 0502580**
DeviceNet thick (trunk) cable for fixed and flexible applications - PVC jacket





DeviceNet™

NETBUS DN P2422M AWM20233

1x2x24/19AWG + 1x2x22/19AWG S/FTP

CODE 0502688

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Drop cable suitable for fixed and dynamic application, DeviceNet type, with PUR sheath. Designed and produced in order to guarantee data transmission under heavy movement conditions in cable chains. UL/CSA approved in accordance with AWM Style 20233 and DESINA approved.

APPROVALS

UL/CSA Compliant AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61158
IEC62026-3

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
906 MJ/km (0,251 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 24/19AWG (0,25 mm²)
Insulation	Foam-skin polyethylene
Insulation coluors	Blue, white
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Inner conductor	Stranded tinned copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation coluors	Red, black
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Assembly of elements	Shielded pair stranded together
Overall shield	Drain wire 24/19AWG + tinned copper braid 65% coverage
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	6,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	78,0 Ω/km (24AWG) - 54,0 Ω/km (22AWG)
Capacitance @ 800 Hz	40 nF/km (data pair)
NVP @ 10 MHz	76% (data pair)
Characteristic impedance (1÷20 MHz)	120Ω (data pair)
Attenuation	0,9 dB/100m @ 100 kHz • 1,6 dB/100m @ 500 kHz 2,1 dB/100m @ 1 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 100 MHz	11 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 7 mΩ/m @ 10 MHz 5 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	77 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	80 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

DeviceNet™

NETBUS DN P1815M AWM20233
1x2x18AWG + 1x2x15AWG S/FTP

CODE 0505655F

INSTALLATION & USE
Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION
Trunk Fieldbus cable suitable for fixed and dynamic application, DeviceNet type, with PUR sheath. Designed and produced in order to guarantee data transmission under heavy movement conditions in cable chains. UL/CSA approved in accordance with AWM Style 20233 and DESINA approved.

APPROVALS
UL/CSA Compliant AWM Style 20233 - 300V/80°C

STANDARD REFERENCE
IEC61158
IEC62026-3

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
2519 MJ/km (0,698 kWh/m)

OTHER VERSIONS

CONSTRUCTION

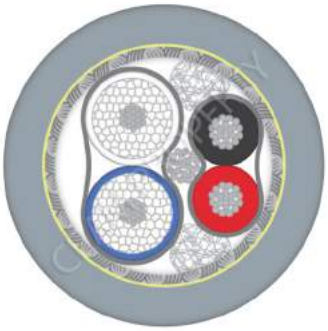
Inner conductor	Stranded tinned copper wire - 18/28AWG (0,9 mm²)
Insulation	Foam-skin polyethylene
Insulation coluors	Blue, white
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Inner conductor	Stranded tinned copper wire - 15/56AWG (1,7 mm²)
Insulation	Solid polyethylene
Insulation coluors	Red, black
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Assembly of elements	Shielded pair stranded together
Overall shield	Drain wire 18/19AWG + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	11,8 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	21,8 Ω/km (18AWG) - 11,3 Ω/km (15AWG)
Capacitance @ 800 Hz	40 nF/km (data pair)
Characteristic impedance (1÷20 MHz)	120Ω (data pair)
Attenuation	0,4 dB/100m @ 100 kHz • 0,8 dB/100m @ 500 kHz 1,3 dB/100m @ 1 MHz
Dielectric strenght (cond./cond.)	2,0 kVac / 1 min
Dielectric strenght (cond./shield)	2,0 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 100 MHz	10 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 5 mΩ/m @ 10 MHz 10 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	185 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	350 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended



DeviceNet™

NETBUS DN Y2422

1x2x24/19AWG + 1x2x22/19AWG S/FTP

CODE 0502581

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Drop cable suitable for fixed application, DeviceNet type, with PVC sheath. The accurate construction and the high shielding efficiency guarantee excellent transmissive performances also in those environments which result particularly polluted by electromagnetic interferences.

APPROVALS

STANDARD REFERENCE

IEC61158
IEC62026-3

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Heat release
1066 MJ/km (0,295 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS DN H2422 LSZH (P/N 0502689)

CONSTRUCTION

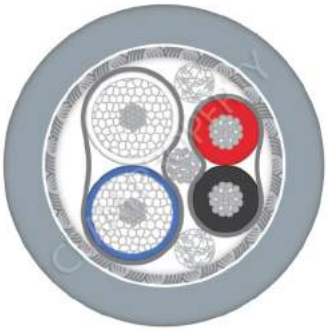
Inner conductor	Stranded tinned copper wire - 24/19AWG (0,25 mm²)
Insulation	Foam-skin polyethylene
Insulation coluors	Blue, white
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Inner conductor	Stranded tinned copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation coluors	Red, black
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Assembly of elements	Shielded pair stranded together
Overall shield	Drain wire 24/19AWG + tinned copper braid 65% coverage
Outer jacket	FR-PVC • Gray RAL7001
Outer ø	6,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	78,0 Ω/km (24AWG) - 54,0 Ω/km (22AWG)
Capacitance @ 800 Hz	40 nF/km (data pair)
NVP @ 10 MHz	76% (data pair)
Characteristic impedance (1÷20 MHz)	120Ω (data pair)
Attenuation	0,9 dB/100m @ 100 kHz • 1,6 dB/100m @ 500 kHz 2,1 dB/100m @ 1 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 100 MHz	11 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 7 mΩ/m @ 10 MHz 5 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

OTHER PROPERTIES

Weight	79 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] installed)
Max pulling strenght	200 N
Operating temperature range	-30°C / +80°C (static) • -5°C / +70°C (installation)
Ozone resistance	Compliant EN 50396 Std.



DeviceNet™

NETBUS DN Y1815

1x2x18/19AWG + 1x2x15/19AWG S/FTP

CODE 0502580

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Trunk cable suitable for fixed application, DeviceNet type, with PVC sheath. The accurate construction and the high shielding efficiency guarantee excellent transmissive performances also in those environments which result particularly polluted by electromagnetic interferences.

APPROVALS

STANDARD REFERENCE

IEC61158
IEC62026-3

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Heat release
3288 MJ/km (0,911 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 18/19AWG (1,00 mm²)
Insulation	Foam-skin polyethylene
Insulation coluors	Blue, white
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Inner conductor	Stranded tinned copper wire - 15/19AWG (1,50 mm²)
Insulation	Solid polyethylene
Insulation coluors	Red, black
Assembly of cores	Stranded to a pair
Shield	AL/PET tape
Assembly of elements	Shielded pair stranded together
Overall shield	Drain wire 18/19AWG + tinned copper braid 65% coverage
Outer jacket	FR-PVC • Gray RAL7001
Outer ø	11,8 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	21,5 Ω/km (18AWG) - 11,3 Ω/km (15AWG)
Capacitance @ 800 Hz	40 nF/km (data pair)
NVP @ 10 MHz	76% (data pair)
Characteristic impedance (1÷20 MHz)	120Ω (data pair)
Attenuation	0,4 dB/100m @ 100 kHz • 0,8 dB/100m @ 500 kHz 1,3 dB/100m @ 1 MHz
Dielectric strenght (cond./cond.)	2,0 kVac / 1 min
Dielectric strenght (cond./shield)	2,0 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 100 MHz	10 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 5 mΩ/m @ 10 MHz 10 mΩ/m @ 30 MHz • 30 mΩ/m @ 100 MHz

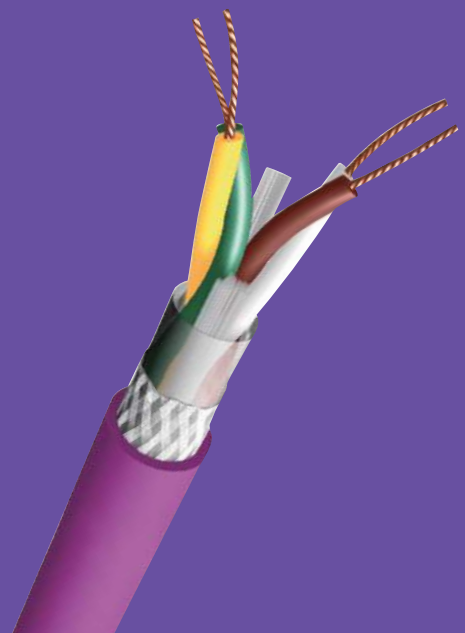
OTHER PROPERTIES

Weight	200 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] installed)
Max pulling strenght	350 N
Operating temperature range	-30°C / +80°C (static) • -20°C / +50°C (installation)
Ozone resistance	Compliant EN 50396 Std.

CAN Open™

CAN fieldbus (Controller Area Network) was developed by Bosch to connect the network of command devices, sensors and actuators in production lines of the car industry. Producers and users established, at international level, the CIA (CAN In Automation) association. The aim of this organization was to promote the use of CAN networks also in the industrial automation field and in other application areas. The maximum length of the bus depends on the transmission speed rate and the selected conductor sizes: 20 metres for 1 Mbps / 100 metres for 500 kbps / 500 metres for 125 kbps / 1 km for 50 kbps.

(CAN Open is a registered trademark of CiA – CAN in Automation Organization)



48 **NETBUS CAN PQ225M 1x4x0,25 mm² AWM20233 - P/N 0502649**
CAN cable for fixed and dynamic applications - HF PUR jacket

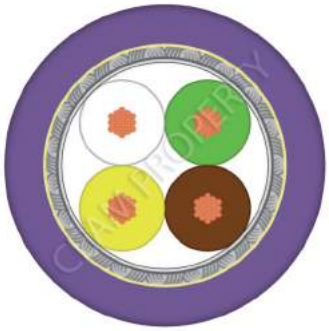
49 **NETBUS CAN PQ234M 1x4x0,34 mm² AWM20236 - P/N 0505588**
CAN cable for fixed and dynamic applications - HF PUR jacket

50 **NETBUS CAN PQ250M 1x4x0,50 mm² AWM20236 - P/N 0502976**
CAN cable for fixed and dynamic applications - HF PUR jacket

51 **NETBUS CAN YQ234 1x4x0,34 mm² AWM2571 - P/N 0505585**
CAN cable for fixed and flexible applications - PVC jacket

52 **NETBUS CAN YQ250 1x4x0,50 mm² AWM2571 - P/N 0505591**
CAN cable for fixed and flexible applications - PVC jacket

53 **NETBUS CAN YQ275 1x4x0,75 mm² AWM2571 - P/N 0502663**
CAN cable for fixed and flexible applications - PVC jacket



CAN Open™

NETBUS CAN PQ225M AWM20233

1x4x0,25mm² S/UTP

CODE 0502649

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Flexible Fieldbus cable for fixed or dynamic application in chain, with PUR sheath. The item is particularly suitable for CAN OPEN applications. The particular building layout in quad (2 pairs) allows to obtain excellent transmissive performances, also when the cable is moved. Homologated UL/CSA in accordance with AWM Style 20233 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

ISO11898
EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1041 MJ/km (0,280 kWh/m)

OTHER VERSIONS

Two pair construction layout - NETBUS CAN P225M AWM 20233 (P/N 0502635)

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,25 mm² (24/19AWG)
Insulation	Solid polyethylene
Insulation coluors	White, brown, green, yellow
Assembly of cores	Stranded to quad • Pair 1 white-blue • Pair 2 green-yellow
Separation	Polyester tape
Overall shield	Tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	6,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,0 Ω/km
Capacitance @ 800 Hz	44 nF/km
NVP @ 10 MHz	67%
Characteristic impedance (1÷20 MHz)	120 Ω (±10%)
Attenuation	2,0 dB/100m @ 1 MHz • 4,1 dB/100m @ 4 MHz 6,7 dB/100m @ 10 MHz • 8,6 dB/100m @ 16 MHz 9,7 dB/100m @ 20 MHz
NEXT	65 dB @ 1 MHz • 55 dB @ 10 MHz • 50 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 10 MHz	30 mΩ/m

OTHER PROPERTIES

Weight	55 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C / +80°C (static) -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

CAN Open™

NETBUS CAN PQ234M AWM20236

1x4x0,34mm² SF/UTP

CODE 0505588

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Flexible Fieldbus cable for fixed o dynamic application in chain, with PUR sheath. The item is particularly suitable for CAN OPEN applications. The particular building layout in quad (2 pairs) allows to obtain excellent transmissive performances also when the cable is moved. UL/CSA approved in accordance with AWM Style 20236 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

ISO11898
EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
931 MJ/km (0,258 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,34 mm² (22/44AWG)
Insulation	Foam-skin polyethylene
Insulation coluors	White, brown, green, yellow
Assembly of cores	Stranded to quad • Pair 1 white-blue • Pair 2 green-yellow
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	6,7 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	59,4 Ω/km
Capacitance @ 800 Hz	42 nF/km
NVP @ 10 MHz	74%
Characteristic impedance (1÷20 MHz)	120 Ω (±10%)
Attenuation	1,9 dB/100m @ 1 MHz • 3,3 dB/100m @ 4 MHz • 5,2 dB/100m @ 10 MHz • 6,1 dB/100m @ 16 MHz 7,3 dB/100m @ 20 MHz
NEXT	65 dB @ 1 MHz • 55 dB @ 10 MHz • 50 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 10 MHz	10 mΩ/m

OTHER PROPERTIES

Weight	61 kg/km
Max operating voltage	30V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	130 N
Operating temperature range	-40°C / +80°C (static) -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

CAN Open™

NETBUS CAN PQ250M AWM20236

1x4x0,50mm² SF/UTP

CODE 0502976

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Flexible Fieldbus cable for fixed and dynamic application in drag chain, with PUR sheath. The item is particularly suitable for CAN OPEN applications. The particular building layout in quad (2 pairs) allows to obtain excellent transmissive performances also when the cable is moved. UL/CSA approved in accordance with AWM Style 20236 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

ISO11898
EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
1437 MJ/km (0,398 kWh/m)

OTHER VERSIONS

PVC jacketed - NETBUS CAN YQ250M AWM2571 (P/N 0502978)
One pair HF-PUR jacketed - NETBUS CAN P150M AWM20236 (P/N 0502966)
One pair HF-PUR jacketed - NETBUS CAN Y150M AWM2571 (P/N 0502968)

CONSTRUCTION

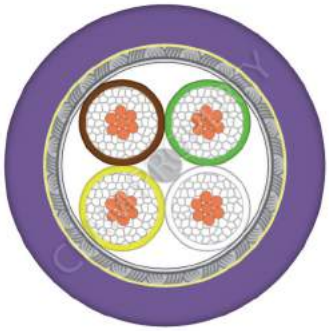
Inner conductor	Stranded bare copper wire 0,50 mm² (21/30AWG)
Insulation	Foam-skin polyethylene
Insulation coluors	White, brown, green, yellow
Assembly of cores	Stranded to quad • pair 1 white-blue • pair 2 green-yellow
Separation	Non-woven tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	39,0 Ω/km
Capacitance @ 800 Hz	42 nF/km
NVP @ 10 MHz	74%
Characteristic impedance (1÷20 MHz)	120Ω (±10%)
Attenuation	0,8 dB/100m @ 100 MHz • 1,5 dB/100m @ 1 MHz 2,8 dB/100m @ 4 MHz • 5,2 dB/100m @ 10 MHz 5,7 dB/100m @ 16 MHz • 6,3 dB/100m @ 20 MHz
NEXT	65 dB @ 1 MHz • 55 dB @ 10 MHz • 50 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 10 MHz	10 mΩ/m

OTHER PROPERTIES

Weight	88 kg/km
Max operating voltage	30V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	170 N
Operating temperature range	-40°C / +80°C (static) -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended



CAN Open™

NETBUS CAN YQ234 AWM2571

1x4x0,34mm² SF/UTP

CODE 0505585

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC. The item is particularly suitable for CAN OPEN applications. The article has a building layout in quad (2 pairs), high shielding efficiency and offers excellent transmissive performances. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

ISO11898
EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
939 MJ/km (0,260 kWh/m)

OTHER VERSIONS

Two pair construction layout - NETBUS CAN Y234 AWM2571 (P/N 0502627)
One pair PVC jacketed - NETBUS CAN Y134 AWM2571 (P/N 0505584)

CONSTRUCTION

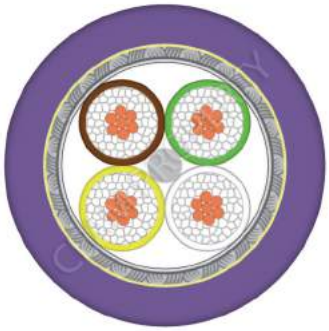
Inner conductor	Stranded bare copper wire 0,34 mm² (22/7AWG)
Insulation	Foam-skin polyethylene
Insulation coluors	White, brown, green, yellow
Assembly of cores	Stranded to quad • pair 1 white-blue • pair 2 green-yellow
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	FR-PVC • Violet RAL4001
Outer ø	6,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	59,4 Ω/km
Capacitance @ 800 Hz	42 nF/km
NVP @ 10 MHz	74%
Characteristic impedance (1÷20 MHz)	120Ω (±10%)
Attenuation	1,9 dB/100m @ 1 MHz • 3,3 dB/100m @ 4 MHz 5,2 dB/100m @ 10 MHz • 6,1 dB/100m @ 16 MHz 7,3 dB/100m @ 20 MHz
NEXT	65 dB @ 1 MHz • 55 dB @ 10 MHz • 50 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 10 MHz	10 mΩ/m

OTHER PROPERTIES

Weight	62 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] (non continuous movements)
Max pulling strenght	120 N
Operating temperature range	-30°C / +80°C (static) -5°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.



CAN Open™

NETBUS CAN YQ250 AWM2571

1x4x0,50mm² SF/UTP

CODE 0505591

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. The item is particularly suitable for CAN OPEN application. The article has a building layout in quad (2 pairs), high shielding efficiency and offers transmissive performances that are suitable for the coverage of long distances. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

ISO11898
EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
939 MJ/km (0,260 kWh/m)

OTHER VERSIONS

One pair PVC jacketed - NETBUS CAN Y150 AWM2571 (P/N 0505656)

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,50 mm² (20/7AWG)
Insulation	Foam-skin polyethylene
Insulation coluors	White, brown, green, yellow
Assembly of cores	Stranded to quad • pair 1 white-blue • pair 2 green-yellow
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	FR-PVC • Violet RAL4001
Outer ø	7,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	36,7 Ω/km
Capacitance @ 800 Hz	42 nF/km
NVP @ 10 MHz	74%
Characteristic impedance (1÷20 MHz)	120 Ω (±10%)
Attenuation	1,5 dB/100m @ 1 MHz • 2,7 dB/100m @ 4 MHz 4,6 dB/100m @ 10 MHz • 5,5 dB/100m @ 16 MHz 6,0 dB/100m @ 20 MHz
NEXT	65 dB @ 1 MHz • 55 dB @ 10 MHz • 50 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 10 MHz	10 mΩ/m

OTHER PROPERTIES

Weight	99 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] (non continuous movements)
Max pulling strenght	200 N
Operating temperature range	-30°C / +80°C (static) -5°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

CAN Open™

NETBUS CAN YQ275 AWM2571

1x4x0,75mm² S/UTP

CODE 0502663

INSTALLATION & USE

Indoor istallation
Vibrating installation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. The item is particularly suitable for CAN OPEN applications. The article has a building layout in quad (2 pairs) and offers transmissive properties that are suitable for the coverage of long distances. UL/CSA homologated in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

ISO11898
EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
1758 MJ/km (0,487 kWh/m)

OTHER VERSIONS

One pair PVC jacketed - NETBUS CAN Y175 AWM2571 (P/N 0505596)

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,75 mm² (19/24AWG)
Insulation	Foam-skin polyethylene
Insulation coluors	White, brown, green, yellow
Assembly of cores	Stranded to quad • pair 1 white-blue • pair 2 green-yellow
Separation	Polyester tape
Overall shield	Tinned copper braid 85% coverage
Outer jacket	FR-PVC • Violet RAL4001
Outer ø	8,8 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	27,5 Ω/km
Capacitance @ 800 Hz	42 nF/km
NVP @ 10 MHz	76%
Characteristic impedance (1÷20 MHz)	120 Ω (±10%)
Attenuation	0,8 dB/100m @ 1 MHz • 2,6 dB/100m @ 4 MHz 3,9 dB/100m @ 10 MHz • 4,8 dB/100m @ 16 MHz 5,5 dB/100m @ 20 MHz
NEXT	65 dB @ 1 MHz • 55 dB @ 10 MHz • 50 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance@ 10 MHz	100 mΩ/m

OTHER PROPERTIES

Weight	112 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] (non continuous movements)
Max pulling strenght	250 N
Operating temperature range	-30°C / +80°C (static) -5°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

INTERBUS™

The producers and users association, INTERBUS™- S, works to ensure the compatibility and interoperability of the devices and their certification. INTERBUS™- S is a system which is particularly widespread in the car industry, mechanical industry, plant engineering and handling. It is suitable for communication at the nearest field level. Due to the very fast transmission modality together with reduced data volumes it is recommended when connecting low-complex components. It is a centralized system that requires a master controller able to check the communication with the network slaves. Multi-master operations are not permitted. The transmission method complies with the EIA RS 485 standard and the transmission speed rate is 500 kbps over a maximum distance between two components of 400 metres (remote connection) or 300 kbps over a maximum distance between two components of 1.5 metres (peripheral connection).

(INTERBUS is a registered trademark of PHOENIX CONTACT)

P-NET™

The P-NET™ electrical/transmission specifications are based on the RS 485 standard. With a specified transmission speed rate of up to 76.8 kbps, a maximum distance of 1200 metres can be reached. This system may also use the EIA RS 232 standard protocol, with a data transmission speed rate in the range between 1.2 and 38.4 kbps. A shielded copper twisted pair cable is used as the transmission medium.

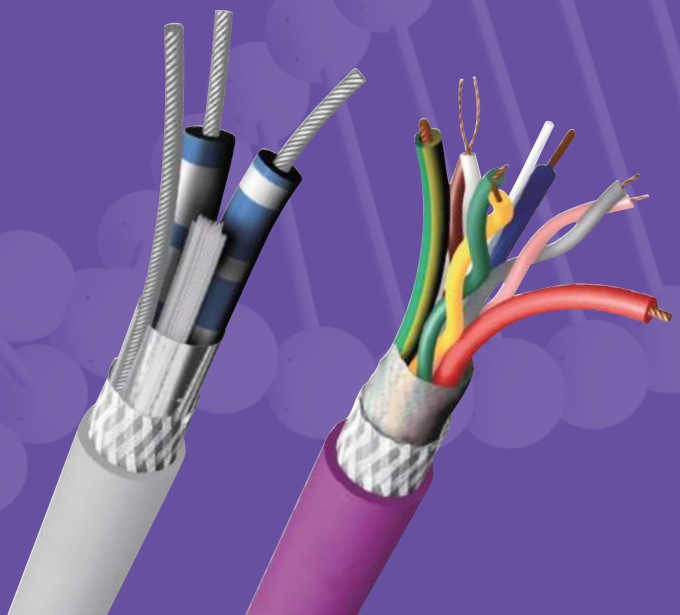
(P-NET is a registered trademark of IPUO – International P-NET User Organization)

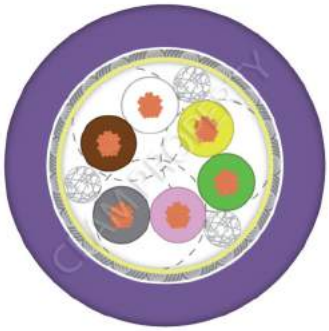
56 **NETBUS IBS P325M 3x2x0,25 mm² - P/N 0502539**
INTERBUS remote cable for fixed and dynamic applications - HF PUR jacket

57 **NETBUS IBS PCB325M 3x2x0,25 mm² + 1x2x1,00 mm² - P/N 0502540**
INTERBUS installation remote cable for fixed and dynamic applications - HF PUR jacket

58 **CPR 6003 1x2x24/7AWG - P/N 0502014**
P-NET cable for fixed and flexible applications - PVC jacket

59 **NETBUS Y09842 2x2x24/7AWG - P/N 0925162**
P-NET cable for fixed and flexible applications - PVC jacket





INTERBUS™

NETBUS IBS P325M

3x2x0,25mm² S/UTP

CODE 0502539

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Three-paired shielded Fieldbus cable for fixed and dynamic application in drag chain, with PUR sheath. The item is particularly suitable for INTERBUS™ applications - remote type. Designed and produced in order to guarantee data transmission under heavy movement conditions in cable chains.

APPROVALS

STANDARD REFERENCE

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1165 MJ/km (0,323 kWh/m)

OTHER VERSIONS

FR-PVC jacketed for fixed installation - NETBUS IBS Y322 (P/N 0502537)
FR-PVC reinforced jacketed for fixed installation - NETBUS IBS Yv322 (P/N 0502541)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 24/32AWG (0,25 mm²)
Insulation	Solid polyethylene
Assembly of cores	Twisted pair • whithe/brown - green/yellow - pink/gray
Assembly of elements	Pairs stranded together
Separation	Polyester tape
Overall shield	Tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	7,7 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	79,5 Ω/km
Capacitance @ 800 Hz	60 nF/km
NVP @ 10MHz	67%
Characteristic impedance	120 Ω @ 100 kHz • 100 Ω @ 1 MHz
Attenuation	1,4 dB/100m @ 200 kHz • 2,2 dB/100m @ 500 kHz 3,2 dB/100m @ 1 MHz • 5,2 dB/100m @ 4 MHz 8,4 dB/100m @ 10 MHz • 11,2 dB/100m @ 16 MHz 11,9 dB/100m @ 20 MHz
Next	59 dB @ 1 MHz • 50 dB @ 4 MHz • 44 dB @ 10 MHz 40 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance @ 10 MHz	250 mΩ/m

OTHER PROPERTIES

Weight	68 kg/km
Max operating voltage	125 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

INTERBUS™

NETBUS IBS PCB325M

3x2x0,25mm² + 1x2x1,00mm² S/UTP

CODE 0502540

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Composite shielded Fieldbus cable, for fixed and dynamic application in drag chain, with PUR sheath. The item is particularly suitable for INTERBUS™ applications - remote installation type.The three pairs guarantee data transmission, while the three peripheral energy conductors serve the function of feeding the connected device. The article is also suitable for usage under heavy movement conditions in cable chains.

APPROVALS

STANDARD REFERENCE

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1160 MJ/km (0,321 kWh/m)

OTHER VERSIONS

HF-PUR jacketed for fixed installation - NETBUS IBS PCB322 (P/N 0502538)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 24/32AWG (0,25 mm²)
Insulation	Solid polyethylene
Assembly of cores	Twisted pair • whithe/brown - green/yellow - pink/gray
Inner conductors	Strander bare copper wire - 18/56AWG (1,00 mm²)
Insulation	Solid polyethylene
Insulation colours	Red, blue, yellow-green
Assembly of elements	Pairs and power conductors stranded together
Separation	Non-woven tape
Overall shield	Tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	7,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	80,0 Ω/km (24AWG) - 19,8 Ω/km (18AWG)
Capacitance @ 800 Hz	60 nF/km (data pairs)
NVP @ 10MHz	67%
Characteristic impedance	120 Ω @ 100 kHz • 100 Ω @ 1 MHz
Attenuation	1,4 dB/100m @ 200 kHz • 2,2 dB/100m @ 500 kHz 3,2 dB/100m @ 1 MHz • 6,9 dB/100m @ 4 MHz 12,0 dB/100m @ 10 MHz • 15,5 dB/100m @ 16 MHz 17,2 dB/100m @ 20 MHz
Next	59 dB @ 1 MHz • 50 dB @ 4 MHz • 44 dB @ 10 MHz 40 dB @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance @ 10 MHz	250 mΩ/m

OTHER PROPERTIES

Weight	104 kg/km
Max operating voltage	125V (data pairs) - 250V (power cond.)
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	250 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

P-NET™

CPR 6003
1x2x24/7AWG S/FTP

CODE0502014

INSTALLATION & USE
Indoor istallation
Vibrating installation
Fixed installation

APPLICATION
Flexible Fieldbus cable for fixed or dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for EIA RS485 type applications. Thanks to its excellent electrical-transmissive performances, it has been used since a long time as transmission fieldbus in various applications - from industrial control systems, to domotics, up to the most recent applications for the control and management of plants dedicated to the production of renewable energies.

APPROVALS

STANDARD REFERENCE
EIA RS 485

COMPLIANCE
2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant IEC60332-1 Std.
Heat release
1110 MJ/km (0,308 kWh/m)

OTHER VERSIONS
FRNC-LSZH jacketed - NETBUS H09841 LSZH (P/N 0626161)
Double jacket outdoor cable version - CPR6003 PV (P/N 0502167)

CONSTRUCTION

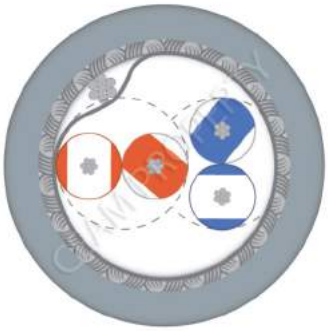
Inner conductor	Stranded bare copper wire 24/7AWG (0,22 mm^2)
Insulation	Solid polyethylene
Assembly of cores	Twisted pair • white/blue - blue/white
Overall shield	AL/PET tape + tinned copper braid 90% coverage
Outer jacket	FR-PVC • Gray RAL7001 colour
Outer ø	6,7 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,0 Ω/km
DC shield resistance	11 Ω/km
Capacitance @ 800 Hz	45 nF/km
NVP @ 10MHz	67%
Characteristic impedance 1 MHz	120Ω
Attenuation	1,0 dB/100m @ 100 kHz • 1,6 dB/100m @ 500 kHz 2,2 dB/100m @ 1 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 15 mΩ/m @ 10 MHz

OTHER PROPERTIES

Weight	63 kg/km
Max operating voltage	30 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	70 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.



P-NET™

Y 09842
2x2x24/7AWG SF/UTP

CODE 0925162

INSTALLATION & USE
Indoor istallation
Vibrating installation
Fixed installation

APPLICATION
Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for EIA RS485 applications. The article is composed of two pairs (globally shielded) which guarantee high electrical and transmissive perormances. It is used as data transmission fieldbus in industrial and domotic systems, and for other particular applications such as the control and management of plants dedicated to the production of renewable energies.

APPROVALS

STANDARD REFERENCE
EIA RS 485

COMPLIANCE
2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant IEC60332-1 Std.
Heat release
1645 MJ/km (0,456 kWh/m)

OTHER VERSIONS
FRNC-LSZH jacketed - NETBUS H09842 LSZH (P/N 0626162)
Double jacket outdoor cable version - YPE09842 PV (P/N 0930010)

CONSTRUCTION

Inner conductor	Stranded bare copper wire 24/7AWG (0,22 mm^2)
Insulation	Solid polyethylene
Assembly of cores	Twisted pair • white/blue-blue/white white/orange-orange/white
Overall shield	AL/PET tape + tinned copper braid 90% coverage
Outer jacket	FR-PVC • Gray RAL7001 colour
Outer ø	8,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,0 Ω/km
DC shield resistance	8 Ω/km
Capacitance @ 800 Hz	45 nF/km
NVP @ 10MHz	67%
Characteristic impedance 1 MHz	120 Ω
Attenuation	1,0 dB/100m @ 100 kHz • 1,6 dB/100m @ 500 kHz 2,2 dB/100m @ 1 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 20 mΩ/m @ 10 MHz

OTHER PROPERTIES

Weight	98 kg/km
Max operating voltage	30 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	90 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.

INDUSTRIAL ETHERNET

In recent years many of the previously mentioned associations have also operated in the diffusion of Ethernet technology in the industrial environment. The enormous success of the Ethernet application in markets much bigger than that of industrial automation (i.e. structured cabling in commercial buildings, residential buildings, data centres) has generated economies of scale to all those involved (such as easy access to measurement equipment, lower cable cost, large-scale special knowledge about this type of network). Taking into consideration all the problems that can be observed in a classic industrial environment, in this field CEAM CAVI SPECIALI is also able to offer a wide range of products suitable to support Ethernet protocols.

62 **NETBUS IE-DQ3 FM5P3 2x2x26AWG + 1x2x22AWG AWM20236 - P/N 0505510**
IND. ETHERNET CAT.5e cable for fixed and dynamic applications - HF PUR jacket

63 **NETBUS IE-DQ3S FM5P3 2x2x26AWG + 1x2x22AWG AWM20236 - P/N 0505516**
IND. ETHERNET CAT.5e cable for fixed and dynamic applications - HF PUR jacket

64 **NETBUS IE-DQ3 F5Y3 2x2x24AWG + 1x2x22AWG AWM20236 - P/N 0505522**
IND. ETHERNET CAT.5e cable for fixed and flexible applications - OR PVC jacket

65 **NETBUS IE R5QY 1x4x22/1AWG - P/N 0503090**
IND. ETHERNET CAT.5e cable for fixed applications - PVC jacket

66 **NETBUS IE FM5FCQP 1x4x22/19AWG - P/N 0503096**
IND. ETHERNET CAT.5e cable for fixed and flexible applications - HF PUR jacket - FAST CONNECT

67 **NETBUS IE R5P4 4x2x24/1AWG - P/N 0502048**
IND. ETHERNET CAT.5e cable for fixed applications - HF PUR jacket

68 **NETBUS IE R5P2 2x2x24/1AWG - P/N 0502041**
IND. ETHERNET CAT.5e cable for fixed installations - HF PUR jacket

69 **NETBUS IE F5P4 4x2x26/7AWG - P/N 0502040**
IND. ETHERNET CAT.5e cable for fixed and flexible applications - HF PUR jacket

70 **NETBUS IE F5P2 2x2x26/7AWG - P/N 0502049**
IND. ETHERNET CAT.5e cable for fixed and flexible applications - HF PUR jacket

71 **NETBUS IE FM5FC4P 4x2x26/19AWG AWM20236 - P/N 0505467**
IND. ETHERNET CAT.5e cable for fixed and dynamic applications - HF PUR jacket - FAST CONNECT

72 **NETBUS IE FM5P4 4x2x26/19AWG - P/N 0502512**
IND. ETHERNET CAT.5e cable for fixed and torsional applications - HF PUR jacket

73 **NETBUS IE FMFC JE-9Y(St)C11Y 4x2x24/19AWG - P/N 0502513**
IND. ETHERNET CAT.5e cable for fixed and dynamic applications - HF PUR jacket - FAST CONNECT

74 **NETBUS IE R6Y4 4x2x23/1AWG - P/N 0562824**
IND. ETHERNET CAT.6 cable for fixed installations - PVC jacket

75 **NETBUS IE F6Y4 4x2x26/7AWG - P/N 0502746**
IND. ETHERNET CAT.6 cable for fixed and flexible applications - PVC jacket

76 **NETBUS IE FM6FC4P26 4x2x26/19AWG AWM20233 - P/N 0505252F**
IND. ETHERNET CAT.6 cable for fixed and flexible applications - HF PUR jacket

77 **NETBUS IE R7P4 4x2x23/1AWG - P/N 0502712**
IND. ETHERNET CAT.7 cable for fixed installations - HF PUR jacket

78 **NETBUS IE R7AY4 4x2x22/1AWG - P/N 0502734**
IND. ETHERNET CAT.7A cable for fixed applications - OR PVC jacket

79 **NETBUS IE F7ST4P26 4x2x26/7AWG - P/N 0505310**
IND. ETHERNET CAT.7 cable for fixed and flexible applications - HF PUR jacket

INDUSTRIAL ETHERNET

NETBUS IE DQ3 FM5P3 AWM20236 CAT.5e

2x2x26/19AWG + 1x2x22/19AWG SF/UTP

CODE 0505510

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET type applications. It is composed of two data pairs and one pair for feeding which are separated one from the other by a special separator; the article has been designed in order to obtain excellent mechanical and eletrical/ transmissive performances in accordance with Cat.5e, in DRIVE-CLIQ™ systems, also in frequent movements conditions. UL/CSA approved in accordance with AWM style 20236.

APPROVALS

UL/CSA Compliant AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
1045 MJ/km (0,290 kWh/m)

OTHER VERSIONS

PVC jacketed - NETBUS IE-DQ3 FM5Y3 (P/N 0505512)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/19AWG (0,15 mm²)
Insulation	Solid polyethylene
Insulation ø	1,0 mm
Insulation colours	Green, yellow, gray, pink
Assembly of cores	Twisted pair • green/yellow - gray/pink
Inner conductors	Stranded bare copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation ø	1,0 mm
Insulation colours	Red/black
Assembly of cores	Twisted pair
Assembly of elements	Pairs stranded together around special separator ("Y" form)
Separation	PET tape
Global shield	AL/PET tape + tinned copper braid 90% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	7,3 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	146,0 Ω/km (26AWG) - 59,4 Ω/km (22AWG)
Capacitance @ 800 Hz	48 pF/m
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	520 nsec/100m
Max propagation delay skew @100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	2,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 12 mΩ/m @ 1 MHz • 25 mΩ/m @ 10 MHz 60 mΩ/m @ 30 MHz • 230 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,6	(65,3)	70	(62,3)	67	(61,0)	69	(59,1)	64,4		29
4	(6,0)	5,5	(56,3)	61	(53,3)	58	(49,0)	56	(47,3)	52,5	(23)	30
10	(9,5)	8,9	(50,3)	56	(47,3)	53	(41,0)	49	(37,8)	44,1	(25)	31
16	(12,1)	11,8	(47,2)	53	(44,2)	50	(36,9)	44	(32,1)	38,2	(25)	31
20	(13,6)	13,2	(45,8)	51	(42,8)	48	(35,0)	42	(29,2)	34,8	(25)	31
31,25	(17,1)	16,7	(42,9)	48	(39,9)	45	(31,1)	39	(22,8)	28,3	(23,3)	27
62,5	(24,8)	24,1	(38,4)	43	(35,4)	40	(25,1)	32	(10,6)	15,9	(20,7)	26
100	(32,0)	31,3	(35,3)	40	(32,3)	37	(21,0)	28	(0,3)	5,7	(19,0)	25

OTHER PROPERTIES

Weight	71 kg/km
Max operating voltage	30 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	120 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 4,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

INDUSTRIAL ETHERNET

NETBUS IE DQ3S FM5P3 AWM20236 CAT.5e

2x2x26/19AWG + 1x2x22/19AWG SF/UTP

CODE 0505516

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fiedbus cable for fixed and dynamic application with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. The article is composed by two data pairs and one for feeding, and is designed in order to guarantee excellent mechanical and electrical-transmissive performances in accordance with Cat.5e, in DRIVE-CLIQ™ systems and also in frequent movements conditions. UL/CSA homologated in accordance with AWM Style 20236.

APPROVALS

UL/CSA Compliant AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
942 MJ/km (0,261 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Strander bare copper wire - 26/19AWG (0,15 mm²)
Insulation	Solid polyethylene
Insulation ø	1,0 mm
Insulation colours	Green, yellow, gray, pink
Assembly of cores	Twisted pair • green/yellow - gray/pink
Inner conductors	Strander bare copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation ø	1,0 mm
Insulation colours	Red/black
Assembly of cores	Stranded to a pair
Assembly of elements	Pairs stranded together
Separation	PET tape
Global shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	6,8 mm

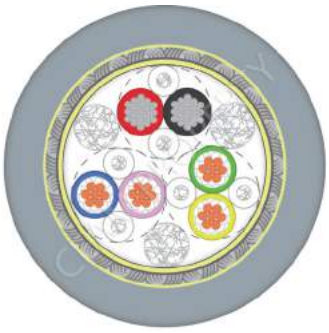
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	146,0 Ω/km (26AWG) - 59,4 Ω/km (22AWG)
Capacitance @ 800 Hz	48 pF/m
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	520 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	2,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 12 mΩ/m @ 1 MHz • 25 mΩ/m @ 10 MHz 60 mΩ/m @ 30 MHz • 230 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,6	(65,3)	70	(62,3)	67	(61,0)	69	(59,1)	64,4		29
4	(6,0)	5,5	(56,3)	61	(53,3)	58	(49,0)	56	(47,3)	52,5	(23)	30
10	(9,5)	8,9	(50,3)	56	(47,3)	53	(41,0)	49	(37,8)	44,1	(25)	31
16	(12,1)	11,8	(47,2)	53	(44,2)	50	(36,9)	44	(32,1)	38,2	(25)	31
20	(13,6)	13,2	(45,8)	51	(42,8)	48	(35,0)	42	(29,2)	34,8	(25)	31
31,25	(17,1)	16,7	(42,9)	48	(39,9)	45	(31,1)	39	(22,8)	28,3	(23,3)	27
62,5	(24,8)	24,1	(38,4)	43	(35,4)	40	(25,1)	32	(10,6)	15,9	(20,7)	26
100	(32,0)	31,3	(35,3)	40	(32,3)	37	(21,0)	28	(0,3)	5,7	(19,0)	25

OTHER PROPERTIES

Weight	68 kg/km
Max operating voltage	30 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	120 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 4,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 4,0 m/sec² (subject to correct installation)
Torsional use	Not recommended



INDUSTRIAL ETHERNET

NETBUS IE DQ3S F5Y3 AWM2571 CAT.5e

2x2x24/7AWG + 1x2x22/19AWG SF/UTP

CODE 0505522

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET type applications. The article is composed of two data pairs with 24/7AWG conductors and one pair for feeding, separated one from the other by a special separator. It offers low attenuations and excellent transmissive properties, all meeting the Cat.5e requirements in DRIVE-CLIQ™ systems. UL/CSA approved in accordance with AWM Style 20236.

APPROVALS

UL/CSA Compliant AWM Style 2571 - 30V/80°C

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
948 MJ/km (0,263 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 24/7AWG (0,25 mm²)
Insulation	Foam-skin polyethylene
Insulation ø	1,0 mm
Insulation colours	Green, yellow, gray, pink
Assembly of cores	Twisted pair • green/yellow - gray/pink
Inner conductors	Stranded tinned copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation ø	1,0 mm
Insulation colours	Red/black
Assembly of cores	Twisted pair
Assembly of elements	Pairs stranded together
Separation	Non-woven tape
Global shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	FR-PVC • Gray RAL7001
Outer ø	7,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	94,2 Ω/km (24AWG) - 59,4 Ω/km (22AWG)
Capacitance @ 800 Hz	50 pF/m
NVP @ 100MHz	76%
Max propagation delay @ 100MHz	490 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	2,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 12 mΩ/m @ 1 MHz • 25 mΩ/m @ 10 MHz 60 mΩ/m @ 30 MHz • 230 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		EL-FEXT		ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,1	(65,3)	70	(63,8)	69	(62,1)	67,9		29
4	(6,0)	4,1	(56,3)	61	(51,8)	58	(50,3)	56,9	(23)	30
10	(9,5)	6,3	(50,3)	56	(43,8)	53	(40,8)	49,7	(25)	31
16	(12,1)	8,0	(47,2)	53	(39,7)	49	(35,1)	45,0	(25)	31
20	(13,6)	8,8	(45,8)	51	(37,8)	45	(32,2)	42,2	(25)	31
31,25	(17,1)	11,2	(42,9)	48	(33,9)	41	(25,8)	36,8	(23,3)	27
62,5	(24,8)	16,1	(38,4)	43	(27,9)	36	(13,6)	26,9	(20,7)	26
100	(32,0)	20,9	(35,3)	40	(23,8)	33	(3,3)	19,1	(19,0)	25

OTHER PROPERTIES

Weight	71 kg/km
Max operating voltage	30 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	120 N
Operating temperature range	-30°C/+80°C (static) • -5°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	max +/-30°/meter

INDUSTRIAL ETHERNET

NETBUS IE R5QY CAT.5e

1x4x22/1AWG SF/UTP

CODE 0503090

INSTALLATION & USE

Indoor istallation

Fixed installation

APPLICATION

Fieldbus cable for fixed application, with PVC sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. The building layout in quad offers reduced external dimensions and excellent electrical-transmissive peformances in Cat5e, which are necessary for the usage of protocols Fast Ethernet type up to 100 Mbps.

APPROVALS

STANDARD REFERENCE

IEC61156-2

EN50288-2-1

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

908 MJ/km (0,252 kWh/m)

OTHER VERSIONS

FRNC-LSZH cable version - NETBUS IE R5QH LSZH (P/N 0503091)

CONSTRUCTION

Inner conductor	Solid bare copper wire - 0,64 mm ø (22/1AWG - 0,34 mm^2)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	Blue, white/blue, orange, white/orange
Assembly of cores	Stranded to a quad • pair 1 blue-white • pair 2 orange-white/orange
Separation	Polyester tape
Global shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Green RAL6018 colour
Outer ø	6,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	56,4 Ω/km
Capacitance @ 800 Hz	48 pF/m
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	520 nsec/100m
Max propagation delay skew @ 100MHz	5 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	11 mΩ/m @ 100 kHz • 11 mΩ/m @ 1 MHz • 11 mΩ/m @ 10 MHz 50 mΩ/m @ 30 MHz • 200 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		EL-FEXT		ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	1,6	(65,3)	80	(64,0)	81	(63,2)	78,4		29
4	(4,1)	3,2	(56,3)	73	(52,0)	72	(52,2)	69,8	(23)	30
10	(6,5)	5,1	(50,3)	65	(44,0)	63	(43,8)	59,9	(25)	31
16	(8,3)	6,5	(47,2)	63	(40,0)	57	(38,9)	56,5	(25)	31
20	(9,3)	7,4	(45,8)	60	(38,0)	54	(36,5)	52,6	(25)	31
31,25	(11,7)	9,5	(42,9)	56	(34,0)	48	(31,2)	46,5	(23,3)	27
62,5	(17,0)	14,3	(38,4)	51	(28,0)	39	(21,4)	36,7	(20,7)	26
100	(22,0)	19,0	(35,3)	48	(24,0)	32	(13,3)	29,0	(19,0)	25
155,52	--	24,2	--	45	--	27	--	20,8	--	23
200	--	28,3	--	43	--	24	--	14,7	--	22

OTHER PROPERTIES

Weight	61 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	150 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.

INDUSTRIAL ETHERNET

NETBUS IE FM5FCQP CAT.5e

1x4x22/19AWG S/UTP

CODE 0503096

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Fieldbus cable for fixed or dynamic application in drag chain, FAST CONNECT type, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET type applications. The building layout in quad offers reduced external dimensions and excellent electrical-transmissive performances in Cat5e, also under heavy movement conditions in drag chain.

APPROVALS

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.
Heat release
967 MJ/km (0,268 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed cable version - NETBUS IE F5QH LSZH (P/N 0503095)

CONSTRUCTION

Inner conductor	Strander bare copper wire - 22/19AWG (0,38 mm^2)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	Blue, white/blue, orange, white/orange
Assembly of cores	Stranded to a quad • pair 1 blue-white • pair 2 orange-white/orange
Filler jacket	Halogen free compound - ø 4,5 mm
Global shield	Aluminized non woven tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	6,7 mm

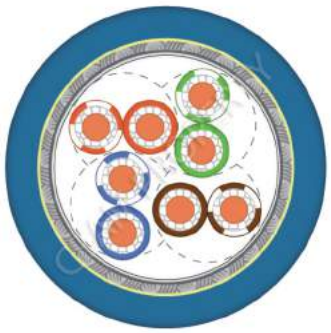
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,4 Ω/km
Capacitance @ 800 Hz	50 pF/m
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	520 nsec/100m
Max propagation delay skew @ 100MHz	5 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 40 mΩ/m @ 10 MHz 120 mΩ/m @ 30 MHz • 250 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		EL-FEXT		ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	1,9	(65,3)	80	(64,0)	81	(63,2)	78,1		29
4	(6,0)	3,9	(56,3)	73	(52,0)	72	(52,2)	69,1	(23)	30
10	(9,5)	6,0	(50,3)	65	(44,0)	63	(43,8)	59,0	(25)	31
16	(12,1)	7,5	(47,2)	63	(40,0)	57	(38,9)	55,5	(25)	33
20	(13,5)	8,4	(45,8)	60	(38,0)	53	(36,5)	51,6	(25)	33
31,25	(17,1)	10,7	(42,9)	56	(34,0)	46	(31,2)	45,3	(23,3)	30
62,5	(24,8)	16,0	(38,4)	51	(28,0)	34	(21,4)	35,0	(20,7)	28
100	(32,0)	20,9	(35,3)	48	(24,0)	27	(13,3)	27,1	(19,0)	26

OTHER PROPERTIES

Weight	61 kg/km
Max operating voltage	125 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation velocity (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec^2 (subject to correct installation)
Use in torsional devices (eg. robot)	Not recommended



INDUSTRIAL ETHERNET

NETBUS IE R5P4 CAT.5e

4x2x24/1AWG SF/UTP

CODE 0502048

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Four-paired Fieldbus cable for fixed application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ELTHERNET type applications. The high shielding efficiency and the excellent electrical-transmissive performances in Cat.5e make this item recommended for usage in environments which are characterised by particular stuffiness conditions.

APPROVALS

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.
Heat release
534 MJ/km (0,148 kWh/m)

OTHER VERSIONS

UL/CSA recognized - NETBUS IE R5P4 AWM20236 (P/N 0505412)
FRNC-LSZH cable version - NETBUS IE R5H4 LSZH (P/N 0502050)
Double FRNC-LSZH compound jacketed - NETBUS IE R5HH4 LSZH (P/N 0502052)

ME95

CONSTRUCTION

Inner conductor	Bare copper wire - 24/1AWG (0,22 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange - green/white-green - brown/white-brown
Assembly of elements	Pairs stranded together
Separation	Non-woven tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	6,1 mm

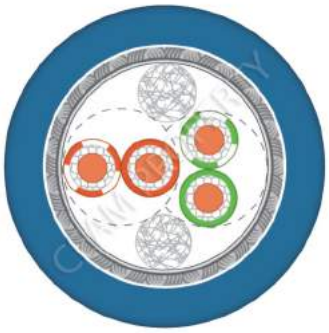
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	86,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800 Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	500 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	12 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 7 mΩ/m @ 100 MHz
Screening attenuation	≥ 92 dB (30 ÷ 300 MHz) • ≥ 85 dB (300 ÷ 600 MHz) ≥ 82 dB (300 ÷ 600 MHz)
Coupling attenuation	≥ 82 dB (30 ÷ 100 MHz) • ≥ 80 dB (100 ÷ 300 MHz) ≥ 65 dB (300 ÷ 600 MHz) • ≥ 62 dB (600÷ 1000 MHz)

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	2,0	(65,3)	70	(62,3)	67	(61,0)	75	(60,2)	65,0		29
4	(4,1)	3,8	(56,3)	61	(53,3)	58	(49,0)	64	(49,2)	54,2	(23)	30
10	(6,5)	5,8	(50,3)	56	(47,3)	53	(41,0)	59	(40,8)	47,2	(25)	31
16	(8,3)	7,3	(47,2)	53	(44,2)	50	(36,9)	55	(36,0)	42,7	(25)	31
20	(9,3)	8,2	(45,8)	51	(42,8)	48	(35,0)	51	(33,5)	39,8	(25)	31
31,25	(11,7)	10,2	(42,9)	48	(39,9)	45	(31,1)	47	(28,2)	34,8	(23,3)	27
62,5	(17,0)	14,7	(38,4)	43	(35,4)	40	(25,1)	40	(18,4)	25,3	(20,7)	26
100	(22,0)	18,8	(35,3)	40	(32,3)	37	(21,0)	38	(10,3)	18,2	(19,0)	25
155,52	--	23,6	--	37	--	34	--	35	--	10,4	--	23
200	--	26,9	--	35	--	32	--	32	--	5,1	--	22

OTHER PROPERTIES

Weight	51 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	120 N
Operating temperature range	-40°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.



INDUSTRIAL ETHERNET

NETBUS IE R5P2 CAT.5e

2x2x24/1AWG SF/UTP

CODE 0502041

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Two-paired Fieldbus cable for fixed application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. The electrical and transmissive performances of Cat.5e are guaranteed to support the Fast Ethernet protocol up to 100 Mbps, also in those environments which are characterised by particular stuffiness conditions.

APPROVALS

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.
Heat release
489 MJ/km (0,135 kWh/m)

OTHER VERSIONS

UL/CSA recognized - NETBUS IE R5P2 AWM20236 (P/N 0505410)
UL/CSA recognized FR-PVC cable version - NETBUS IE R5Y2 (P/N 0505403)
FRNC-LSZH compound jacketed - NETBUS IE R5H2 LSZH (P/N 0502044)

CONSTRUCTION

Inner conductor	Bare copper wire - 24/1AWG (0,22 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • orange/white-orange - green/white-green
Assembly of elements	Pairs stranded together with fillers
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	5,8 mm

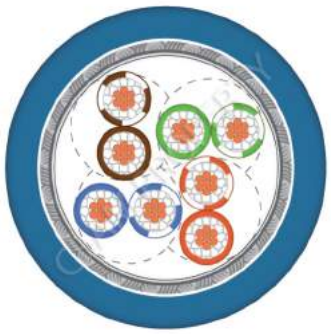
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	86,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	500 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	12 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 7 mΩ/m @ 100 MHz
Screening attenuation	≥ 92 dB (30 ÷ 300 MHz) • ≥ 85 dB (300 ÷ 600 MHz) ≥ 82 dB (600 ÷ 1000 MHz)
Coupling attenuation	≥ 85 dB (30 ÷ 100 MHz) • ≥ 80 dB (100 ÷ 300 MHz) ≥ 65 dB (300 ÷ 600 MHz) • ≥ 62 dB (600 ÷ 1000 MHz)

FREQUENCY	ATTENUATION		NEXT		EL-FEXT		ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	2,0	(65,3)	72	(64,0)	81	(63,2)	72,0		29
4	(4,1)	3,8	(56,3)	63	(52,0)	72	(52,2)	59,2	(23)	30
10	(6,5)	5,8	(50,3)	57	(44,0)	63	(43,8)	51,2	(25)	31
16	(8,3)	7,3	(47,2)	55	(40,0)	57	(38,9)	47,7	(25)	31
20	(9,3)	8,2	(45,8)	53	(38,0)	54	(36,5)	44,8	(25)	31
31,25	(11,7)	10,2	(42,9)	50	(34,0)	48	(31,2)	39,8	(23,3)	27
62,5	(17,0)	14,7	(38,4)	45	(28,0)	39	(21,4)	30,3	(20,7)	26
100	(22,0)	18,8	(35,3)	42	(24,0)	32	(13,3)	23,2	(19,0)	25
155,52	--	23,6	--	39	--	27	--	15,4	--	23
200	--	26,9	--	37	--	24	--	10,1	--	22

OTHER PROPERTIES

Weight	43 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	70 N
Operating temperature range	-40°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.



INDUSTRIAL ETHERNET

NETBUS IE F5P4 CAT.5e

4x2x26/7AWG SF/UTP

CODE 0502049

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Four-paired Fieldbus cable for fixed or dynamic (non continuous) application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET application. The high shielding efficiency, the good flexibility and the excellent eletrical-transmissive performances in Cat.5e make this item recommended for usage in environments which are characterised by particular stuffiness conditions.

APPROVALS

STANDARD REFERENCE

IEC61156-3

EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2; IEC 60754-2 Std.

Heat release

590 MJ/km (0,163 kWh/m)

OTHER VERSIONS

UL/CSA recognized - NETBUS IE F5P4 AWM20236 (P/N 0502446)

FRNC-LSZH cable version - NETBUS IE F5H4 LSZH (P/N 0502051)

UL/CSA recognized with FR-PVC jacket cable version - NETBUS IE F5Y4 AWM2571 (P/N 0502443)

ME95

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/7AWG (0,14 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange - green/white-green - brown/white-brown
Assembly of elements	Pairs stranded together
Separation	Non-woven tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	6,1 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	142,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	500 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	11 mΩ/m @ 100 kHz • 11 mΩ/m @ 1 MHz • 2 mΩ/m @ 10 MHz 2 mΩ/m @ 30 MHz • 0,7 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,6	(65,3)	70	(62,3)	67	(61,0)	69	(59,1)	67,4		29
4	(6,0)	5,5	(56,3)	61	(53,3)	58	(49,0)	58	(47,3)	52,5	(23)	30
10	(9,5)	8,0	(50,3)	56	(47,3)	53	(41,0)	53	(37,8)	45,0	(25)	31
16	(12,1)	10,2	(47,2)	53	(44,2)	50	(36,9)	49	(32,1)	39,8	(25)	31
20	(13,6)	11,4	(45,8)	51	(42,8)	48	(35,0)	45	(29,2)	36,6	(25)	31
31,25	(17,1)	14,3	(42,9)	48	(39,9)	45	(31,1)	41	(22,8)	30,7	(23,3)	27
62,5	(24,8)	20,6	(38,4)	43	(35,4)	40	(25,1)	36	(10,6)	19,4	(20,7)	26
100	(32,0)	26,5	(35,3)	40	(32,3)	37	(21,0)	33	(0,3)	10,5	(19,0)	25
155,52	--	33,6	--	37	--	34	--	29	--	0,4	--	23
200	--	38,7	--	35	--	32	--	26	--	-6,7	--	22

OTHER PROPERTIES

Weight	47 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	120 N
Operating temperature range	-40°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.

INDUSTRIAL ETHERNET

NETBUS IE F5P2 CAT.5e

2x2x26/7AWG SF/UTP

CODE 0502040

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Two-paired Fieldbus cable for fixed or dynamic (non continuous) application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET application. The electrical and transmissive performances of Cat.5e are guaranteed to support the Fast Ethernet protocol up to 100 Mbps, also in those working environments which are characterised by particular stuffiness conditions.

APPROVALS

STANDARD REFERENCE

IEC61156-3

EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2; IEC 60754-2 Std.

Heat release

489 MJ/km (0,135 kWh/m)

OTHER VERSIONS

UL/CSA recognized - NETBUS IE F5P2 AWM20236 (P/N 0505436)

FRNC-LSZH cable version - NETBUS IE F5H2 LSZH (P/N 0502042)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/7AWG (0,14 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • orange/white-orange - green/white-green
Assembly of elements	Pairs stranded together with fillers
Separation	Non-woven tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	5,8 mm

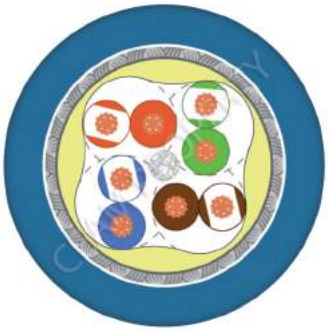
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	142,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	500 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	11 mΩ/m @ 100 kHz • 11 mΩ/m @ 1 MHz • 2 mΩ/m @ 10 MHz 2 mΩ/m @ 30 MHz • 0,7 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		EL-FEXT		ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,6	(65,3)	70	(64,0)	79	(62,1)	67,4	67,4	29
4	(6,0)	5,5	(56,3)	61	(52,0)	72	(50,3)	55,5	(23)	30
10	(9,5)	8,0	(50,3)	56	(44,0)	63	(40,8)	48,0	(25)	31
16	(12,1)	10,2	(47,2)	53	(40,0)	57	(35,1)	42,8	(25)	31
20	(13,6)	11,4	(45,8)	51	(38,0)	54	(32,2)	39,6	(25)	31
31,25	(17,1)	14,3	(42,9)	48	(34,0)	47	(25,8)	33,7	(23,3)	27
62,5	(24,8)	20,6	(38,4)	43	(28,0)	35	(13,6)	22,4	(20,7)	26
100	(32,0)	26,5	(35,3)	40	(24,0)	29	(3,3)	13,5	(19,0)	25
155,52	--	33,6	--	37	--	26	--	3,4	--	23
200	--	38,7	--	35	--	23	--	-3,7	--	22

OTHER PROPERTIES

Weight	39 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	60 N
Operating temperature range	-40°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.



INDUSTRIAL ETHERNET

NETBUS IE FM5FC4P CAT.5e AWM20236
4x2x26/19AWG S/UTP

CODE 0505467

INSTALLATION & USE
Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION
Four-paired Fieldbus cable for fixed and dynamic application, FAST CONNECT type, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. The building layout is designed to obtain excellent mechanical and transmissive performances in accordance with Cat.5e, also in frequent movement conditions. UL/CSA approved in accordance with AWM Style 20236.

APPROVALS
UL/CSA AWM Style 20236 - 30V/80°C

STANDARD REFERENCE
IEC61156-3
EN50288-2-2

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
736 MJ/km (0,204 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/19AWG (0,15 mm²)
Insulation	Solid polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange - green/white-green - brown/white-brown
Assembly of elements	Pairs stranded together
Inner jacket	TPE compound - ø 5,1 mm
Overall shield	Tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	7,2 mm

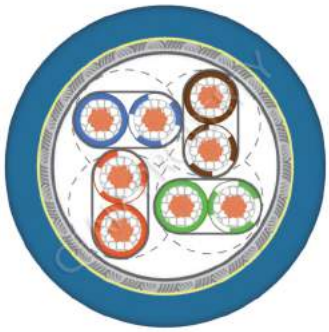
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	142,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	520 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 40 mΩ/m @ 10 MHz 120 mΩ/m @ 30 MHz • 250 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,6	(65,3)	70	(62,3)	67	(61,0)	69	(59,1)	64,4		29
4	(6,0)	5,5	(56,3)	61	(53,3)	58	(49,0)	56	(47,3)	52,5	(23)	30
10	(9,5)	8,9	(50,3)	56	(47,3)	53	(41,0)	49	(37,8)	44,1	(25)	31
16	(12,1)	11,8	(47,2)	53	(44,2)	50	(36,9)	44	(32,1)	38,2	(25)	31
20	(13,6)	13,2	(45,8)	51	(42,8)	48	(35,0)	42	(29,2)	34,8	(25)	31
31,25	(17,1)	16,7	(42,9)	48	(39,9)	45	(31,1)	39	(22,8)	28,3	(23,3)	27
62,5	(24,8)	24,1	(38,4)	43	(35,4)	40	(25,1)	32	(10,6)	15,9	(20,7)	26
100	(32,0)	31,3	(35,3)	40	(32,3)	37	(21,0)	28	(0,3)	5,7	(19,0)	25

OTHER PROPERTIES

Weight	56 kg/km
Max operating voltage	30 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation velocity (drag chain)	≤ 4,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 5,0 m/sec² (subject to correct installation)
Torsional use	Not recommended



INDUSTRIAL ETHERNET

NETBUS IE FMT5P4 CAT.5e

4x2x26/19AWG SF/UTP

CODE 0502512

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)
For torsional movements

APPLICATION

Four-paired Fieldbus cable for fixed and dynamic application, TORSION type, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. Designed and produced in order to guarantee excellent transmissive performances in Cat.5e and a high torsion capability in particular conditions, such as usage in rotating mobile devices (for example, robots). Tested for 360°/m torsion movements, for more than 10 million cycles.

APPROVALS

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.

Heat release
614 MJ/km (0,170 kWh/m)

OTHER VERSIONS

Two pair cable version - NETBUS IE FMT5P2 (P/N 0502046)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/19AWG (0,15 mm²)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange - green/white-green - brown/white-brown
Assembly of elements	Pairs stranded together
Overall shield	Aluminized non woven tape + special tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	6,2 mm

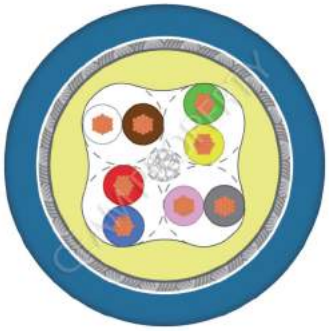
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	142,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	500 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	11 mΩ/m @ 100 kHz • 11 mΩ/m @ 1 MHz • 2 mΩ/m @ 10 MHz 2 mΩ/m @ 30 MHz • 0,7 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	2,6	(65,3)	70	(62,3)	67	(61,0)	69	(59,1)	64,4		29
4	(6,0)	5,5	(56,3)	61	(53,3)	58	(49,0)	56	(47,3)	52,5	(23)	30
10	(9,5)	8,9	(50,3)	56	(47,3)	53	(41,0)	49	(37,8)	44,1	(25)	31
16	(12,1)	11,8	(47,2)	53	(44,2)	50	(36,9)	44	(32,1)	38,2	(25)	31
20	(13,6)	13,2	(45,8)	51	(42,8)	48	(35,0)	42	(29,2)	34,8	(25)	31
31,25	(17,1)	16,7	(42,9)	48	(39,9)	45	(31,1)	39	(22,8)	28,3	(23,3)	27
62,5	(24,8)	24,1	(38,4)	43	(35,4)	40	(25,1)	32	(10,6)	15,9	(20,7)	26
100	(32,0)	31,3	(35,3)	40	(32,3)	37	(21,0)	28	(0,3)	5,7	(19,0)	25

OTHER PROPERTIES

Weight	47 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chian)
Max pulling strenght	60 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation velocity (drag chain)	≤ 2,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Up to +/- 180°



INDUSTRIAL ETHERNET

NETBUS IE FM5FC4P-24 CAT.5e

4x2x24/19AWG SF/UTP

CODE 0502513

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Four-paired Fieldbus cable for fixed or dynamic application, FAST CONNECT type, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. The use of 24/19AWG conductors allows to obtain mechanical and transmissive performances in Cat.5e that are to be considered even better than the ones of similar articles having 24/19AWG conductors.

APPROVALS

STANDARD REFERENCE

IEC61156-3
EN50288-2-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.
Heat release
2081 MJ/km (0,576 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 24/19AWG (0,25 mm²)
Insulation	Solid polypropylene
Insulation colours	ref. DIN47100
Assembly of elements	Pairs stranded together
Separation	Non-woven tape
Inner jacket	Halogen free compound - ø 6,9 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Blue RAL5023 colour
Outer ø	9,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	78,0 Ω/km
Capacitance @ 800 Hz	51 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	520 nsec/100m
Max propagation delay skew @ 100MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 5 mΩ/m @ 10 MHz 13 mΩ/m @ 30 MHz • 25 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	1,5	(65,3)	77	(62,3)	75	(61,0)	73	(59,1)	73,5		29
4	(6,0)	4,1	(56,3)	69	(53,3)	57	(49,0)	65	(47,3)	60,9	(23)	30
10	(9,5)	6,8	(50,3)	64	(47,3)	62	(41,0)	59	(37,8)	55,2	(25)	31
16	(12,1)	8,8	(47,2)	61	(44,2)	59	(36,9)	56	(32,1)	50,2	(25)	31
20	(13,6)	10,0	(45,8)	55	(42,8)	53	(35,0)	52	(29,2)	43,0	(25)	31
31,25	(17,1)	12,9	(42,9)	52	(39,9)	50	(31,1)	47	(22,8)	37,1	(23,3)	27
62,5	(24,8)	19,1	(38,4)	48	(35,4)	46	(25,1)	41	(10,6)	26,9	(20,7)	26
100	(32,0)	24,9	(35,3)	45	(32,3)	43	(21,0)	37	(0,3)	18,1	(19,0)	25
155,52	--	31,8	--	43	--	41	--	34	--	9,2	--	23
200	--	36,6	--	41	--	39	--	31	--	2,4	--	22

OTHER PROPERTIES

Weight	107 kg/km
Max operating voltage	125 V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	180 N
Operating temperature range	-40°C/+80°C (static) • -30°C/+70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation velocity (drag chain)	≤ 4,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 5,0 m/sec² (subject to correct installation)
Use in torsional devices (eg. robot)	Not recommended

INDUSTRIAL ETHERNET

NETBUS IE R6Y4 CAT.6

4x2x23/1AWG SF/UTP

CODE 0562824

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Four-paired Fieldbus cable for fixed application, with PVC sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. It meets the electrical-transmissive requirements of Cat.6 (250 MHz) and offers an adequate shielding which guarantees support to the Gigabit Ethernet 1000 Mbps protocol also in industrial environments.

APPROVALS

STANDARD REFERENCE

EN50288-5-1

COMPLIANCE

2011/65 EC RoHS
2006/95/EC LVD
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Heat release
979 MJ/km (0,271 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS IE R6H4 LSZH (P/N 0562708)

CONSTRUCTION

Inner conductor	Bare copper wire - 23/1AWG (0,25 mm^2)
Insulation	Foam-skin polyethylene
Assembly of elements	Pairs stranded together with central cross-separator
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 60% coverage
Outer jacket	FR-PVC • White RAL9018 colour
Outer ø	7,5 mm

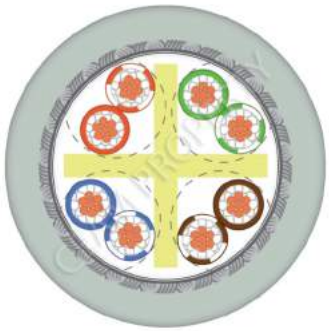
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	74,5 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	490 nsec/100m
Max propagation delay skew @ 100MHz	25 nsec/100m
Characteristic impedance	100 Ω (± 15%) (1÷100 MHz) • 100Ω (± 20%) (1÷250 MHz)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 113 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 40 mΩ/m @ 30 MHz • 120 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	1,9	(74,3)	83	(72,3)	81	(64,0)	81	(70,2)	79,1		29
4	(3,8)	3,6	(65,3)	77	(63,3)	75	(55,0)	74	(59,5)	71,4	(23)	30
10	(6,0)	5,6	(59,3)	73	(57,3)	71	(47,0)	73	(51,3)	65,4	(25)	31
16	(7,6)	7,1	(56,2)	69	(54,2)	67	(43,0)	65	(46,6)	59,9	(25)	31
20	(8,5)	8,0	(54,8)	66	(52,8)	64	(41,0)	62	(44,3)	56,0	(25)	31
31,25	(10,7)	10,2	(51,9)	64	(49,9)	62	(37,1)	52	(39,2)	51,8	(23,6)	30
62,5	(15,4)	14,6	(47,4)	63	(45,4)	61	(31,1)	42	(30,0)	46,4	(21,5)	29
100	(19,8)	18,7	(44,3)	56	(42,3)	54	(27,0)	36	(22,5)	35,3	(20,1)	27
155,52	(25,2)	23,8	(41,4)	53	(39,4)	51	(23,2)	34	(14,2)	27,2	(18,8)	25
200	(29,0)	27,3	(39,8)	47	(37,8)	45	(21,0)	32	(8,8)	17,7	(18,0)	25
250	(32,8)	30,9	(38,3)	45	(36,3)	43	(19,0)	31	(3,5)	12,1	(17,3)	23
300	--	34,2	--	44	--	42	--	26	--	7,8	--	22
350	--	37,0	--	42	--	40	--	22	--	3,0	--	20

OTHER PROPERTIES

Weight	68 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	130 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.



INDUSTRIAL ETHERNET

NETBUS IE F6Y4 CAT.6

4x2x26/7AWG SF/UTP

CODE 0502746

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Four-paired Fieldbus cable for fixed and dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. It meets the electrical-transmissive requirements of Cat.6 (250 MHz) and offers an adequate shielding which guarantees the support of the Gigabit Ethernet 1000 Mbps protocol also in industrial environments.

APPROVALS

STANDARD REFERENCE

EN50288-5-2

COMPLIANCE

2011/65 EC RoHS

2006/95/EC LVD

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

949 MJ/km (0,180 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS IE F6H4 LSZH (P/N 0502744)

High-flex cable version - NETBUS IE FM6SF4P26 (P/N 0502749)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/7AWG (0,14 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange - green/white-green - brown/white-brown
Assembly of elements	Pairs stranded together with central cross-separator
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 60% coverage
Outer jacket	FR-PVC • White RAL9018 colour
Outer ø	6,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	142,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	75%
Max propagation delay @ 100MHz	490 nsec/100m
Max propagation delay skew @ 100MHz	25 nsec/100m
Characteristic impedance	100Ω (± 15%) (1÷100 MHz) • 100Ω (± 20%) (1÷250 MHz)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	15 mΩ/m @ 100 kHz • 113 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz 40 mΩ/m @ 30 MHz • 120 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,1)	2,6	(74,3)	80	(72,3)	78	(65,0)	78	(69,2)	75,4		29
4	(5,8)	5,3	(65,3)	71	(63,3)	69	(53,0)	71	(57,5)	63,7	(23)	30
10	(9,0)	8,1	(59,3)	67	(57,3)	65	(45,0)	70	(48,3)	56,9	(25)	31
16	(11,4)	10,2	(56,2)	63	(54,2)	61	(40,9)	63	(42,8)	50,8	(25)	31
20	(12,8)	11,4	(54,8)	61	(52,8)	59	(39,0)	54	(40,0)	47,6	(25)	31
31,25	(16,1)	14,5	(51,9)	57	(49,9)	55	(35,1)	45	(33,8)	40,5	(23,6)	30
62,5	(23,3)	21,1	(47,4)	52	(45,4)	50	(29,1)	39	(22,1)	28,9	(21,5)	29
100	(29,9)	27,3	(44,3)	49	(42,3)	47	(25,0)	36	(12,4)	19,7	(20,1)	27
155,52	(38,1)	34,7	(41,4)	46	(39,4)	44	(21,2)	33	(1,3)	9,3	(18,8)	25
200	(43,8)	39,5	(39,8)	44	(37,8)	42	(19,0)	31	--	2,5	(18,0)	25
250	(49,7)	44,2	(38,3)	41	(36,3)	39	(17,0)	29	--	-5,2	(17,3)	23
300	--	48,9	--	38	--	36	--	26	--	-12,9	--	22
350	--	53,6	--	37	--	35	--	22	--	-18,6	--	20

OTHER PROPERTIES

Weight	48 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	100 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.

INDUSTRIAL ETHERNET

NETBUS IE FM6FC4P26 CAT.6 AWM20233

4x2x26/19AWG SF/UTP

CODE 0505252F

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Four-paired Fieldbus cable for fixed or dynamic application, FAST CONNECT type, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. The particular attention to the building layout allows to obtain excellent eletrical-transmissive performance of Cat.6 (250 MHz), also in drag chain continuous movement conditions.

APPROVALS

UL/CSA AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

EN50288-5-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
1120 MJ/km (0,310 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/19AWG (0,15 mm²)
Insulation	Solid polypropylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange - green/white-green - brown/white-brown
Assembly of elements	Pairs stranded together with central cross-separator
Separation	Non woven tape
Inner jacket	TPE compound - ø 5,5 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	7,8 mm

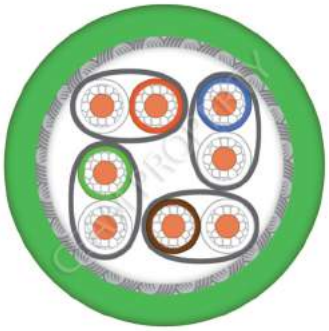
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	142,0 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800Hz	1000 pF/km
NVP @ 100MHz	67%
Max propagation delay @ 100MHz	500 nsec/100m
Max propagation delay skew @ 100MHz	25 nsec/100m
Characteristic impedance	100Ω (± 15%) (1÷100 MHz) • 100Ω (± 20%) (1÷250 MHz)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 10 mΩ/m @ 1 MHz • 5 mΩ/m @ 10 MHz 13 mΩ/m @ 30 MHz • 25 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,1)	2,6	(74,3)	82	(72,3)	80	(65,0)	78	(69,2)	79,7		28
4	(5,8)	5,2	(65,3)	77	(63,3)	75	(53,0)	71	(57,5)	74,5	(23)	30
10	(9,0)	8,3	(59,3)	69	(57,3)	67	(45,0)	70	(48,3)	66,2	(25)	31
16	(11,4)	10,6	(56,2)	66	(54,2)	64	(40,9)	63	(42,8)	62,9	(25)	31
20	(12,8)	12,0	(54,8)	60	(52,8)	58	(39,0)	54	(40,0)	56,8	(25)	31
31,25	(16,1)	15,3	(51,9)	57	(49,9)	55	(35,1)	45	(33,8)	53,5	(23,6)	29
62,5	(23,3)	22,6	(47,4)	51	(45,4)	49	(29,1)	39	(22,1)	46,7	(21,5)	28
100	(29,9)	29,3	(44,3)	44	(42,3)	42	(25,0)	36	(12,4)	39,1	(20,1)	27
155,52	(38,1)	37,5	(41,4)	43	(39,4)	41	(21,2)	33	(1,3)	37,2	(18,8)	24
200	(43,8)	43,1	(39,8)	42	(37,8)	40	(19,0)	31	--	35,7	(18,0)	23
250	(49,7)	48,5	(38,3)	41	(36,3)	39	(17,0)	29	--	34,1	(17,3)	22

OTHER PROPERTIES

Weight	77 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C/+80°C (static) • -10°C/+50°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation velocity (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 4,0 m/sec² (subject to correct installation)
Use in torsional devices (eg. robot)	Not recommended



INDUSTRIAL ETHERNET

NETBUS IE R7P4 CAT.7

4x2x23/1AWG S/FTP

CODE 0502712

INSTALLATION & USE

Indoor istallation

Fixed installation

APPLICATION

Four-paired Fieldbus cable for fixed application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. It meets the electrical-transmissive requirements of Cat.7 and is tested up to a 750 MHz frequency.Thanks to the high shielding efficiency, the protection offered by the PUR sheath and the excellent transmissive properties, the item guarantees the support of the 10 Gigabit Ethernet protocol also in industrial environments.

APPROVALS

STANDARD REFERENCE

IEC61156-5

EN50288-4-1

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2; IEC 60754-2 Std.

Heat release

776 MJ/km (0,215 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS IE R7H4 LSZH (P/N 0502713)

FR-PVC jacketed - NETBUS IE R7Y4 LSZH (P/N 0502715)

CONSTRUCTION

Inner conductor	Bare copper wire - 23/1AWG (0,25 mm^2)
Insulation	Foam-skin polyethylene
Assembly of cores	Twisted pair • blue/white - orange/white - green/white - brown/white
Shield	AL/PET tape
Assembly of elements	Shielded pairs stranded together
Overall shield	Tinned copper braid 50% coverage
Separation	Polyester tape
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	8,2 mm

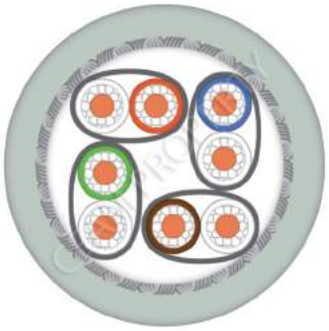
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	74,5 Ω/km
Capacitance @ 800 Hz	43 pF/m
Max capacitance unbalance @ 800Hz	1600 pF/km
NVP @ 100MHz	77%
Max propagation delay @ 100MHz	480 nsec/100m
Max propagation delay skew @ 100MHz	25 nsec/100m
Characteristic impedance	100Ω (± 15%) (1÷250 MHz) • 100Ω (± 20%) (250÷600 MHz)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	7 mΩ/m @ 100 kHz • 4 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 10 mΩ/m @ 30 MHz • 20 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min[dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,0)	1,9	(75,0)	> 95	(75,0)	> 85	(73,0)	93,1		30
4	(3,7)	3,4	(75,0)	> 95	(75,0)	> 85	(71,3)	91,6	(23)	33
10	(5,9)	5,4	(75,0)	> 95	(71,0)	> 85	(69,1)	89,6	(25)	33
16	(7,4)	6,9	(75,0)	92	(66,9)	> 85	(67,6)	85,1	(25)	33
20	(8,3)	7,7	(75,0)	92	(65,0)	84	(66,7)	84,3	(25)	33
31,25	(10,4)	9,7	(75,0)	89	(61,1)	82	(64,6)	79,3	(23,3)	33
62,5	(14,9)	14,0	(72,5)	87	(55,1)	77	(57,6)	73,0	(20,7)	30
100	(19,0)	17,8	(69,4)	85	(51,0)	74	(50,4)	67,2	(19,0)	28
155,52	(24,0)	22,4	(66,5)	83	(47,2)	70	(42,5)	60,6	(17,3)	26
250	(31,0)	28,9	(63,4)	80	(43,0)	60	(31,4)	51,1	(17,3)	25
500	(45,3)	40,5	(58,9)	76	(37,0)	51	(13,6)	35,5	(17,3)	23
600	(50,1)	45,3	(57,7)	74	(35,4)	46	(7,6)	28,7	(17,3)	22
750	--	51,5	--	72	--	37	--	20,5	--	20

OTHER PROPERTIES

Weight	64 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	180 N
Operating temperature range	-40°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.



INDUSTRIAL ETHERNET

NETBUS IE R7AY22 CAT.7A AWM2571

4x2x22/1AWG S/FTP

CODE 0502734

INSTALLATION & USE

Indoor istallation

Fixed installation

APPLICATION

Four-paired Fieldbus cable for fixed application, with PVC sheath. The item is particularly suitable for INDUSTRIAL ETHERNET application. It meets the electrical-transmissive requirements of Cat. 7a and it is tested up to a 1200 MHz frequency. In the transmissive field, it currently represents the top article as it is able to support the most modern transmissive protocols designed for data transmission on copper. The particular choices adopted for the realization of the shielding make it suitable for industrial environments too.

APPROVALS

UL/CSA AWM Style 2571 - 30V/80°C

STANDARD REFERENCE

IEC61156-5

EN50288-4-1

COMPLIANCE

2011/65 EC RoHS

2006/95/EC LVD

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Heat release

1310 MJ/km (0,363 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS IE R7AH4 LSZH (P/N 0502714)

CONSTRUCTION

Inner conductor	Bare copper wire - 22/1AWG (0,34 mm^2)
Insulation	Foam-skin polyethylene
Assembly of cores	Twisted pair • blue/white - orange/white - green/white - brown/white
Shield	AL/PET tape
Assembly of elements	Shielded pairs stranded together
Overall shield	Tinned copper braid 60% coverage
Outer jacket	FR-PVC • White RAL9018 colour
Outer ø	9,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	56,4 Ω/km
Capacitance @ 800 Hz	43 pF/m
Max capacitance unbalance @ 800Hz	1600 pF/km
NVP @ 100MHz	77%
Max propagation delay @ 100MHz	480 nsec/100m
Max propagation delay skew @ 100MHz	25 nsec/100m
Characteristic impedance	100Ω (± 15%) (1÷250 MHz) • 100Ω (± 20%) (250÷600 MHz) 100Ω (± 25%) (600÷1200 MHz)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	7 mΩ/m @ 100 kHz • 4 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 8 mΩ/m @ 30 MHz • 15 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,0)	1,6	(75,0)	> 95	(75,0)	> 95	(73,0)	93,6		30
4	(3,7)	2,9	(75,0)	> 95	(75,0)	> 95	(71,3)	92,1	(23)	32
10	(5,8)	4,7	(75,0)	> 95	(72,3)	95	(69,2)	90,3	(25)	32
16	(7,3)	6,0	(75,0)	> 95	(68,2)	90	(67,7)	89,0	(25)	32
20	(8,2)	6,7	(75,0)	> 95	(66,3)	85	(66,8)	88,3	(25)	32
31,25	(10,3)	8,5	(75,0)	> 95	(62,4)	82	(64,7)	86,5	(23,3)	30
62,5	(14,6)	12,3	(75,0)	> 95	(56,4)	78	(57,9)	82,7	(20,7)	29
100	(18,5)	15,5	(72,4)	95	(52,3)	73	(53,9)	79,5	(19,0)	27
155,52	(23,2)	20,1	(69,5)	95	(48,5)	70	(46,3)	74,9	(17,3)	27
250	(29,7)	24,9	(66,4)	92	(44,3)	64	(36,7)	67,1	(17,3)	25
500	(42,8)	36,8	(61,9)	88	(38,3)	55	(19,2)	51,2	(17,3)	23
600	(47,1)	42,8	(60,7)	87	(36,7)	50	(13,6)	44,2	(17,3)	22
750	(53,1)	48,3	(59,3)	82	(34,8)	46	(6,2)	33,7	(17,3)	21
900	(58,5)	52,1	(58,1)	80	(33,2)	43	--	27,9	(15,5)	20
1000	(61,9)	55,7	(57,4)	76	(32,3)	41	--	20,3	(15,1)	19
1200	--	62,0	--	73	--	36	--	11,0	--	17

OTHER PROPERTIES

Weight	92 kg/km
Max operating voltage	30 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	200 N
Operating temperature range	-30°C/+80°C (static)
Ozone resistance	Compliant EN 50396 Std.

INDUSTRIAL ETHERNET

NETBUS IE F7-ST4P26 CAT.7

4x2x26/7AWG S/FTP

CODE 0505310

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Four-paired Fieldbus cable for fixed and dynamic (non continuous) application, with PUR sheath. The item is particularly suitable for INDUSTRIAL ETHERNET applications. It meets the electrical and transmissive requirements of Cat.7, and is tested up to a 750 MHz frequency. The good flexibility, the particular shielding, the protection offered by the PUR sheath and the excellent transmissive properties guarantee the support of the 10 Gigabit Ethernet protocol also in industrial environments.

APPROVALS

STANDARD REFERENCE

IEC61156-6

EN50288-4-2

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2; IEC 60754-2 Std.

Heat release

643 MJ/km (0,178 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS IE F7-ST4H26 LSZH (P/N 0505315)

FR-PVC jacketed - NETBUS IE F7-ST4Y26 (P/N 0505313)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 26/7AWG (0,14 mm^2)
Insulation	Foam-skin polyethylene
Insulation ø	Max 1,05 mm
Assembly of cores	Twisted pair # blue/white - orange/white - green/white - brown/white
Shield	AL/PET tape
Assembly of elements	Shielded pairs stranded together
Overall shield	Tinned copper braid 65% coverage
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	6,3 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	143,0 Ω/km
Capacitance @ 800 Hz	44 pF/m
Max capacitance unbalance @ 800Hz	1600 pF/km
NVP @ 100MHz	77%
Max propagation delay @ 100MHz	480 nsec/100m
Max propagation delay skew @ 100MHz	25 nsec/100m
Characteristic impedance	100Ω (± 15%) (1÷250 MHz) • 100Ω (± 20%) (250÷600 MHz)
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	11 mΩ/m @ 100 kHz • 6 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 2 mΩ/m @ 30 MHz • 5 mΩ/m @ 100 MHz
Screening attenuation	≥ 80 dB (30÷300 MHz) • ≥ 80 dB (300÷600 MHz) ≥ 80 dB (600÷1000 MHz)
Coupling attenuation	≥ 90 dB (30÷100 MHz) • ≥ 80 dB (100÷300 MHz) ≥ 77 dB (300÷600 MHz) • ≥ 75 dB (600÷1000 MHz)

FREQUENCY	ATTENUATION		PS NEXT		PS EL-FEXT		PS ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,0)	2,9	(75,0)	> 95	(75,0)	93	(72,0)	> 90		27
4	(5,6)	5,4	(75,0)	> 95	(75,0)	93	(69,4)	> 90	(23)	28
10	(8,8)	8,4	(75,0)	95	(71,0)	92	(66,2)	86,6	(25)	31
16	(11,1)	10,4	(75,0)	95	(66,9)	85	(63,9)	84,6	(25)	31
20	(12,4)	11,4	(75,0)	92	(65,0)	79	(62,6)	80,6	(25)	31
31,25	(15,6)	14,2	(75,0)	92	(61,1)	71	(59,4)	77,8	(23,3)	28
62,5	(22,3)	20,5	(72,5)	90	(55,1)	58	(50,1)	69,5	(20,7)	27
100	(28,5)	26,2	(69,4)	90	(51,0)	55	(40,9)	63,8	(19,0)	25
155,52	(36,0)	33,2	(66,5)	88	(47,2)	51	(30,5)	54,8	(17,3)	25
250	(46,5)	42,5	(63,4)	84	(43,0)	47	(17,0)	41,5	(15,6)	23
500	(67,9)	62,2	(58,9)	75	(37,0)	41	--	12,8	(15,6)	21
600	(75,1)	67,8	(57,7)	73	(35,4)	38	--	5,2	(15,6)	20
750	--		--	70	--	33	--	-7,2	--	19

OTHER PROPERTIES

Weight	46 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	80 N
Operating temperature range	-40°C/+80°C (static)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.

PROFINET™

PROFINET is an open and innovative standard for industrial Ethernet in automation applications. The PROFINET standard was defined and published by PROFIBUS & PROFINET International (PI). PROFINET is intended for process automation, manufacturing automation and real-time movement control solutions. It allows the integration of existing fieldbuses, such as PROFIBUS, INTERBUS, DeviceNet and other technologies, in an open network based on the Ethernet. PROFINET uses the Ethernet standard and TCP, UDP and IP protocols for the communication, configuration and diagnostics of the network. It easily integrates with Internet and ICT infrastructures. Fieldbus cables intended for PROFINET applications are supplied for CAT.5e performance levels. These cables are available either for fixed or mobile installations and are used in the industrial field and process automation to support applications such as Ethernet with a transmission speed rate of up to 100 Mbps.

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82 **NETBUS PN-A R5FCQY 1x4x22/1AWG AWM2571 - P/N 0503102**
PROFINET TYP A CAT.5e cable for fixed installations - PVC jacket - FAST CONNECT

83 **NETBUS PN-A R5Y4-23 4x2x23/1AWG AWM2571 - P/N 0505480F**
PROFINET TYP A CAT.5e cable for fixed installations - PVC jacket - FAST CONNECT

84 **NETBUS PN-B F5FCQY 1x4x22/7AWG AWM2571 - P/N 0503105**
PROFINET TYP B CAT.5e cable for fixed and flexible applications - PVC jacket - FAST CONNECT

85 **NETBUS PN-B F5Y4-23 4x2x23/7AWG AWM2571 - P/N 0505484F**
PROFINET TYP B CAT.5e cable for fixed and flexible applications - PVC jacket - FAST CONNECT

86 **NETBUS PN-C FM5FCQP 1x4x22/19AWG AWM20233 - P/N 0503108**
PROFINET TYP C CAT.5e cable for fixed and dynamic applications - HF PUR jacket - FAST CONNECT

87 **NETBUS PN-C FM5FC4P 4x2x24/19AWG AWM20236 - P/N 0505488F**
PROFINET TYP C CAT.5e cable for fixed and dynamic applications - HF PUR jacket - FAST CONNECT

88 **NETBUS PN-B HYBRID 4 F5QH 1x4x22/7AWG + 4x1,50 mm² - P/N 0505476F**
PROFINET TYP B CAT.5e combi cable for fixed and flexible applications - FRNC LSZH jacket

89 **NETBUS PN-C HYBRID 4 FM5QP 1x4x22/19AWG + 4x0,50 mm² AWM20236 - P/N 0505477F**
PROFINET TYP C CAT.5e combi cable for fixed and dynamic applications - FRNC LSZH jacket

PROFINET™

NETBUS PN-A R5FCQY AWM2571 CAT.5e
1x4x22/1AWG SF/UTP

CODE 0503102

INSTALLATION & USE
Indoor istallation
Fixed installation

APPLICATION
Fieldbus cable for fixed application, FAST CONNECT type, with oil resistant PVC sheath. The item is particularly suitable for PROFINET TYP A applications. The article has a building layout in quad (2 pairs), high shielding efficiency, and offers excellent eletrical-transmissive performances in accordance with the PROFINET and Cat.5e specifications. It is also suitable for data transmission in Fast Ethernet type protocols up to 100 Mbps. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS
UL/CSA Compliant AWM Style 2571 - 300V/80°C

STANDARD REFERENCE
IEC61156-2
EN50288-2-1
PROFINET guideline Ver.3.01 10/2011

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
1047 MJ/km (0,290 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Solid bare copper wire - 22/1AWG (0,34 mm²)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	White, blue, yellow, orange
Assembly of cores	Stranded to quad • pair 1 white/blue • pair 2 yellow/orange
Separation	Polyester tape
Inner jacket	FR-PVC - ø 4,0 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Green RAL6018 colour
Outer ø	6,5 mm

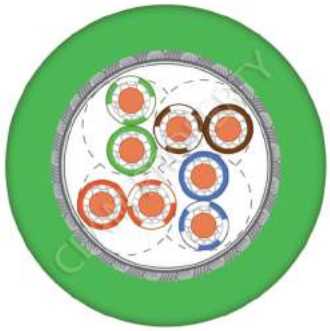
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,4 Ω/km
Capacitance @ 800 Hz	52 pF/m
NVP @ 100 MHz	67%
Max propagation delay @ 100 MHz	520 nsec/100m
Max propagation delay skew @ 100 MHz	5 nsec/100m
Characteristic impedance	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 MHz • 7 mΩ/m @ 1 MHz • 2 mΩ/m @ 10 MHz 2 mΩ/m @ 30 MHz • 3 mΩ/m @ 100 MHz
Screening attenuation	80 dB (30 ÷ 300 MHz) • 80 dB (300 ÷ 600 MHz) 80 dB (600 ÷ 1000 MHz)

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		EL-FEXT min [dB/100m]		ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	1,6	(65,3)	80	(64,0)	81	(63,2)	78,4		29
4	(4,1)	3,2	(56,3)	73	(52,0)	72	(52,2)	69,8	(23)	30
10	(6,5)	5,1	(50,3)	65	(44,0)	63	(43,8)	59,9	(25)	31
16	(8,3)	6,5	(47,2)	63	(40,0)	57	(38,9)	56,5	(25)	31
20	(9,3)	7,4	(45,8)	60	(38,0)	54	(36,5)	52,6	(25)	31
31,25	(11,7)	9,5	(42,9)	56	(34,0)	48	(31,2)	46,5	(23,3)	27
62,5	(17,0)	14,3	(38,4)	51	(28,0)	39	(21,4)	36,7	(20,7)	26
100	(22,0)	19,0	(35,3)	48	(24,0)	32	(13,3)	29,0	(19,0)	25
155,52	--	24,2	--	45	--	27	--	20,8	--	23
200	--	28,3	--	43	--	24	--	14,7	--	22

OTHER PROPERTIES

Weight	74 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	100 N
Operating temperature range	-30°C / +80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.



PROFINET™

NETBUS PN-A R5Y4 CAT.5e AWM2571

4x2x23/1AWG SF/UTP

CODE 0505480F

INSTALLATION & USE

Indoor istallation

Fixed installation

APPLICATION

Four-paired fieldbus cable for fixed application, with oil resistant PVC sheath. Suitable for PROFINET TYP A applications. Specifically designed in order to meet the new performance requirements of the PROFINET Guideline Ver.3.01 Oct.2011 and of Cat.5e. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61156-2

EN50288-2-1

PROFINET guideline Ver. 3.01 10/2011

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1)

CSA22.2 FT1 • IEC60332-1

Heat release

1048 MJ/km (0,290 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Solid bare copper wire - 23/1AWG (0,26 mm²)
Insulation	Foam-skin polyethylene
Assembly of cores	Twisted pair • blue/white-blue • orange/white-orange green/white-green • brown/white-brown
Assembly of elements	Pairs stranded together
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Green RAL6018 colour
Outer ø	7,4 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	74,5 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800 Hz	1000 pF/km
NVP @ 100 MHz	75%
Max propagation delay @ 100 MHz	490 nsec/100m
Max propagation delay skew @ 100 MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	12 mΩ/m @ 100 MHz • 10 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 7 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	1,8	(65,3)	72	(62,3)	70	(61,0)	75	(60,2)	68,2		29
4	(4,1)	3,4	(56,3)	63	(53,3)	61	(49,0)	64	(49,2)	57,6	(23)	30
10	(6,5)	5,3	(50,3)	57	(47,3)	55	(41,0)	59	(40,8)	49,7	(25)	31
16	(8,3)	6,9	(47,2)	55	(44,2)	53	(36,9)	55	(36,0)	46,1	(25)	31
20	(9,3)	7,8	(45,8)	53	(42,8)	51	(35,0)	51	(33,5)	43,2	(25)	31
31,25	(11,7)	9,9	(42,9)	50	(39,9)	48	(31,1)	47	(28,2)	38,1	(23,3)	27
62,5	(17,0)	13,8	(38,4)	45	(35,4)	43	(25,1)	40	(18,4)	29,2	(20,7)	26
100	(22,0)	18,2	(35,3)	42	(32,3)	40	(21,0)	38	(10,3)	21,8	(19,0)	25
155,52	--	22,8	--	39	--	37	--	35	--	14,2	--	23
200	--	25,9	--	37	--	35	--	32	--	9,1	--	22

OTHER PROPERTIES

Weight	77 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	120 N
Operating temperature range	-30°C / +80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

PROFINET™

NETBUS PN-B F5FCQY AWM2571 CAT.5e
1x4x22/7AWG SF/UTP

CODE 0503105

INSTALLATION & USE
Indoor istallation
Fixed and flexible installation

APPLICATION
Flexible Fieldbus cable for fixed or dynamic (non continuous) application, FAST CONNECT type,with oil resistant PVC sheath. The item is particularly suitable for PROFINET TYP B applications. It has a building layout in quad (two pairs), high shielding efficiency, and offers excellent electrical-transmissive performances in accordance with the PROFINET and Cat. 5e specifications. The article is also suitable for the transmission of Fast Ethernet type protocols up to 100 Mbps. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS
UL/CSA Compliant AWM Style 2571 - 300V/80°C

STANDARD REFERENCE
IEC61156-3
EN50288-2-2
PROFINET guideline Ver.3.01 10/2011

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
1135 MJ/km (0,315 kWh/m)

OTHER VERSIONS
Haloge free PUR jacketed cable version - NETBUS PN-B F5FCQP AWM20233 (P/N 0503109)

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 22/7AWG (0,35 mm²)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	White, blue, yellow, orange
Assembly of cores	Stranded to quad • pair 1 white/blue • pair 2 yellow/orange
Separation	Polyester tape
Inner jacket	FR-PVC - ø 4,3 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Green RAL6018 colour
Outer ø	6,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,4 Ω/km
Capacitance @ 800 Hz	53 pF/m
NVP @ 100 MHz	67%
Max propagation delay @ 100 MHz	520 nsec/100m
Max propagation delay skew @ 100 MHz	5 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 MHz • 7 mΩ/m @ 1 MHz • 9 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 150 mΩ/m @ 100 MHz
Screening attenuation	78 dB (30 ÷ 300 MHz) • 75 dB (300 ÷ 600 MHz) 75 dB (600 ÷ 1000 MHz)

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		EL-FEXT min [dB/100m]		ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	1,7	(65,3)	80	(61,0)	81	(63,2)	78,3		29
4	(4,1)	3,3	(56,3)	73	(49,0)	72	(52,2)	69,7	(23)	30
10	(6,5)	5,4	(50,3)	65	(41,0)	63	(43,8)	59,6	(25)	31
16	(8,3)	7,1	(47,2)	63	(36,9)	57	(38,9)	55,9	(25)	33
20	(9,3)	8,1	(45,8)	60	(35,0)	53	(36,5)	51,9	(25)	33
31,25	(11,7)	10,3	(42,9)	56	(31,1)	46	(31,2)	45,7	(23,3)	30
62,5	(17,0)	15,2	(38,4)	51	(25,1)	34	(21,4)	35,8	(20,7)	28
100	(22,0)	19,8	(35,3)	48	(21,0)	27	(13,3)	28,2	(19,0)	26
155,52	--	25,5	--	45	--	24	--	19,5	--	24
200	--	29,3	--	43	--	21	--	13,7	--	23

OTHER PROPERTIES

Weight	74 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	100 N
Operating temperature range	-30°C / +80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

PROFINET™

NETBUS PN-B F5Y4 CAT.5e AWM2571

4x2x23/7AWG SF/UTP

CODE 0505484F

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Four-paired flexible Fieldbus cable for fixed or dynamic (non continous) application. The item is particularly suitable for PROFINET TYP B applications. Specifically designed in order to meet the new performance requirements of the PROFINET Guideline Ver.3.01 Oct.2011 and of Cat.5e. UL/CSA approved in accordance with AWM Style 2571.

APPROVALS

UL/CSA Compliant AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

IEC61156-3
EN50288-2-2
PROFINET guideline Ver. 3.01 10/2011

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
1172 MJ/km (0,325 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 23/7AWG (0,26 mm²)
Insulation	Foam-skin polyethylene
Assembly of cores	Twisted pair • blue/white-blue • orange/white-orange green/white-green • brown/white-brown
Assembly of elements	Pairs stranded together
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC • Green RAL6018 colour
Outer ø	7,8 mm

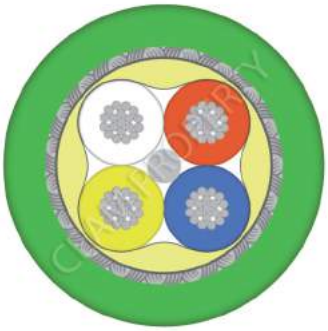
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	72 Ω/km
Capacitance @ 800 Hz	48 pF/m
Max capacitance unbalance @ 800 Hz	1000 pF/km
NVP @ 100 MHz	75%
Max propagation delay @ 100 MHz	490 nsec/100m
Max propagation delay skew @ 100 MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	12 mΩ/m @ 100 MHz • 10 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 7 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	2,0	(65,3)	72	(62,3)	70	(61,0)	72	(60,2)	68,0		29
4	(4,1)	3,6	(56,3)	63	(53,3)	61	(49,0)	60	(49,2)	57,4	(23)	30
10	(6,5)	5,6	(50,3)	57	(47,3)	55	(41,0)	55	(40,8)	49,4	(25)	31
16	(8,3)	7,6	(47,2)	55	(44,2)	53	(36,9)	51	(36,0)	45,4	(25)	31
20	(9,3)	8,3	(45,8)	53	(42,8)	51	(35,0)	47	(33,5)	42,7	(25)	31
31,25	(11,7)	10,2	(42,9)	50	(39,9)	48	(31,1)	42	(28,2)	37,8	(23,3)	27
62,5	(17,0)	14,6	(38,4)	45	(35,4)	43	(25,1)	35	(18,4)	28,4	(20,7)	26
100	(22,0)	19,0	(35,3)	42	(32,3)	40	(21,0)	33	(10,3)	21,0	(19,0)	25
155,52	--	24,0	--	39	--	37	--	30	--	13,0	--	23
200	--	27,5	--	37	--	35	--	27	--	7,5	--	22

OTHER PROPERTIES

Weight	82 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 8 x outer ø [mm] (non continuous movements)
Max pulling strenght	140 N
Operating temperature range	-30°C / +80°C (static)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.



PROFINET™

NETBUS PN-C FM5FCQP AWM20233 CAT.5e

1x4x22/19AWG SF/UTP

CODE 0503108

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Flexible Fieldbus cable for fixed or dynamic application in drag chain, FAST CONNECT type, with PUR sheath. The item is particularly suitable for PROFINET TYP C applications. The article has a building layout in quad (two pairs), high shielding efficiency, and offers electrical and transmissive performance which meet the requirements of PROFINET and Cat.5e specifications also in drag chain movement conditions. It is also suitable for data transmission in Fast Ethernet type protocols up to 100 Mbps. UL/CSA approved in accordance to AWM Style 20233.

APPROVALS

UL/CSA Compliant AWM Style 20233 - 300V/80°C

STANDARD REFERENCE

IEC61156-3
EN50288-2-2
PROFINET guideline Ver.3.01 10/2011

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
1135 MJ/km (0,315 kWh/m)

OTHER VERSIONS

No FAST CONNECT version -
NETBUS PN-C FM5QP AWM20236 (P/N 0503114)

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 22/19AWG (0,38 mm^2)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	White, blue, yellow, orange
Assembly of cores	Stranded to quad • pair 1 white/blue • pair 2 yellow/orange
Separation	Polyester tape
Inner jacket	TPE-O compound - ø 4,2 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	6,5 mm

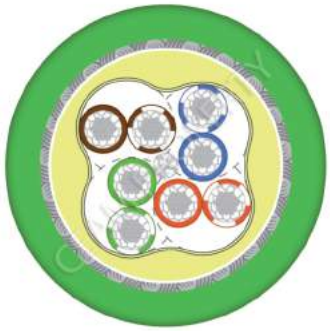
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	59,4 Ω/km
Capacitance @ 800 Hz	52 pF/m
NVP @ 100 MHz	67%
Max propagation delay @ 100 MHz	520 nsec/100m
Max propagation delay skew @ 100 MHz	5 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 MHz • 7 mΩ/m @ 1 MHz • 9 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 150 mΩ/m @ 100 MHz
Screening attenuation	75 dB (30 ÷ 300 MHz) • 74 dB (300 ÷ 600 MHz) 74 dB (600 ÷ 1000 MHz)

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		EL-FEXT min [dB/100m]		ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	1,9	(65,3)	80	(64,0)	81	(63,2)	78,1		29
4	(6,0)	3,9	(56,3)	73	(52,0)	72	(52,2)	69,1	(23)	30
10	(9,5)	6,0	(50,3)	65	(44,0)	63	(43,8)	59,0	(25)	31
16	(12,1)	7,5	(47,2)	63	(40,0)	57	(38,9)	55,5	(25)	33
20	(13,5)	8,4	(45,8)	60	(38,0)	53	(36,5)	51,6	(25)	33
31,25	(17,1)	10,7	(42,9)	56	(34,0)	46	(31,2)	45,3	(23,3)	30
62,5	(24,8)	16,0	(38,4)	51	(28,0)	34	(21,4)	35,0	(20,7)	28
100	(32,0)	20,9	(35,3)	48	(24,0)	27	(13,3)	27,1	(19,0)	26

OTHER PROPERTIES

Weight	63 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec^2 (subject to correct installation)
Torsional use	Not recommended



PROFINET™

NETBUS PN-C FM5FC4P CAT.5e AWM20236
4x2x24/19AWG SF/UTP

CODE 0505488F

INSTALLATION & USE
Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION
Flexible Fieldbus cable for fixed or dynamic application in drag chain, FAST CONNECT type, with PUR sheath. The item is particularly suitable for PROFINET TYP C applications. Specifically designed in order to meet the new performance requirements of the PROFINET Guideline Ver.3.01 Oct.2011 and Cat.5e also in particular conditions of continuous movement of the cable. UL/CSA approved in accordance with AWM Style 20236.

APPROVALS
UL/CSA Compliant AWM Style 20236 - 30V/80°C

STANDARD REFERENCE
IEC61156-3
EN50288-2-2
PROFINET guideline Ver. 3.01 10/2011

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1
Heat release
1034 MJ/km (0,286 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 24/19AWG (0,25 mm²)
Insulation	Foam-skin polyethylene
Assembly of cores	Twisted pair • blue/white-blue • orange/white-orange green/white-green • brown/white-brown
Assembly of elements	Pairs stranded together
Separation	Non-woven tape
Inner Jacket	TPE-O compound - ø 5,8 mm
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	94,0 Ω/km
Capacitance @ 800 Hz	50 pF/m
Max capacitance unbalance @ 800 Hz	1000 pF/km
NVP @ 100 MHz	75%
Max propagation delay @ 100 MHz	490 nsec/100m
Max propagation delay skew @ 100 MHz	20 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	12 mΩ/m @ 100 MHz • 10 mΩ/m @ 1 MHz • 3 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 7 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		PS NEXT min [dB]		PS EL-FEXT min [dB/100m]		PS ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	1,5	(65,3)	77	(62,3)	75	(61,0)	73	(59,1)	73,5		29
4	(6,0)	4,1	(56,3)	69	(53,3)	57	(49,0)	65	(47,3)	60,9	(23)	30
10	(9,5)	6,8	(50,3)	64	(47,3)	62	(41,0)	59	(37,8)	55,2	(25)	31
16	(12,1)	8,8	(47,2)	61	(44,2)	59	(36,9)	56	(32,1)	50,2	(25)	31
20	(13,6)	10,0	(45,8)	55	(42,8)	53	(35,0)	52	(29,2)	43,0	(25)	31
31,25	(17,1)	12,9	(42,9)	52	(39,9)	50	(31,1)	47	(22,8)	37,1	(23,3)	27
62,5	(24,8)	19,1	(38,4)	48	(35,4)	46	(25,1)	41	(10,6)	26,9	(20,7)	26
100	(32,0)	24,9	(35,3)	45	(32,3)	43	(21,0)	37	(0,3)	18,1	(19,0)	25
155,52	--	31,8	--	43	--	41	--	34	--	9,2	--	23
200	--	36,6	--	41	--	39	--	31	--	2,4	--	22

OTHER PROPERTIES

Weight	82 kg/km
Max operating voltage	300V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	160 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 5,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 5,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

PROFINET™

NETBUS PN-B HYBRID 4 F5QH LSZH CAT.5e

1x4x22/7AWG + 4x1,50mm² SF/UTP

CODE 0505476F

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation

APPLICATION

Composite Fieldbus cable for fixed or dynamic (non continuous) application, with FRNC-LSZH compound sheath. The item is particularly suitable for PROFINET TYP C applications. Near the Cat.5 quad data unit are placed four conductors dedicated to the feeding of the connected devices.

APPROVALS

STANDARD REFERENCE

IEC61156-3
EN50288-2-2
PROFINET guideline Ver.3.01 10/2011

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Heat release
1440 MJ/km (0,399 kWh/m)
Smoke emission
Compliant IEC61034-2 Std.
Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 22/7AWG (0,35 mm²)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	White, blue, yellow, orange
Assembly of cores	Stranded to quad • pair 1 white/blue • pair 2 yellow/orange
Separation	Polyester tape
Shield	AL/PET tape + tinned copper braid 85% coverage
Inner conductor	Stranded bare copper wire - 16/84AWG (1,50 mm²)
Insulation	FRNC-LSZH compound
Insulation colours	Black numbered
Assembly of elements	Shielded data quad and power conductor stranded together with fillers
Separation	Non-woven tape
Outer jacket	FRNC-LSZH compound • Green RAL6018 colour
Outer ø	10,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,4 Ω/km (22AWG) • 13,3 Ω/km (16AWG)
Capacitance @ 800 Hz	53 pF/m (data pair)
NVP @ 100 MHz	67%
Max propagation delay @ 100 MHz	520 nsec/100m
Max propagation delay skew @ 100 MHz	5 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 MHz • 7 mΩ/m @ 1 MHz • 9 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 50 mΩ/m @ 100 MHz

FREQUENCY	ATTENUATION		NEXT		EL-FEXT		ACR		RETURN LOSS	
MHz	max [dB/100m]		min [dB]		min [dB/100m]		min [dB/100m]		min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(2,1)	1,7	(65,3)	80	(61,0)	81	(63,2)	78,3		29
4	(4,1)	3,3	(56,3)	73	(49,0)	72	(52,2)	69,7	(23)	30
10	(6,5)	5,4	(50,3)	65	(41,0)	63	(43,8)	59,6	(25)	31
16	(8,3)	7,1	(47,2)	63	(36,9)	57	(38,9)	55,9	(25)	33
20	(9,3)	8,1	(45,8)	60	(35,0)	53	(36,5)	51,9	(25)	33
31,25	(11,7)	10,3	(42,9)	56	(31,1)	46	(31,2)	45,7	(23,3)	30
62,5	(17,0)	15,2	(38,4)	51	(25,1)	34	(21,4)	35,8	(20,7)	28
100	(22,0)	19,8	(35,3)	48	(21,0)	27	(13,3)	28,2	(19,0)	26
155,52	--	25,5	--	45	--	24	--	19,5	--	24
200	--	29,3	--	43	--	21	--	13,7	--	23

OTHER PROPERTIES

Weight	180 kg/km
Max operating voltage	30V
Min bending radius	8 x outer ø [mm] (static)
	10 x outer ø [mm] (non continuous movements)
Max pulling strenght	350 N
Operating temperature range	-30°C / +80°C (static)
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

PROFINET™

NETBUS PN-C HYBRID 4 FM5QP CAT.5e

1x4x22/19AWG + 4x0,50mm² SF/UTP

CODE 0505477F

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Compound Fieldbus cable for fixed and dynamic application, with PUR sheath. The item is particularly suitable for PROFINET TYP C applications. Near the Cat.5 quad data unit are placed four conductors dedicated to the feeding of the connected devices.

APPROVALS

UL/CSA AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

IEC61156-3
EN50288-2-2
PROFINET guideline Ver.3.01 10/2011

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
1655 MJ/km (0,459 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation ø	Max 1,6 mm
Insulation colours	White, blue, yellow, orange
Assembly of cores	Stranded to quad • pair 1 white/blue • pair 2 yellow/orange
Separation	Polyester tape
Shield	AL/PET tape + tinned copper braid 85% coverage
Separation	Polyester tape
Inner conductor	Stranded bare copper wire - 20/30AWG (0,50 mm²)
Insulation	Solid polyethylene
Insulation colours	Brown, blue, white, black
Assembly of elements	Shielded data quad and power conductor stranded together with fillers
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Green RAL6018 colour
Outer ø	8,6 mm

Data pairs

Power elements

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,4 Ω/km (22AWG) • 36,7 Ω/km (20AWG)
Capacitance @ 800 Hz	53 pF/m (data pair)
NVP @ 100 MHz	67%
Max propagation delay @ 100 MHz	520 nsec/100m
Max propagation delay skew @ 100 MHz	5 nsec/100m
Characteristic impedance (1÷100 MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 MHz • 7 mΩ/m @ 1 MHz • 9 mΩ/m @ 10 MHz 20 mΩ/m @ 30 MHz • 150 mΩ/m @ 100 MHz

FREQUENCY MHz	ATTENUATION max [dB/100m]		NEXT min [dB]		EL-FEXT min [dB/100m]		ACR min [dB/100m]		RETURN LOSS min [dB/100m]	
	(STD)	typical	(STD)	typical	(STD)	typical		typical	(STD)	typical
1	(3,2)	1,9	(65,3)	80	(64,0)	81	(63,2)	78,1		29
4	(6,0)	3,9	(56,3)	73	(52,0)	72	(52,2)	69,1	(23)	30
10	(9,5)	6,0	(50,3)	65	(44,0)	63	(43,8)	59,0	(25)	31
16	(12,1)	7,5	(47,2)	63	(40,0)	57	(38,9)	55,5	(25)	33
20	(13,5)	8,4	(45,8)	60	(38,0)	53	(36,5)	51,6	(25)	33
31,25	(17,1)	10,7	(42,9)	56	(34,0)	46	(31,2)	45,3	(23,3)	30
62,5	(24,8)	16,0	(38,4)	51	(28,0)	34	(21,4)	35,0	(20,7)	28
100	(32,0)	20,9	(35,3)	48	(24,0)	27	(13,3)	27,1	(19,0)	26

OTHER PROPERTIES

Weight	125 kg/km
Max operating voltage	30V
Min bending radius	8 x outer ø [mm] (static) 15 x outer ø [mm] (axial drag chain)
Max pulling strenght	200 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 3,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

USB™

Universal Serial Bus (USB) is an industry standard, developed in the mid-1990s, that defines all those cables, connectors and communications protocols that are generally used in a bus for connection, communication and power supply between computers and other electronic devices. USB was originally designed in order to standardize the connection of computer peripherals, such as keyboards, pointing devices, digital cameras, printers, portable media players, disk drives and network adapters to personal computers, both to communicate and to supply electric power. It has then become commonplace also on other devices, such as smartphones, PDAs and video game consoles. USB has now effectively replaced a variety of earlier interfaces, such as serial and parallel ports, as well as separate power chargers for portable devices.

(USB is a registered trademark of USB Implementers Forum, Inc)

FireWire™

The IEEE 1394 interface, developed in late 1980s and early 1990s by Apple as FireWire, is a serial bus interface standard for high-speed communications and isochronous real-time data transfer, comparable with USB. Apple first included FireWire in some of its 1999 models and, starting from the year 2000, most Apple computers have included FireWire ports (currently, nothing beyond the 800 version (IEEE-1394b)). IEEE 1394b-2002 introduced FireWire 800 (which is Apple's name for the 9-conductor "S800 bilingual" version of the IEEE 1394b standard). This specification and its corresponding products allow a transfer rate of 786.432 Mbps full-duplex via a new encoding scheme (termed beta mode).

(FireWire is a registered trademark of Apple Computer Inc.)

92 **NETBUS USB 2.0 Y2826 1x2x26/1AWG + 1x2x28/1AWG - P/N 0505568**
USB 2.0 cable for fixed installations - PVC jacket

93 **NETBUS USB 2.0 Y2424 1x2x24/7AWG + 2x24/7AWG - P/N 0505565F**
PROFINET TYP B CAT.5e cable for fixed and flexible applications - PVC jacket - FAST CONNECT

94 **NETBUS USB 3A P28M 2x(1x2x28/19AWG) + 2x(1x2x28/19AWG) AWM20236 - P/N 0505560**
USB 3.0 cable for fixed and dynamic applications - HF PUR jacket

95 **NETBUS FW P2622 F800 2x2x26/19AWG + 2x22/19AWG AWM20236 - P/N 0505610**
FIREWIRE 800 cable for fixed and dynamic applications - HF PUR jacket

USB™

NETBUS USB 2.0 Y2826

1x2x28/7AWG + 2x26/7AWG S/FTP

CODE 0505568

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Fieldbus cable for fixed application, with PVC sheath. The item is particularly suitable for USB applications. The cable has two shielded pairs (data and feeding) in accordance with the USB 2.0 Standard and is also suitable for usage in environments which are particularly polluted by electromagnetic interferences.

APPROVALS

STANDARD REFERENCE

USB 2.0

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

665 MJ/km (0,184 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 28/7AWG (0,09 mm²)
Insulation	Solid polyethylene
Insulation coluors	White, green
Assembly of cores	Twisted pair
Separation	Polyester tape
Shield	AL/PET tape
Inner conductor	Stranded tinned copper wire - 26/7AWG (0,14 mm²)
Insulation	PVC
Insulation coluors	Red, black
Assembly of elements	Shielded pair and power conductor stranded together
Global Shiled	AL/PET tape + tinned copper drain wire 28AWG + tinned copper braid 75% coverage
Separation	Polyester tape
Outer jacket	FR-PVC • Black colour
Outer ø	5,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	210 Ω/km (28AWG) - 150 Ω/km (26AWG)
Capacitance @ 800 Hz	48 pF/m
NVP @ 100 MHz	67%
Characteristic impedance (1MHz)	90Ω (± 15%)
Dielectric strenght (cond./cond.)	1,0 kVac / 1 min
Dielectric strenght (cond./shield)	1,0 kVac / 1 min
Min insulation resistance	200 MΩ x km

OTHER PROPERTIES

Weight	38 kg/km
Max operating voltage	48V
Min bending radius	6 x outer ø [mm] (static) 8 x outer ø [mm] (non continuous movements)
Max pulling strenght	50 N
Operating temperature range	-30°C / +80°C
Ozone resistance	Compliant EN 50396 Std.

USB™

NETBUS USB 2.0 Y2424

1x2x24/7AWG + 2x24/7AWG SF/UTP

CODE 0505565F

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Flexible Fieldbus cable for fixed or dynamic (non continuous) application, with PVC sheath. The cable is particularly suitable for USB applications. It is composed of two shielded pairs (data and feeding) in accordance with USB 2.0 Standard and is suitable also for usage in environments which are particularly polluted by electromagnetic interferences.

APPROVALS

STANDARD REFERENCE

USB 2.0

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

529 MJ/km (0,147 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 24/7AWG (0,22 mm²)
Insulation	Foam skin polyethylene
Insulation coluors	White, green
Assembly of cores	Twisted pair
Inner conductor	Stranded tinned copper wire - 24/7AWG (0,22 mm²)
Insulation	Solid polyethylene
Insulation coluors	Red, black
Assembly of elements	Shielded pair and power conductor stranded together
Separation	Non-woven tape
Global Shiled	AL/PET tape + tinned copper drain wire 28/7AWG + tinned copper braid 85% coverage
Outer jacket	FR-PVC • White colour
Outer ø	4,8 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	94,2 Ω/km
Capacitance @ 800 Hz	48 pF/m
NVP @ 100 MHz	67%
Characteristic impedance (1MHz)	90Ω (± 15%)
Dielectric strenght (cond./cond.)	1,0 kVac / 1 min
Dielectric strenght (cond./shield)	1,0 kVac / 1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	38 kg/km
Max operating voltage	48V
Min bending radius	6 x outer ø [mm] (static) 8 x outer ø [mm] (non continuous movements)
Max pulling strenght	80 N
Operating temperature range	-30°C / +80°C
Ozone resistance	Compliant EN 50396 Std.

USB™

NETBUS USB 3.0A P28M AWM20236

2x(1x2x28/19AWG) + 2x(1x2x28/19AWG) S/FTP

CODE 0505560

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation
For drag chain application (axial movements)

APPLICATION

Flexible Fieldbus cable for fixed or dynamic application in drag chain, with PUR sheath. The cable is particularly suitable for USB application. The cable has been designed in order to obtain excellent mechanical and electrical/transmissive performances - in accordance with USB 3.0 Standard - also in frequent movement conditions. UL/CSA approved in accordance with AWM Style 20236 and Desina approved.

APPROVALS

UL/CSA Compliant AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

USB 3.0

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
871 MJ/km (0,241 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 28/19AWG (0,09 mm²)
Insulation	Foam skin polyethylene
Insulation coluors	Blue, yellow, red, violet
Assembly of cores	Twisted pair • blue/yellow - red/violet
Shield	AL/PET tape + tinned copper braid 90% coverage
Inner conductor	Stranded tinned copper wire - 28/19AWG (0,09 mm²)
Insulation	Solid polyethylene
Insulation coluors	Red, black, green, white-green
Assembly of cores	Twisted pair • red/black - green/white-green
Assembly of elements	Data and signal pairs stranded together
Separation	Non-woven tape
Global Shiled	Tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	6,4 mm

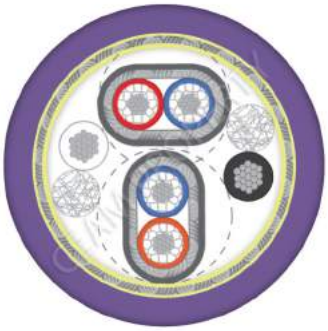
ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	90,0 Ω/km
Capacitance @ 800 Hz	52 pF/m
NVP @ 100 MHz	74%
Intra pair delay skew @ 100 MHz	< 15 psec/m
Characteristic impedance (1MHz)	90Ω
Dielectric strenght (cond./cond.)	0,5 kVac / 1 min
Dielectric strenght (cond./shield)	0,5 kVac / 1 min
Min insulation resistance	2,0 GΩ x km
Transfer impedance @ 10 MHz	20 mΩ/m

FREQUENCY MHz	ATTENUATION typical [dB/10m]	NEXT min [dB]
1 (SSP)	0,5	30
625 (SSP)	10	30
1200 (SSP)	15	30
1 (UTP)	0,4	25
625 (UTP)	N/A	25

OTHER PROPERTIES

Weight	70 kg/km
Max operating voltage	30V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	90 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 4,0 m/sec² (subject to correct installation)
Torsional use	Not recommended



FireWire™

NETBUS FW P2622 F 800 AWM20236

2x2x26/19AWG + 2x22/19AWG S/STP

CODE 0505610

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

For drag chain application (axial movements)

APPLICATION

Flexible Fieldbus cable for fixed or dynamic application in chain, with PUR sheath. The item is particularly suitable for FIREWIRE 800 type applications. It has been designed in order to obtain excellent mechanical and electrical/ transmissive performances in accordance with the FIREWIRE 800 Mbps type applications, also in frequent movement conditions. UL/CSA homologated in accordance with AWM Style 20236 and Desina approved.

APPROVALS

UL/CSA Compliant AWM Style 20236 - 30V/80°C

STANDARD REFERENCE

FIRE WIRE 800 Mbps

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1) CSA22.2 FT1 • IEC60332-1 Std.

Halogen acid gas

Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree

Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release

986 MJ/km (0,273 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire - 26/19AWG (0,15 mm²)
Insulation	Foam skin polyethylene
Insulation coluors	Blue, yellow, red, violet
Assembly of cores	Twisted pair • blue/yellow - red/violet
Shield	AL/PET tape + tinned copper braid 95% coverage
Inner conductor	Stranded tinned copper wire - 22/19AWG (0,38 mm²)
Insulation	Solid polyethylene
Insulation coluors	White, black
Assembly of cores	Twisted pair
Assembly of elements	Data pairs and signal conductors stranded together
Separation	Non-woven tape
Global Shiled	Tinned copper braid 85% coverage
Separation	Non-woven tape
Outer jacket	Halogen free PUR • Violet RAL4001 colour
Outer ø	8,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	150,0 Ω/km (26AWG) - 59,4 Ω/km (22AWG)
Capacitance @ 800 Hz	45 pF/m
NVP @ 100 MHz	74%
Max propagation delay @ 100 MHz	4,6 nsec/m
Max propagation delay skew @ 100 MHz	8 psec/m
Characteristic impedance (1MHz)	100Ω (± 15%)
Dielectric strenght (cond./cond.)	0,7 kVac / 1 min
Dielectric strenght (cond./shield)	0,7 kVac / 1 min
Min insulation resistance	2,0 GΩ x km
Transfer impedance	8 mΩ/m @ 100 kHz • 1 mΩ/m @ 100 MHz • 2 mΩ/m @ 10 MHz 3 mΩ/m @ 30 MHz • 3 mΩ/m @ 100 MHz •

FREQUENCY MHz	ATTENUATION typical [dB/5m]	NEXT typical [dB]	EL-FEXT typical [dB/10m]
250	2,5	90	60
400	3,0	87	54
500	3,6	83	48
800	4,7	77	35
1000	5,6	73	26

OTHER PROPERTIES

Weight	88 kg/km
Max operating voltage	30V
Min bending radius	6 x outer ø [mm] (static) 12 x outer ø [mm] (axial drag chain)
Max pulling strenght	100 N
Operating temperature range	-40°C / +80°C (static) • -30°C / +70°C (moved)
Oil resistance	Compliant IEC608011-2-1, ASTM Oil 1 and ICEA S-82-552 Std.
Saturated hydrocarbons	Good resistance (diesel, kerosene, petrol ether)
Mud resistance	Compliant NEK 606 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.
Microbe resistance	Compliant 0282/10 Std.
Translation speed (drag chain)	≤ 3,0 m/sec (subject to correct installation)
Acceleration (drag chain)	≤ 4,0 m/sec² (subject to correct installation)
Torsional use	Not recommended

SafetyBUS p™

The main use of SafetyBUS p is the communication of data with safety relevant content. SafetyBUS p is found where the data integrity and timely delivery of data is required for the protection against risks. In this respect risks may affect not only life or health, but also the protection of valuables or machinery. The technology of SafetyBUS p has been administered since 1999 by the user organization Safety Network International e.V. This fieldbus is suitable for the safety controls of various devices (sensors, actuators). It supports a data transmission speed rate between 50 and 500 kbps depending on the section length (max. 1000 metres).

(SafetyBUS p is a registered trademark of PILZ GmbH)

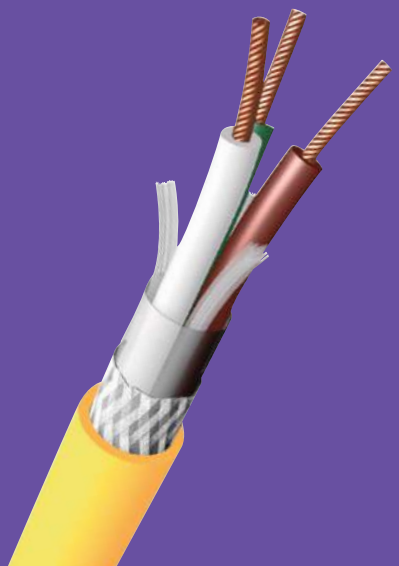
CC-Link™

CC-Link is an open industrial network which enables communication between devices developed by numerous manufacturers. Its main applications are machine, cell or process control applications in manufacturing and production industries, but it is also useful to mention its usage in facilities management, process control and building automation. Originally developed by the Mitsubishi Electric Corporation in 1997, this open-architecture network shows the following features: based on EIA RS485 with networks up to 1.2 km (or extended to 13.2 km with repeaters); network transmission 10 Mbps; 64 stations for network.

(CC-Link is a registered trademark of CLPA - CC-Link Partner Association)

98 **NETBUS SAFETY H375 1x3x0,75 mm² - P/N 0502565**
SafetyBUS-p cable for fixed and flexible applications - FRNC LSZH jacket

99 **NETBUS CCL YCB20-18 1x3x20/7AWG + 2x18/19AWG AWM2571 - P/N 050840F**
CC-Link composed cable for fixed and flexible applications - OR PVC jacket



SafetyBUS p™

NETBUS SAFETY H375 LSZH

1x3x0,75mm² S/UTP

CODE 0502565

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Shielded Fieldbus cable for fixed and dynamic (non continuous) application, with compound FRNC-LSZH sheath. The item is particularly suitable for SafetyBUS-p™ type applications. Composed by an opportunely shielded tern (110 Ohms impedence), the article is used for data transmission and control in safety/protection systems in industrial environments.

APPROVALS

STANDARD REFERENCE

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.

Heat release
803 MJ/km (0,223 kWh/m)

Smoke emission
Compliant IEC61034-2 Std.

Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,75 mm² (19/24AWG)
Insulation	Foam-skin polyethylene
Insulation colours	White, brown, green
Assembly of cores	Stranded to tern with fillers
Separation	Polyester tape
Overall shield	Tinned copper braid 85% coverage
Outer jacket	FRNC-LSZH compound • Yellow RAL1003 colour
Outer ø	7,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	26,0 Ω/km
Capacitance @ 800 Hz	42 nF/km (cond./cond.)
NVP @ 100 MHz	77%
Characteristic impedance (1÷20 MHz)	120Ω (±15%)
Attenuation	0,35 dB/100m @ 100 kHz • 0,52 dB/100m @ 200 kHz 0,72 dB/100m @ 500 kHz • 1,1 dB/100m @ 1 MHz 4,2 dB/100m @ 10 MHz
Dielectric strenght (cond./cond.)	3,0 kVac / 1 min
Dielectric strenght (cond./shield)	2,0 kVac / 1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	20 mΩ/m @ 1 MHz • 50 mΩ/m @ 10 MHz 250 mΩ/m @ 30 MHz

OTHER PROPERTIES

Weight	71 kg/km
Max operating voltage	125V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	130 N
Operating temperature range	-20°C / +80°C
Ozone resistance	Compliant EN 50396 Std.

CC-Link™

NETBUS CCL YCB20-18 AWM2571

1x3x20/7 + 2x18/19AWG S/FTP

CODE 0505840F

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Composite Fieldbus cable for fixed and dynamic (non continous) application, with PVC sheath. The item is particularly suitable for CC-Link™ type applications. Composed by an opportunely shielded tern (110 Ohms impedence) and by two peripheral conductors - mainly dedicated to the feeding of the connected devices, the item is generally used for data transmission and control in safety/protection systems in industrial environments.

APPROVALS

UL/CSA Compliant AWM Style 2571 - 30V/80°C

STANDARD REFERENCE

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1)

CSA22.2 FT1 • IEC60332-1

Heat release

2352 MJ/km (0,652 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded bare copper wire 0,50 mm² (20/7AWG)
Insulation	Foam-skin polyethylene
Insulation coluors	White,+L16
Assembly of cores	Stranded to tern
Shield	AL/PET tape + tinned copper drain wire 22/7AWG
Inner conductors	Stranded tinned copper wire 0,75 mm² (18/19AWG)
Insulation	FR-PVC
Insulation colours	Red, black
Assembly of elements	Shielded data tern and power conductor stranded together with fillers
Overall shield	Tinned copper braid 75% coverage
Separation	Polyester tape
Outer jacket	FR-PVC • Red RAL3000 colour
Outer ø	10,5 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	36,7 Ω/km (20AWG) - 23,2 Ω/km (18AWG)
Capacitance @ 800 Hz	42 nF/km (cond./cond.)
NVP @ 10MHz	77%
Characteristic impedance	120 Ω (±10%)
Attenuation	0,5 dB/100m @ 100 kHz • 0,7 dB/100m @ 200 kHz 1,0 dB/100m @ 500 kHz • 1,4 dB/100m @ 1 MHz 4,7 dB/100m @ 10 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 1 MHz • 30 mΩ/m @ 10 MHz 200 mΩ/m @ 30 MHz

OTHER PROPERTIES

Weight	160 kg/km
Max operating voltage	30 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	250 N
Operating temperature range	-30°C/+80°C
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

BACnet™

BACnet is an ASHRAE, ANSI, and ISO standard communication protocol used in building automation and control networks. It has been originally designed in order to allow communication in building automation and control systems for various applications, such as heating, ventilating, and air-conditioning control, lighting control, access control, fire detection systems and their associated equipment. The BACnet protocol also provides mechanisms for computerized building automation devices, in order to exchange information, regardless of the particular building service they perform.

(BACnet is a registered trademark of American Society of Heating, Refrigerating and Air-Conditioning Engineers)

MeterBUS (M-BUS)

M-Bus (Meter-Bus) is a European standard (EN 13757-2 physical and link layer, EN 13757-3 application layer) aimed at the remote reading of gas or electricity meters. M-Bus is also suitable for other types of consumption meters. The M-Bus interface is made for communication on two wires, making it very cost effective. The need for a system dedicated to the networking and remote reading of utility meters, (for example to measure the consumption of gas or water in the home) represented the starting point for the development of the M-Bus . This bus not only fulfils the special requirements of remotely powered or battery-driven systems, including consumer utility meters, but is also suitable for many other applications such as alarm systems, flexible illumination installations, heating control, etc.

102 **NETBUS RS785SF2H22 2x2x22/7AWG - P/N 0502290**
BACnet cable for fixed and flexible applications - FRNC LSZH jacket

103 **NETBUS HART 1E5 H 1x2x22/7AWG + 1x22/7AWG - P/N 0502596**
BACnet cable for fixed and flexible applications - FRNC LSZH jacket

104 **NETBUS Y08719 1x2x16/19AWG - P/N 0925175**
MeterBUS cable for fixed and flexible applications - PVC jacket

105 **NETBUS Y08762 1x2x20/7AWG - P/N 0925185**
MeterBUS cable for fixed and flexible applications - PVC jacket

BACnet™

RS485SF2H22-7

2x2x22/7AWG SF/UTP

CODE 0502290

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation

APPLICATION

Two-paired Fieldbus cable for fixed and dynamic (non continuous) application, with FRNC-LSZH compound sheath. The item is particularly suitable for BACnet™ applications. Thanks to its excellent fire-resistance characteristics and its electrical-transmissive properties, this article results particularly suitable for usage in domotic systems in private houses or public places with high density of people (schools, banks, hospitals, etc.)

APPROVALS

STANDARD REFERENCE

EIA RS485
EIA RS422

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 and IEC60332-3-24 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Smoke emission
Compliant IEC61034-2 Std.
Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.
Heat release
793 MJ/km (0,220 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Strander tinned copper wire 0,35 mm² (22/7AWG)
Insulation	Foam-skin polyethylene
Insulation colours	White/blue, blue, white/orange, orange
Assembly of cores	Twisted pair • pair 1 white/blue - blue pair 2 white/orange - orange
Assembly of elements	Pairs stranded together
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire 24/1AWG + tinned copper braid 80% coverage
Outer jacket	FRNC-LSZH compound • Yellow RAL1021 colour
Outer ø	7,8 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,0 Ω/km
Capacitance @ 800 Hz	48 nF/km
Max capacitance unbalance @ 800 Hz	1000 pF/km
Characteristic impedance (1÷20 MHz)	120 Ω (±10%)
Attenuation	0,7 dB/100m @ 100 kHz • 0,9 dB/100m @ 200 kHz 1,3 dB/100m @ 500 kHz • 1,6 dB/100m @ 1 MHz 3,8 dB/100m @ 4 MHz • 4,5 dB/100m @ 8 MHz 5,1 dB/100m @ 10 MHz • 7,2 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance	10 mΩ/m @ 100 kHz • 5 mΩ/m @ 1 MHz • 10 mΩ/m @ 10 MHz

OTHER PROPERTIES

Weight	88 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	100 N
Operating temperature range	-20°C/+80°C
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

BACnet™

NETBUS HART 1e5 LSZH

1x2x22/7AWG + 1x22/7AWG SF/UTP

CODE 0502596

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation

APPLICATION

Flexible Fiedlbus cable for fixed or dynamic (non continuous) application, with FRNC-LSZH compound sheath. The item is particularly suitable for BACnet™ applications and has been designed for data transmission and device control in domotic systems, both in private houses and public places with high density of people (schools, banks, hospitals, etc.)

APPROVALS

STANDARD REFERENCE

EIA RS485
EIA RS422

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 and IEC60332-3-24 Std.
Halogen acid gas
Compliant IEC60332-1 and IEC60332-3-24 Std.
Gas acidity degree
Compliant EN 50267-2-2 • IEC 60754-2 Std.
Smoke emission
Compliant IEC61034-2 Std.
Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.
Heat release
1013 MJ/km (0,281 kWh/m)

OTHER VERSIONS

CONSTRUCTION

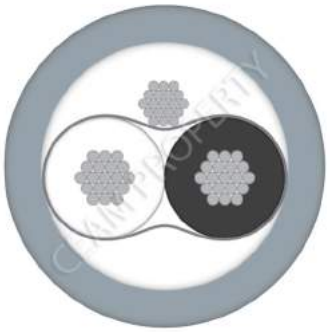
Inner conductor	Strander tinned copper wire 0,35 mm² (22/7AWG)
Insulation	Foam-skin polyethylene
Insulation colours	White, blue
Assembly of cores	Twisted pair
Shield	AL/PET tape + tinned copper drain wire 22/7AWG
Inner conductors	Strander tinned copper wire 0,35 mm² (22/7AWG)
Insulation	Solid polyethylene
Insulation colours	Orange
Assembly of elements	Shielded data pair and signal conductor stranded together
Overall shield	Tinned copper braid 90% coverage
Outer jacket	FRNC-LSZH compound • Orange RAL2003 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,0 Ω/km
Capacitance @ 800 Hz	42 nF/km (data pair)
NVP @ 10MHz	77%
Characteristic impedance (1÷20 MHz)	120Ω (±10%)
Attenuation	0,7 dB/100m @ 100 kHz • 0,9 dB/100m @ 200 kHz 1,3 dB/100m @ 500 kHz • 1,6 dB/100m @ 1 MHz 3,8 dB/100m @ 4 MHz • 4,5 dB/100m @ 8 MHz 5,1 dB/100m @ 10 MHz • 7,2 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance @ 10 MHz	10 mΩ/m @ 100 kHz • 15 mΩ/m @ 1 MHz • 50 mΩ/m @ 10 MHz

OTHER PROPERTIES

Weight	83 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	70 N
Operating temperature range	-20°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



MeterBUS (M-BUS)

NETBUS Y08719

1x2x16/19AWG U/FTP

CODE 0925175

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Flexible Fieldbus cable for fixed or dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for M-BUS type (MeterBUS) applications. The electrical performances of capacity and inductance of the shielded cable guarantee the functioning of the systems that are configurated in accordance with the MeterBUS™ protocol.

APPROVALS

STANDARD REFERENCE

EN 13757-2

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant IEC60332-1 Std.

Heat release

1267 MJ/km (0,351 kWh/m)

OTHER VERSIONS

18AWG cable version- NETBUS Y08760 (P/N 0925005)

CONSTRUCTION

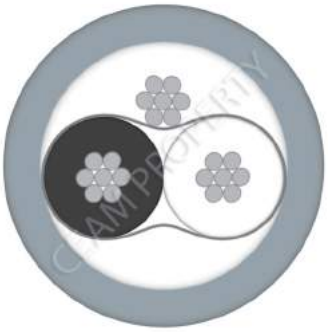
Inner conductor	Strander tinned copper wire 16/19AWG (1,34 mm²)
Insulation	Solid polyethylene
Insulation colours	Black, natural
Assembly of cores	Twisted pair
Overall shield	AL/PET tape + tinned copper drain wire 18AWG
Outer jacket	FR-PVC compound • Gray RAL7001 colour
Outer ø	7,9 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	15,8 Ω/km
DC shield resistance	18,0 Ω/km
Capacitance @ 800 Hz	79 nF/km
Characteristic impedance	80 Ω @ 100 kHz • 65 Ω @ 1 MHz
Unductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	82 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	160 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



MeterBUS (M-BUS)

NETBUS Y08762

1x2x20/7AWG U/FTP

CODE 0925185

INSTALLATION & USE

Indoor istallation
Fixed and flexible installation

APPLICATION

Flexible Fieldbus cable for fixed or dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for M-BUS type (MeterBUS) applications. The electrical performances of capacity and inductance of the shielded cable meet the requirements of the MeterBUS™ system; its isection and external dimensions are reduced, and it guarantees correct data transmission and sensors'/ actuators' feeding on short distances.

APPROVALS

STANDARD REFERENCE

EN 13757-2

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Heat release
665 MJ/km (0,184 kWh/m)

OTHER VERSIONS

22AWG cable version- NETBUS Y08761 (P/N 0925010)

CONSTRUCTION

Inner conductor	Strander tinned copper wire 20/7AWG (0,50 mm^2)
Insulation	Solid polyethylene
Insulation colours	Black, natural
Assembly of cores	Twisted pair
Overall shield	AL/PET tape + tinned copper drain wire 20AWG
Outer jacket	FR-PVC compound • Gray RAL7001 colour
Outer ø	5,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	34,1 Ω/km
DC shield resistance	25,0 Ω/km
Capacitance @ 800 Hz	90 nF/km
Characteristic impedance	75 Ω @ 100 kHz • 60 Ω @ 1 MHz
Unductance @ 31,25 kHz	0,65 mH/km
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	43 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	70 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.

HART™

The HART Communication Foundation is an international, not-for-profit, membership organization founded in 1993. The Foundation covers the role of the technology owner and central authority on the HART Protocol, and provides global support in the applications of the HART technology. The HART standards - including new technologic developments and enhancements which support industrial needs – are managed by the Foundation. The HART Physical Layer is based on the Bell 202 Standard, using frequency shift keying (FSK) to communicate at 1200 bps. The signal frequencies representing bit values of 0 and 1 are 2200 and 1200Hz respectively. This signal is superimposed at a low level on the 4-to-20mA analog measurement signal without causing any interference with the analog signal.

(HART is a registered trademark of the HART Communication Foundation)

MODBUS™

Modbus history started in the late seventies of the 20th century. Everything began in 1979, when the PLC manufacturer Modicon - which is now a brand of Schneider Electric's Telemecanique - published the Modbus communication interface for a multidrop network based on a master/client architecture. Communication between the various Modbus nodes was made possible by messages, and the overall messaging structure was defined by an open standard. The physical layer of the Modbus interface was free to choose. While the original Modbus interface ran on EIA RS232, the greater part of later Modbus implementations used EIA RS485: this is due to the fact that the latter allowed the coverage of longer distances, higher speeds and, in addition, the chance of a true multi-drop network. The Modbus messaging systems was quickly adopted by a great number of vendors, until it became the de facto standard for industrial communication networks.

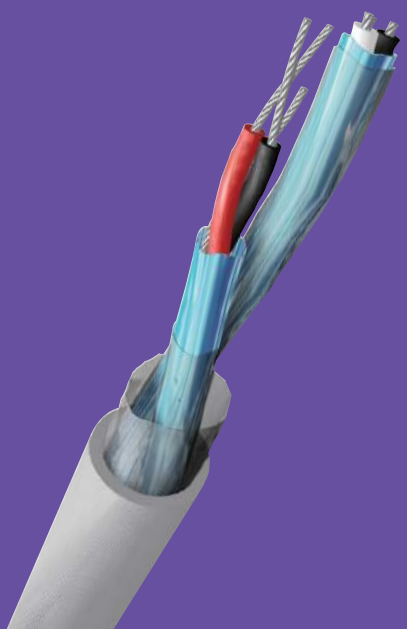
(MODBUS is a registered trademark of Schneider Electric's)

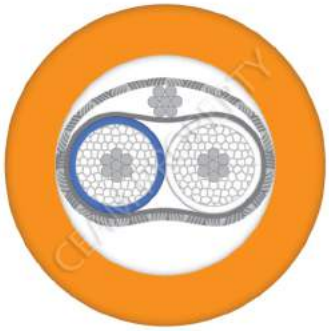
108 **NETBUS HART 1 H 1x2x22/7AWG - P/N 0502594**
HART cable for fixed and flexible applications - FRNC LSZH jacket

109 **NETBUS HART 1E5 H 1x2x22/7AWG + 1x22/7AWG - P/N 0502596**
HART cable for fixed and flexible applications - FRNC LSZH jacket

110 **NETBUS Y09729 2x2x24/7AWG - P/N 0925072**
MODBUS cable for fixed and flexible applications - PVC jacket

111 **NETBUS Y09730 3x2x24/7AWG - P/N 0925073**
MODBUS cable for fixed and flexible applications - PVC jacket





HART™

NETBUS HART 1H LSZH

1x2x22/7AWG SF/UTP

CODE 0502594

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with compound FRNC-LSZH sheath. The item is particularly suitable for HART™ type applications. It is mostly used for data transmission, management and control of sensors and actuators in industrial environments. This article can also offer excellent transmissive perfomances in accordance with EIA RS485 protocol.

APPROVALS

STANDARD REFERENCE

EIA RS 485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2 ; IEC 60754-2 Std.
Heat release
801 MJ/km (0,222 kWh/m)
Smoke emission
Compliant IEC61034-2 Std.
Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.

OTHER VERSIONS

FR-PVC jacketed - NETBUS HART 1Y (P/N0502611)

CONSTRUCTION

Inner conductor	Stranded tinned copper wire 0,35 mm² (22/7AWG)
Insulation	Foam skin polyethylene
Insulation coluors	White, blue
Assembly of cores	Twisted pair
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire 22/7AWG
Outer jacket	FRNC-LSZH compound • Orange RAL2003 colour
Outer ø	7,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,0 Ω/km
Capacitance @ 800 Hz	42 nF/km
NVP @ 10MHz	77%
Characteristic impedance	120 Ω (±10%)
Attenuation	0,6 dB/100m @ 100 kHz • 0,8 dB/100m @ 200 kHz 1,2 dB/100m @ 500 kHz • 1,5 dB/100m @ 1 MHz 3,6 dB/100m @ 4 MHz • 4,5 dB/100m @ 8 MHz 4,8 dB/100m @ 10 MHz • 6,9 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance @ 10 MHz	50 mΩ/m

OTHER PROPERTIES

Weight	73 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	50 N
Operating temperature range	-20°C/+80°C
Ozone resistance	Compliant EN 50396 Std.

HART™

NETBUS HART 1e5H LSZH

1x2x22/7AWG + 1x22/7AWG SF/UTP

CODE 0502596

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Flexible Fiedbus cable for fixed and dynamic (non continuous) application, with compound FRNC-LSZH sheath. The item is particularly suitable for HART™ type applications. It is composed of a data transmission shielded pair and a peripheral external conductor used as signal and reference value. Used in industrial environments, the article offers transmissive performances in accordance with EIA RS485 protocol.

APPROVALS

STANDARD REFERENCE

EIA RS 485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2 ; IEC 60754-2 Std.

Heat release
1013 MJ/km (0,281 kWh/m)

Smoke emission
Compliant IEC61034-2 Std.

Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.

OTHER VERSIONS

FR-PVC jacketed - NETBUS HART 1e5Y (P/N0502612)

CONSTRUCTION

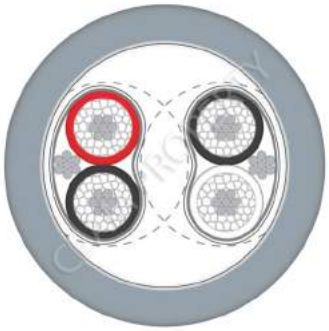
Inner conductor	Stranded tinned copper wire 0,35 mm² (22/7AWG)
Insulation	Foam skin polyethylene
Insulation coluors	White, blue
Assembly of cores	Twisted pair
Shield	AL/PET tape + tinned copper drain wire 22/7AWG
Inner conductors	Strander tinned copper wire 0,35 mm² (22/7AWG)
Insulation	Solid polyethylene
Insulation colours	Orange
Assembly of elements	Shielded data pair and signal conductor stranded together
Overall shield	Tinned copper braid 90% coverage
Outer jacket	FRNC-LSZH compound • Orange RAL2003 colour
Outer ø	8,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,0 Ω/km
Capacitance @ 800 Hz	42 nF/km (data pair)
NVP @ 10MHz	77%
Characteristic impedance	120 Ω (±10%)
Attenuation	0,7 dB/100m @ 100 kHz • 0,9 dB/100m @ 200 kHz 1,3 dB/100m @ 500 kHz • 1,6 dB/100m @ 1 MHz 3,8 dB/100m @ 4 MHz • 4,5 dB/100m @ 8 MHz 5,1 dB/100m @ 10 MHz • 7,2 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km
Transfer impedance @ 10 MHz	50 mΩ/m

OTHER PROPERTIES

Weight	83 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	70 N
Operating temperature range	-20°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



MODBUS™

NETBUS Y09729

2x2x24/7AWG U/FTP

CODE 0925072

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for MOD-BUS type applications. This two-paired (each pair singularly shielded) article is mostly used in domotic systems for of serial data transmission, control, and management of the connected devices.

APPROVALS

STANDARD REFERENCE

EIA RS 422

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Heat release
1260 MJ/km (0,350 kWh/m)

OTHER VERSIONS

4 pairs 24AWG cable version - NETBUS Y09728 (P/N 0925074)

CONSTRUCTION

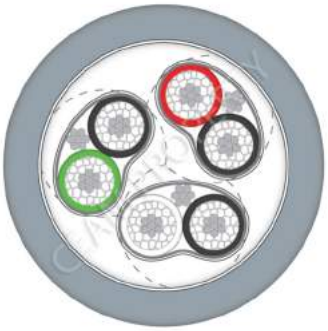
Inner conductor	Stranded tinned copper wire 24/7AWG (0,22 mm²)
Insulation	Foam skin polyethylene
Assembly of cores	Twisted pair • red/black - white/black
Shield	AL/PET tape + tinned copper drain wire 24AWG
Assembly of elements	Shielded pairs stranded together
Outer jacket	FR-PVC compound • Gray RAL7001 colour
Outer ø	7,4 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,0 Ω/km
Capacitance @ 800 Hz	50 nF/km
Max propagation delay @ 10MHz	75%
Characteristic impedance @ 1 MHz	100 Ω
Attenuation	2,6 dB/100m @ 500 kHz • 3,0 dB/100m @ 1 MKz 5,1 dB/100m @ 4 MHz
Inductance @ 31,25 kHz	0,75 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	2,0 GΩ x km

OTHER PROPERTIES

Weight	67 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	60 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



MODBUS™

NETBUS Y09730
3x2x24/7AWG U/FTP

CODE 0925073

INSTALLATION & USE
Indoor istallation
Fixed installation

APPLICATION
Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with PVC sheath. The item is particularly suitable for MOD-BUS type applications. This three-paired (each pair singularly shielded) article is mostly used in domotic systems for of serial data transmission, control, and management of the connected devices.

APPROVALS

STANDARD REFERENCE
EIA RS 422

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant IEC60332-1 Std.
Heat release
1405 MJ/km (0,390 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Stranded tinned copper wire 24/7AWG (0,22 mm^2)
Insulation	Foam skin polyethylene
Assembly of cores	Twisted pair • red/black - white/black - green/black
Shield	AL/PET tape + tinned copper drain wire 24AWG
Assembly of elements	Shielded pairs stranded together
Outer jacket	FR-PVC compound • Gray RAL7001 colour 7,4 mm
Outer ø	8,1 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,0 Ω/km
Capacitance @ 800 Hz	50 nF/km
Max propagation delay @ 10MHz	75%
Characteristic impedance @ 1 MHz	100 Ω
Attenuation	2,6 dB/100m @ 500 kHz • 3,0 dB/100m @ 1 MKz 5,1 dB/100m @ 4 MHz
Inductance @ 31,25 kHz	0,75 mH/km
Dielectric strenght (cond./cond.)	1,5 kVac / 1 min
Dielectric strenght (cond./shield)	1,5 kVac / 1 min
Min insulation resistance	2,0 GΩ x km

OTHER PROPERTIES

Weight	80 kg/km
Max operating voltage	300V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	70 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.

EIB-KONNEX™

KONNEX is the first "open" building automation standard, protectd by royalty and independent from the platform, approved as a European (EN 50090 – EN 13321-1) and global (ISO/IEC 14543) standard. This standard has been developed by KNX Association on the basis of the experience of its precursors BatiBUS, EIB, and EHS.

(KNX is a registered trademark of KNX Association cvba)

LON Works™

LON (Local Operating Network) is a fieldbus developed in 1989 by the US company Echelon and in 1992 LON technology was introduced in Europe. The LON fieldbus structure is commonly linear, although it is possible to realize other network topologies through a router. LON is widely used also in the building automation field. A peculiar characteristic of LON protocol is its independence from the physical transmission media. At the lowest level different transmission media can be used, such as: Manchester signal coding and the RS 485 standard are used and the data volume depends on the selected transmission media. The copper twisted pair cable allows a maximum length of the network of up to 1300 metres with a maximum transmission speed rate of 78 kbps. The maximum transmission speed rate up of to 1.25 Mbps reduces the network length to 500 metres.

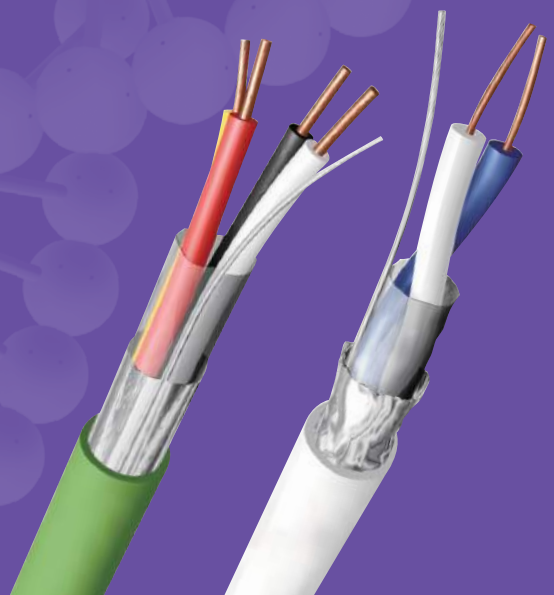
(LONworks is a registered trademark of ECHELON Corporation)

114 **NETBUS EIB J-2Y(St)Y 1x4x0,80 mm (2 pairs) - P/N 0502475**
EIB-KONNEX cable for fixed installations - PVC jacket

115 **NETBUS EIB ONE J-2Y(St)Y 1x2x0,80 mm - P/N 0502474**
EIB-KONNEX cable for fixed installations - PVC jacket

116 **NETBUS LON H122 1x2x22/1AWG - P/N 0502571**
LON Works cable for fixed installations - FRNC LSZH jacket

117 **NETBUS LON COMBI H23-20 1x2x23/1AWG + 1x2x20/1AWG - P/N 0505825**
LON Works composed cable for fixed installations - FRNC LSZH jacket



EIB-KONNEX™

NETBUS EIB J-2Y(St)Y
1x4x0,80mm F/UTP

CODE 0502475

INSTALLATION & USE
Indoor istallation
Fixed installation

APPLICATION
Shielded Fieldbus cable for fixed application, with PVC sheath. The item is particularly suitable for EIB-KONNEX™ applications and has a building layout in quad (2 pairs) in order to guarantee reducedexternal dimensions. Thanks to its excellent electrical and transmission performances, it is used for data transmission, control and management of connected devices in domotic systems, both in private houses and public places (in this case, the FRNC-LSZH version is suggested).

APPROVALS

STANDARD REFERENCE
EN50090
EN50090-2-2
CEI-EN60669-2-1

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant IEC60332-1 Std.
Heat release
983 MJ/km (0,272 kWh/m)

OTHER VERSIONS
FRNC-LSZH jacketed - NETBUS EIùB J-2Y(St)H LSZH (P/N 0502477)

CONSTRUCTION

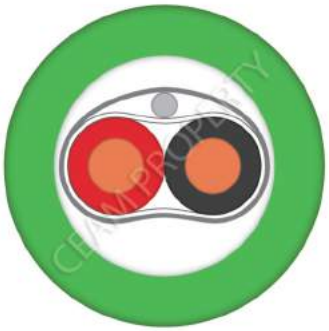
Inner conductor	Solid bare copper wire 0,80 mm ø (20/1AWG - 0,50mm²)
Insulation	Solid polyethylene
Insulation colours	Red, black, yellow, white
Assembly of cores	Stranded to a quad • pair 1 red/black • pair 2 yellow/white
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire 26AWG
Outer jacket	FR-PVC • Green RAL6018
Outer ø	6,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	37,5 Ω/km
Capacitance @ 800 Hz	75 nF/km (100 nF/km max)
NVP @ 10MHz	67%
Max delay skew @ 10 MHz	5 nsec/100m
Characteristic impedance @ 1 MHz	80 Ω
Attenuation	3,5 dB/100m @ 500 kHz • 4,2 dB/100m @ 4 MHz 20,0 dB/100m @ 25 MHz
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	59 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	100 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



EIB-KONNEX™

NETBUS EIB ONE J-2Y(St)Y

1x2x0,80mm U/FTP

CODE 0502474

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Shielded Fieldbus cable for fixed application with PVC sheath. The item is particularly suitable for EIB-KONNEX™ applications. This one-paired article is used for data transmission, control and management of devices connected in domotic systems. A FRNC-LSZH version is available, and strongly suggested for systems located in public places.

APPROVALS

STANDARD REFERENCE

EN50090
EN50090-2-2
CEI-EN60669-2-1

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Heat release
784 MJ/km (0,217 kWh/m)

OTHER VERSIONS

FRNC-LSZH jacketed - NETBUS EIB-ONE J-2Y(St)H LSZH (P/N 0502476)

CONSTRUCTION

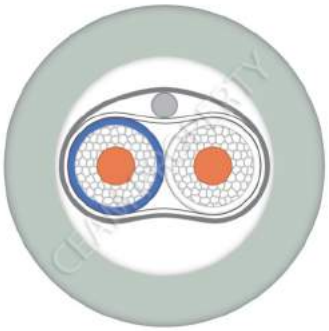
Inner conductor	Solid bare copper wire 0,80 mm ø (20/1AWG - 0,50mm^2)
Insulation	Solid polyethylene
Insulation colours	Red, black
Assembly of cores	Twisted pair red/black
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire 26AWG
Outer jacket	FR-PVC • Green RAL6018
Outer ø	5,0 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	37,5 Ω/km
Capacitance @ 800 Hz	75 nF/km (100 nF/km max)
NVP @ 10MHz	67%
Characteristic impedance @ 1 MHz	80 Ω
Attenuation	3,5 dB/100m @ 500 kHz • 4,2 dB/100m @ 4 MHz 20,0 dB/100m @ 25 MHz
Dielectric strenght (cond./cond.)	2,5 kVac/1 min
Dielectric strenght (cond./shield)	2,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	42 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	50 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



LON Works™

NETBUS LON H122 LSZH

1x2x22/1AWG U/FTP

CODE 0502571

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Shielded Fieldbus cable for fixed application, with compound FRNC-LSZH sheath. The item is particularly suitable for LON-Works™ type applications. This one-paired article is used for data transmission, control and management of devices in domotic systems, both in private houses and public places.

APPROVALS

STANDARD REFERENCE

EIA RS 485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.

Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.

Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.

Smoke emission
Compliant IEC61034-2 Std.

Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.

Heat release
337 MJ/km (0,094 kWh/m)

OTHER VERSIONS

Unshielded version - NETBUS LON H022 LSZH (P/N 0502568)

CONSTRUCTION

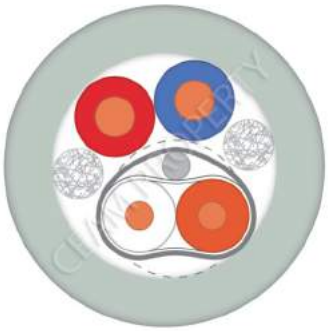
Inner conductor	Solid bare copper wire - 22/1AWG (0,34 mm^2)
Insulation	Foam-skin polyethylene
Insulation colours	White, blue
Assembly of cores	Twisted pair
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire 26AWG
Outer jacket	FRNC-LSZH compound • White RAL9018 colour
Outer ø	4,4 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	55,0 Ω/km
Capacitance @ 800 Hz	45 nF/km
NVP @ 10MHz	75%
Characteristic impedance (1÷20 MHz)	100Ω (±10%)
Attenuation	0,9 dB/100m @ 100 kHz • 1,5 dB/100m @ 500 kHz 2,0 dB/100m @ 1 MHz • 3,4 dB/100m @ 4 MHz 5,4 dB/100m @ 10 MHz
Inductance @ 31,25 kHz	0,6 mH/km
Dielectric strenght (cond./cond.)	1,0 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	25 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	40 N
Operating temperature range	-20°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



LON Works™

NETBUS LON COMBI H23-20 LSZH

1x2x23AWG + 1x2x20AWG U/FTP

CODE 0505825

INSTALLATION & USE

Indoor istallation
Fixed installation

APPLICATION

Hybrid Fieldbus cable for fixed application, with compound FRNC-LSZH sheath. The item is particularly suitable for LON-Works™ applications. It is composed by a pair for data/instructions transmission and two conductors used for feeding the connected devices. This article is particularly suitable for domotic systems in public places (schools, hospitals, etc ...).

APPROVALS

STANDARD REFERENCE

EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR

Flame propagation
Compliant IEC60332-1 Std.
Halogen acid gas
Compliant EN 50267-2-1 and IEC 60754-1 Std.
Gas acidity degree
Compliant EN 50267-2-2; IEC 60754-2 Std.
Smoke emission
Compliant IEC61034-2 Std.
Toxicity index
Compliant CEI20-37/7 and CEI20-38 Std.
Heat release
880 MJ/km (0,244 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Solid bare copper wire - 23/1AWG (0,30 mm^2)
Insulation	Foam-skin polyethylene
Insulation colours	White, orange
Assembly of cores	Twisted pair
Shield	AL/PET tape + tinned copper drain wire 23AWG
Inner conductors	Solid bare copper wire - 20/1AWG (0,50 mm^2)
Insulation colours	Red, blue
Shield	Shielded data pair and power pair stranded together with fillers
Outer jacket	FRNC-LSZH compound • White RAL9018 colour
Outer ø	7,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	70,0 Ω/km (23AWG) - 35,0 Ω/km (20AWG)
Capacitance @ 800 Hz	44 nF/km (data pair)
Max capacitance unbalance @ 800 Hz	1000 pF/km
NVP @ 10MHz	75%
Characteristic impedance (1÷20 MHz)	100Ω (±10%)
Attenuation	1,0 dB/100m @ 100 kHz • 1,6 dB/100m @ 500 kHz 2,1 dB/100m @ 1 MHz • 3,4 dB/100m @ 4 MHz 6,3 dB/100m @ 10 MHz
Inductance @ 31,25 kHz	0,7 mH/km
Dielectric strenght (cond./cond.)	1,0 kVac/1 min
Dielectric strenght (cond./shield)	1,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	25 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	80 N
Operating temperature range	-20°C/+80°C
Ozone resistance	Compliant EN 50396 Std.

EQUIPMENT & INSTRUMENTATION

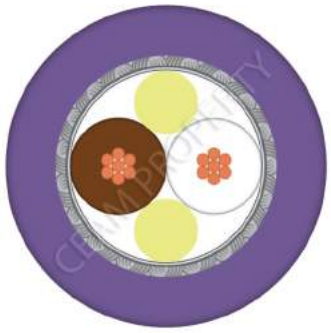
The shielded equipment and instrumentation cables, having only twisted pair construction, are designed for the interconnection of electronics equipment such as drives, encoder and many kind of active slaves. Thanks to the use of specific raw materials together with a right constructive dimensioning, they are suitable to support the most current protocols in the industrial electronics such as EIA RS232, EIA RS422 and EIA RS485.

120 **NETBUS Z100 Y122S 1x2x24/7AWG AWM2571 - P/N 0505551**
Fieldbus 100Ω cable for fixed and flexible applications - PVC jacket

121 **NETBUS Z100 YQ222S 1x4x24/7AWG AWM2571 - P/N 0505552**
Fieldbus 100Ω cable for fixed and flexible applications - PVC jacket

122 **TWINAX 78Ω 1x2x20/7AWG - P/N 0502502**
Twinaxial 78Ω cable for fixed and flexible applications - PVC jacket

123 **CPR 6220 2x2x22/1AWG - P/N 0502006**
Fieldbus 100Ω cable for fixed installations - PVC jacket



EQUIPMENT

NETBUS Z100 Y122s AWM2571
1x2x24/7AWG S/FTP

CODE 0505551

INSTALLATION & USE
Indoor istallation
Fixed and flexible installation

APPLICATION
Flexible Fieldbus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. The item is particularly suitable for PROFIBUS L1 applications. The construction and the used materials allow to offer high electrical and transmissive performances, also in those industrial environments which are particularly polluted by electromagnetic interferences. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS
UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE
EIA RS485

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.
Heat release
678 MJ/km (0,188 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Strander bare copper wire 24/7AWG (0,22 mm²)
Insulation	Solid polyethylene
Insulation colours	White, brown
Assembly of cores	Twisted pair with fillers
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC compound • Violet RAL4001 colour
Outer ø	5,3 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,9 Ω/km
Capacitance @ 800 Hz	52 nF/km
Characteristic impedance	120 Ω @ 100 kHz • 100 Ω (±15%) (1÷20 MHz)
Attenuation	0,9 dB/100m @ 100 kHz • 2,5 dB/100m @ 1 MHz 7,9 dB/100m @ 10 MHz • 11,8 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	41 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	70 N
Operating temperature range	-30°C/+80°C
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.

EQUIPMENT

NETBUS Z100s YQ222s AWM2571

1x4x24/7AWG SF/UTP

CODE 0505553

INSTALLATION & USE

Indoor istallation

Fixed and flexible installation

APPLICATION

Flexible Fiedlus cable for fixed and dynamic (non continuous) application, with oil resistant PVC sheath. The item is particularly suitable for PROFIBUS L1 applications. The construction in quad (2 pairs) andthe used materials allow to offer high electrical and transmissive performances also in those industrial environments whch are particularly polluted by electromagnetic interferences. UL/CSA approved in accordance with AWM Style 2571 and DESINA compliant.

APPROVALS

UL/CSA AWM Style 2571 - 300V/80°C

STANDARD REFERENCE

EIA RS422

EIA RS485

COMPLIANCE

2011/65 EC RoHS compliant

2006/95/EC LVD compliant

CE marking

FIRE BEHAVIOUR

Flame propagation

Compliant UL1581 §1061, §1080 (VW-1)
CSA22.2 FT1 • IEC60332-1 Std.

Heat release

857 MJ/km (0,238 kWh/m)

OTHER VERSIONS

CONSTRUCTION

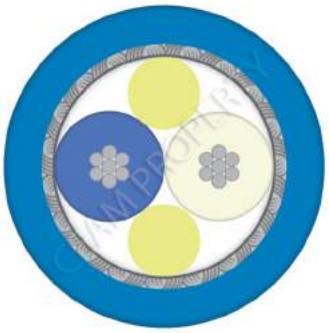
Inner conductor	Strander bare copper wire 24/7AWG (0,22 mm²)
Insulation	Solid polyethylene
Insulation colours	White, brown, green, yellow
Assembly of cores	Stranded to a quad • pair 1 white-blue • pair 2 green-yellow
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper braid 85% coverage
Outer jacket	FR-PVC compound • Violet RAL4001 colour
Outer ø	5,6 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	85,9 Ω/km
Capacitance @ 800 Hz	52 nF/km
Characteristic impedance	120 Ω @ 100 kHz • 100 Ω (±15%) (1÷20 MHz)
Attenuation	0,9 dB/100m @ 100 kHz • 2,5 dB/100m @ 1 MHz 7,9 dB/100m @ 10 MHz • 11,8 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	47 kg/km
Max operating voltage	300 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	90 N
Operating temperature range	-30°C/+80°C
Oil resistance	Compliant IEC608011-2-1 and ICEA S-82-552 Std.
UV resistance	Compliant UL1581 §1200 Std.
Ozone resistance	Compliant EN 50396 Std.



EQUIPMENT

TWINAX 78Ω
1x2x20/7AWG S/FTP

CODE 0502502

INSTALLATION & USE
Indoor istallation
Fixed and flexible installation

APPLICATION
Flexible Fieldbus cable for fixed and dynamic (non continuous) application, TWINAX type, with PVC sheath. The item is composed by a shielded pair (78 Ohms impedence) and is used in particular protocols for data/instructions transmission in industrial environments.

APPROVALS

STANDARD REFERENCE

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant IEC60332-1 Std.
Heat release
784 MJ/km (0,217 kWh/m)

OTHER VERSIONS

CONSTRUCTION

Inner conductor	Strander tinned copper wire 20/7AWG (0,50 mm^2)
Insulation	Solid polyethylene
Insulation colours	Blue, natural
Assembly of cores	Twisted pair
Overall shield	AL/PET tape + tinned copper braid 55% coverage
Outer jacket	FR-PVC compound • Blue RAL5015 colour
Outer ø	6,2 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	32,0 Ω/km
Capacitance @ 800 Hz	65 nF/km
NVP @ 10 MHz	67%
Characteristic impedance(1÷20 MHz)	78 Ω (±10%)
Attenuation	1,4 dB/100m @ 500 kHz • 2,0 dB/100m @ 1 MHz 6,9 dB/100m @ 10 MHz • 9,6 dB/100m @ 20 MHz 10,9 dB/100m @ @ 25 MHz
Dielectric strenght (cond./cond.)	2,0 kVac/1 min
Dielectric strenght (cond./shield)	2,0 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	50 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static) 10 x outer ø [mm] (non continuous movements)
Max pulling strenght	100 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.

EQUIPMENT

CPR 6220
2x2x22/1AWG S/FTP

CODE 0502006

INSTALLATION & USE
Indoor istallation
Fixed installation

APPLICATION
Shielded Fieldbus cable for fixed application, with PVC sheath. The item derives from the IBM article p/n 1657265, is composed of two pairs (globally shielded) and is mainly used for serial data transmission, control, command and management of devices both in domotic systems and industrial plants.

APPROVALS

STANDARD REFERENCE
EIA RS422
EIA RS485

COMPLIANCE
2011/65 EC RoHS compliant
2006/95/EC LVD compliant
CE marking

FIRE BEHAVIOUR
Flame propagation
Compliant IEC60332-1 Std.
Heat release
1507 MJ/km (0,418 kWh/m)

OTHER VERSIONS

CONSTRUCTION

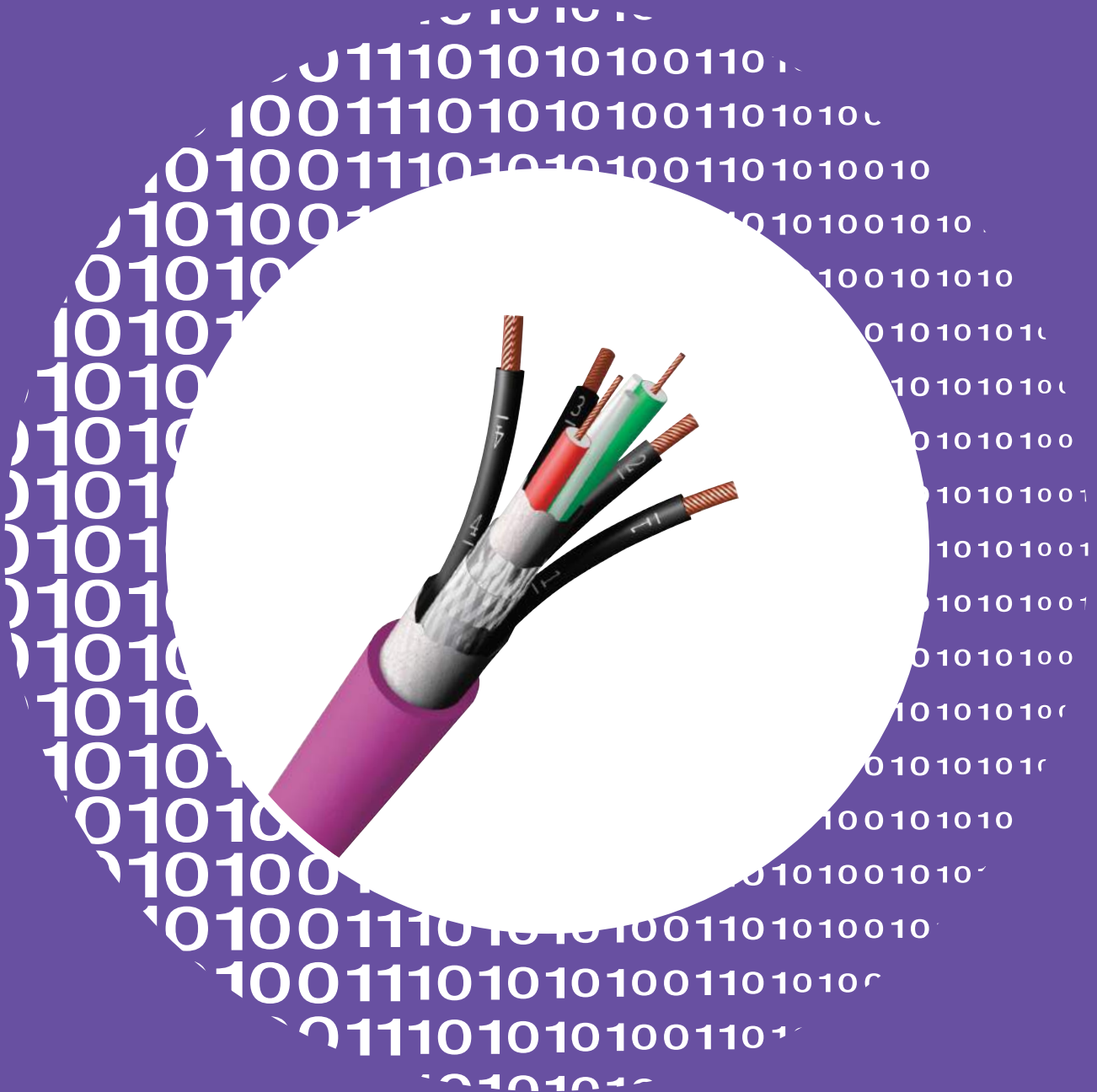
Inner conductor	Solid bare copper wire 22/1AWG (0,34 mm^2)
Insulation	Solid polyethylene
Insulation colours	Blue, white/blue, orange, white/orange
Assembly of cores	Twisted pair • blue/white-blue - orange/white-orange
Separation	Polyester tape
Overall shield	AL/PET tape + tinned copper drain wire + tinned copper braid 65% coverage
Outer jacket	FR-PVC compound • Black colour
Outer ø	7,7 mm

ELECTRICAL & TRANSMISSION PROPERTIES @ 20°C

Max DC conductor resistance	57,0 Ω/km
Capacitance @ 800 Hz	55 nF/km
NVP @ 10 MHz	67%
Characteristic impedance	120 Ω 100 kHz • 100Ω (±15%) (1÷20 MHz)
Attenuation	0,7 dB/100m @ 100 kHz • 2,1 dB/100m @ 1 MHz 7,4 dB/100m @ 10 MHz • 10,9 dB/100m @ 20 MHz
Dielectric strenght (cond./cond.)	1,5 kVac/1 min
Dielectric strenght (cond./shield)	1,5 kVac/1 min
Min insulation resistance	5,0 GΩ x km

OTHER PROPERTIES

Weight	47 kg/km
Max operating voltage	125 V
Min bending radius	8 x outer ø [mm] (static)
Max pulling strenght	120 N
Operating temperature range	-30°C/+80°C
Ozone resistance	Compliant EN 50396 Std.



TECHNICAL NOTES

RULES AND INSTRUCTIONS

The choice

CEAM's Fieldbus cable range has been realized in order to comply with the most restrictive usage conditions, especially in industrial environments. It is advisable to choose, as cables to be applied in such environments, products that are able to meet installation requirements. The wide range of existing applications, the environment and the installation typology, the resistance against aggressive substances, are only some of the parameters that need evaluation in order to obtain the best performances from a cable. CEAM Cavi Speciali has designed and developed more than 700 Fieldbus cables, with numerous building variables aimed at meeting and satisfying several requirements. Shouldn't you find in our catalogue the most suitable cable for your needed application, feel free to send your request to our Technical Department: we will be glad to put all our efforts and our passion in the meeting of your requirements.

Movement and transport

Cable drums need to be moved with the appropriate attention and precautions. Incorrect transports and/or movements could risk, in fact, to have a negative impact on the quality of the product.

Storage

Storage of the products out of rain and sun is advisable. Should the storage be outside, it is necessary to protect the drum with an extensible UV rays resistant film; the cable ends should be sealed. Storage temperatures shall not exceed the ones listed in the catalogue relevant to the cable's fixed application. If the cable needs to be cut again by the customer, this cut shall be performed respecting the maximum pulling strenght allowed by the product.

Fixed application

The cables should be unwinded and installed without applying any torsion. If they come in drums or coils, they must be unwinded straight. It is very important to respect the maximum pulling strenght and the minimum bending radius allowed by the cables during their installation.

Flexible application (non continuos)

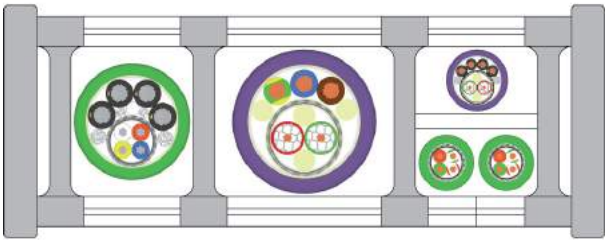
There are particular conditions in which it is necessary to use products that are able to bear some stress typologies – generally, not hard. This products prove to be preferable to the ones that are generally used for fixed application in case of low and slow movement or, more frequently, for usage in systems characterized by low or high vibrations. Also in this case, the cables must be unwinded and installed without applying any torsion. If they come in drums or coils, they must be unwinded straight. It is very important to respect the maximum pulling strenght and the minimum bending radius allowed by the cables during their installation.

Axial dynamic application in cable-carrier chain

It is fundamental for the cables to be unwinded and installed inside the chains without applying any torsion. If they come in drums or coils, they must be unwinded straight. An incorrect installation of the cable could risk to have a sensible negative impact on the duration and the functioning of the system itself.

The installation of the cables on cable chains shall be carried out correctly, leaving the cable free to move inside the chain and never locking it – except at the two ends of the chain. It is very important to use chains which respect the minimum bending radius of the cables. Greater bending radius increase the duration of the system.

When several cables are installed inside a chain, it is important to provide for the inner separation of the chain by using separating walls. If it is not possible to place more than one cable next to each other without a separator, it must be remembered that the free space shall be inferior to the diameter of the smaller cable.



Dynamic application, torsion type

Generally, the data transmission cables for dynamic application in axial-sliding cable chains are not suitable for torsion movements. Revolving movements ask for a particular building layout of the cable, in order to allow application up to +/-180° each meter torsions. CEAM Cavi Speciali's experience in design allows us to offer ad-hoc products for any installation requirement. Some of those products are described in this catalogue. Technical evolutions is now heading to the development of the so-called hybrid products, suitable both for combined axial movement and for torsion. CEAM Cavi Speciali's test laboratory has been trying out new items for combined dynamic application - in cable chains with axial movement, and in torsion with a +/-30° each meter rotation - since several months.

System life

The concept of system life is strictly related to the right choice of products and to their correct installation. The respect of the basic rules that have already been listed allows to obtain from CEAM's products a sensibly high life and duration; if the rules are not respected, instead, bad results can be obtained. This could frequently cause high costs due to the need of stopping the machines and then re-establishing the systems, not to mention the neutralization of the products' guarantee.

COMPARISON CABLES CHART

The CEAM/BELDEN and the CEAM/SIEMENS comparison chart below indicates the products that are functionally equivalent. In some cases construction, colour coding and/or approvals may vary and are not indicated. Please, contact our customer service for further information

BELDEN P/N	FIELDBUS TYPE	DESCRIPTION	FORMATION	CEAM P/N
YE 00819	EIB KONNEX	NETBUS EIB ONE J-2Y(St)Y	1x2x0,8mmØ	0502474
YE 00820	EIB KONNEX	NETBUS EIB J-2Y(St)Y	1x4x0,8mmØ	0502475
YE 00905	EIB KONNEX	NETBUS EIB ONE-H J-2Y(St)H LSZH	1x2x0,8mmØ	0502476
YE 00906	EIB KONNEX	NETBUS EIB-H J-2Y(St)H LSZH	1x4x0,8mmØ	0502477
3076F	FOUNDATION	NETBUS FF Y180	1x2x1,2mmØ (18/7AWG)	0925295
3079A	PROFIBUS DP	NETBUS L2/FIP Y22	1x2x0,64mmØ	0502491
3079A	PROFIBUS DP	NETBUS L2/FIP Y22 AWM2571	1x2x0,64mmØ	0502321
3079E	PROFIBUS DP	NETBUS L2/FIP Y22/7	1x2x22/7AWG	0502488
3079E	PROFIBUS DP	NETBUS L2/FIP Y175	1x2x22/7AWG	0502464
3079E	PROFIBUS DP	NETBUS L2/FIP Y22/7 OR AWM2571	1x2x22/7AWG	0502930
3079E NH	PROFIBUS DP	NETBUS L2/FIP H22/7 LSZH	1x2x22/7AWG	0502482
3082A	DEVICE NET	NETBUS DN Y1815 THICK	1x2x18/19AWG + 1x2x15/19AWG	0502580
3084A	DEVICE NET	NETBUS DN Y2422 THIN	1x2x24/19AWG + 1x2x22/19AWG	0502581
3084A NH	DEVICE NET	NETBUS DN H2422 THIN LSZH	1x2x24/19AWG + 1x2x22/19AWG	0502689
3105A	HART	NETBUS HART 1 Y	1x2x22/7AWG	0502611
3105A (NH)	HART	NETBUS HART 1H LSZH	1x2x22/7AWG	0502594
3106A	HART	NETBUS HART 1e5 Y	1x2x22/7AWG + 1x22/7AWG	0502612
3106A (NH)	HART	NETBUS HART 1e5 LSZH	1x2x22/7AWG + 1x22/7AWG	0502596
3106A (NH)	BAC NET	NETBUS HART 1e5 LSZH	1x2x22/7AWG + 1x22/7AWG	0502596
3107A (NH)	BAC NET	RS485SF2H22-7	2x2x22/7AWG	0502290
3107A (NH)	P-NET RS485	RS485SF2H22-7	2x2x22/7AWG	0502290
3119A	INTERBUS	NETBUS IBS PCB325M	3x2x0,25 + 3x1,0	0502540
3120A	INTERBUS	NETBUS IBS P325M	3x2x0,25	0502539
8719	METER BUS	Y 08719	1x2x16/19AWG	0925175
8760	METER BUS	Y 08760	1x2x18/16AWG	0925005
8761	METER BUS	Y 08761	1x2x22/7AWG	0925010
8762	METER BUS	Y 08762	1x2x20/7AWG	0925185
9463	EQUIPMENT	TWINAX 78 Ω	1x2x20/7AWG	0502502
9728	MOD BUS	Y 09728	4x2x24/7AWG	0925074
9729	MOD BUS	Y 09729	2x2x24/7AWG	0925072
9730	MOD BUS	Y 09730	3x2x24/7AWG	0925073
9841	P-NET RS485	CPR 6003 S/FTP	1x2x24/7AWG	0502014
9842	P-NET RS485	Y 09842	2x2x24/7AWG	0925162
9842 NH	P-NET RS485	H 09842 LSZH	2x2x24/7AWG	0926162
7701NH	LON WORKS	NETBUS LON H022 UTP LSZH	1x2x22/1AWG	0502568
7703NH	LON WORKS	NETBUS LON H122 FTP LSZH	1x2x22/1AWG	0502571
70006E	PROFINET TYP A	NETBUS PN R5FCQY AWM2571	1x4x22/1AWG	0503102
70007E	PROFINET TYP B	NETBUS PN F5FCQY-UV AWM2571	1x4x22/7AWG	0503106
70007PU	PROFINET TYP B	NETBUS PN F5FCQP AWM20236	1x4x22/7AWG	0503107
70007PU	PROFINET TYP B	NETBUS PN-B F5FCQP-1 AWM20233	1x4x22/7AWG	0503109
70008PU	PROFINET TYP C	NETBUS PN FM5FCQP-UV AWM20233	1x4x22/19AWG	0503108
72001PU	IND. ETHERNET	NETBUS IE R5P2 CAT.5e AWM20236	2x2x24/1AWG	0505410
72002NH	IND. ETHERNET	NETBUS IE F5H2 CAT.5e LSZH	2x2x26/7AWG	0502042
72002PU	IND. ETHERNET	NETBUS IE F5P2-UV CAT.5e AWM20236	2x2x26/7AWG	0505436
74001NH	IND. ETHERNET	NETBUS IE R5H4 CAT.5e LSZH	4x2x24/1AWG	0502050
74001PU	IND. ETHERNET	NETBUS IE R5P4 CAT.5e	4x2x24/1AWG	0502048
74002E	IND. ETHERNET	NETBUS IE F5Y4-UV CAT.5e AWM2571	4x2x26/7AWG	0505442
74002NH	IND. ETHERNET	NETBUS IE F5H4 CAT.5e LSZH	4x2x26/7AWG	0502051
74002PU	IND. ETHERNET	NETBUS IE F5P4-UV CAT.5e AWM20236	4x2x26/7AWG	0505446
74003PU	IND. ETHERNET	NETBUS IE FM5P4L-UV CAT.5e AWM20236	4x2x26/19AWG	0505464
74003PU	IND. ETHERNET	NETBUS IE C-5 Hi-FLEX 4P CAT.5e AWM21198	4x2x26/19AWG	0502182
74004PU	IND. ETHERNET	DATABIT-11Y C-7 S/STP CAT.7	4x2x23/1AWG	0502712
74005PU	IND. ETHERNET	NETBUS IE F7-ST6P26 CAT.7	4x2x26/7AWG	0505310

SIEMENS P/N	FIELDBUS TYPE	DESCRIPTION	FORMATION	CEAM P/N
6ES7 194-1LY10-0AA0	PROFIBUS DP	NETBUS L2/FIP PCB24M	1x2x24/19AWG + 3x1,0	0502504
6XV 1830 0CH10	PROFIBUS DP	NETBUS L2/FIP H22 LSZH	1x2x0,64mmØ	0502485
6XV 1830 0EH10	PROFIBUS DP	NETBUS L2/FIP YFC22 AWM2571	1x2x0,64mmØ	0502890
6XV 1830 0EH10	PROFIBUS DP	NETBUS L2/FIP YFC22	1x2x0,64mmØ	0502450
6XV 1830 0EH10	PROFIBUS DP	NETBUS L2/FIP YFC22	1x2x0,64mmØ	0502490
6XV 1830 0EH10	PROFIBUS DP	NETBUS L2/FIP YFC22-UV	1x2x0,64mmØ	0502440
6XV 1830 0GH10	PROFIBUS DP	NETBUS L2/FIP PE22	1x2x0,64mmØ	0502492
6XV 1830 0GH10	PROFIBUS DP	NETBUS L2/FIP PE22	1x2x0,64mmØ	0502322
6XV 1830 0LH10	PROFIBUS DP	NETBUS L2/FIP HFC22 LSZH	1x2x0,64mmØ	0502489
6XV 1830 0LH10	PROFIBUS DP	NETBUS L2/FIP HFC22-85 LSZH	1x2x0,64mmØ	0502483
6XV 1830 0PH10	PROFIBUS DP	NETBUS L2/FIP TORSION P23T AWM20233	1x2x23/19AWG	0502940
6XV 1830 0PH10	PROFIBUS DP	NETBUS L2/FIP TORSION P22T AWM20233	1x2x22/19AWG	0502941
6XV 1830 3EH10	PROFIBUS DP	NETBUS L2/FIP PFC24M AWM20233	1x2x24/19AWG	0502902
6XV 1830 3FH10	PROFIBUS DP	NETBUS L2/FIP YPE22 (double PVC/PE jacket)	1x2x0,64mmØ	0502501
6XV 1830 3FH10	PROFIBUS DP	NETBUS L2/FIP YPE22S (double PVC/PE jacket)	1x2x0,64mmØ	0502486
6XV 1830 3FH10	PROFIBUS DP	NETBUS L2/FIP YPE22 (HK) (double PVC/PE jacket)	1x2x0,64mmØ	0502325
6XV 1830 7AH1	PROFIBUS DP	NETBUS L2/FIP PROFYBRID	1x2x24/19AWG + 4x1,5	0502505
6XV 1830 5A(B)H10	PROFIBUS PA	NETBUS PA Y1	1x2x1,0mm^2	0502515
6XV 1840 2AH10	PROFINET TYP A	NETBUS PN R5FCQY AWM2571	1x4x22/1AWG	0503102
6XV 1840 3AH10	PROFINET TYP A	NETBUS PN FM5FCQP-UV AWM20233	1x4x22/19AWG	0503108
6XV 1830 0GH10	PROFIBUS DP	NETBUS L2/FIP PE22	1x2x0,64mmØ	0502322
6XV 1830 5A(B)H10	PROFIBUS PA	NETBUS PA Y1	1x2x1,0mm^2	0502515

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