



PROFINET/Industrial Ethernet Cables for Industrial Automation

Belcom



Fields of Application	4-5
PROFINET/IE Overview	6
Cable Finder	7
PROFINET/IE Cables	8-61
Stripping Tool	62
FireFighter®	63
Index	64
Quality Management	65

Descriptions are correct at time of publication, however these may be reviewed at any time and are subject to change without notice. E&OE (Errors and Omissions Excepted) which means that whilst every effort has been made to ensure that the information contained within this publication is accurate, specifications may vary or be subject to change at Belcom's discretion. As such, this publication should be used as a guide only. Exact details can be confirmed at point of enquiry. All cable renders are indicative of the product specified.

There are two major differences that separate Belcom from any other source of Fieldbus cables.

The first is stock, available cut to length and with a next day delivery across the UK or standard 2 day delivery to EIRE. The second is an unwavering commitment to providing the best quality Fieldbus cables available, this has been achieved by joining forces with Leoni special cables GmbH whose modern manufacturing plant in Northern Germany bristles with the latest in cable manufacturing technology. 'In process' continual testing cumulating in one of the best final test facilities we have seen, ensure strict adherence to performance standards critical to the performance of today's high speed data transfer requirements in the industrial network.

Many high tech intelligent process projects are functioning faultlessly over Leoni Fieldlink cables across the world, chemical, pharmaceutical, oil and gas, packaging, water treatment, food and beverage, automotive, you can name a process and there is already a strong presence or developing requirement for Fieldlink Fieldbus cables.

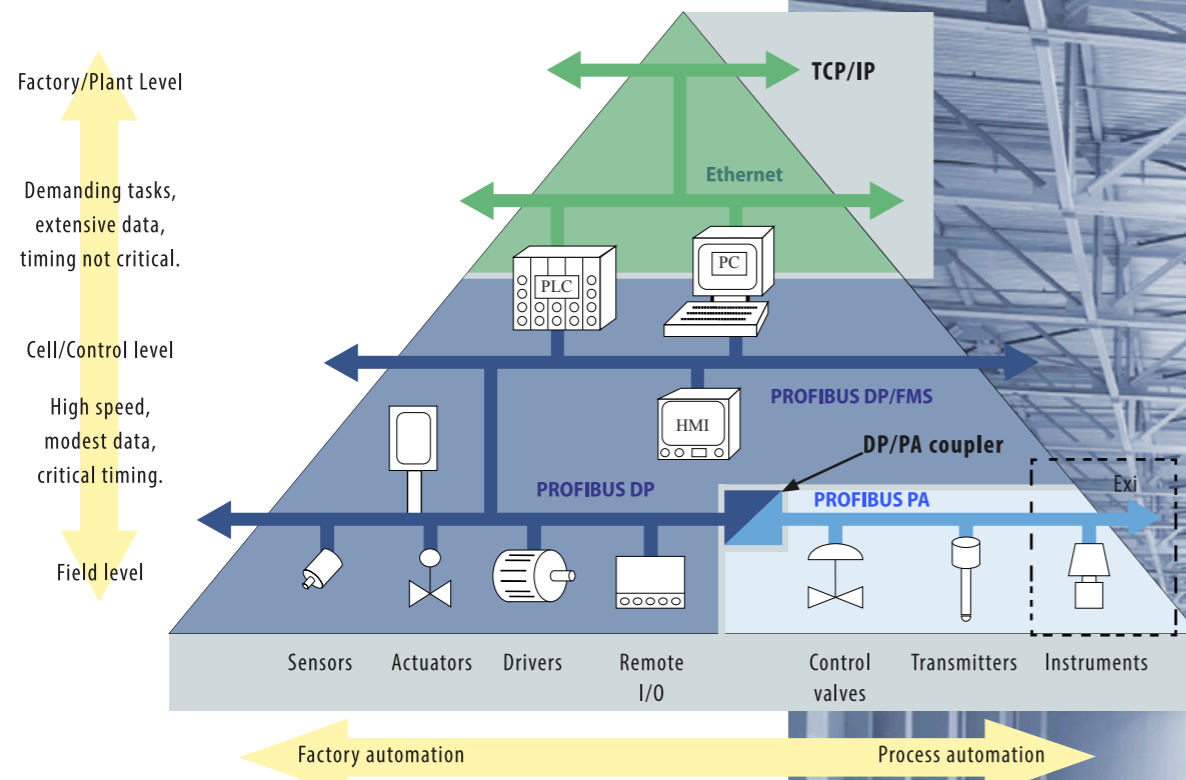
Cable is often an afterthought in the development of new technology process development, which often belies the time, research and testing that goes into producing specific cables for specific applications. With Belcom's range of Leoni Fieldlink cables you have the assurance and confidence that the best cable will be maintaining the integrity of your industrial network.



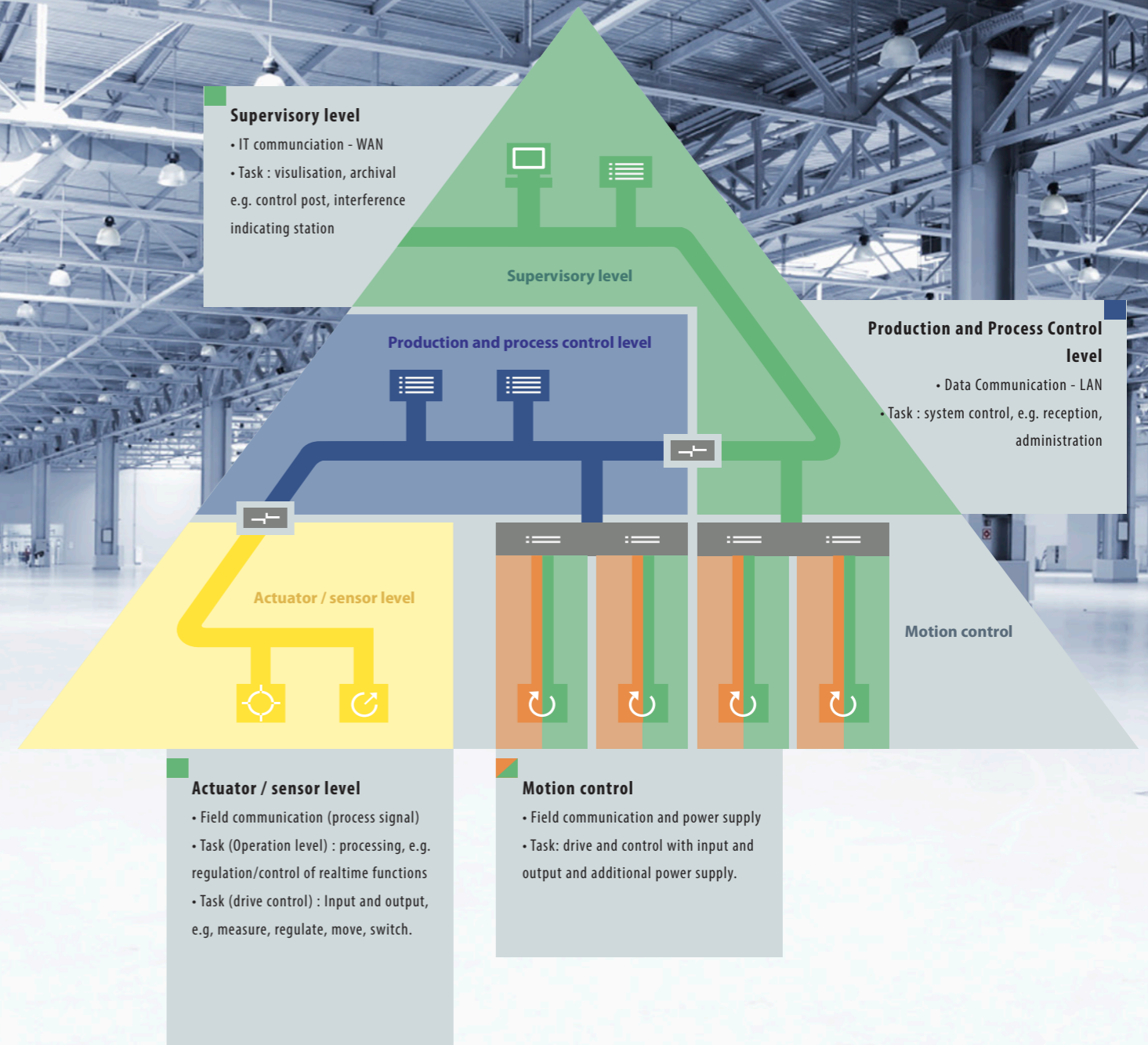
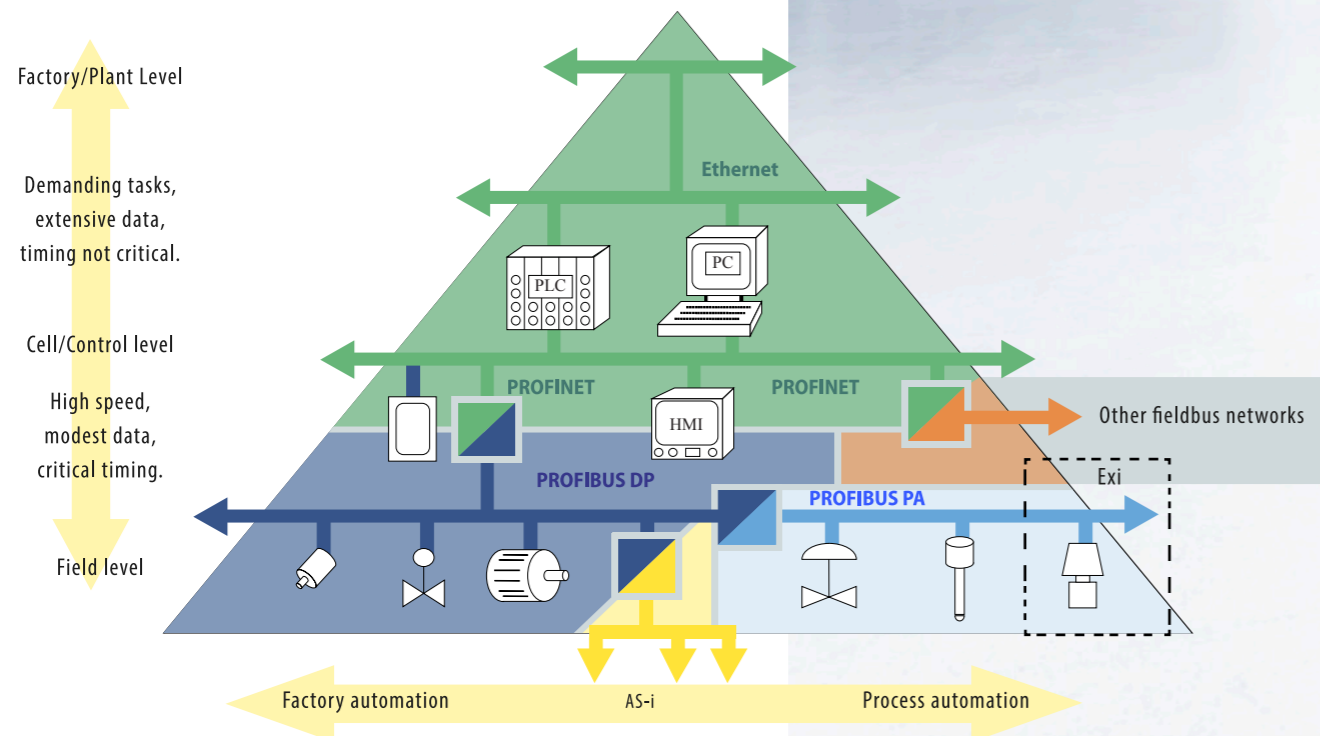
Belcom is a member of
PROFIBUS International

www.profinet.com

Fields of Application



The Control system hierarchy and use of PROFIBUS and Ethernet technology





PROFINET Cable Finder

Click on the cable cross section to view the product specification

Industrial Ethernet/Profinet has been developing rapidly over several years and now has the potential to transcend from the Corporate IT level right to the I/O device level on the production line.

Whilst there is little convergence between the Commercial Ethernet products and the industrial Applications, there is no reason why this should not develop a smoother integration in the future. For the cable there is a distinct look and feel of difference between Commercial Ethernet cable and Industrial Ethernet cable and whilst the technology may converge there are still very good reasons to keep these cables different. Primarily the environment in which Industrial Ethernet networks are being asked to operate in is harsher and in many localised applications potentially destructive to standard Commercial Grade cables, hence "Industrial" Ethernet.

In this section you will find a broad range of Industrial Ethernet cables covering many environmental challenges, if you cannot, call us to discuss it and we will find you the optimum solution.

Several different types of PROFINET/Industrial Ethernet are available from stock at Belcom .

- Flame retardant
- Weld splatter resistant
- Highly flexible
- Permanent installation
- Halogen free
- Silicon free
- Sunlight resistant
- Oil resistant
- Cold resistant
- Chemical resistant
- Trailing cable
- RoHS compliant



Belcom is a member of
PROFIBUS International

www.profinet.com



PROFINET

- 8-9  PROFINET Type A Industrial Ethernet Cat 5e ES (PVC)
- 10-11  PROFINET Type A Industrial Ethernet Cat 5e ES (LSZH FireFighter®)
- 12-13  PROFINET Type B Industrial ethernet Cat 5e ES (PVC)
- 14-15  PROFINET Type B Industrial ethernet Cat 5e ES (LSZH FireFighter®)
- 16-17  PROFINET Type B Industrial ethernet Cat 5e ES Sunlight Resistant
- 18-19  PROFINET Type B Industrial ethernet Cat 5e Hybrid Cable
- 20-21  PROFINET Type C Industrial ethernet Cat 5e ES Trailing Cable (TPU)
- 22-23  PROFINET Type C Industrial ethernet Cat 5e Cable for Torsional Stress Applications
- 24-25  PROFINET Type B Insulation Integrity under fire conditions FE90
- 26-27  PROFINET Armada® Type B Cable for Flexible Installation in Marine Applications SHF-1
- 28-29  PROFINET Armada® Type B Cable for Offshore Applications MUD RES
- 30-31  PROFINET Type A Industrial Ethernet Cat 5e ES DataGuard® (SWA) (PVC)
- 32-33  PROFINET Type A Industrial Ethernet Cat 5e ES DataGuard® (SWA) LSZH FireFighter®
- 34-35  PROFINET Type B Industrial Ethernet Cat 5e ES DataGuard® (SWA) (PVC)
- 36-37  PROFINET Armada® Type B Cable for Marine Applications SHF-1 DataGuard® (GSWB)

Industrial Ethernet

- 38-39  Trailing Patch Cable
- 40-41  Trailing Patch Cable 4x2x26AWG19
- 42-43  Armada® Cat5e Patch Cable for Marine Applications SHF-1
- 44-45  Patch Cable for Trailing and Torsional Stress
- 46-47  Cat 6 ES for Fixed Installation
- 48-49  Cat5e Patch Cable for Outdoor Use
- 50-51  Cat 6 ES for Trailing and Flexible Installation
- 52-53  Cat 6 ES Trailing Patch Cable
- 54-55  Cat 6A ES Trailing Patch Cable
- 56-57  Cat 6A ES for Trailing and Torsional Stress Applications
- 58-59  Armada® Cat6A Cable for Offshore Use MUD RES
- 60-61  Cat6A for Flexible Installation



PROFINET

FieldLink®

Type A Industrial Ethernet Cat 5e ES (PVC)

Cable Design

Wire

Conductor	Solid bare copper wire (22awg)	Ø 0,64 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Polyvinylchloride (PVC)	Ø 3,90 mm
Screen	Aluminium foil overlapped	
Braid	Tinned copper wire braid, 90% coverage	Ø 4,50 mm

Outer Jacket

	Polyvinylchloride (PVC), Green	Ø 6,5 ± 0,20 mm
Wall thickness	0,9 mm	

Characteristics

- Flame retardant acc. to IEC 60332-1-2 and UL 1685 (CSA FT 4),
- Limited oil resistant,
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5,
- UL-Style 21694 (600 V)

Specification

Part Number	Type
L45467-J16-B35	Industrial Ethernet Cat5e ES, PROFINET cable for permanent installation, 2x2x22AWG1, UL listed: CMG and PLTC and ITC



Electrical Data @ 20°C

Loop resistance	≤	115	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)		2000	V

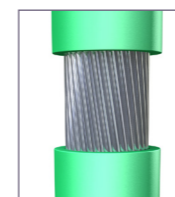
Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	1,6	3,2	5,2	6,9	7,8	10,5	15	19,5
NEXT typ. Value (dB/100m)	80	75	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	repeated	7,5 x Ø
Min. Bending radius allowed	single	3 x Ø
Tensile loading	≤	150 N
Weight (approx.)		66 kg/km

Also available with DataGuard® armoured protection :



DataGuard® SWA
Page 30-31



PROFINET

FieldLink®

Type A Industrial Ethernet Cat 5e ES (LSZH FireFighter®)

Cable Design

Wire

Conductor	Solid bare copper wire (22awg)	∅ 0,65 mm
Insulation	Polyethylene (PE)	∅ 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	∅ 4,0 mm
Screen	Alulaminare foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	∅ 4,60 mm

Outer Jacket

Outer Jacket	LSZH FireFighter®, Green	∅ 6,5 ± 0,20 mm
Wall thickness	0,9 mm	

Characteristics

- Flame retardant acc. to IEC 60332-3 Cat. A/F,
- Halogen free acc. to IEC 60754,
- Sunlight resistant,
- UL-Style 21279 (600 V)

Specification

Part Number	Type
L45467-J16-B136	Industrial Ethernet Cat 5e, PROFINET cable for permanent installation LSZH FireFighter®, 2x2x22AWG1, UL listed: CMG



Electrical Data @ 20°C

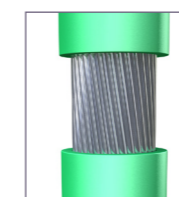
Loop resistance	≤	124	Ohm/km
Resistance Difference		5	%
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MΩm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Ground unbalance attenuation	64 kHz	> 43	dB
Capacity unbalanced to ground	1 MHz	≤ 3300	pF/m
Return Loss (dB)	1 ≤ f ≤ 10 MHz	20+5	log (f)
Return Loss (dB)	10 ≤ f ≤ 20 MHz	25	
Return Loss (dB)	20 ≤ f ≤ 100 MHz	25-7	log (f/20)
Surface Transfer Impedance	10 MHz	≤ 10	mΩm/m
UL-Rating		600	V
Test Voltage (wire/wire/screen rms 50Hz min.)		2000	V

Frequency (MHz)	0,256	0,512	0,772	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	0,8	1,0	1,1	1,6	3,2	5,2	6,9	7,8	10,5	15	19,5
NEXT typ. Value (dB/100m)	-	-	≥ 80	≥ 80	75	70	65	63	60	55	50
FEXT typ. Value (dB/100m)	-	-	≥ 80	≥ 80	75	65	59	55	50	47	45

Mechanical & Thermal Characteristics

Permissible temperature range	-25 ~ +75	°C
Min. Bending radius allowed	repeated	10 x ∅
Min. Bending radius allowed	single	5 x ∅
Weight (approx.)	65	kg/km

Also available with DataGuard® armoured protection :



DataGuard® SWA
Page 32-33



PROFINET

FieldLink®

Type B Industrial ethernet Cat 5e ES (PVC)

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Polyvinylchloride (PVC)	Ø 3,90 mm
Screen	Aluminium foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Outer Jacket

	Polyvinylchloride (PVC), Green	Ø 6,5 ± 0,20 mm
Wall thickness	0,9 mm	



PROFINET TYPE B L45467-J17-B15

Characteristics

- Flame retardant acc. to IEC 60332-1-2 and UL 1685 (CSA FT 4),
- Oil resistant acc. to IEC 60811-2-1 (4 hours, 70°C),
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5,
- UL-Style 21694 (600 V)

Specification

Part Number	Type
L45467-J17-B15	Industrial Ethernet Cat5e ES, PROFINET cable for flexible installation, 2x2x22AWG7, UL listed: CMG and PLTC

Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
UL Rating		600	V
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)		2000	V

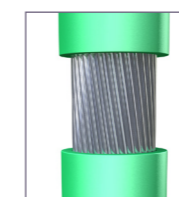
Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	2,1	4	6,3	8	9	11,4	16,5	21,3
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	repeated	7 x Ø
Min. Bending radius allowed	single	3 x Ø
Tensile loading	≤	150 N
Weight (approx.)		67 kg/km

Also available with DataGuard® armoured protection :



DataGuard® SWA
Page 34-35



PROFINET

FieldLink®

Type B Industrial ethernet Cat 5e ES (LSZH FireFighter®)

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 3,90 mm
Screen	Alulamine foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Outer Jacket

Outer Jacket	LSZH FireFighter®, Green	Ø 6,5 ± 0,20 mm
Wall thickness	0,9 mm	

Characteristics

- Flame retardant acc. to IEC 60332-3 cat. A/F and UL 1685 (CSA FT 4)
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5
- Halogen free acc. to IEC 60754
- Limited oil resistance

Specification

Part Number	Type
L45467-J16-B146	Industrial Ethernet Cat5e ES, PROFINET cable for flexible installation LSZH FireFighter®, 2x2x22AWG7, UL listed: CMG and PLTC



Electrical Data @ 20°C

Loop resistance	≤	124	Ohm/km
Resistance Difference		5	%
Signal run time	≤	5,55	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Ground unbalance attenuation	64 kHz	> 43	dB
Capacity unbalanced to ground	1 MHz	≤ 3300	pF/m
Return Loss (dB)	1 ≤ f ≤ 10 MHz	20+5	log (f)
Return Loss (dB)	10 ≤ f ≤ 20 MHz	25	
Return Loss (dB)	20 ≤ f ≤ 100 MHz	25-8,6	log (f/20)
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Capacitance	1 kHz	≈ 53	nF/km
Inductance	0,06 MHz	≈ 670	µH/km
Inductance	1 MHz	≈ 520	µH/km
Inductance	≥ 10 MHz	≈ 500	µH/km
UL-Rating		300	V
Test Voltage (wire/wire/screen rms 50Hz min.)		700	V

Frequency (MHz)	0,256	0,512	0,772	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	0,9	1,1	1,4	1,8	3,6	6,0	7,6	8,7	11,2	17	22
NEXT typ. Value (dB/100m)	-	-	≥ 80	≥ 80	75	70	65	63	60	55	50
FEXT typ. Value (dB/100m)	-	-	≥ 80	≥ 80	75	65	59	55	50	47	45

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	repeated	8 x Ø
Min. Bending radius allowed	single	4 x Ø
Weight (approx.)	65	kg/km



PROFINET

FieldLink®

Type B Industrial ethernet Cat 5e ES Sunlight Resistant

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polyethylene (PE)	Ø 1,55 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Polyvinylchloride (PVC)	Ø 3,90 mm
Screen	Alulaminat foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Outer Jacket

	Polyvinylchloride (PVC), Black	Ø 6,5 ± 0,20 mm
Wall thickness	0,9 mm	

Characteristics

- Flame retardant acc. to UL 1685 (CSA FT 4),
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5,
- UL-Style 21695 (600 V)

Specification

Part Number	Type
L45467-J17-B115	Industrial Ethernet Cat5e ES, PROFINET Type B cable for flexible installation with special sunlight resistance, 2x2x22AWG7, UL listed: CMG and PLTC



Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
UL-Rating		600	V
Surface Transfer Impedance	10 MHz	≤ 20	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	2000	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	2,1	4	6,3	8	9	11,4	16,5	21,3
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40°C up to +80°C	-40 ~ +80	°C
Min. Bending radius allowed	repeated	5	x Ø
Min. Bending radius allowed	single	3	x Ø
Weight (approx.)	67 kg/km	67	kg/km



PROFINET

FieldLink®

Type B Industrial ethernet Cat 5e Hybrid Cable

Cable Design

Power Core

Conductor	Stranded bare copper wire (84x0,15mm) 1,50 mm ²	Ø 1,55 mm
Insulation	LSZH FireFighter® Black with white numerals	Ø 2,40 mm

Shielded Pair

Conductor	Stranded bare copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Foamed Polyethylene (PE) with skin	Ø 1,50 mm
Pair	2 insulated cores twisted to a pair	
Tape	Plastic tape overlapped	
Screen	Alulaminat foil overlapped	
Braid	Tinned copper wire braid, 75% coverage	Ø 3,60 mm

Core

Central Element	Filler	
Assembly	2 shielded pairs + 4 cores numbered 1-2-3-4	
Tape	Plastic tape overlapped	Ø 8,30 mm

Outer Jacket	LSZH FireFighter®, Green	Ø 10,30 ± 0,3 mm
---------------------	--------------------------	------------------

Characteristics

- Flame retardant acc. to IEC 60332-1-2,
- Halogen free acc. to IEC 60754,
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5,
- UL Style 21282

Specification

Part Number	Type
L45467-J116-C6	Industrial Ethernet Cat 5e, PROFINET Hybrid Cable for Flexible installation (LSZH FireFighter®), 2x2x22AWG7 + 4x1.5 mm ² . UL recognised: AWM



Electrical Data @ 20°C Power Cores

Conductor resistance	≤	14	Ohm/km
Insulation resistance	≥	20	MOhm*km
Operating Voltage (peak)	≤	100	V
Test Voltage (wire/wire/screen rms 50Hz min.)	=	1000	V

Electrical Data @ 20°C Shielded Pairs

Loop resistance	≤	120	Ohm/km
Signal run time	≤	4,4	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Surface Transfer Impedance	1 MHz	≤ 50	mOhm/m
Surface Transfer Impedance	1-100 MHz	≤ 10	dB
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	2,1	4,0	6,3	8,0	9,0	11,4	16,5	21,3
NEXT typ. Value (dB/100m)	65,3	56,3	50,3	47,2	45,8	42,9	38,4	35,3

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-20 ~ +70	°C
Min. Bending radius allowed	repeated	10 x Ø
Min. Bending radius allowed	single	5 x Ø
Tensile strength	≤	200 N
Weight (approx.)		153 kg/km



PROFINET

FieldLink®

Type C Industrial ethernet Cat 5e ES Trailing Cable (TPU)

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 3,90 mm
Screen	Alulaminare foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Outer Jacket

Material	Thermoplastic Polyurethane (TPU) Green	Ø 6,5 ± 0,20 mm
Wall thickness	0,9 mm	

Characteristics

- Flame retardant acc. to IEC 60332-1-2 and UL 2556 Sec. 9.4 (VW 1),
- Halogen free acc. to IEC 60754,
- Oil resistant acc. to IEC 60811-2-1 and UL 13 Sec. 40 (60 °C),
- UV light resistant acc. to UL 2556 Sec. 4.2.8.5,

Specification

Part Number	Type
L45467-J17-B18	Industrial Ethernet Cat5e ES, PROFINET Type C trailing cable, 2x2x22AWG7, UL listed: CMX



Electrical Data @ 20 °C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Capacitance (nom.)	1 kHz	52	nF/km
UL-Rating		300	V
Surface transfer impedance	10 MHz	≤ 20	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	2000	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	2,1	4	6,3	8	9	11,4	16,5	21,3
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
During Laying temperature range	-20 ~ +60	°C
Transport and Storage temperature range	-50 ~ +70	°C
Min. Bending radius allowed	repeated	7,5 x Ø
	single	5 x Ø
Weight (approx.)	61	kg/km
Tensile strength	≤ 150	N
Trailing Cable for following requirements	3 million bending cycles	
	diameter 200mm	
	at a speed of 4 m/s	
	acceleration 4 m/s ²	



PROFINET

FieldLink®

Type C Industrial ethernet Cat 5e Cable for Torsional Stress Applications

Cable Design

Wire

Conductor	Stranded tinned copper wire (19x0,15mm) (22awg)	Ø 0,75 mm
Insulation	Foamed Polyethylene (PE) with skin	Ø 1,50 mm

Core

Central Element	Filler	
1° Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Braid	Tinned copper wire braid, 85% coverage	
Tape	Plastic tape overlapped	Ø 4,50 mm

Outer Jacket

	Polyurethane (PUR) Green	Ø 6,5 ± 0,20 mm
Wall thickness	1,0 mm	

Characteristics

- Flame retardant acc. to IEC 60332-1-2,
- Halogen free acc. to IEC 60754,
- UL-Style 21161

Specification

Part Number	Type
L45467-J17-B78	Industrial Ethernet Cat5e, PROFINET Type C flexible cable for torsional stress applications (FRNC), 2x2x22AWG19, UL recognised: AWM



Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	4,8	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation Max. (dB/100m)	2,9	5,0	8,1	10,4	11,9	15,5	26,5	41,0
ELFEXT ≤ (dB/100m)	63,8	51,8	43,8	39,7	37,8	33,9	24,0	20,0

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Torsional Strength	1 million cycles at ± 180° on 1 metre (not adapted for garland mounting)		
Permissible temperature range	-40 ~ +80	°C	
Min. Bending radius allowed	single	5	x Ø
Weight (approx.)	54		kg/km



PROFINET

FieldLink®

Type B Insulation Integrity under fire conditions FE90

Cable Design

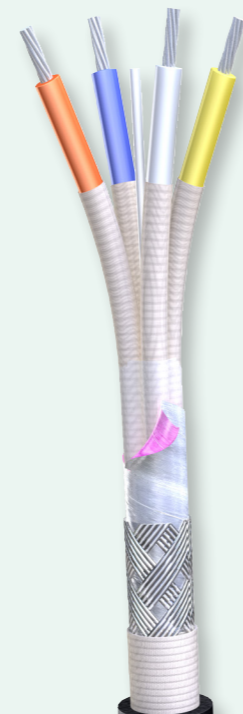
Wire

Conductor	Stranded tinned copper wire (0,34mm ²) (22awg)	∅ 0,75 mm
Insulation	Polyethylene (PE)	∅ 1,56 mm
Fire Barrier	Fire Resistant tape, overlapped	

Core

1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Screen	Alulamine foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	
Fire Barrier	Fire Resistant tape, overlapped	∅ 5,60 mm

Outer Jacket	LSZH FireFighter®, Black	∅ 6,5 ± 0,20 mm
---------------------	--------------------------	-----------------



Characteristics

- Fire Resistant acc. to IEC 60331-23 (90 min.),
- Halogen free acc. to IEC 60754,
- UL-Style 21281 (300 V)

Specification

Part Number	Type
L45467-J17-B46	Industrial Ethernet Cat5e , PROFINET cable for flexible installation with isolation preservation in case of fire (FE90, LSZH), 2x2x22AWG7, UL recognised: AWM

Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Insulation resistance	≥	500	MOhm*km
Signal run time	≤	5,3	ns/m
Characteristic Impedance		100	MHz 100±5 Ohm
Operating Voltage (effective value)	≤	80	V
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Next (dB)	65,3	56,3	50,3	47,2	45,8	42,9	38,4	35,3
PSNext (dB)	62,3	53,3	47,3	44,2	42,8	39,9	35,4	32,3
ELFext (dB)	63,8	51,8	43,8	39,7	37,8	33,9	27,9	23,8
PSELFext (dB)	60,8	48,8	40,8	36,7	34,8	30,9	24,9	20,8
Attenuation (dB/100m)	2,1	4,0	6,3	8,0	9,0	11,4	16,5	21,3

Frequency (MHz)	4	8	10	16	20	31,25	62,5	250
Return Loss (dB)	23,0	24,5	25,0	25,0	25,0	23,6	21,5	20,1

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range		-25 ~ +80	°C
Min. Bending radius allowed	repeated	15	x ∅
Min. Bending radius allowed	single	5	x ∅
Weight (approx.)		67	kg/km



PROFINET

FieldLink®

Armada® Type B Cable for Flexible Installation in Marine Applications SHF-1

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polypropylene (PP)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 3,90 mm
Screen	Alulaminare foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Outer Jacket

	LSZH FireFighter® SHF-1, Green	Ø 6,5 ± 0,40 mm
Wall thickness	0,9 mm	

Characteristics

- Flame retardant acc. to IEC 60332-3-22 category A/F,
- Halogen free acc. to IEC 60754,
- Smoke density acc. to IEC 61034,
- Sunlight-resistant,
- Limited oil resistant,
- **Maritime and offshore approvals: Germanischer Lloyd, Lloyds Register of Shipping, ABS Europe, Bureau Veritas, Det Norske Veritas**

Specification

Part Number	Type
L45467-J16-B26	Industrial Ethernet Cat5e ES, PROFINET flexible cable for marine applications LSZH FireFighter® SHF-1, 2x2x22AWG7, UL listed: CMG and PLTC



Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

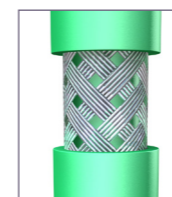
Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	1,8	3,6	6,0	7,6	8,7	11	16	21
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Temperature range	Permissible	-40 ~ +75	°C
Temperature range	During laying	0 ~ +50	°C
Temperature range	Transport	-40 ~ +75	°C
Min. Bending radius allowed	repeated	7,5	x Ø
Min. Bending radius allowed	single	3	x Ø
Tensile loading	≤	150	N
Weight (approx.)		65	kg/km

Also available with DataGuard® armoured protection :



DataGuard® GSWB
Page 36-37



PROFINET

FieldLink®

Armada® Type B Cable for Flexible Installation in Offshore Applications MUD-resistant

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 3,90 mm
Screen	Alulaminare foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Outer Jacket	LSZH FireFighter® MUD-resistant, Green	Ø 6,5 ± 0,20 mm
---------------------	--	-----------------



Characteristics

- Flame retardant acc. to IEC 60332-3-24,
- Halogen free acc. to IEC 60754,
- Mud resistant acc. to NEK606,
- Sunlight resistant

Specification

Part Number	Type
L45467-J16-B216	Industrial Ethernet Cat5e ES, PROFINET cable for flexible installation in offshore applications with higher oil res. acc. to NEK606, LSZH FireFighter® 2x2x22AWG7

Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	1,8	3,6	6,0	7,6	8,7	11	16	21
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	repeated	10 x Ø
Min. Bending radius allowed	single	5 x Ø
Weight (approx.)	64	kg/km



PROFINET

FieldLink®

Type A Industrial Ethernet Cat 5e ES DataGuard® (SWA) (PVC)

Cable Design

Wire

Conductor	Solid bare copper wire (22awg)	Ø 0,64 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Polyvinylchloride (PVC)	Ø 3,90 mm
Screen	Aluminium foil overlapped	
Braid	Tinned copper wire braid, 90% coverage	Ø 4,50 mm

Inner Jacket	Polyvinylchloride (PVC), Green	Ø 6,5 ± 0,20 mm
---------------------	--------------------------------	-----------------

Armour	DataGuard® Steel Wire Armour (DSWA)	
---------------	-------------------------------------	--

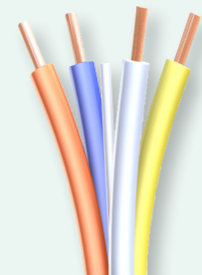
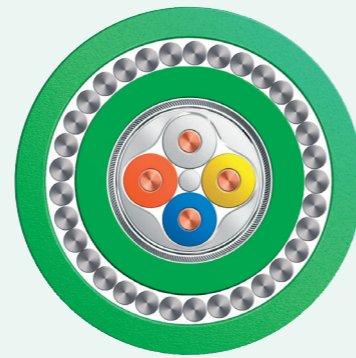
Outer Jacket	Polyvinylchloride (PVC), Green UV-Stable and colourfast	Ø 10,30 ± 0,40 mm
---------------------	--	-------------------

Characteristics

- Flame retardant acc. to IEC 60332-1-2 and UL 1685 (CSA FT 4),
- Limited oil resistant,
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5,
- UL-Style 21694 (600 V)

Specification

Part Number	Type
11L45467-J16-B35	Industrial Ethernet Cat5e ES, PROFINET cable for permanent installation, 2x2x22AWG1, UL listed: CMG and PLTC and ITC / DataGuard® (SWA) / PVC UV-Stable



Electrical Data @ 20°C

Loop resistance	≤	115	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)		2000	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	1,6	3,2	5,2	6,9	7,8	10,5	15	19,5
NEXT typ. Value (dB/100m)	80	75	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	10	x Ø (see Ø tolerance)
Weight (approx.)	340	kg/km



PROFINET

FieldLink®

Type A Industrial Ethernet Cat 5e ES DataGuard® (SWA) LSZH FireFighter®

Cable Design

Wire

Conductor	Solid bare copper wire (22awg)	Ø 0,65 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

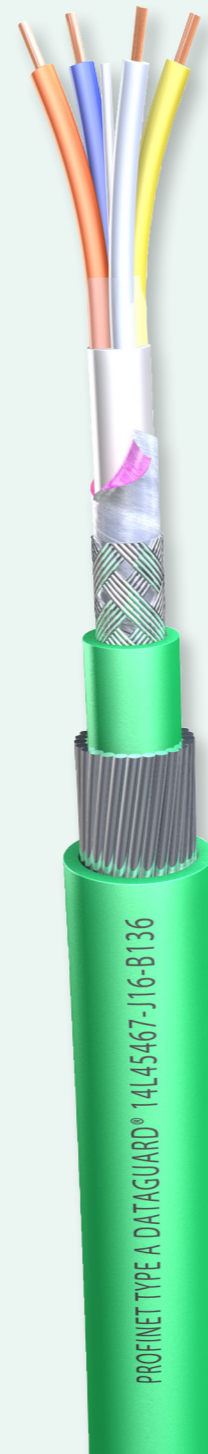
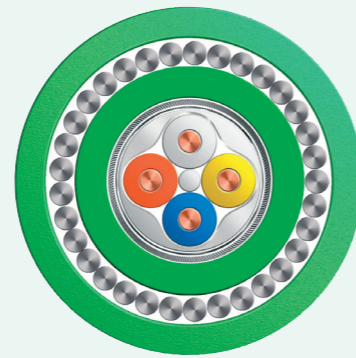
Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 4,0 mm
Screen	Alulaminare foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,60 mm

Inner Jacket LSZH FireFighter®, Green Ø 6,5 ± 0,20 mm

Armour DataGuard® Steel Wire Armour (DSWA)

Outer Jacket LSZH FireFighter®, Green Ø 10,30 ± 0,40 mm
UV-Stable and colourfast



Characteristics

- Flame retardant acc. to IEC 60332-3 Cat. A/F,
- Halogen free acc. to IEC 60754,
- Sunlight resistant,
- UL-Style 21279 (600 V)

Specification

Part Number	Type
14L45467-J16-B136	Industrial Ethernet Cat 5e, PROFINET cable for permanent installation LSZH, 2x2x22AWG1, UL listed: CMG / DataGuard® (SWA) / LSZH FireFighter®

Electrical Data @ 20°C

Loop resistance	≤	124	Ohm/km
Resistance Difference		5	%
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Ground unbalance attenuation	64 kHz	> 43	dB
Capacity unbalanced to ground	1 MHz	≤ 3300	pF/m
Return Loss (dB)	1 ≤ f ≤ 10 MHz	20+5	log (f)
Return Loss (dB)	10 ≤ f ≤ 20 MHz	25	
Return Loss (dB)	20 ≤ f ≤ 100 MHz	25-7	log (f/20)
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
UL-Rating		600	V
Test Voltage (wire/wire/screen rms 50Hz min.)		2000	V

Frequency (MHz)	0,256	0,512	0,772	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	0,8	1,0	1,1	1,6	3,2	5,2	6,9	7,8	10,5	15	19,5
NEXT typ. Value (dB/100m)	-	-	≥ 80	≥ 80	75	70	65	63	60	55	50
FEXT typ. Value (dB/100m)	-	-	≥ 80	≥ 80	75	65	59	55	50	47	45

Mechanical & Thermal Characteristics

Permissible temperature range	-25 ~ +75	°C
Min. Bending radius allowed	10 x Ø	(see Ø tolerance)
Weight (approx.)	340	kg/km



PROFINET

FieldLink®

Type B Industrial Ethernet Cat 5e ES DataGuard® (SWA) (PVC)

Cable Design

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polyethylene (PE)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Polyvinylchloride (PVC)	Ø 3,90 mm
Screen	Alulaminare foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Inner Jacket	Polyvinylchloride (PVC), Green	Ø 6,5 ± 0,20 mm
---------------------	--------------------------------	-----------------

Armour	DataGuard® Steel Wire Armour (DSWA)	
---------------	-------------------------------------	--

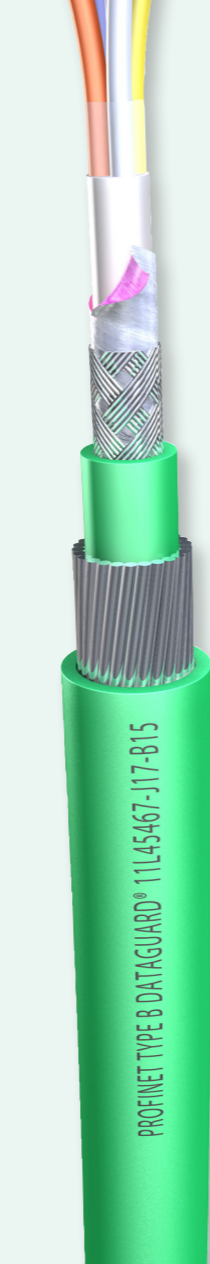
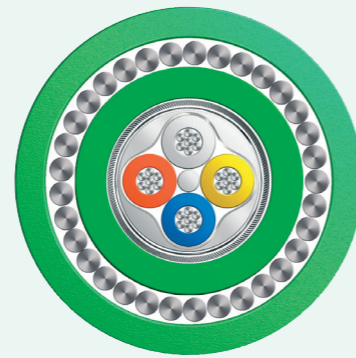
Outer Jacket	Polyvinylchloride (PVC), Green UV-Stable and colourfast	Ø 10,30 ± 0,40 mm
---------------------	--	-------------------

Characteristics

- Flame retardant acc. to IEC 60332-1-2 and UL 1685 (CSA FT 4),
- Oil resistant acc. to IEC 60811-2-1 (4 hours, 70°C),
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5,
- UL-Style 21694 (600 V)

Specification

Part Number	Type
11L45467-J17-B15	Industrial Ethernet Cat5e ES, PROFINET cable for flexible installation, 2x2x22AWG7, UL listed: CMG and PLTC / DataGuard® (SWA) / PVC UV-Stable



Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100	MHz	100±15 Ohm
UL Rating		600	V
Surface Transfer Impedance	10	MHz	≤ 10 mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)		2000	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	2,1	4	6,3	8	9	11,4	16,5	21,3
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-25 ~ +75	°C
Min. Bending radius allowed	10	x Ø (see Ø tolerance)
Weight (approx.)	340	kg/km



PROFINET

FieldLink®

Armada® Type B Cable for Flexible Installation in Marine Applications SHF-1 DataGuard® (GSWB)

Cable Design (DataGuard® GSWB armouring using L45467-J16-B26)

Wire

Conductor	Stranded tinned copper wire 7/0,25mm (22awg)	Ø 0,75 mm
Insulation	Polypropylene (PP)	Ø 1,50 mm

Core

Central Element	Filler	
1 st Layer	4 wires twisted (WH-YE-BU-OG)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 3,90 mm
Screen	Alulminate foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	Ø 4,70 mm

Inner Jacket

LSZH FireFighter® SHF-1, Green	Ø 6,5 ± 0,40 mm
Wall thickness	0,9 mm

Armour

DataGuard® Galvanised Steel Wire Braid (GSWB)

Outer Jacket

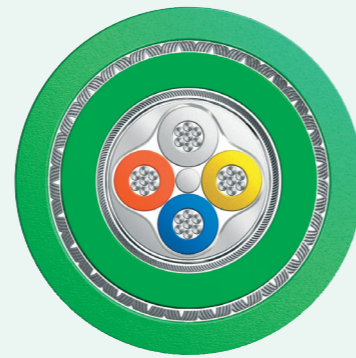
LSZH FireFighter® SHF-1, Green	Ø 9,50 ± 0,40 mm
UV-Stable and colourfast	

Characteristics

- Flame retardant acc. to IEC 60332-3-22 category A/F,
- Halogen free acc. to IEC 60754,
- Smoke density acc. to IEC 61034,
- Sunlight-resistant,
- Limited oil resistant,
- Maritime and offshore approvals (base cable): Germanischer Lloyd, Lloyds Register of Shipping, ABS Europe, Bureau Veritas, Det Norske Veritas**

Specification

Part Number	Type
24L45467-J16-B26	Industrial Ethernet Cat5e ES, PROFINET flexible cable for Offshore use, LSZH FireFighter® SHF-1, 2x2x22AWG7 / DataGuard® (GSWB) / FireFighter® SHF-1



Electrical Data @ 20°C

Loop resistance	≤	120	Ohm/km
Signal run time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance	1-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤ 10	mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation typ. Value (dB/100m)	1,8	3,6	6,0	7,6	8,7	11	16	21
NEXT typ. Value (dB/100m)	80	76	70	65	63	60	55	50

The electrical requirements acc. to EN 50288-2-1.

Mechanical & Thermal Characteristics

Temperature range	Permissible	-40 ~ +75	°C
Temperature range	During laying	0 ~ +50	°C
Temperature range	Transport	-40 ~ +75	°C
Min. Bending radius allowed		10	x Ø (see Ø tolerance)
Weight (approx.)		205	kg/km



Industrial Ethernet

FieldLink®

Trailing Patch Cable

Cable Design

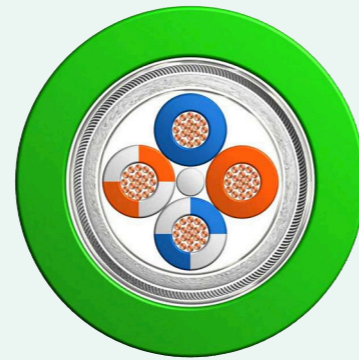
Wire

Conductor	Stranded bare copper wire (19/0,1mm)	Ø 0,50 mm
Insulation	Polypropylene (PP)	Ø 1,00 mm

Core

Strain member	Kevlar	
1 st Layer	4 wires twisted (BU-OG-WHBU-WHOG)	
Tape	Plastic tapes overlapped	
Braid	Tinned copper wire braid, 85% coverage	
Tape	Plastic tapes conductiv	Ø 3,30 mm

Outer Jacket	Thermoplastic Polyurethane (TPU)	Ø 4,8 ± 0,30 mm
---------------------	----------------------------------	-----------------



INDUSTRIAL ETHERNET L45581-B41-K8

Characteristics

- Flame retardant
- Halogen free acc. to IEC 60754,
- Oil resistant acc. to IEC 60811-2-1,
- Sunlight resistant
- UL/CSA

Specification

Part Number	Type
L45581-B41-K8	Industrial Ethernet trailing patch cable similar to Cat5, 2x2x26AWG19

Electrical Data @ 20°C

Loop resistance	≤	250	Ohm/km
Resistance difference	≤	3	%
Signal run time	≤	5,55	ns/m
Insulation resistance	≥	150	MOhm*km
Characteristic Impedance	64	kHz	125±25 Ohm
Characteristic Impedance	1-100	MHz	100±15 Ohm
Ground unbalance attenuation	64	kHz	> 43 dB
Capacity unbalanced to ground	1	kHz	≤ 3400 pF/km
Return Loss	1-20	MHz	≥ 23 dB
Return Loss	20-100	MHz	≥ 23 dB - 10 LOG (f/20)
Surface transfer impedance	10	MHz	≤ 50 mOhm/m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V
Capacitance	800	Hz	51 pF/m

Frequency (MHz)	0,064	0,256	0,512	0,772	1	4	10	16	20	31,25	62,5	100
Attenuation Max. (dB/100m)	1,2	1,65	2,25	2,70	3,15	6,45	9,90	12,3	13,8	17,7	26,65	33,0
NEXT ≤ (dB)	-	-	-	64	62	53	47	44	42	40	35	32

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	single	4 x Ø
Weight (approx.)	31	kg/km
Tensile strength	≤	100 N
Trailing Cable for following requirements	5 million bending cycles (must be testified)	
	bending radius 7,5 x max. Ø	
	at a speed of 180 m/s	
	acceleration 5 m/s ²	



Industrial Ethernet

FieldLink®

Trailing Patch Cable 4x2x26AWG19

Cable Design

Wire

Conductor	Stranded bare copper wire (19/0,1mm) (26awg)	Ø 0,50 mm
Insulation	Polypropylene (PP)	Ø 1,00 mm

Pair

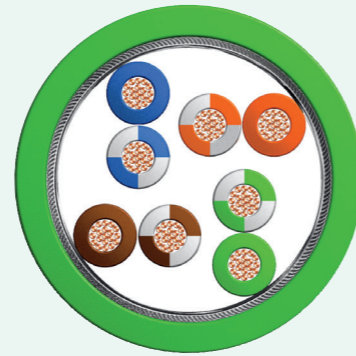
2 insulated wires twisted to a pair

Core

1° Layer	4 pairs stranded + Fillers (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)
Tape	Plastic tapes overlapped
Braid	Tinned copper wire braid, 90% coverage
Tape	Plastic tapes conductiv

Outer Jacket

Thermoplastic Polyurethane (TPU) Ø 6,8 ± 0,30 mm



Characteristics

- Flame retardant acc. to IEC 60332-1-2,
- Halogen free acc. to IEC 60754,
- Oil resistant acc. to UL 758 Sec. 15 (60 °C),
- Sunlight resistant,
- UL-Style 20963

Specification

Part Number	Type
L45581-B42-K8	Industrial Ethernet trailing patch cable similar Cat5 (FRNC), 4x2x26AWG19, UL recognised: AWM

Electrical Data @ 20°C

Loop resistance	≤	260	Ohm/km
Resistance Difference	≤	3	%
Signal running time	≤	5,55	ns/m
Insulation resistance	≥	150	MOhm*km
Capacitance	800	Hz	≈ 50 nF/km
Characteristic Impedance	100	MHz	100±5 Ohm
Capacity unbalanced to ground	1	kHz	≤ 3400 pF/m
Surface Transfer Impedance	10	MHz	≤ 70 mOhm/m
Return Loss	4-20	MHz	≥ 23 dB
Return Loss	20-1000	MHz	≥ 23 dB - 10 log (f/20)
Operating Voltage			30 V
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Attenuation Max. (dB/100m)	3	6	9	11	12	16	24	31
NEXT ≤ (dB)	62	53	47	44	42	40	35	32

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80 °C
Weight (approx.)	55 kg/km
Pulling Force with	≤ 100 N
Trailing Cable for following requirements	10 million bending cycles (must be testified)
	bending radius 7,5 x max. Ø
	at a speed of 180 m/s
	acceleration 5 m/s²



Industrial Ethernet

FieldLink®

Armada® Cat5e Patch Cable for Marine Applications SHF-1

Cable Design

Wire

Conductor	Stranded bare copper wire 7x0.2 (24AWG)(0.22mm ²)	∅ 0,60 mm
Insulation	Polypropylene (PP)	∅ 1,20 mm

Pair

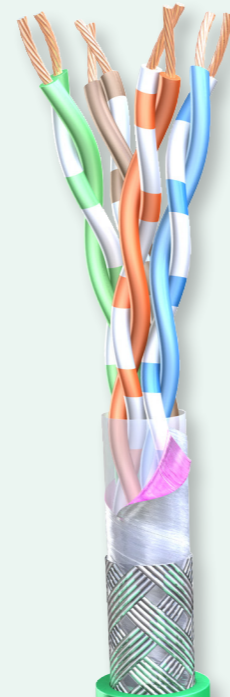
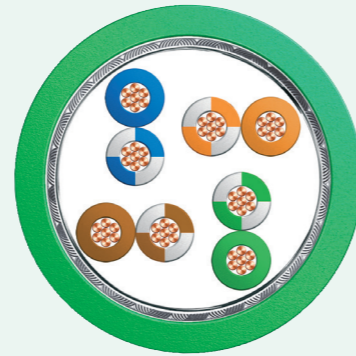
2 insulated wires twisted to a pair

Core

1 st Layer	4 pairs twisted (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)	
Tape	Plastic tapes overlapped	
Screen	Alulamine foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	∅ 5,80 mm

Outer Jacket

LSZH FireFighter® (IEC 60092-359 SHF-1) ∅ 7,8 ± 0,30 mm



Characteristics

- Flame retardant acc. to IEC 60332-3-22 category A,
- Halogen free acc. to IEC 60754-2,
- Smoke density acc. to IEC 61034,
- Sunlight-resistant,
- **Maritime and offshore approvals: Germanischer Lloyd**

Specification

Part Number	Type
L45467-J816-B6	Industrial Ethernet Cat5e, Patch cable for marine applications LSZH FireFighter®, 4x2x24AWG7, GL Approved.



Electrical Data @ 20°C

Loop resistance	≤	180	Ohm/km
Insulation resistance	≥	5	GOhm*km
Signal running time	≤	5,3	ns/m
Capacitance	1 kHz	≈	50 nF/km
Characteristic Impedance	4-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤	100 mOhm/m
Operating Voltage		100	V
Test Voltage (wire/wire/screen rms 50Hz min.)		=	700 V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Next (dB)	65,3	56,3	50,3	47,2	45,8	42,9	38,4	35,3
PSNext (dB)	62,3	53,3	47,3	44,2	42,8	39,9	35,4	32,3
ELFext (dB)	63,8	51,8	43,8	39,7	37,8	33,9	27,9	23,8
PSELFext (dB)	60,8	48,8	40,8	36,7	34,8	30,9	24,9	20,8
Attenuation (dB/100m)	2,1	4,0	6,3	8,0	9,0	11,4	16,5	21,3

Frequency (MHz)	4	8	10	16	20	31,25	62,5	100
Return Loss (dB)	23,0	24,5	25,0	25,0	25,0	23,6	21,5	20,1

Electrical requirements at max. 90m installed cable of the category 5 (EN 50288-2-1)

Mechanical & Thermal Characteristics

Permissible temperature range	-25 ~ +80	°C
Min. Bending radius allowed	repeated	8 x ∅
Min. Bending radius allowed	single	4 x ∅
Weight (approx.)	79	kg/km



Industrial Ethernet

FieldLink®

Patch Cable for Trailing and Torsional Stress

Cable Design

Wire

Conductor	Stranded bare copper wire (19/0,1mm) (26awg)	Ø 0,50 mm
Insulation	Polypropylene (PP)	Ø 0,95 mm

Pair

Pair	2 insulated wires twisted to a pair
Tape	Plastic tape overlapped

Core

1° Layer	4 pairs stranded + Fillers (WH/BU-WH/OG-WH/GN-WH/BN)	
Screen	Aluminum foil overlapped	
Braid	Tinned copper wire braid, 90% coverage	
Tape	Plastic tape overlapped	Ø 5,60 mm

Outer Jacket

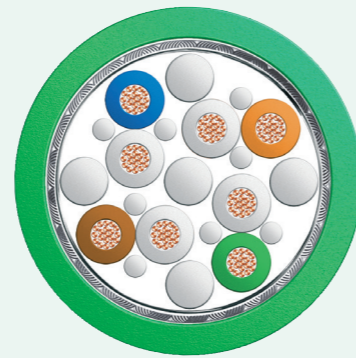
Outer Jacket	Thermoplastic Polyurethane (TPU)	Ø 7,5 ± 0,20 mm
--------------	----------------------------------	-----------------

Characteristics

- Halogen free acc. to IEC 60754,
- Oil resistant,
- UL-Style 20963

Specification

Part Number	Type
L45581-B42-K68	Industrial Ethernet flexible patch cable for trailing and torsional stress applications similar Cat5 (LSZH), 4x2x26AWG19, UL recognised: AWM



INDUSTRIAL ETHERNET L45581-B42-K68

Electrical Data @ 20°C

Loop resistance	≤	260	Ohm/km
Resistance Difference	≤	2	%
Signal running time	≤	5,55	ns/m
Insulation resistance	≥	500	MΩm*km
Capacitance	800	Hz	≈ 50 nF/km
Characteristic Impedance	64	kHz	125±25 Ohm
Characteristic Impedance	1-100	MHz	100±15 Ohm
Ground unbalance attenuation	64	kHz	> 43 dB
Capacity unbalanced to ground	1	kHz	≤ 1600 pF/m
Surface Transfer Impedance	10	MHz	≤ 350 mΩm/m
Operating Voltage (peak)	≤	100	V
UL Rating		30	V
Test Voltage (wire/wire/screen rms 50Hz min.)	=	1000	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Next (dB)	65,3	56,3	50,3	47,2	45,8	42,9	38,4	35,3
PSNext (dB)	62,3	53,3	47,3	44,2	42,8	39,9	35,4	32,3
ELFext (dB)	63,8	51,8	43,8	39,7	37,8	33,9	27,9	23,8
PSELFext (dB)	60,8	48,8	40,8	36,7	34,8	30,9	24,9	20,8
Attenuation (dB/100m)	3,0	6,0	9,0	11	12	16	24	31

Frequency (MHz)	4	8	10	16	20	31,25	62,5	100
Return Loss (dB)	23,0	24,1	25,0	25,0	25,0	23,6	21,5	20,1

Electrical transmission requirements Cat.5 acc. to EN 50288-2-2:2004 (except Attenuation max. 10% higher)

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	single	5 x Ø
Weight (approx.)	62,9	kg/km
Pulling Force with	≤	100 N
Trailing Cable for following requirements	1 million bending cycles	
	Torsional angle ±180°m	
	bending radius 7,5 x max. Ø	
	at a speed of 180 m/s	
	acceleration 5 m/s²	



Industrial Ethernet

FieldLink®

Cat 6 ES for Fixed Installation

Cable Design

Wire

Conductor	Solid bare copper wire (24awg)	Ø 0,51 mm
Insulation	Polyethylene (PE)	Ø 1,00 mm

Pair 2 insulated wires twisted to a pair

Core

1° Layer	4 pairs in separating element (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)
Tape	Plastic tape overlapped
Easystrip Jacket	Soft Thermoplastic copolymer Ø 6,10 mm
Screen	Aluminum foil overlapped
Braid	Tinned copper wire braid, 85% coverage Ø 6,60 mm

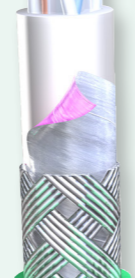
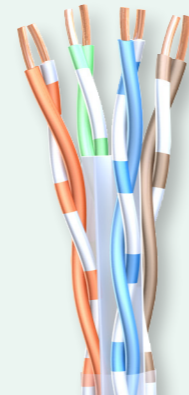
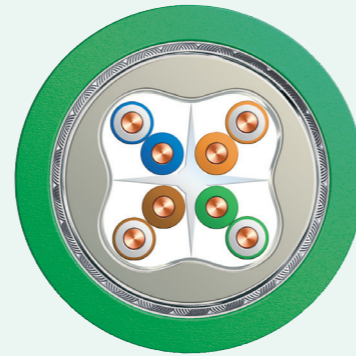
Outer Jacket Polyvinylchloride (PVC) Ø 8,0 ± 0,20 mm

Characteristics

- Flame retardant acc. to UL 1685 (CSA FT 4)
- Flame retardant acc. to IEC 60332-3-24 (Cat. C)
- Sunlight resistant acc. to UL 2556 Sec. 4.2.8.5
- Oil resistant acc. to DIN EN 50290-2-22 (VDE 0819), compound type TM54 (4h/70°C)

Specification

Part Number	Type
L45467-J15-B15	Industrial Ethernet Cat 6 ES cable for fixed installation (easy to strip), 4x2x24AWG1, UL listed: CMG



Electrical Data @ 20°C

Loop resistance	≤	190	Ohm/km
Signal run time	≤	5,13	ns/m
Insulation resistance	≥	500	MOhm*km
Operating Voltage (peak)	≤	100	V
Characteristic Impedance	100	MHz	100±5 Ohm
Surface Transfer Impedance of screen	up to 100	MHz	≤ 20 mOhm/m
Time delay skew (pair to pair)	All Pairs	≤	45 ns/100m
Time delay skew (pair to pair)	WHGN/GN to WHOG/OG	≤	20 ns/100m
Time delay skew (pair to pair)	WHBN/BN to WHBU/BU	≤	20 ns/100m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	700	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100	155	200	250
Next (dB) ≥	66,0	65,3	59,3	56,2	54,8	51,9	47,4	44,3	41,4	39,8	38,3
PSNext (dB) ≥	64,0	63,3	57,3	54,2	52,8	49,9	45,4	42,3	39,4	37,8	36,3
ELFext (dB) ≥	66,0	58	50,0	45,9	44,0	40,1	34,1	30,0	26,2	24,0	22,0
PSELFext (dB) ≤	64,0	55,0	47,0	43,0	41,0	37,1	31,1	27,0	23,2	21,0	19,0
Attenuation (dB/100m)	2,1	4,0	6,3	7,9	8,8	11,1	16,0	20,7	26,5	30,6	35,0

Frequency (MHz)	4	8	10	16	20	31,25	62,5	100	155	200	250
Return Loss (dB)	23,1	24,5	25,0	25,0	25,0	23,6	21,5	20,1	18,8	18,0	17,3

The electrical requirements at max. 90m installed cable acc. to EN 50288-5-1.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	repeated	5 x Ø
Min. Bending radius allowed	single	3 x Ø
Max. Pull Force	≤	100 N
Weight (approx.)		76 kg/km



Industrial Ethernet

FieldLink®

Cat5e Patch Cable for Outdoor Use

Cable Design

Wire

Conductor	Stranded bare copper wire 7x0.16 (26AWG)	Ø 0,48 mm
Insulation	Foamed Polyethylene (PE) with skin	Ø 0,98 mm

Pair 2 insulated wires twisted to a pair

Core

1 st Layer	4 pairs twisted (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)
Screen	Alulamine foil overlapped
Braid	Tinned copper wire braid, 70% coverage Ø 4,40 mm

Outer Jacket LSZH FireFighter® Ø 6,1 ± 0,30 mm



Characteristics

- Flame retardant acc. to UL 1685 Sec. 1160 (Vertical Tray),
- Sunlight resistant,
- Halogen free acc. to IEC 60754

Specification

Part Number	Type
L45581-B42-Y249	Industrial Ethernet Cat5e flexible patch cable for outdoor use (FRNC), 4x2x26AWG7, UL listed: CM

Electrical Data @ 20°C

Loop resistance	≤	290	Ohm/km
Signal running time	≤	5,3	ns/m
Insulation resistance	≥	500	MOhm*km
Capacitance	1 kHz	≈	48 nF/km
Characteristic Impedance	4-100 MHz	100±15	Ohm
Surface Transfer Impedance	10 MHz	≤	100 mOhm/m
Operating Voltage (peak)		≤	300 V
Voltage rating jacket			1500 V
Test Voltage (wire/wire/screen rms 50Hz min.)		=	700 V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100
Next (dB)	65,3	56,3	50,3	47,2	45,8	42,9	38,4	35,3
PSNext (dB)	62,3	53,3	47,3	44,2	42,8	39,9	35,4	32,3
ELFext (dB)	63,8	51,8	43,8	39,7	37,8	33,9	27,9	23,8
PSELFext (dB)	60,8	48,8	40,8	36,7	34,8	30,9	24,9	20,8
Attenuation (dB/100m)	3,2	6,0	9,5	12,1	13,6	17,1	24,8	32,0

Frequency (MHz)	4	8	10	16	20	31,25	62,5	100
Return Loss (dB)	23,0	24,1	25,0	25,0	25,0	23,6	21,5	20,1

Electrical requirements acc. to EN 50288-2-2 (08/2004)

Mechanical & Thermal Characteristics

Permissible temperature range	Assembling	-25 ~ +60	°C
Permissible temperature range	Operating	-35 ~ +80	°C
Min. Bending radius allowed	repeated	7	x Ø
Min. Bending radius allowed	single	5	x Ø
Weight (approx.)		44	kg/km



Industrial Ethernet

FieldLink®

Cat 6 ES for Trailing and Flexible Installation

Cable Design

Wire

Conductor	Stranded bare copper wire 7/0,2mm (24awg)	Ø 0,60 mm
Insulation	Foamed Polyethylene (PE) with skin	Ø 1,10 mm

Pair

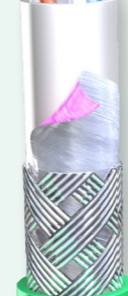
2 insulated wires twisted to a pair

Core

1° Layer	4 pairs in separating element (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 6,10 mm
Screen	Aluminum foil overlapped	
Braid	Tinned copper wire braid, 80% coverage	Ø 6,60 mm

Outer Jacket

Polyvinylchloride (PVC) Ø 8,0 ± 0,20 mm



Characteristics

- Flame retardant acc. to UL 1685 (CSA FT 4) and IEC 60332-3-24 (CAT. C)
- Sunlight resistant
- Limited oil resistant

Specification

Part Number	Type
L45467-J415-C5	Industrial Ethernet Cat6 ES, PROFINET trailing cable for flexible installation (easy to strip), 4x2x24AWG7, UL listed: CMG

Electrical Data @ 20°C

Loop resistance	≤	180	Ohm/km
Signal run time	≤	5,13	ns/m
Insulation resistance	≥	500	MOhm*km
Operating Voltage (peak)	≤	100	V
Characteristic Impedance	100	MHz	100±5 Ohm
Surface Transfer Impedance of screen	up to 100	MHz	≤ 20 mOhm/m
Time delay skew (pair to pair)	All Pairs	≤	45 ns/100m
Time delay skew (pair to pair)	WHGN/GN to WHOG/OG	≤	20 ns/100m
Time delay skew (pair to pair)	WHBN/BN to WHBU/BU	≤	20 ns/100m
Test Voltage (wire/wire/screen rms 50Hz min.)	=	1500	V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100	155	200	250
Next (dB) ≥	66,0	65,3	59,3	56,2	54,8	51,9	47,4	44,3	41,4	39,8	38,3
PSNext (dB) ≥	64,0	63,3	57,3	54,2	52,8	49,9	45,4	42,3	39,4	37,8	36,3
ELFext (dB) ≥	66,0	58,0	50,0	45,9	44,0	40,1	34,1	30,0	26,2	24,0	22,0
PSELFext (dB) ≤	64,0	55,0	47,0	43,0	41,0	37,1	31,1	27,0	23,2	21,0	19,0
Attenuation (dB/100m)	3,1	5,8	9,0	11,4	12,8	16,1	23,2	29,9	38,0	43,7	49,5

Frequency (MHz)	4	8	10	16	20	31,25	62,5	100	155	200	250
Return Loss (dB)	23,1	24,5	25,0	25,0	25,0	23,6	21,5	20,1	18,8	18,0	17,3

The electrical requirements acc. to EN 50288-5-2.

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Weight (approx.)	72	kg/km
Min. Bending radius allowed	single	3 x Ø
Max. Pull Force	≤	100 N
Trailing Cable for following requirements	1 million bending cycles	
	bending radius 20 x max. Ø	
	at a speed of 4 m/s	
	acceleration 4 m/s²	
	not adapted for garland mounting	



Industrial Ethernet

FieldLink®

Cat 6 ES Trailing Patch Cable

Cable Design

Wire

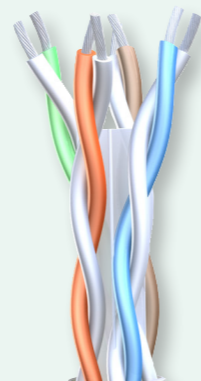
Conductor	Stranded tinned copper wire 19/0,1mm (26awg)	Ø 0,55 mm
Insulation	Polypropylene (PP)	Ø 0,98 mm

Pair 2 insulated wires twisted to a pair

Core

1 st Layer	4 pairs in separating element (WH/BU-WH/OG-WH/GN-WH/BN)	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 5,70 mm
Screen	Aluminium foil overlapped	
Braid	Tinned copper wire braid, 85% coverage	
Tape	Plastic tape overlapped	Ø 6,30 mm

Outer Jacket Thermoplastic Polyurethane (TPU) green Ø 7,80 ± 0,20 mm



Characteristics

- Flame retardant acc. to IEC 60332-1-2, UL 2556 Sec 9.4 (VW1) and UL 1581, Sec. 1060 (CSA FT-1),
- Halogen free acc. to IEC 60754-1,
- Oil resistant acc. to CSA-C22.2 (4x24h / 100°C),

Specification

Part Number	Type
L45467-J415-C48	Industrial Ethernet Cat6 ES, trailing patch cable (easy to strip, FRNC), 4x2x26AWG19, UL listed: CMX

Electrical Data @ 20°C

Loop resistance	≤	280	Ohm/km
Signal run time	≤	5,34	ns/m
Insulation resistance	≥	500	MΩm*km
Capacitance (1 kHz)	nom.	52	nF/km
Characteristic Impedance	100	MHz	100±5 Ohm
Transfer Impedance	10	MHz	≤ 30 mΩm/m
Time delay skew (pair to pair)	Pair to Pair	≤	30 ns/100m
Operating Voltage (peak)		≤	100 V
Test Voltage (wire/wire/screen rms 50Hz min.)		=	1500 V

Frequency (MHz)	1	4	10	16	20	31,25	62,5	100	155	200	250
Next (dB) ≥	66,0	65,3	59,3	56,2	54,8	51,9	47,4	44,3	41,4	39,8	38,3
PSNext (dB) ≥	64,0	63,3	57,3	54,2	52,8	49,9	45,4	42,3	39,4	37,8	36,3
ELFext (dB) ≥	66,0	58,0	50,0	45,9	44,0	40,1	34,1	30,0	26,2	24,0	22,0
PSELFext (dB) ≤	64,0	55,0	47,0	43,0	41,0	37,1	31,1	27,0	23,2	21,0	19,0
Attenuation (dB/100m)	3,1	5,8	9,0	11,4	12,8	16,1	23,2	29,9	38,0	43,7	49,5

Frequency (MHz)	4	8	10	16	20	31,25	62,5	100	155	200	250
Return Loss (dB)	23,1	24,5	25,0	25,0	25,0	23,6	21,5	20,1	18,8	18,0	17,3

The electrical requirements acc. to EN 50288-5-2.

Mechanical & Thermal Characteristics

Permissible temperature range	Fixed	-40 ~ +80	°C
Permissible temperature range	Flexing	-30 ~ +70	°C
Min. Bending radius allowed	single	4	x Ø
Min. Bending radius allowed	repeated	7,5	x Ø
Weight (approx.)		63	kg/km
Max. Pull Force		≤ 100	N
Trailing Cable for following requirements		1 million bending cycles	
		bending radius 7,5 x max. Ø	
		at a speed of 4 m/s	
		acceleration 4 m/s ²	
		Travel distance 10m	
		Standard atmospheres (20°C)	



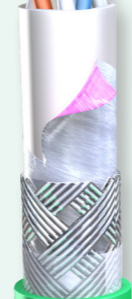
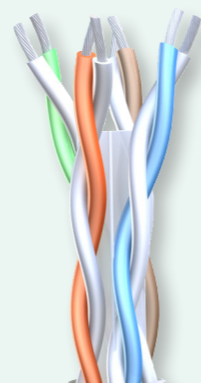
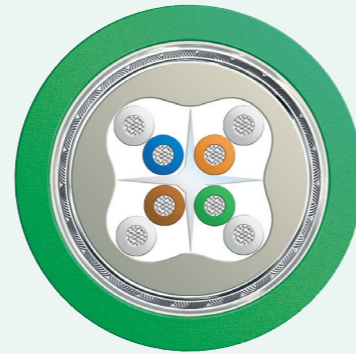
Industrial Ethernet

FieldLink®

Cat 6A ES Trailing Patch Cable

Cable Design

Wire		
Conductor	Stranded tinned copper wire (25awg)	Ø 0,55 mm
Insulation	Polypropylene (PP)	Ø 0,98 mm
Pair		
	2 insulated wires twisted to a pair	
Core		
1° Layer	4 pairs in separating element (WH/BU-WG/OG-WH/GN-WH/BN)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 6,50 mm
Screen	Aluminium foil overlapped	
Braid	Tinned copper wire braid, 90% coverage	
Tape	Plastic tape overlapped	Ø 7,10 mm
Outer Jacket		
	Thermoplastic Polyurethane (TPU) green	Ø 8,80 ± 0,20 mm



Characteristics

- Flame retardant acc. to IEC 60332-1-2,
- Halogen free acc. to IEC 60754-1,
- Oil resistant acc. to DIN EN 60811-404 (7x24h / 90°C),
- UL-Style 21198

Specification

Part Number	Type
L45467-J415-K28	Industrial Ethernet Cat6A ES, trailing patch cable (easy to strip, (FRNC), 4x2x25AWG19, UL recognised: AW

Electrical Data @ 20°C

Loop resistance	≤	290	Ohm/km
Signal run time	≤	5,34	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance		100	MHz
		100±5	Ohm
Operating Voltage (peak)	≤	100	V
Test Voltage (wire/wire/screen rms 50Hz min.)		700	V

Frequency (MHz)	1	4	8	10	16	20	25	31,25	62,5	100	200	250	300	400	500
Next (dB)	75,3	66,3	61,8	60,3	57,2	55,8	54,3	52,8	48,4	45,3	40,8	39,3	38,1	36,3	34,8
PSNext (dB)	72,3	63,3	58,8	57,3	54,2	52,8	51,3	49,9	45,4	42,3	37,8	36,3	35,1	33,3	31,8
ELFext (dB)	67,8	55,8	49,7	47,8	43,7	41,8	39,8	37,9	31,9	27,8	21,8	19,8	18,3	15,8	13,8
PSELFext (dB)	64,8	52,8	46,7	44,8	40,7	38,8	36,8	34,9	28,9	24,8	18,8	16,8	15,3	12,8	10,8
Attenuation (dB/100m)	3,1	5,7	8	8,9	11,2	12,6	14,1	15,8	22,5	28,7	41,4	46,6	51,4	60,1	67,9
Return Loss (dB)	20	23	24,5	25	25	25	24,2	23,3	20,7	19	16,4	15,6	15,6	15,6	15,6

Electrical requirements acc. to IEC 61156-5

Mechanical & Thermal Characteristics

Permissible temperature range	Fixed	-40 ~ +80	°C
Permissible temperature range	Flexing	-30 ~ +70	°C
Min. Bending radius allowed	single	4	x Ø
Min. Bending radius allowed	repeated	8	x Ø
Weight (approx.)		109	kg/km
Trailing Cable for following requirements		1 million bending cycles	
		bending radius 15 x max. Ø	
		at a speed of 4 m/s	
		acceleration 4 m/s²	
		Max. Travel distance 10m	
		Standard atmospheres (20°C)	



Industrial Ethernet

FieldLink®

Cat 6A ES for Trailing and Torsional Stress Applications

Cable Design

Wire

Conductor	Stranded bare copper wire (24awg)	Ø 0,60 mm
Insulation	Polyethylene (PE)	Ø 1,05 mm

Pair

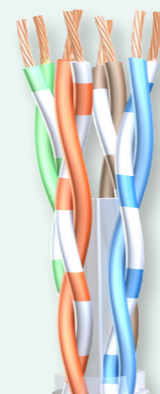
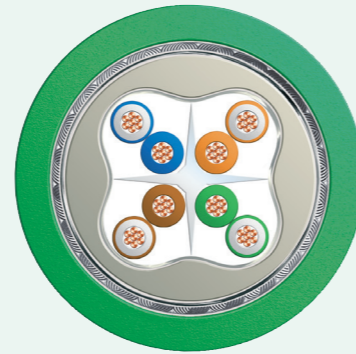
2 insulated wires twisted to a pair

Core

1" Layer	4 pairs in separating element (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)
Tape	Plastic tape overlapped
Easystrip Jacket	Soft Thermoplastic copolymer Ø 6,50 mm
Screen	Aluminium foil overlapped
Braid	Tinned copper wire braid, 90% coverage
Tape	Plastic tape overlapped Ø 7,20 mm

Outer Jacket

Thermoplastic Polyurethane (TPU) green Ø 8,9 ± 0,20 mm



Characteristics

- Flame retardant acc. to IEC 60332-1-2,
- Halogen free acc. to IEC 60754-1,
- Oil resistant acc. to DIN EN 60811-404 (7x24h / 90°C),
- UL-Style 21198

Specification

Part Number	Type
L45467-J416-B28	Industrial Ethernet Cat6A ES, PROFINET patch cable for trailing and torsional stress applications (easy to strip, FRNC), 4x2x24AWG7, UL recognised: AWM

Electrical Data @ 20°C

Loop resistance	≤	180	Ohm/km
Signal run time	≤	5,34	ns/m
Insulation resistance	≥	500	MOhm*km
Characteristic Impedance		100	MHz 100±5 Ohm
Operating Voltage (peak)	≤	100	V
Test Voltage (wire/wire/screen rms 50Hz min.)		700	V

Frequency (MHz)	1	4	8	10	16	20	25	31,25	62,5	100	200	250	300	400	500
Next (dB)	75,3	66,3	61,8	60,3	57,2	55,8	54,3	52,8	48,4	45,3	40,8	39,3	38,1	36,3	34,8
PSNext (dB)	72,3	63,3	58,8	57,3	54,2	52,8	51,3	49,9	45,4	42,3	37,8	36,3	35,1	33,3	31,8
ELFext (dB)	67,8	55,8	49,7	47,8	43,7	41,8	39,8	37,9	31,9	27,8	21,8	19,8	18,3	15,8	13,8
PSELFext (dB)	64,8	52,8	46,7	44,8	40,7	38,8	36,8	34,9	28,9	24,8	18,8	16,8	15,3	12,8	10,8
Attenuation (dB/100m)	3,1	5,7	8	8,9	11,2	12,6	14,1	15,8	22,5	28,7	41,4	46,6	51,4	60,1	67,9
Return Loss (dB)	20	23	24,5	25	25	25	24,2	23,3	20,7	19	16,4	15,6	15,6	15,6	15,6

Electrical requirements acc. to IEC 61156-5

Mechanical & Thermal Characteristics

Permissible temperature range	Fixed	-40 ~ +80	°C
Permissible temperature range	Flexing	-30 ~ +70	°C
Min. Bending radius allowed	single	4	x Ø
Min. Bending radius allowed	repeated	8	x Ø
Weight (approx.)		106	kg/km
Trailing Cable for following requirements		1 million bending cycles	
		bending radius 15 x max. Ø	
		at a speed of 4 m/s	
		acceleration 4 m/s²	
		Max. Travel distance 10m	
		Standard atmospheres (20°C)	



Industrial Ethernet

FieldLink®

Armada® Cat6A Cable for Offshore Use MUD resistant NEK606

Cable Design

Wire

Conductor	Stranded bare copper wire (24awg)	Ø 0,60 mm
Insulation	Polyethylene (PE)	Ø 1,05 mm

Pair

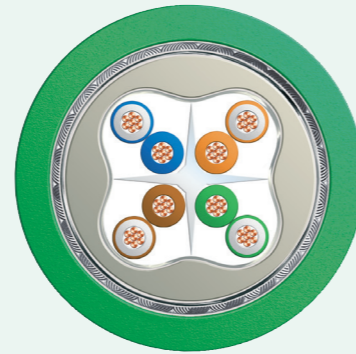
2 insulated wires twisted to a pair

Core

1" Layer	4 pairs in separating element (WHBU/BU-WHOG/OG-WHGN/GN-WHBN/BN)	
Tape	Plastic tape overlapped	
Easystrip Jacket	Soft Thermoplastic copolymer	Ø 6,40 mm
Screen	Alulminate foil overlapped	
Braid	Tinned copper wire braid, 80% coverage	Ø 6,90 mm
Tape	Plastic tape overlapped	

Outer Jacket

Low Smoke Zero Halogen FireFighter® MUD-resistant Ø 8,0 ± 0,20 mm



Characteristics

- Flame retardant acc. to IEC 60332-3-24 (CAT. C),
- Halogen free acc. to IEC 60754,
- MUD resistant acc. to NEK606,
- Sunlight resistant

Specification

Part Number	Type
L45467-J416-B16	Industrial Ethernet Cat6A ES, PROFINET cable for flexible installation in offshore applications with higher oil res. acc. to NEK606 (easy to strip, LSZH), 4x2x24AWG7

Electrical Data @ 20°C

Loop resistance	≤	180	Ohm/km
Signal run time	≤	5,13	ns/m
Insulation resistance	≥	500	MOhm*km
Operating Voltage (effective value)	≤	80	V
Characteristic Impedance	100	MHz	100±5 Ohm
Surface Transfer Impedance of screen	up to 100	MHz	≤ 20 mOhm/m
Coupling attenuation	30-100	MHz	≥ 80 dB
Time delay skew (pair to pair)	≤	45	ns/100m
Relative velocity of propagation	nom.	68	%
Test Voltage (wire/wire/screen rms 50Hz min.)		700	V

Frequency (MHz)	1	4	8	10	16	20	25	31,25	62,5	100	200	250	300	400	500
Next (dB)	75,3	66,3	61,8	60,3	57,2	55,8	54,3	52,8	48,4	45,3	40,8	39,3	38,1	36,3	34,8
PSNext (dB)	72,3	63,3	58,8	57,3	54,2	52,8	51,3	49,9	45,4	42,3	37,8	36,3	35,1	33,3	31,8
ELFext (dB)	67,8	55,8	49,7	47,8	43,7	41,8	39,8	37,9	31,9	27,8	21,8	19,8	18,3	15,8	13,8
PSELFext (dB)	64,8	52,8	46,7	44,8	40,7	38,8	36,8	34,9	28,9	24,8	18,8	16,8	15,3	12,8	10,8
Attenuation (dB/100m)	3,1	5,7	8	8,9	11,2	12,6	14,1	15,8	22,5	28,7	41,4	46,6	51,4	60,1	67,9
Return Loss (dB)	20	23	24,5	25	25	25	24,2	23,3	20,7	19	16,4	15,6	15,6	15,6	15,6

Electrical requirements acc. to IEC 61156-5

Mechanical & Thermal Characteristics

Permissible temperature range	Fixed	-40 ~ +80	°C
Permissible temperature range	Flexing	-25 ~ +80	°C
Min. Bending radius allowed	single	4	x Ø
Min. Bending radius allowed	repeated	8	x Ø
Weight (approx.)		97	kg/km



Industrial Ethernet

FieldLink®

Cat6A for Flexible Installation

Cable Design

Wire

Conductor	Stranded tinned copper wire (23AWG)	Ø 0,72 mm
Insulation	Foamed Polyethylene (PE) with skin	Ø 1,58 mm

Screened Pair

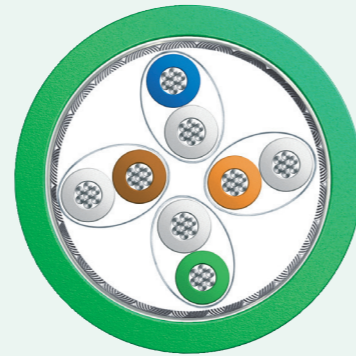
Screen	2 insulated wires twisted to a pair Aluminum foil overlapped
--------	---

Core

1 st Layer	4 screened pairs (WH/BU-WH/OG-WH/GN-WH/BN)	
Braid	Tinned copper wire braid, 85% coverage	
Tape	Plastic tape overlapped	Ø 7,10 mm

Outer Jacket

Outer Jacket	Polyvinylchloride (PVC), Green	Ø 8,7 ± 0,20 mm
--------------	--------------------------------	-----------------



Characteristics

- Flame retardant acc. to IEC 60332-1-2,
- Sunlight resistant,
- Limited oil resistant,
- UL-Style 2461

Specification

Part Number	Type
L45467-J416-C5	Industrial Ethernet Cat6A, PROFINET cable for flexible installation, 4x2x23AWG7, UL recognised: AWM

Electrical Data @ 20°C

Loop resistance	≤	150	Ohm/km
Time delay	≤	5,13	ns/m
Insulation resistance	≥	500	MOhm*km
Operating Voltage (effective value)	≤	80	V
Time delay skew	Pair to Pair	≤	20 ns/100m
Characteristic Impedance	100 MHz	100±5	Ohm
Coupling attenuation	30-100 MHz	≥	80 dB
Test Voltage (wire/wire/screen rms 50Hz min.)		800	V

Frequency (MHz)	1	4	8	10	16	20	25	31,25	62,5	100	200	250	300	400	500
Next (dB)	75,3	66,3	61,8	60,3	57,2	55,8	54,3	52,8	48,4	45,3	40,8	39,3	38,1	36,3	34,8
PSNext (dB)	72,3	63,3	58,8	57,3	54,2	52,8	51,3	49,9	45,4	42,3	37,8	36,3	35,1	33,3	31,8
ELFext (dB)	67,8	55,8	49,7	47,8	43,7	41,8	39,8	37,9	31,9	27,8	21,8	19,8	18,3	15,8	13,8
PSELFext (dB)	64,8	52,8	46,7	44,8	40,7	38,8	36,8	34,9	28,9	24,8	18,8	16,8	15,3	12,8	10,8
Attenuation (dB/100m)	2,1	3,8	5,3	5,8	7,5	8,4	9,4	10,5	15	19,1	27,6	31,1	34,3	40,1	45,3
Return Loss (dB)	20	23	24,5	25	25	25	24,3	23,6	21,5	20,1	18	17,3	17,3	17,3	17,3

Electrical requirements acc. to IEC 61156-5

Mechanical & Thermal Characteristics

Permissible temperature range	-40 ~ +80	°C
Min. Bending radius allowed	repeated	8 x Ø
Min. Bending radius allowed	single	4 x Ø
Pulling Force	≤	150 N
Weight (approx.)		83 kg/km



Stripping Tool



1. After consulting the scale table on the back of the cutter, mark the cable with your thumb. Insert the cable using your thumb as a guide.



2. Close the clamp by turning the dial, for the best results first click the dial by 2 notches.



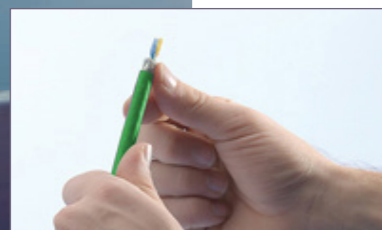
3. Rotate the tool twice away from you, then close the clamp fully and rotate twice more.



4. Pull the stripping tool lengthways from the cable. Avoid tilting the tool as this could damage the wires inside.

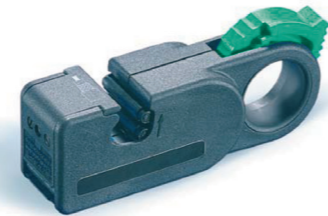


5. Inspect the resulting cable strip, if unsatisfactory rotate or replace the blade cassette and retry.



6. Remove the remaining plastic foil by slitting up the cable with a small slotted screw driver. Once clear attach the stripped cable to the connector of your choice.

Siemens 6GK1901-1GA00 Ethernet Easy Strip (Fast Connect) Stripping tool



FireFighter®

FireFighter cables are produced to exacting IEC standards for fire performance covering 60332-1 flame resistance for single cables and section 3 for bunched cables as well as low smoke generation (61034) and negligible halogen gas emission (60754-1). In addition to these, all FireFighter® cables are sheathed according to IEC60092-359 where applicable for electrical installation in ships as well as being 600 V rated for Tray Cable applications.

In order to meet demanding and diverse customer applications, FireFighter® performance materials are used in conjunction with other brands including DataGuard® (Armoured Cables), Armada® (MOG Cables), SureLAN® (Local area network cables), SureLIGHT® (Fibre Optic) and EventSeries® (Audio & Broadcast).

Whatever the application or installation, where public safety and reliability are concerned, FireFighter® Low smoke zero halogen properties have been proven to perform. It's not just LSZH sheath, It's a FireFighter® Cable.





Index

Part Number	Page No.
11L45467-J16-B35	30-31
11L45467-J17-B15	34-35
14L45467-J16-B136.....	32-33
24L45467-J16-B26	36-37
L45467-J116-C6	18-19
L45467-J15-B15	46-47
L45467-J16-B136	10-11
L45467-J16-B146	14-15
L45467-J16-B216	28-29
L45467-J16-B26	26-27
L45467-J16-B35	8-9
L45467-J17-B115	16-17
L45467-J17-B15	12-13
L45467-J17-B18	20-21
L45467-J17-B46	24-25
L45467-J17-B78	22-23
L45467-J415-C48	52-53
L45467-J415-C5	50-51
L45467-J415-K28	54-55
L45467-J416-B16	58-59
L45467-J416-B28	56-57
L45467-J416-C5	60-61
L45467-J816-B6	42-43
L45581-B41-K8	38-39
L45581-B42-K68	44-45
L45581-B42-K8	40-41
L45581-B42-Y249.....	48-49

Quality Management

Belcom recognise the importance of quality control and constantly monitor our quality performance to ensure compliance with relevant standards whether they are self imposed, statutory or regulatory.

Our management system is approved by DNV to BS-EN-ISO 9001:2008 standard and is an imperative part of our organisation.

Environmental documentation is available at www.belcom.co.uk/qa-environmental





Belcom Cables Ltd

Green Street
Elsenham
Essex
CM22 6DS

Tel: 01279 871150

Fax: 01279 871129

E-mail: sales@belcom.co.uk

Website: www.belcom.co.uk