ELCO
INDUSTRIAL AUTOMATION

flex.i.wire von Elco

Ultraflexible und hochbelastbare Kabel für industrielle Ethernetlösungen

Vorteile von **flex.i.wire**

- verschiedenste Standards schon ab einer Länge von 10 cm
- 360°-Schirmung für sichere Datenübertragung
- extrem beweglich für engste Biegeradien
- schleppkettenfähig
- konfektioniert, umspritzt, zu 100 % getestet
- ab Lager verfügbar

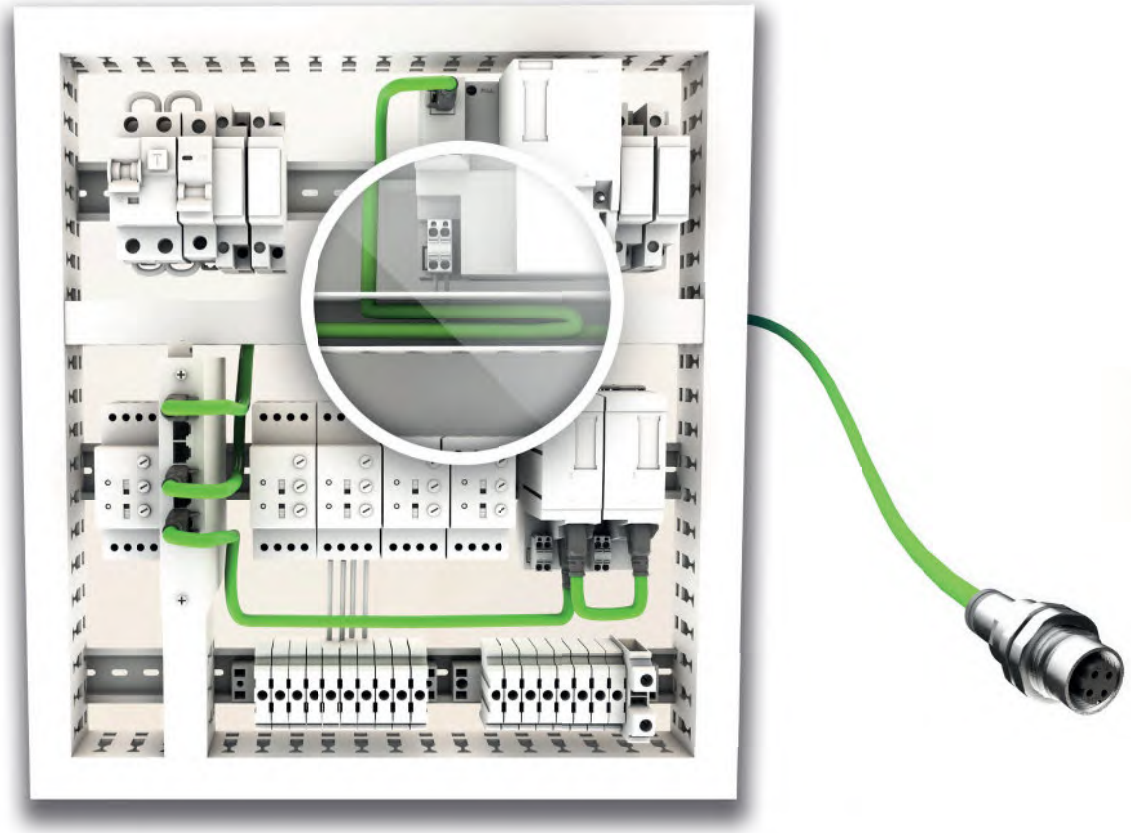
Ein Kabel – hundert Möglichkeiten!

Variieren Sie Anschlüsse und Längen.

Einfache Verdrahtung im Schaltschrank und im Feld

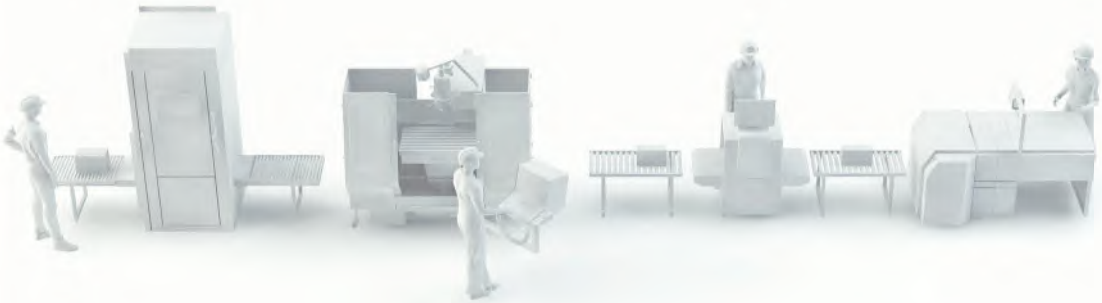
Die Ethernet-Steckverbinder flex.i.wire der Elco Industrie Automation GmbH bilden eine zuverlässige Basis für die Buskommunikation in Ihren Maschinen.

Durch die hohe Qualität und die 360°-Schirmung erhalten Sie einen störungsfreien Aufbau und einen reibungslosen Produktionsablauf in Ihrer Anlage. Die hochflexible Ummantelung ermöglicht extrem enge Biegeradien. So sparen Sie wertvollen Platz in Ihrem Kabelkanal oder der Schleppkette. Da unsere Steckverbinder industriell umspritzt sind, schließen Sie schon beim Einsatz der Ethernet Steckverbinder kategorisch Verdrahtungs- sowie Kontaktfehler aus.



Ethernet auf M8 – M12 – Basis

Anwendungsbeispiel – Verkabelung einer Produktionsstrecke auf M8-M12- / M12-M12-Basis



Compact 67 Slim

Ethernetleitung M8 – M12

Compact 67

Ethernetleitung M12 – M12

Compact 67

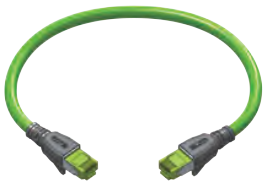
Profinet - RJ45/ RJ45 Pre-wired Cable

Double-ended RJ45 Pre-wired Cable

Cat 5e, 100Mbit/S, 4-pin, IP20

Support: PROFINET EtherCAT EtherNet/IP

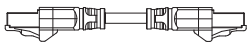
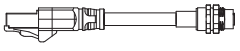
Apply to: Connection between the devices in cabinet, the controller and switch.



Technical Data

Material	
Square Injection Molding Body	TPU
Contact Carrier	Gold plated
Cable	PU
Rated Voltage	250V
Rated Current	4A
Conductor	2x2x26AWG/26AWG，shielded twisted pair
TIA/EIA Grade	Cat5e
Certificate	CE，UL
Protection Class	IP67
Ambient Temperature	-30...+80℃
Mechanical Life	>100

Type List

				
100Base-TX(4wire) Male 1. Yellow(TD+) 2. Orange(TD-) 3. White(RD+) 4. N/C 5. N/C 6. Blue(RD-) 7. N/C 8. N/C 12345678	Cable material	Specification	Type	Type
	PU	26 AWG	E66DA4009M020	E2R6DA4009M020

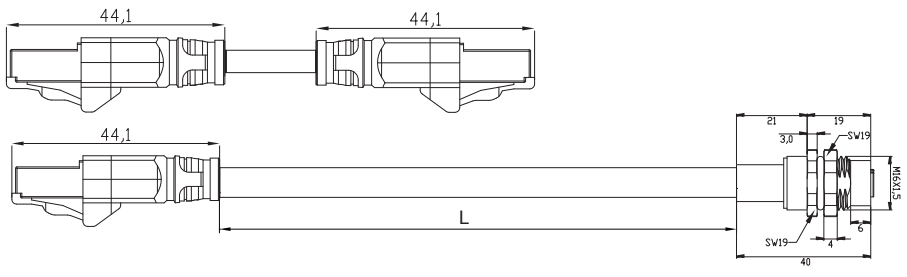
Order Code

E66DA4009Mxxx

66: Double-ended RJ45
60: Single-ended RJ45

003: 30cm cable
020: 2m cable

Dimensions



Profinet - M8-M12 Double-ended Pre-wired Cable

Double-ended M8-M12 Pre-wired Cable

Cat 5e, 100Mbit/, 4-pin, IP67->IP20

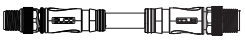
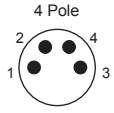
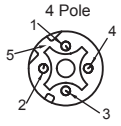
Support: PROFINET EtherCAT EtherNet/IP

Apply to: Connection of panel and cabinet.

Technical Data

Material	
Circular Cordsets	PUR
Contact	Gold plated
Connecting Nut/Bolt	Nickel plated brass
Cable	For details, see cable list.
Rated Voltage	250V
Rated Current	4A
Conductor	2x2x26AWG，shielded twisted pair
TIA/EIA Grade	Cat5e
Certificate	CE，UL
Protection Class	IP67
Ambient Temperature	-30...+80℃
Mechanical Life	>100

Type List

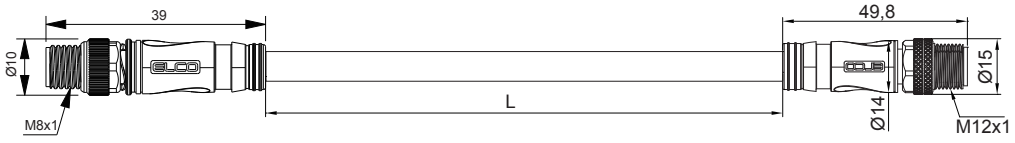
Pin Assignment				
		Cable material	Specification	Type
1-Yellow(TD+) 2-White(RD+) 3-Orange(TD-) 4-Blue(RD-)	1-Yellow(TD+) 2-White(RD+) 3-Blue(RD-) 4-Orange(TD-)	PU	26 AWG	E18D04009M020

Order Code

E18D04009Mxxx

18: M8-M12

Dimensions



Profinet - M12/M12 (Pin) Pre-wired Cable

Double-ended M12 D-code Pre-wired Cable

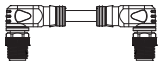
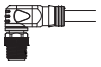
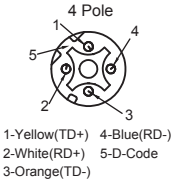
Cat 5e, 100Mbit/S, 4-pin, IP67

Support: PROFINET EtherCAT EtherNet/IP ETHERNET POWERLINK sercos the automation bus

Apply to: Connection of devices on field.

Technical Data	
Material	
Circular Cordsets	PUR
Contact	Gold plated
Connecting Nut/Bolt	Nickel plated brass
Cable	For details, see cable list.
Rated Voltage	250V
Rated Current	4A
Conductor	2x2x22AWG/26AWG，shielded twisted pair
TIA/EIA Grade	Cat5e
Certificate	CE，UL
Protection Class	IP67
Ambient Temperature	-30...+80℃
Mechanical Life	>100

Type List

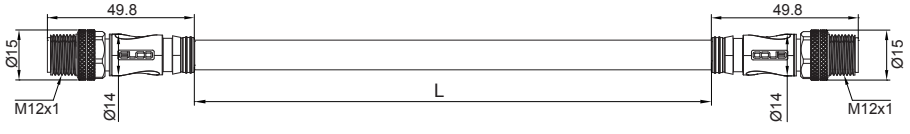
Pin Assignment					
 4 Pole 1 2 3 4 5 1-Yellow(TD+) 2-White(RD+) 3-Orange(TD-) 4-Blue(RD-) 5-D-Code	Cable material	Specification	Type	Type	Type
	PU	22 AWG	E11D04003M020	E1W1WD04003M020	E1W0D04003M020
	PU	26 AWG	E11D04009M020	E1W1WD04009M020	E1W0D04009M020

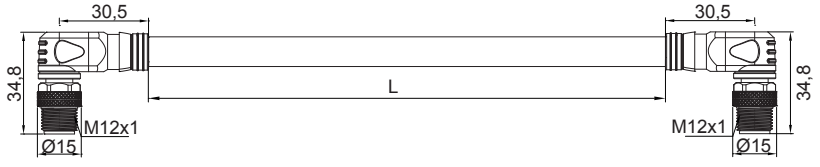
Order Code

E11D04003Mxxx

11:	Straight double-ended M12	003:	84-0003 cable
10:	Straight single-ended M12	009:	84-0009 cable
1W1W:	Angled double-ended M12		
1W:	Angled single-ended M12		

Dimensions





Profinet - M8-M8 Double-ended Pre-wired Cable

Double-ended M8-M8 Pre-wired Cable

Cat 5e, 100Mbit/S, 4-pin, IP67->IP20

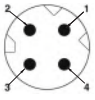
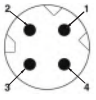
Support: PROFINET EtherCAT EtherNet/IP ETHERNET POWERLINK sercos the automation bus

Apply to: Connection of panel and cabinet.

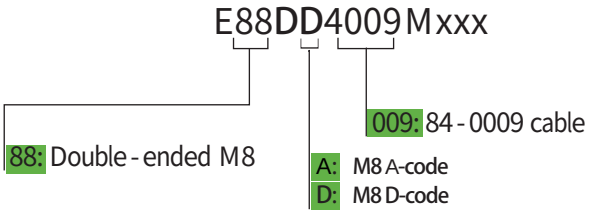
Technical Data

Material	
Circular Cordsets	PUR
Contact	Gold plated
Connecting Nut/Bolt	Nickel plated brass
Cable	For details, see cable list.
Operating Voltage	60V (30V UL)
Operating Current	4A
Conductor	2x2x26 AWG, shielded twisted pair
TIA/EIA Grade	Cat5e
Certificate	CE, UL
Protection Class	IP67
Ambient Temperature	-30...+80℃
Mechanical Life	>100

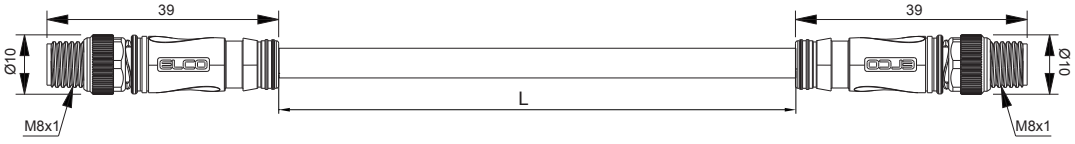
Type List

Pin Assignment				
4 Pole  1-Yellow(TD 2-White(RD+) 3-Blue(RD-) 4-Orange(TD-)	4 Pole  1-Yellow(TD 2-White(RD+) 3-Blue(RD-) 4-Orange(TD-)	Cable material	Specification	Type
		PUR	26 AWG	E88DD4009M020
		PUR	26 AWG	E88DD4009M050
		PUR	26 AWG	E88DD4009M100

Order Code



Dimensions



Profinet - M8-M12 Double-ended Pre-wired Cable

Double-ended M8-M12 Pre-wired Cable

Cat 5e, 100Mbit/, 4-pin, IP67->IP20

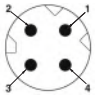
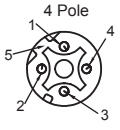
Support: PROFINET EtherCAT EtherNet/IP

Apply to: Connection of panel and cabinet.

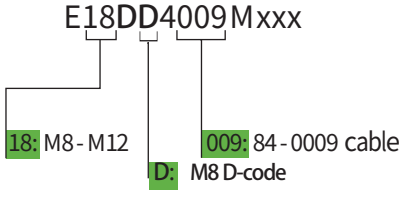
Technical Data

Material	
Circular Cordsets	PUR
Contact	Gold plated
Connecting Nut/Bolt	Nickel plated brass
Cable	For details, see cable list.
Operating Voltage	60V (30V UL)
Operating Current	4A
Conductor	2x2x26 AWG，shielded twisted pair
TIA/EIA Grade	Cat5e
Certificate	CE, UL
Protection Class	IP67
Ambient Temperature	-30...+80 ℃
Mechanical Life	>10

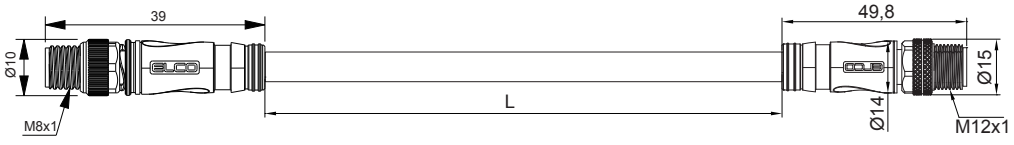
Type List

Pin Assignment				
4 Pole  1-Yellow(TD 2-White(RD+) 3-Blue(RD-) 4-Orange(TD-)	4 Pole  1-Yellow(TD 2-White(RD+) 3-Blue(RD-) 4-Orange(TD-)	Cable material	Specification	Type
		PUR	26 AWG	E18DD4009M020
		PUR	26 AWG	E18DD4009M050
		PUR	26 AWG	E18DD4009M100

Order Code



Dimensions



flex.i.wire 4C 26AWG S/FTQ CAT5 PU CABLE (009)

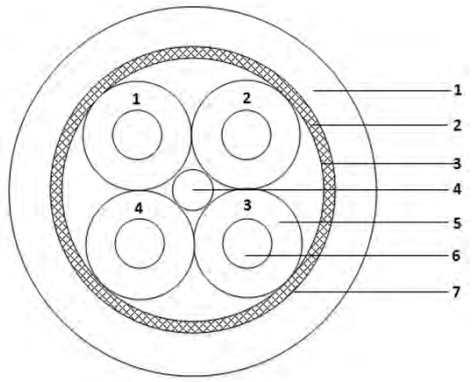
Description

- Rated temperature: 80℃
- Reference standard: UL 758
- Customer`s request
- Product standard certification:UL STYLE 20233
- Flame test: VW-1
- Stranded Tinned copper conductor
- Colour-coded PE insulation
- PU jacket
- Packaging: Per customer request

Application

- Profinet
- 100 Base-Tx

Product figure



Core colour:
1.Blue 2.Brown 3.White/Blue 4.White/Brown

1	Jacket
2	Braid
3	PP-tape+AL-mylar
4	Filler
5	Insulation
6	Conductor
7	Tape(Optional)

Physical characteristics

Structure	Construction	S/FTQ
	Number of Core	4C
Conductor	AWG/Size	26 AWG
	Conductor material	Stranded Tinned copper
	Conductor dimension	19/0.1±0.02 mm
Insulation	Insulation material	PE
	Insulation dimension	0.98±0.1 mm
Cabling	Cabling structure	4C+Filler
Tape	PP-tape	YES
	PP-tape overlapping	>=25%
Shield	Primary overall shield AL-mylar	YES
	Primary overall shield overlapping	25%
	Primary overall shield braid&material	Tinned copper
	Shield coverage Nom	85%
	Tape	Optional
Outer jacket	Outer jacket material	PU
	Outer jacket thickness (nom.)	0.90 mm
	Overall nominal dimension	4.9 ± 0.3 mm
	Outer jacket rip cord	N/A
	Outer jacket colour	Per request
Mechanical characteristics	Operating temperature range	-40 ℃ ~ +80 ℃
	Outer jacket tensile strength	≧10.3 MPa
	Outer jacket elongation	≧100%
	Outer jacket aging condition	113 ±2℃ x 168 hrs
	After aging, Tensile strength variation	>= 70%
	After aging, Elongation variation	>= 45%
Electrical characteristics	Nom. mutual capacitance	≦51 pF/m (800Hz)
	Pair to ground capacitance unbalance	≦340 pF/100m
	Nominal velocity of propagation	65%
	Max. conductor DC resistance	145Ω/km (@ 20°C)
	Max. conductor resistance unbalance	3% (@ 20°C)
	Min. insulation resistance	150 MΩ•KM
	Max. operating voltage - UL	300 V
	Dielectric strength	1,0 kV d.c. or 0,7 kV a.c. for 1 min，or 2,5 kV d.c. or 1,7 kV a.c. for 2 s

flex.i.wire 4C 26AWG S/FTQ CAT5 PU CABLE (009)

Marking

HUAXUN Profinet Trailing Cable E317851 SHIELDED AWM STYLE 20233 80℃ 300V VW-1 26AWG S/FTQ CAT5E ROHS YYYYMMDDJNN *****M	Note : 1.The jacket shall be used black jet print marking excepte white color on black jacket. 2.YYYYMMDDJNN-Batch number. 3.*****-Sequential lmeter marking with 1m intervals. 4.Marking height :3±0.2mm,width 2±0.2mm.

Mechanical performance Requirements for the tests for outer jacket.

Test	Type of compound		test method
Oil resistant	70±1℃x4hrs (IRM 902)	tensile strength retained>=60% original elongation retained >=60% original	ANSI/ICEA S-73
UV resistant	300hrs of xenon-arc exposure	tensile strength and elongation retained >=85%	UL 1581 1200
Trailing test	R=7.5XOD,speed for 3m/s,acceleration for 5m/s^2	>=5 million cycles	

Electrical characteristics

Frequency	Input Impedance impedance	ATT	RL	NEXT	PD		
(MHz)	(Ω)	(dB/100m Max)	(dB Min)	(dB Min)	(dB/100m Max)		
0.772	100+/-15	2.70	23.0	64.0	555.0		
1	100+/-15	3.15	23.0	62.0	555.0		
4	100+/-15	6.45	23.0	53.0	555.0		
10	100+/-15	9.90	23.0	47.0	555.0		
16	100+/-15	12.30	23.0	44.0	555.0		
20	100+/-15	13.80	23.0	42.0	555.0		
31.25	100+/-15	17.70	21.1	40.0	555.0		
62.5	100+/-15	25.65	18.1	35.0	555.0		
100	100+/-15	33.00	16.0	32.0	555.0		

* Cable that meet the requirements of the characteristic impedance are not required to be measured for return loss;

alternately cables that meet the return loss requirements are not required to be measured for characteristic impedance.

FieldLink®

Industrial Ethernet Cat 5e ES (003)

Design

Wire:

Stranded tinned wire 7 X 0.25	ø 0.75 mm
Insulation of Polyethylene (PE)	ø 1.5 mm

Core:

Filler as central element	
1. layer: 4 wires 2Y 0.75/1.5 LI	
Sequence of colors: WH-YE-BU-OG	
Plastic tape, overlapped	
Inner jacket: Thermoplastic copolymer (FRNC)	ø 3.9 mm
Alulaminate foil overlapped	
Shield braiding of tinned copper wires 0.13 mm dia	
Coverage about 85%	ø 4.7 mm

Jacket:

Polyurethane (PUR) GN	
Wall thickness about 0.9 mm	ø (6.5 ±0.2) mm

Printing: "sequential length in metres" LEONI LA INDUSTRIAL ETHERNET TRAILING CABLE * PROFINET Type C ES CAT5 PLUS * 22AWG (SHIELDED) * E130266-LA c UL us AWM STYLE 20233 * AWM I/II A/B 80°C 300V FT1 * "year/internal order number"
Textintervals about 1000 mm

Electrical data at 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 (1 kHz)		nom.	52	nF/km
Surface transfer impedance	10 MHz		20	mOhm/m
Test voltage (wire/wire/screen rms 50Hz 1min)		=	2000	V

Near-end crosstalk attenuation

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100
typ. value (dB - 100m)	80	76	70	65	63	60	55	50

Attenuation

Frequency (MHz)	1	4	10	16	20	31.25	62.5	100
typ. value (dB/100m)	2,1	4	6,3	8	9	11,4	16,5	21,3
(dB/100ft)	(0,6)	(1,2)	(1,9)	(2,4)	(2,7)	(3,5)	(5,0)	(6,5)

The electrical requirements similar to EN 50288-2-1

Mechanical and thermal characteristics
Conductor/Screen material acc. to DIN EN 13602 Cu-ETP-A...-B
Insulating material acc. to DIN EN 50290-2-23 (VDE 0819), table L/MD (HD 624.3)
Jacket material acc. F45052-F5100 (similar to DIN VDE 0282)
Flame retardant acc. to IEC 60332-1-2
Oil resistant acc. to DIN EN 60811-2-1

Other characteristics:
RoHS compliant (DirectiRoHS compliant (Directive 2011/65/EC)ve 2011/65/EC)
UV-resistant, Halogen free

Tensile strength ≤ 150N
Trailing cable for following requirements
- 3 million bending cycles
- diameter 200 mm
- at a speed of 4 m/s
- acceleration 4 m/s²

Permissible temperature range : -40°C up to +70°C
During laying : -20°C up to +60°C
Transport temperature range : -50°C up to +70°C
Min. bending radius allowed : repeated 7,5X ø , single 5X ø
Weight about : 61 Kg/km (40,9 lb/1000ft)

Application:
Trailing cable