M12 L-CODE CABLE ASSEMBLY

M12 Power L-code connectors are an extension of the current M12 IEC standard and have been selected by PROFIBUS and PROFINET International as the standard for 24-volt power supply systems used in PROFINET devices. An extension of TE's M12 product portfolio, M12 L-code cable assemblies handle up to 16A per pin – the highest in TE's M12 family – delivering four times the power of standard M12 connectors while providing reliable and efficient power supply.

M12 Power L-coded connectors take up to 40% less space and almost 80% more power than 7/8" connectors traditionally used for high-power connections. The M12 power cable assemblies are available in both male and female connectors and suitable for every purpose with its conductor size from 1.5 mm^2 up to 2.5 mm^2 allowing for a more compact build of a high-power solutions for automation devices.

TE's new M12 Power L-code connectors are IP67 rated, protected from dust and resist temporary submersion in water at depths of up to 1 meter for 30 minutes. The L-coding version is designed for DC power supplies with 63 V DC / 16 A, where a high current and low voltage is required making ideal for Fieldbus Ethernet I/O boxes, Ethernet systems, Network Devices, Motors and Drives and Valve applications. The power cable assemblies are available through TE's global distribution network, which provides customers with short lead-times and fast responses for technical support.

KEY FEATURES

- IEnclosure rating of IP67
- 360 degrees shielding for reliable EMC protection and robustness
- Preventing mismatching connectors with different voltages
- PROFINET-conforming color scheme with L-coding versions
- Different cable materials PUR or PVC in shielded and non-shielded versions
- Custom specifications and cable lengths are available
- Depending on the material, the assemblies withstand up to 4 million flexes, machine oils, abrasion and UV radiation
- The new assemblies are available with several standard cable length options from 0.5m through to 20m

BENEFITS

- Unit remains protected and fully operational in most industrial applications
- Secured signal connections and data transmission
- Protection against mismatching with coded pin connector patterns
- PNO approved for immediate implementation into PROFINET standard and embracing miniaturization of distribution boxes
- One stop shop solution with broad product portfolio with cable jacket colors and material options
- Highly configurable with numerous connector variations, standard cable lengths
  up to 20mtrs and wire sizes

APPLICATIONS

- Industrial communications
- Industrial machinery
- Robotics
- Material handling
- Industrial control and factory automation
- Test equipment
- I/O connectivity
- Sensor and actuators

ELECTRICAL

- 63V DC/AC
- 12A (16AWG)
- 16A (14AWG)
- Initial value contact resistance: 5mΩ Max.
- Rated impulse voltage 1.5KV

MECHANICAL

- Durability: 100 cycles
- Degree of protection: IP67
- Mating and un-mating force:
  - Insertion: 30N max. for 4P,45N Max. for 5P
  - Withdraw: 30N max. for 4P,45N Max. for 5P
- Sinusoidal vibration per IEC60512, Test 6d
- Mechanical shock per EIA364-27

STANDARDS

- UL 2237
- AWM style cables
- Electrical Standard 61076-2-111

MATERIALS

- Nylon for HSG
- TPU for overmolding
- Copper alloy for metal nuts, Nickel plated
  Cable jacket materials: PVC and PUR
- Cable information:
  - Temperature rating:
    - Power cable AWM2464 4C AWG14 (2.5mm²)
      PVC black
      Operating temperature -40°C to +80°C (fixed)
      -20°C to +80°C (flexible)
    - Power cable AWM20233 4C AWG16 (1.5mm²)
      PUR black drag chain
      Operating temperature -50°C to +80°C (fixed)
      -30°C to +80°C (flexible)
    - Power cable AWM2464 5C AWG14 (2.5mm²)
      PVC Gray
      Operating temperature -40°C to +80°C (fixed)
      -20°C to +80°C (flexible)
    - Power cable AWM20233 5C AWG14 (2.5mm²)
      PUR Gray drag chain
      Operating temperature -40°C to +80°C (fixed)
      -20°C to +80°C (flexible)
    - Power cable AWM20233 5C AWG16 (1.5mm²)
      PUR Gray drag chain
      Operating temperature -50°C to +80°C (fixed)
      -30°C to +80°C (flexible)
    - Power cable AWM20233 5C AWG14 (2.5mm²)
      PUR Gray Shielded Drag chain
      Operating temperature -50°C to +80°C (fixed)
      -30°C to +80°C (flexible)
  - PUR cables suitable for drag chain application
    (up to 4 million cycles)
  - Oil resistant
  - Flame retardant: VW-1/FT1
  - UV resistant
  - High Conductivity Copper alloy for terminals, Gold plated

Note: Color coding has been introduced by the "PROFIBUS and PROFINET International" (PI) user organization for better identification and to avoid confusion during installation:

- 4-pole versions have a black contact carrier and jacket
- 5-pole versions have a grey contact carrier and jacket

The contact carriers and the cables are color-coded so that end users don't confuse the 4-pin and 5-pin variants. The 4-pin L-coded M12 variants have a black contact carrier and cable. The 5-pin variants with an FE contact have a gray contact carrier and cable.

T	4	1	S	B	X	W	Y	L	M	N	-XXX

T	TE Brand
4	Circular Connector
1	M12

S	Shielding
5	Unshielded
6	Shielded

B	Forms
1	Single Sided
2	Double Sided

X	Interface Type
1	Male Straight
2	Male Angled
3	Female Straight
4	Female Angled
5	Male Straight to Female Straight
6	Male Straight to Female Angled
A	Male Angled to Female Straight

W	Wire Gauge
9	14 AWG PVC
B	14 AWG PUR
C	16 AWG PUR

Y	Cable Grip
9	Black TPU

L	Code Type
L	L Code

M	Jacket Color
1	Black
2	Grey

N	Pole Numbers
4	4 Poles
5	5 Poles

-00L	Cable Length
-001	0.5M
-002	1.0M
-003	1.5M
-020	2.0M
-004	3.0M
-005	5.0M
-006	7.0M
-007	10.0M
-200	20.0M
-XXX	**Customized Cable Length**
-XX0	XX.0M
-XX5	XX.5M
-99X	(<1M)0.XM

Following PI Guidelines, the available configurations are as below table:

Wire Gauge	Positions	Amp/V	Cable Materials	Contact Carrier
AWG14 (2.5mm²)	4	16A/63V	PVC black	Black
AWG16 (1.5mm²)	4	12A/63V	PUR black drag	Black
AWG14 (2.5mm²)	5 (4+FE)	16A/63V	PVC gray	Gray
AWG14 (2.5mm²)	5 (4+FE)	16A/63V	PUR gray drag	Gray
AWG16 (1.5mm²)	5 (4+FE)	12A/63V	PUR gray drag	Gray
AWG14 (2.5mm²)	5 (4+FE)	16A/63V	PUR gray Shield drag	Gray

Note: Color coding has been introduced by the "PROFIBUS and PROFINET International" (PI) user organization for better identification and to avoid confusion during installation:

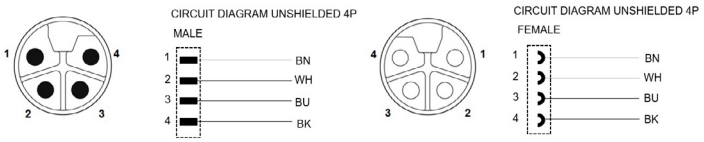
- 4-pole versions have a black contact carrier and jacket
- 5-pole versions have a grey contact carrier and jacket

The contact carriers and the cables are color-coded so that end users don't confuse the 4-pin and 5-pin variants. The 4-pin L-coded M12 variants have a black contact carrier and cable. The 5-pin variants with an FE contact have a gray contact carrier and cable.

WIRING SCHEMA UNSHIELDED 4P

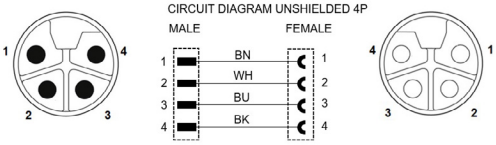
Wiring Diagram: M12 L-code Cable Single Ended

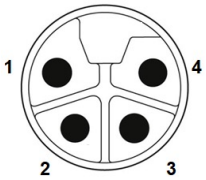
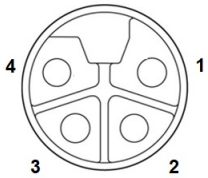
From Pin	4 Poles	To Pin
1	Brown	-
2	White	-
3	Blue	-
4	Black	-
Shielded	Metal Nut	-



Wiring Diagram: M12 L-code Cable Double Ended

From Pin	4 Poles	To Pin
1	Brown	1
2	White	2
3	Blue	3
4	Black	4

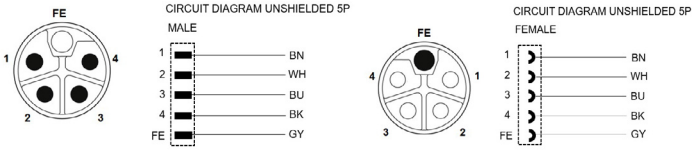


Application	Code	Pin Assignment	Male	Female	Shielding
Power	L-code	PIN1 Brown PIN2 White PIN3 Blue PIN4 Black			Option on metal nut

WIRING SCHEMA UNSHIELDED 5P

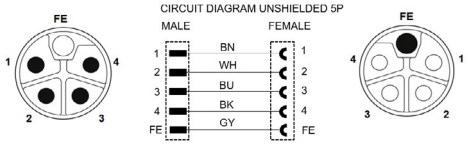
Wiring Diagram: M12 L-code Cable Single Ended

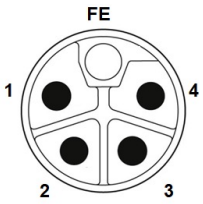
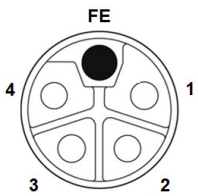
From Pin	5 Poles	To Pin
1	Brown	-
2	White	-
3	Blue	-
4	Black	-
FE	Gray	-



Wiring Diagram: M12 L-code Cable Double Ended

From Pin	5 Poles	To Pin
1	Brown	1
2	White	2
3	Blue	3
4	Black	4
FE	Gray	FE

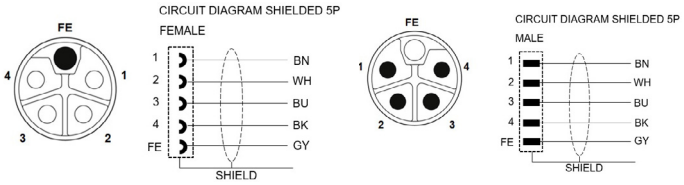


Application	Code	Pin Assignment	Male	Female	Shielding
Power	L-code	PIN1 Brown PIN2 White PIN3 Blue PIN4 Black FE Gray			N/A

WIRING SCHEMA SHIELDED 5P

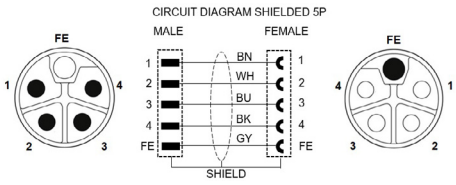
Wiring Diagram: M12 L-code Cable Single Ended

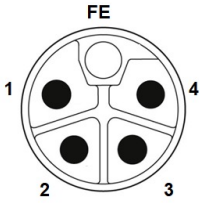
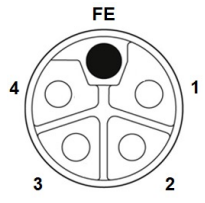
Side 1	5 Poles	Side 2
1	Brown	-
2	White	-
3	Blue	-
4	Black	-
FE	Gray	-
Shielded	Metal Nut	-



Wiring Diagram: M12 L-code Cable Double Ended

Side 1	5 Poles	Side 2
1	Brown	1
2	White	2
3	Blue	3
4	Black	4
FE	Gray	FE
Shielded	Metal Nut	Shielded



Application	Code	Pin Assignment	Male	Female	Shielding
Power	L code	PIN1 Brown PIN2 White PIN3 Blue PIN4 Black FE Gray			On metal nut

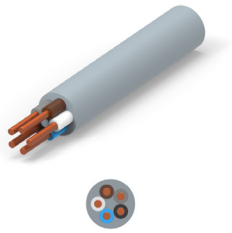
Part Number List

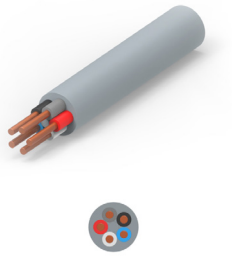
Part Number	Part Description	Code	POS	Type	Cable Material
T4151199L14-001	M12L-4MS-0.5-PVC 14AWG BK	L	4	Male Straight	PVC 14 AWG Black 
T4151299L14-001	M12L-4MR-0.5-PVC 14AWG BK			Male Right Angle	
T4151399L14-001	M12L-4FS-0.5-PVC 14AWG BK			Female Straight	
T4151499L14-001	M12L-4FR-0.5-PVC 14AWG BK			Female Right Angle	
T4152599L14-001	M12L-4MS-0.5-4FS-PVC 14AWG BK			Male Straight to Female Straight	
T4152699L14-001	M12L-4MS-0.5-4FR-PVC 14AWG BK			Male Straight to Female Right Angle	
T4152A99L14-001	M12L-4MR-0.5-4FS-PVC 14AWG BK			Male Right Angle to Female Straight	

Part Number	Part Description	Code	POS	Type	Cable Material
T41511C9L14-001	RPC-M12L-4MS-0.5-PUR 16AWG BK	L	4	Male Straight	PUR 16 AWG Black  
T41513C9L14-001	RPC-M12L-4FS-0.5-PUR 16AWG BK			Female Straight	
T41514C9L14-001	RPC-M12L-4FR-0.5-PUR 16AWG BK			Female Right Angle	
T41525C9L14-001	RPC-M12L-4MS-0.5-4FS-PUR 16AWG BK			Male Straight to Female Straight	
T41526C9L14-001	RPC-M12L-4MS-0.5-4FR-PUR 16AWG BK			Male Straight to Female Right Angle	
T4152AC9L14-001	RPC-M12L-4MR-0.5-4FS-PUR 16AWG BK			Male Right Angle to Female Straight	

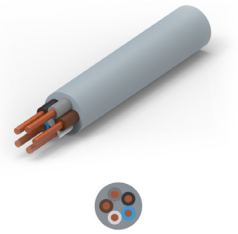
Note: Cable lengths are available up to 20mtrs. For full scope of lengths please visit PN guide on page 3

Part Number List

Part Number	Part Description	Code	POS	Type	Cable Material
T4151199L25-001	RPC-M12L-5MS-0.5-PVC 14AWG GY	L	5(4+FE)	Male Straight	PVC 14 AWG Gray 
T4151399L25-001	RPC-M12L-5FS-0.5-PVC 14AWG GY			Female Straight	
T4151499L25-001	RPC-M12L-5FR-0.5-PVC 14AWG GY			Female Right Angle	
T4152599L25-001	RPC-M12L-5MS-0.5-5FS-PVC 14AWG GY			Male Straight to Female Straight	
T4152699L25-001	RPC-M12L-5MS-0.5-5FR-PVC 14AWG GY			Male Straight to Female Right Angle	
T4152A99L25-001	RPC-M12L-5MR-0.5-5FS-PVC 14AWG GY			Male Right Angle to Female Straight	

Part Number	Part Description	Code	POS	Type	Cable Material
T41511B9L25-001	RPC-M12L-5MS-0.5-PUR 14AWG GY	L	5(4+FE)	Male Straight	PUR 14 AWG Gray 
T41512B9L25-001	RPC-M12L-5MR-0.5-PUR 14AWG GY			Male Right Angle	
T41513B9L25-001	RPC-M12L-5FS-0.5-PUR 14AWG GY			Female Straight	
T41514B9L25-001	RPC-M12L-5FR-0.5-PUR 14AWG GY			Female Right Angle	
T41525B9L25-001	RPC-M12L-5MS-0.5-5FS-PUR 14AWG GY			Male Straight to Female Straight	
T41526B9L25-001	RPC-M12L-5MS-0.5-5FR-PUR 14AWG GY			Male Straight to Female Right Angle	
T4152AB9L25-001	RPC-M12L-5MR-0.5-5FS-PUR 14AWG GY			Male Right Angle to Female Straight	

Part Number List

Part Number	Part Description	Code	POS	Type	Cable Material
T41511C9L25-001	RPC-M12L-5MS-0.5-PUR 16AWG GY	L	5(4+FE)	Male Straight	PUR 16 AWG Gray 
T41512C9L25-001	RPC-M12L-5MR-0.5-PUR 16AWG GY			Male Right Angle	
T41513C9L25-001	RPC-M12L-5FS-0.5-PUR 16AWG GY			Female Straight	
T41514C9L25-001	RPC-M12L-5FR-0.5-PUR 16AWG GY			Female Right Angle	
T41525C9L25-001	RPC-M12L-5MS-0.5-5FS-PUR 16AWG GY			Male Straight to Female Straight	
T41526C9L25-001	RPC-M12L-5MS-0.5-5FR-PUR 16AWG GY			Male Straight to Female Right Angle	
T4152AC9L25-001	RPC-M12L-5MR-0.5-5FS-PUR 16AWG GY			Male Right Angle to Female Straight	

Part Number	Part Description	Code	POS	Type	Cable Material
T41611B9L25-001	RPC-M12L-5MS-0.5-SH PUR 14AWG GY	L	5(4+FE)	Male Straight	PUR 14 AWG Shielded Gray  
T41612B9L25-001	RPC-M12L-5MR-0.5-SH PUR 14AWG GY			Male Right Angle	
T41613B9L25-001	RPC-M12L-5FS-0.5-SH PUR 14AWG GY			Female Straight	
T41614B9L25-001	RPC-M12L-5FR-0.5-SH PUR 14AWG GY			Female Right Angle	
T41625B9L25-001	RPC-M12L-5MS-0.5-5FS-SH PUR 14AWG GY			Male Straight to Female Straight	
T41626B9L25-001	RPC-M12L-5MS-0.5-5FR-SH PUR 14AWG GY			Male Straight to Female Right Angle	
T4162AB9L25-001	RPC-M12L-5MR-0.5-5FS-SH PUR 14AWG GY			Male Right Angle to Female Straight	