

**maxon motor**

**maxon motor control  
Cable Starting Set**

**EPOS Positioning Controller  
Edition October 2005**

# ***EPOS* 70/10**

**Positioning Controller**

**Documentation**

## **Cable Starting Set**



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### 3 Introduction

This documentation “Cable Starting Set” provides the wiring details from each EPOS cable. It contains pictures, drawings, cable specification, pin assignment and detailed connector information. The included “Cable selector” helps to choose the correct cable.

The latest edition of these “Cable Starting Set”, additional documentation and software for EPOS positioning controller may also be found in the internet under <http://www.maxonmotor.com> category <Service>, subdirectory <Downloads>.

### 4 How to use this guide

#### Setup



Getting Started

#### Installation



- Cable Starting Set



- Hardware Reference

#### Configuration



- Graphical User Interface

#### Programming



- Windows DLL



- IEC1131 Libraries



- Firmware Specification



- Communication Guide

#### Application



- Application Notes
- Application Samples

Figure 1: EPOS documentation hierarchy

## 5 Cable selector

### 5.1 EPOS with maxon DC motor with separated motor and encoder cable

EPOS power cable (Connector J1).....	order number	275829
EPOS motor cable (Connector J2).....	order number	275851
EPOS encoder cable (Connector J4).....	order number	275934

Optional:

EPOS power cable [Logic supply] (Connector J1A).....	order number	275829
EPOS signal cable 1 (Connector J5).....	order number	275932
EPOS signal cable 2 (Connector J5A).....	order number	300586

### 5.2 EPOS with maxon EC motor with separated motor and encoder cable

EPOS power cable (Connector J1).....	order number	275829
EPOS motor cable (Connector J2).....	order number	275851
EPOS Hall sensor cable (Connector J3).....	order number	275878
EPOS encoder cable (Connector J4).....	order number	275934

Optional:

EPOS power cable [Logic supply] (Connector J1A).....	order number	275829
EPOS signal cable 1 (Connector J5).....	order number	275932
EPOS signal cable 2 (Connector J5A).....	order number	300586

### 5.3 RS-232 Communication

EPOS RS232-COM cable (Connector J6).....	order number	275900
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### 5.4 CAN Communication

EPOS CAN-COM cable (Connector J7 or J8).....	order number	275908
EPOS CAN termination plug (Connector J7 or J8).....	order number	275937

Optional:

EPOS CAN-CAN cable (Connector J7 or J8).....	order number	275926
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## 6 EPOS power cable [Power supply] (Connector J1)

Order number: EPOS power cable **275829**



Figure 2: EPOS power cable 275829

Technical data: The “EPOS power cable” is a 2 x 0.75 mm<sup>2</sup>, 3 m length cable.



Figure 3: EPOS power cable head A

The used Molex Mini-Fit Jr.<sup>TM</sup> connector fits to EPOS 70/10 connector “J1 Power Supply”.

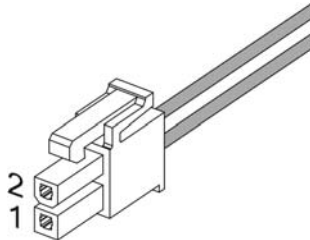


Figure 4: Pin assignment EPOS power cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	Black “1”		Power_Gnd	Ground of supply voltage
2	Black “2”		+V <sub>CC</sub>	Power supply voltage +11 ... +70 VDC

Connector: Molex Mini-Fit Jr.<sup>TM</sup> 2 poles (39-01-2020)  
 Crimp terminals: Molex Mini-Fit Jr.<sup>TM</sup> female crimp terminals (444-76-1112)  
 Hand crimper: Molex hand crimper (Europe: 69008-0724; America: 11-01-0197)



Figure 5: EPOS power cable head B

Connect this cable end to the power supply (+11 ... +70 VDC).

Pin No.	Colour	Twisted wire	Signal	Description
1	Black “-“		Power_Gnd	Ground of supply voltage
2	Black “+“		+V <sub>CC</sub>	Power supply voltage +11 ... +70 VDC

Cable end sleeve: 0.75 mm<sup>2</sup>

## 7 EPOS power cable [Logic supply] (Connector J1A)

Order number: EPOS power cable **275829**



Figure 6: EPOS power cable 275829

Technical data: The “EPOS power cable” is a 2 x 0.75 mm<sup>2</sup>, 3 m length cable.



Figure 7: EPOS power cable head A

The used Molex Mini-Fit Jr.<sup>TM</sup> connector fits to EPOS 70/10 connector “J1A Logic supply”.

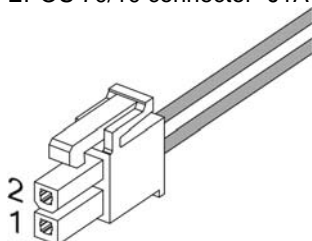


Figure 8: Pin assignment EPOS power cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	Black “1”		Power_Gnd	Ground of supply voltage
2	Black “2”		+V <sub>C</sub>	Logic supply voltage +11 ... +70 VDC

Connector: Molex Mini-Fit Jr.<sup>TM</sup> 2 poles (39-01-2020)  
 Crimp terminals: Molex Mini-Fit Jr.<sup>TM</sup> female crimp terminals (444-76-1112)  
 Hand crimper: Molex hand crimper (Europe: 69008-0724; America: 11-01-0197)





Figure 9: EPOS power cable head B

Connect this cable end to the logic supply (+11 ... +70 VDC).

Pin No.	Colour	Twisted wire	Signal	Description
1	Black “-”		Power_Gnd	Ground of supply voltage
2	Black “+”		+V <sub>C</sub>	Supply voltage +11 ... +70 VDC

Cable end sleeve: 0.75 mm<sup>2</sup>

## 8 EPOS motor cable (Connector J2)

Order number: EPOS motor cable **275851**



Figure 10: EPOS motor cable 275851

The “EPOS motor cable” is a 3 x 0.75 mm<sup>2</sup>, shielded, 3 m length cable.



Figure 11: EPOS motor cable head A

The used Molex Mini-Fit Jr.<sup>TM</sup> connector fits to EPOS 70/10 connector “J2 Motor”.

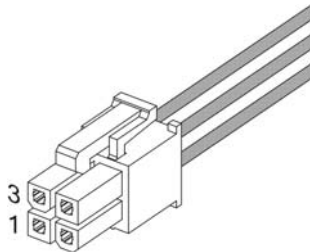


Figure 12: Pin assignment EPOS motor cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	White		Motor winding 1 (+M)	EC motor: Winding 1 DC motor: Motor +
2	Brown		Motor winding 2 (-M)	EC motor: Winding 2 DC motor: Motor -
3	Green		Motor winding 3	EC motor: Winding 3
4	Black		Motor shield	Cable shield

Connector: Molex Mini-Fit Jr.<sup>TM</sup> 4 poles (39-01-2040)  
 Crimp terminals: Molex Mini-Fit Jr.<sup>TM</sup> female crimp terminals (444-76-1112)  
 Hand crimper: Molex hand crimper (Europe: 69008-0724; America: 11-01-0197)



Figure 13: EPOS motor cable head B

Connect this cable end to the motor windings.

Pin No.	Colour	Twisted wire	Signal	Description
	White		Motor winding 1 (+M)	EC motor: Winding 1 DC motor: Motor +
	Brown		Motor winding 2 (-M)	EC motor: Winding 2 DC motor: Motor -
	Green		Motor winding 3	EC motor: Winding 3
	Black		Motor shield	Cable shield

Cable end sleeve: 0.75 mm<sup>2</sup>

**Note:**

For EMC-compliant installation the cable shield should be connected to the motor housing.

## 9 EPOS Hall sensor cable (Connector J3)

Order number: EPOS Hall sensor cable **275878**



Figure 14: EPOS Hall sensor cable 275878

The “EPOS Hall sensor cable” is a 5 x 0.14 mm<sup>2</sup>, shielded, 3 m length cable.



Figure 15: EPOS Hall sensor cable head A

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector “J3 Hall sensor”.

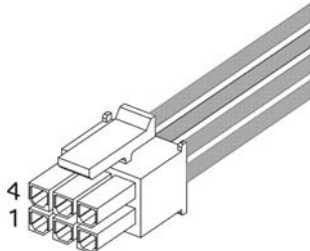


Figure 16: Pin assignment EPOS Hall sensor cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	Green		Hall sensor 1	Hall sensor 1 Input
2	Brown		Hall sensor 2	Hall sensor 2 Input
3	White		Hall sensor 3	Hall sensor 3 Input
4	Yellow		GND	Ground of Hall supply
5	Grey		+V <sub>Hall</sub>	Hall sensor supply voltage +5 VDC / 30 mA
6	Black		Hall shield	Cable shield

Connector: Molex Micro-Fit 3.0™ 6 poles (430-25-0600)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)



Figure 17: EPOS Hall sensor cable head B

Connect this cable end to the Hall sensor

Pin No.	Colour	Twisted wire	Signal	Description
	Green		Hall sensor 1	Hall sensor 1 Input
	Brown		Hall sensor 2	Hall sensor 2 Input
	White		Hall sensor 3	Hall sensor 3 Input
	Yellow		GND	Ground of Hall supply
	Grey		+V <sub>Hall</sub>	Hall sensor supply voltage +5 VDC / 30 mA
	Black		Hall shield	Cable shield

Cable end sleeve: 0.14 mm<sup>2</sup>

**Note:**

For EMC-compliant installation the cable shield should be connected to the motor housing.

## 10 EPOS encoder cable (Connector J4)

Order number: EPOS encoder cable **275934**



Figure 18: EPOS encoder cable 275934

The “EPOS encoder cable“ is a 10 x AWG28, round-jacket, twisted pair flat cable, pitch 1.27 mm, 3.20 m length cable.



Figure 19: EPOS encoder cable head A

The used DIN 41651 female connector fits to EPOS 70/10 connector “J4 Encoder“.

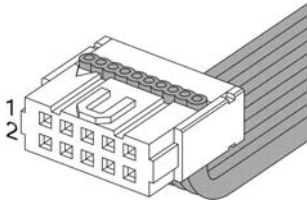


Figure 20: Pin assignment EPOS encoder cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	Brown	Pair 1	n.c.	Not connected
2	White	Pair 1	+5 VDC / 100 mA	Encoder supply voltage
3	Red	Pair 2	GND	Ground
4	White	Pair 2	n.c.	Not connected
5	Orange	Pair 3	Channel A\	Channel A complement
6	White	Pair 3	Channel A	Channel A
7	Yellow	Pair 4	Channel B\	Channel B complement
8	White	Pair 4	Channel B	Channel B
9	Green	Pair 5	Channel I\	Index complement
10	White	Pair 5	Channel I	Index

Connector: DIN 41651 female connector, pitch 2.54 mm, 10 poles, plug strain relief



Figure 21: EPOS encoder cable head B

Connect this cable end to the encoder.

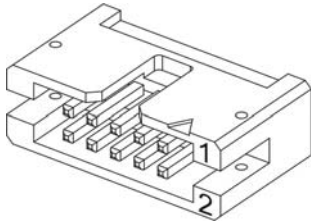


Figure 22: Pin assignment EPOS encoder cable head B

Pin No.	Colour	Twisted wire	Signal	Description
1	Brown	Pair 1	n.c.	Not connected
2	White	Pair 1	+5 VDC / 100 mA	Encoder supply voltage
3	Red	Pair 2	GND	Ground
4	White	Pair 2	n.c.	Not connected
5	Orange	Pair 3	Channel A\	Channel A complement
6	White	Pair 3	Channel A	Channel A
7	Yellow	Pair 4	Channel B\	Channel B complement
8	White	Pair 4	Channel B	Channel B
9	Green	Pair 5	Channel I\	Index complement
10	White	Pair 5	Channel I	Index

Connector: DIN 41651 Plug, pitch 2.54 mm, 10 poles, plug strain relief

**Note:**

EPOS encoder cable head B, the pin out suits for example:

- maxon digital MR-Encoder type ML, L all with Line Driver
- maxon digital encoder HEDL 55\_ with Line Driver RS 422

## 11 EPOS signal cable 1 (Connector J5)

Order number: EPOS signal cable 1 **275932**



Figure 23: EPOS signal cable 1 275932

The "EPOS signal cable 1" is a 16 x 0.14 mm<sup>2</sup>, 3 m length cable.



Figure 24: EPOS signal cable 1 head A

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector "J5 Signal 1".

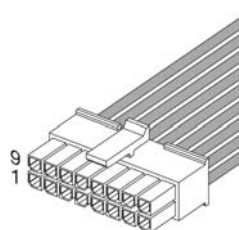


Figure 25: Pin assignment EPOS signal cable 1 head A

Pin No.	Colour	Twisted wire	Signal	Description
1	White		IN_COM 2	Common signal 2 for DigIN4...6
2	Brown		IN_COM 1	Common signal 1 for DigIN1...3
3	Green		DigIN 6	Digital input 6 "negative limit switch"
4	Yellow		DigIN 5	Digital input 5 "positive limit switch"
5	Grey		DigIN 4	Digital input 4 "Home switch"
6	Pink		DigIN 3	Digital input 3 "general purpose"
7	Blue		DigIN 2	Digital input 2 "general purpose"
8	Red		DigIN 1	Digital input 1 "general purpose"
9	Black		+V Opto IN	External supply input voltage for Digital Outputs (+12... 24 VDC)
10	Violet		DigOUT 4	Digital output 4 "Brake"
11	Grey-Pink		DigOUT 3	Digital output 3 "general purpose"
12	Red-Blue		DigOUT 2	Digital output 2 "general purpose"
13	White-Green		DigOUT 1	Digital output 1 "general purpose"
14	Brown-Green		DigOUT_Gnd	Digital OUT Ground refer to "+V Opto IN"
15	White-Yellow		n.c.	Not connected
16	Yellow-Brown		n.c.	Not connected

Connector: Molex Micro-Fit 3.0™ 16 poles (430-25-1600)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)





Figure 26: EPOS signal cable 1 head B

Connect this cable end to any used Interface.

Pin No.	Colour	Twisted wire	Signal	Description
1	White		IN_COM 2	Common signal 2 for DigIN4...6
2	Brown		IN_COM 1	Common signal 1 for DigIN1...3
3	Green		DigIN 6	Digital input 6 "negative limit switch"
4	Yellow		DigIN 5	Digital input 5 "positive limit switch"
5	Grey		DigIN 4	Digital input 4 "Home switch"
6	Pink		DigIN 3	Digital input 3 "general purpose"
7	Blue		DigIN 2	Digital input 2 "general purpose"
8	Red		DigIN 1	Digital input 1 "general purpose"
9	Black		+V Opto IN	External supply input voltage for Digital Outputs (+12... 24 VDC)
10	Violet		DigOUT 4	Digital output 4 "Brake"
11	Grey-Pink		DigOUT 3	Digital output 3 "general purpose"
12	Red-Blue		DigOUT 2	Digital output 2 "general purpose"
13	White-Green		DigOUT 1	Digital output 1 "general purpose"
14	Brown-Green		DigOUT_Gnd	Digital OUT Ground refer to "+V Opto IN"
15	White-Yellow		n.c.	Not connected
16	Yellow-Brown		n.c.	Not connected

Cable end sleeve: 0.14 mm<sup>2</sup>

## 12 EPOS signal cable 2 (Connector J5A)

Order number: EPOS signal cable 2 **300586**



Figure 27: EPOS signal cable 2 300586

The "EPOS signal cable 2" is a 6 x 2 x 0.14 mm<sup>2</sup>, twisted pair, 3 m length cable.



Figure 28: EPOS signal cable 2 head A

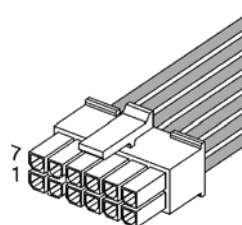


Figure 29: Pin assignment EPOS signal cable 2 head A

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector "J5A Signal 2".

Pin No.	Colour	Twisted wire	Signal	Description
1	White	Pair 1	+5VOUT	Reference Output voltage +5V
2	Brown	Pair 1	A_Gnd	Analogue signal ground
3	Green	Pair 2	AnIN2-	Negative analogue signal input 2
4	Yellow	Pair 2	AnIN2+	Positive analogue signal input 2
5	Grey	Pair 3	AnIN1-	Negative analogue signal input 1
6	Pink	Pair 3	AnIN1+	Positive analogue signal input 1
7	Blue	Pair 4	D_Gnd	Digital signal ground
8	Red	Pair 4	D_Gnd	Digital signal ground
9	Black	Pair 5	DigIN8/	Digital input 8 "high speed command" complement signal
10	Violet	Pair 5	DigIN8	Digital input 8 "high speed command"
11	Grey-Pink	Pair 6	DigIN7/	Digital input 7 "high speed command" complement signal
12	Red-Blue	Pair 6	DigIN7	Digital input 7 "high speed command"

Connector: Molex Micro-Fit 3.0™ 12 poles (430-25-1200)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)



Figure 30: EPOS signal cable 2 head B

Connect this cable end to any used Interface.

Pin No.	Colour	Twisted wire	Signal	Description
1	White	Pair 1	+5VOUT	Reference Output voltage +5V
2	Brown	Pair 1	A_Gnd	Analogue signal ground
3	Green	Pair 2	AnIN2-	Negative analogue signal input 2
4	Yellow	Pair 2	AnIN2+	Positive analogue signal input 2
5	Grey	Pair 3	AnIN1-	Negative analogue signal input 1
6	Pink	Pair 3	AnIN1+	Positive analogue signal input 1
7	Blue	Pair 4	D_Gnd	Digital signal ground
8	Red	Pair 4	D_Gnd	Digital signal ground
9	Black	Pair 5	DigIN8/	Digital input 8 "high speed command" complement signal
10	Violet	Pair 5	DigIN8	Digital input 8 "high speed command"
11	Grey-Pink	Pair 6	DigIN7/	Digital input 7 "high speed command" complement signal
12	Red-Blue	Pair 6	DigIN7	Digital input 7 "high speed command"

Cable end sleeve: 0.14 mm<sup>2</sup>

## 13 EPOS RS232-COM cable (Connector J6)

Order number: EPOS RS232-COM cable **275900**



Figure 31: EPOS RS232-COM cable 275900

The "RS232-COM" is a 2 x 2 x 0.14 mm<sup>2</sup>, twisted pair, shielded, 3 m length cable.



Figure 32: EPOS RS232-COM cable head A

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector "J6 RS-232".

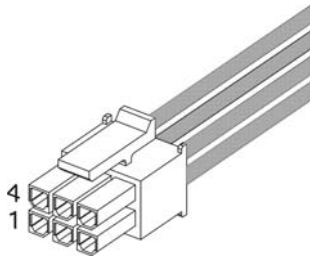


Figure 33: Pin assignment EPOS RS232-COM cable head A

Pin No.	Colour	Twisted Wire	Signal	Description
1	Yellow	Pair 1	EPOS RxD	EPOS RS232 receive
2	White	Pair 2	EPOS TxD	EPOS RS232 transmit
3	Not connected			
4	Green	Pair 1	GND	RS232_Ground
5	Brown	Pair 2	GND	RS232_Ground
6	Black		Shield	Cable shield

Connector: Molex Micro-Fit 3.0™ 6 poles (430-25-0600)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)



Figure 34: EPOS RS232-COM cable head B

Connect this cable end to your COM interface.

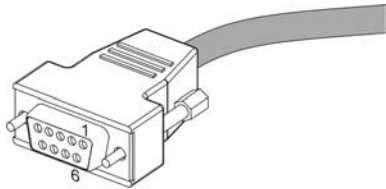


Figure 35: Pin assignment EPOS RS232-COM cable head B

Pin No.	Colour	Twisted wire	Signal	Description
1	Not connected			
2	White	Pair 2	RS232 RxD	COM RS232 receive
3	Yellow	Pair 1	RS232 TxD	COM RS232 transmit
4	Not connected			
5	Brown Green	Pair 2 Pair 1	RS232 GND RS232 GND	COM RS232_Ground COM RS232_Ground
6	Not connected			
7	Not connected			
8	Not connected			
9	Not connected			
x	Shield		Cable shield	Soldered on connector housing

Pin assignment according to RS-232 standard

Connector: Female D-Sub connector DIN 41652, 9 poles, with mounting screws

## 14 EPOS CAN-COM cable (Connector J7 or J8)

Order number: EPOS CAN-COM cable **275908**



Figure 36: EPOS CAN-COM cable 275908

The "CAN-COM" is a 2 x 2 x 0.14mm<sup>2</sup>, twisted pair, shielded, 3 m length cable.



Figure 37: EPOS CAN-COM cable head A

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector "J7 CAN and J8 CAN".

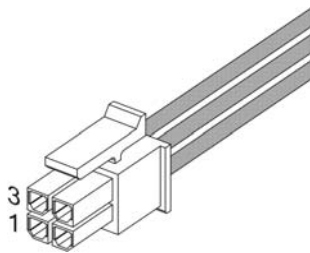


Figure 38: Pin assignment EPOS CAN-COM cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	Yellow	Pair 1	CAN high	CAN high bus line
2	Green	Pair 1	CAN low	CAN low bus line
3	Brown		CAN GND	CAN Ground
4	Black		CAN shield	Cable shield

Connector: Molex Micro-Fit 3.0™ 4 poles (430-25-0400)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)



Figure 39: EPOS CAN-COM cable head B

Connect this cable end to your CAN Master.

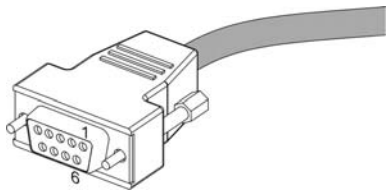


Figure 40: Pin assignment EPOS CAN-COM cable head B

Pin No.	Colour	Twisted wire	Signal	Description
1	Not connected			
2	Green	Pair 1	CAN low	CAN low bus line
3	Brown		CAN GND	CAN Ground
4	Not connected			
5	Shield		CAN shield	Cable shield
6	Not connected			
7	Yellow	Pair 1	CAN high	CAN high bus line
8	Not connected			
9	Not connected			

Pin assignment according to CiA DS102-2

Connector: Female D-Sub connector DIN 41652, 9 poles, with mounting screws

## 15 EPOS CAN-CAN cable (Connector J7 or J8)

Order number: EPOS CAN-CAN cable **275926**



Figure 41: EPOS CAN-CAN cable 275926

The "CAN-CAN" is a 2 x 2 x 0.14mm<sup>2</sup>, twisted pair, shielded, 3 m length cable.



Figure 42: EPOS CAN-CAN cable head A

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector "J7 CAN and J8 CAN".

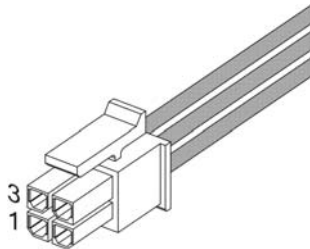


Figure 43: Pin assignment EPOS CAN-CAN cable head A

Pin No.	Colour	Twisted wire	Signal	Description
1	Yellow	Pair 1	CAN high	CAN high bus line
2	Green	Pair 1	CAN low	CAN low bus line
3	Brown		CAN GND	CAN Ground
4	Shield		CAN shield	Cable shield

Connector: Molex Micro-Fit 3.0™ 4 poles (430-25-0400)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)





Figure 44: EPOS CAN-CAN cable head B

The used Molex Micro-Fit 3.0™ connector fits to EPOS 24/5 connector "J7 CAN and J8 CAN".

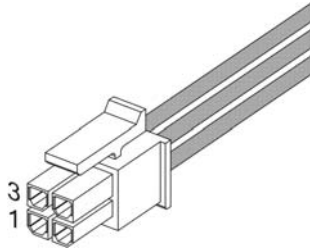


Figure 45: Pin assignment EPOS CAN-CAN cable head B

Pin No.	Colour	Twisted Wire	Signal	Description
1	Yellow	Pair 1	CAN high	CAN high bus line
2	Green	Pair 1	CAN low	CAN low bus line
3	Brown		CAN GND	CAN Ground
4	Shield		CAN shield	Cable shield

Connector:

Molex Micro-Fit 3.0™ 4 poles (430-25-0400)

Crimp terminals:

Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)

Hand crimper:

Molex hand crimper (Europe: 69008-0983; America: 63811-2800)

## 16 EPOS CAN termination plug (Connector J7 or J8)

Order number: EPOS CAN termination plug **275937**



Figure 46: EPOS CAN termination plug 275937

The used Molex Micro-Fit 3.0™ connector fits to EPOS 70/10 connector "J7 CAN and J8 CAN".

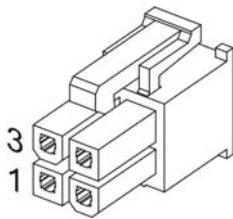


Figure 47: Pin assignment EPOS CAN termination plug

Pin No.	Colour	Twisted wire	Signal	Description
1			Resistor terminal 1	120 Ohm bus termination
2			Resistor terminal 2	120 Ohm bus termination
3	Not connected			
4	Not connected			

Connector: Molex Micro-Fit 3.0™ 4 poles (430-25-0400)  
 Crimp terminals: Molex Micro-Fit 3.0™ female crimp terminals (430-30-0010)  
 Hand crimper: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)

## 17 EPOS connector set

Order number: EPOS connector set **276248**

Complete connector set contains:

Connector	Specification	Number
J1, J1A	Molex Mini-Fit Jr. <sup>TM</sup> 2 poles (39-01-2020)	2
J2	Molex Mini-Fit Jr. <sup>TM</sup> 4 poles (39-01-2040)	1
J3	Molex Micro-Fit 3.0 <sup>TM</sup> 6 poles (430-25-0600)	1
J5	Molex Micro-Fit 3.0 <sup>TM</sup> 16 poles (430-25-1600)	1
J5A	Molex Micro-Fit 3.0 <sup>TM</sup> 12 poles (430-25-1200)	1
J6	Molex Micro-Fit 3.0 <sup>TM</sup> 6 poles (430-25-0600)	1
J7	Molex Micro-Fit 3.0 <sup>TM</sup> 4 poles (430-25-0400)	1
J8	Molex Micro-Fit 3.0 <sup>TM</sup> 4 poles (430-25-0400)	1
	Molex Mini-Fit Jr. <sup>TM</sup> female crimp terminals (444-76-1112)	12
	Molex Micro-Fit 3.0 <sup>TM</sup> female crimp terminals (430-30-0010)	52
	Tyco C42334-A421-C42 (right), encoder clip right	1
	Tyco C42334-A421-C52 (left), encoder clip left	1

Useful accessories (not available at maxon motor ag):

Hand crimper 1: Molex hand crimper (Europe: 69008-0724; America: 11-01-0197)  
 Hand crimper 2: Molex hand crimper (Europe: 69008-0983; America: 63811-2800)