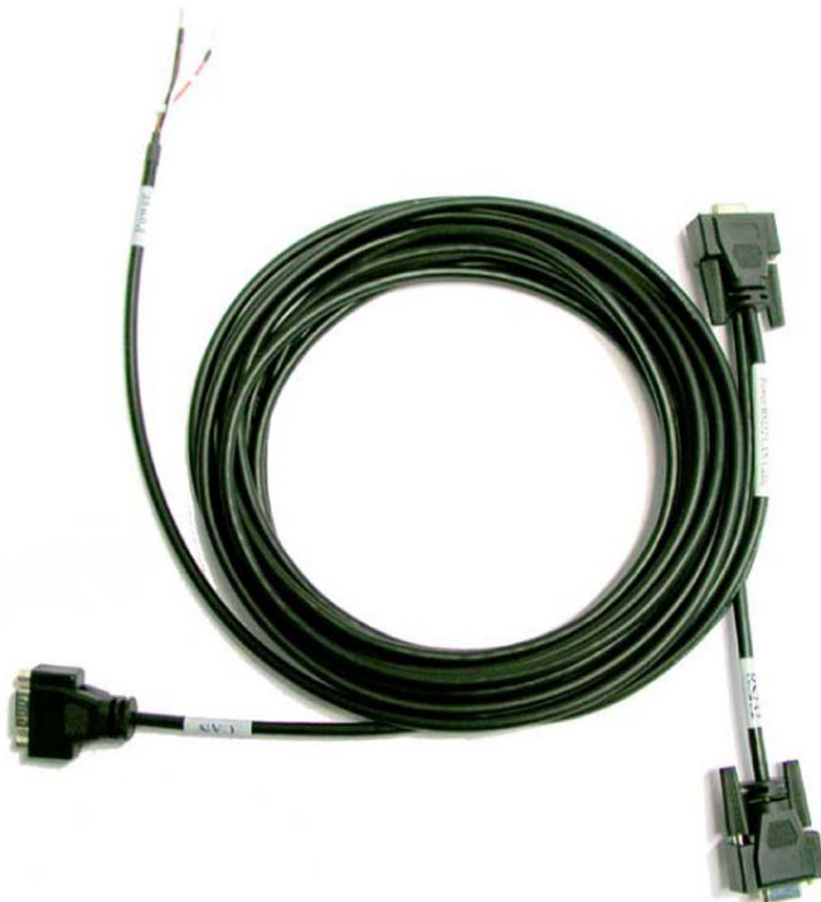


MCD EPOS P 60 W
MCD EPOS 60 W
maxon compact drive

Cable Starting Set



Document ID: 787 798-03

PLEASE READ THIS FIRST



These instructions are intended for qualified technical personnel. Prior commencing with any activities ...

- *you must carefully read and understand this manual and*
- *you must follow the instructions given therein.*

We have tried to provide you with all information necessary to install and commission the equipment in a **secure, safe and time-saving** manner. Our main focus is ...

- to familiarize you with all relevant technical aspects,
- to let you know the easiest way of doing,
- to alert you of any possibly dangerous situation you might encounter or that you might cause if you do not follow the description,
- to **write as little** and to **say as much** as possible and
- not to bore you with things you already know.

Likewise, we tried to skip repetitive information! Thus, you will find things **mentioned just once**. If, for example, an earlier mentioned action fits other occasions you then will be directed to that text passage with a respective reference.



Follow any stated reference – observe respective information – then go back and continue with the task!

PREREQUISITES FOR PERMISSION TO COMMENCE INSTALLATION

The **MCD EPOS P / EPOS 60 W** are considered as partly completed machinery according to EU's directive 2006/42/EC, Article 2, Clause (g) and therefore **is intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment**.



You must not put the device into service, ...

- *unless you have made completely sure that the other machinery – the surrounding system the device is intended to be incorporated to – fully complies with the requirements stated in the EU directive 2006/42/EC!*
- *unless the surrounding system fulfills all relevant health and safety aspects!*
- *unless all respective interfaces have been established and fulfill the stated requirements!*

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1 About this Document

1.1 Intended Purpose

The purpose of the present document is to familiarize you with the described equipment and the tasks on safe and adequate installation and/or commissioning.

Observing the described instructions in this document will help you ...

- to avoid dangerous situations,
- to keep installation and/or commissioning time at a minimum and
- to increase reliability and service life of the described equipment.

Use for other and/or additional purposes is not permitted. maxon motor, the manufacturer of the equipment described, does not assume any liability for loss or damage that may arise from any other and/or additional use than the intended purpose.

1.2 Target Audience

This document is meant for trained and skilled personnel working with the equipment described. It conveys information on how to understand and fulfill the respective work and duties.

This document is a reference book. It does require particular knowledge and expertise specific to the equipment described.

1.3 How to use

Take note of the following notations and codes which will be used throughout the document.

Notation	Explanation
(n)	referring to an item (such as order number, list item, etc.)
→	denotes "see", "see also", "take note of" or "go to"

Table 1-1 Notations used in this Document

1.4 Symbols and Signs

1.4.1 Safety Alerts



Take note of when and why the alerts will be used and what the consequences are if you should fail to observe them!

Safety alerts are composed of...

- a signal word,
- a description of type and/or source of the danger,
- the consequence if the alert is being ignored, and
- explanations on how to avoid the hazard.

Following types will be used:

1) **DANGER**

Indicates an **imminently hazardous situation**. If not avoided, the situation will result in death or serious injury.

2) WARNING

Indicates a **potentially hazardous situation**. If not avoided, the situation **can** result in death or serious injury.

3) CAUTION

Indicates a **probable hazardous situation** and is also used to alert against unsafe practices. If not avoided, the situation **may** result in minor or moderate injury.

Example:



DANGER

High Voltage and/or Electrical Shock

Touching live wires causes death or serious injuries!

- Make sure that neither end of cable is connected to live power!
- Make sure that power source cannot be engaged while work is in process!
- Obey lock-out/tag-out procedures!
- Make sure to securely lock any power engaging equipment against unintentional engagement and tag with your name!

1.4.2 Prohibited Actions and Mandatory Actions

The signs define prohibitive actions. So, you **must not**!

Examples:



Do not touch!



Do not operate!

The signs point out actions to avoid a hazard. So, you **must**!

Examples:



Unplug!



Tag before work!

1.4.3 Informatory Signs



Requirement / Note / Remark

Indicates an action you must perform prior continuing or refers to information on a particular item.



Best Practice

Gives advice on the easiest and best way to proceed.



Material Damage

Points out information particular to potential damage of equipment.



Reference

Refers to particular information provided by other parties.

1.5 Copyright

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2 Introduction

The present document provides you with information on the wiring details for each cable which will be used with the MCD EPOS P / EPOS 60 W hardware. It contains pictures, drawings, cable specification, pin assignment and detailed connector information. The included «Cable Selector» will help you to choose the correct cable for the setup you are using.

Find the latest edition of the present document, as well as additional documentation and software to the MCD EPOS P / EPOS 60 W maxon compact drive also on the internet:

- www.maxonmotor.com – category «Service & Downloads»
- shop.maxonmotor.com

2.1 Documentation Structure

The present document is part of a documentation set. Please find below an overview on the documentation hierarchy and the interrelationship of its individual parts:

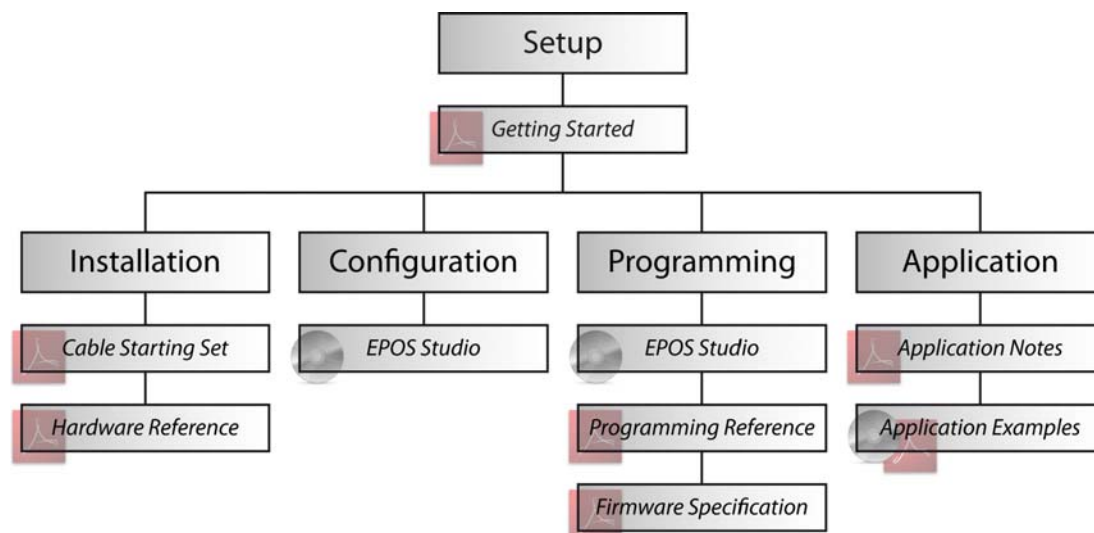


Figure 2-1 Documentation Structure

2.2 Safety Precautions

Prior continuing ...

- make sure you have read and understood chapter “PLEASE READ THIS FIRST” on page A-2,
- do not engage with any work unless you possess the stated skills (→ chapter “1.2 Target Audience” on page 1-5,
- refer to chapter “1.4 Symbols and Signs” on page 1-5 to understand the subsequently used indicators,
- you must observe any regulation applicable in the country and/or at the site of implementation with regard to health and safety/accident prevention and/or environmental protection,
- take note of the subsequently used indicators and follow them at all times.



DANGER

High Voltage and/or Electrical Shock

Touching live wires causes death or serious injuries!

- *Consider any power cable as connected to life power, unless having proven the opposite!*
- *Make sure that neither end of cable is connected to life power!*
- *Make sure that power source cannot be engaged while work is in process!*
- *Obey lock-out/tag-out procedures!*
- *Make sure to securely lock any power engaging equipment against unintentional engagement and tag with your name!*



Requirements

- *Make sure that all associated devices and components are installed according to local regulations.*
- *Be aware that, by principle, an electronic apparatus can not be considered fail-safe. Therefore, you must make sure that any machine/apparatus has been fitted with independent monitoring and safety equipment. If the machine/apparatus should break down, if it is operated incorrectly, if the control unit breaks down or if the cables break or get disconnected, etc., the complete drive system must return – and be kept – in a safe operating mode.*
- *Be aware that you are not entitled to perform any repair on components supplied by maxon motor.*



Electrostatic Sensitive Device (ESD)

- *Make sure to wear working cloth in compliance with ESD.*
- *Handle device with extra care.*

3 Cables

3.1 Important Notice: Prerequisites for Permission to commence Installation

The MCD EPOS P / EPOS 60 W are considered as partly completed machinery according to EU's directive 2006/42/EC, Article 2, Clause (g) and therefore **is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment.**



WARNING

Risk of Injury

Operating the device without the full compliance of the surrounding system with the EU directive 2006/42/EC may cause serious injuries!

- *Do not operate the device, unless you have made sure that the other machinery fulfills the requirements stated in EU's directive!*
- *Do not operate the device, unless the surrounding system fulfills all relevant health and safety aspects!*
- *Do not operate the device, unless all respective interfaces have been established and fulfill the stated requirements!*

3.2 Cable Selector

Find matching cables for the setup you are using.

Single Axis System

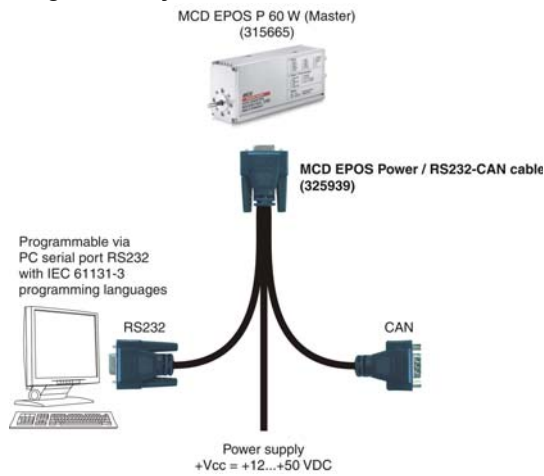


Figure 3-2 Single Axis System – Cable Setup

Multi Axes System

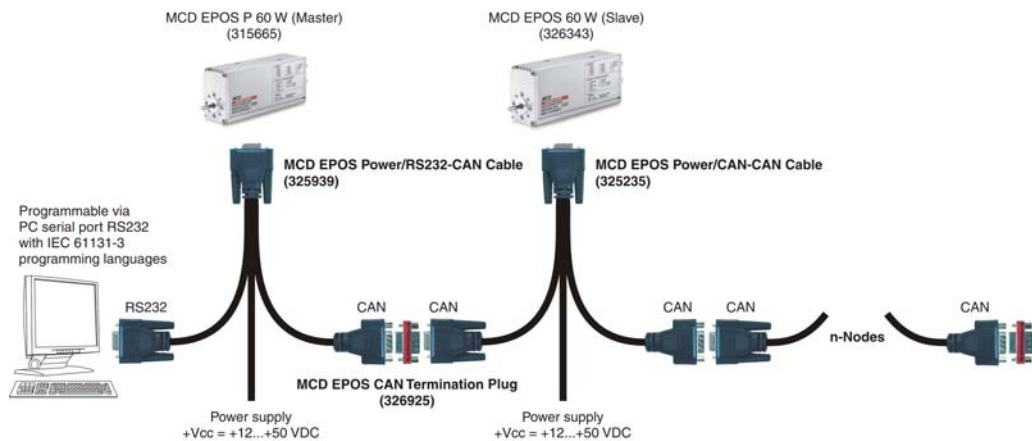


Figure 3-3 Multi Axes System – Cable Setup

Cable		Quantity required in a ...	
Designation	Order #	Single Axis System	Multi Axes System
MCD EPOS Power/RS232-CAN Cable	325939	1	1
MCD EPOS Power/CAN-CAN Cable	325235	–	n
MCD EPOS CAN Termination Plug	326925	–	2
MCD EPOS Signal Cable	326923	O	O
n = number of drives in system / O = optional			

Table 3-2 Cable Selector

3.3 Cable Assemblies

3.3.1 MCD EPOS Power/RS232-CAN Cable (325939) – Connector J2

Head A

Heads B / C / D



Figure 3-4 MCD EPOS Power/RS232-CAN Cable

Specifications		
Power	Type Cross-section Length	3 x AWG 22 0.34 mm ² 3 m
RS232	Type Cross-section Length	2 x 2 x AWG 28, twisted pair, shielded 0.08 mm ² 3 m
CAN	Type Cross-section Length	2 x 2 x AWG 28, twisted pair, shielded 0.08 mm ² 1.5 m
Head A	Female D-Sub connector DIN 41652, 9 poles with mounting screws	
Head B	Female D-Sub connector DIN 41652, 9 poles with mounting screws	
Head C	Cable end sleeves 0.34 mm ²	
Head D	Male D-Sub connector DIN 41652, 9 poles with mounting nut	

Table 3-3 MCD EPOS Power/RS232-CAN Cable – Specifications

Power/Communication (Head A)

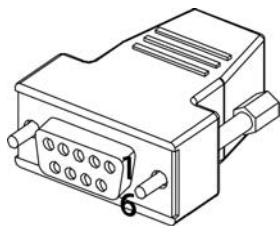


Figure 3-5 MCD EPOS Power/RS232-CAN Cable – Head A

Head A Pin	Cable	Twisted Pair	Signal	Description
1	RS232	1	EPOS RxD	EPOS RS232 receive
2	RS232		Gnd	Ground
3	RS232	2	EPOS TxD	EPOS RS232 transmit
4	RS232, CAN		Gnd	Ground
5	Power	–	Power_Gnd	Ground of supply voltage
6	RS232, CAN	3	CAN high	CAN high bus line
7	RS232, CAN		CAN low	CAN low bus line
8	Power	–	+V _C	Logic supply voltage +12...+50 VDC (optional)
9	Power	–	+V _{CC}	Power supply voltage +12...+50 VDC
Shield	RS232, CAN	–	Shield	Shield soldered to connector housing

Table 3-4 MCD EPOS Power/RS232-CAN Cable – Head A, Pin Assignment

RS232 (Head B)

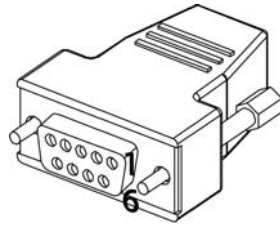


Figure 3-6 MCD EPOS Power/RS232-CAN Cable – Head B

Head B Pin	Cable	Twisted Pair	Signal	Description
1	not connected			
2	RS232	1	EPOS TxD	EPOS RS232 transmit
3	RS232	2	EPOS RxD	EPOS RS232 receive
4	not connected			
5	RS232	1 / 2	Gnd	Ground
6...9	not connected			
Shield	RS232	–	Shield	Shield soldered to connector housing
Remark: pin assignment according to RS232 standard				

Table 3-5 MCD EPOS Power/RS232-CAN Cable – Head B, Pin Assignment

Supply Voltage Terminals (Head C)

Head C Lead	Cable	Color	Signal	Description
-	Power	black	Power_Gnd	Ground of supply voltage
+	Power	brown	+V _C	Logic supply voltage +12...+50 VDC (optional)
++	Power	red	+V _{CC}	Power supply voltage +12...+50 VDC

Table 3-6 MCD EPOS Power/RS232-CAN Cable – Head C, Lead Assignment

CAN (Head D)

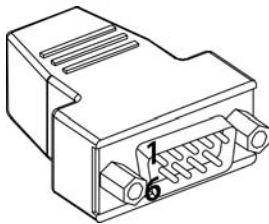


Figure 3-7 MCD EPOS Power/RS232-CAN Cable – Head D

Head B Pin	Cable	Twisted Pair	Signal	Description
1	not connected			
2	CAN	1	CAN low	CAN low bus line
3	CAN	–	Gnd	Ground
4	not connected			
5	CAN	–	Shield	Connected to shield and soldered to connector housing
6	not connected			
7	CAN	1	CAN high	CAN high bus line
8...9	not connected			
Shield	CAN	–	Shield	Shield soldered to connector housing
Remark: pin assignment according to “CiA Draft Standard 102, Version 2.0”				

Table 3-7 MCD EPOS Power/RS232-CAN Cable – Head D, Pin Assignment

3.3.2 MCD EPOS Power/CAN-CAN Cable (325235) – Connector J2

Head A

Heads B / C / D



Figure 3-8 MCD EPOS Power/CAN-CAN Cable

Specifications		
Power	Type Cross-section Length	3 x AWG 22 0.34 mm ² 3 m
CAN 1	Type Cross-section Length	2 x 2 x AWG 28, twisted pair, shielded 0.08 mm ² 1.5 m
CAN 2	Type Cross-section Length	2 x 2 x AWG 28, twisted pair, shielded 0.08 mm ² 1.5 m
Head A	Female D-Sub connector DIN 41652, 9 poles with mounting screws	
Head B	Female D-Sub connector DIN 41652, 9 poles with mounting screws	
Head C	Cable end sleeves 0.34 mm ²	
Head D	Male D-Sub connector DIN 41652, 9 poles with mounting nut	

Table 3-8 MCD EPOS Power/CAN-CAN Cable – Specifications

Power/Communication (Head A)

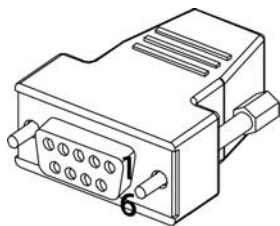


Figure 3-9 MCD EPOS Power/CAN-CAN Cable – Head A

Head A Pin	Cable	Twisted Pair	Signal	Description
1...3	not connected			
4	CAN 1, CAN 2	–	Gnd	Ground
5	Power	–	Power_Gnd	Ground of supply voltage
6	CAN 1, CAN 2	1	CAN high	CAN high bus line
7	CAN 1, CAN 2		CAN low	CAN low bus line
8	Power	–	+V _C	Logic supply voltage +12...+50 VDC (optional)
9	Power	–	+V _{CC}	Power supply voltage +12...+50 VDC
Shield	CAN 1, CAN 2	–	Shield	Shield soldered to connector housing

Table 3-9 MCD EPOS Power/CAN-CAN Cable – Head A, Pin Assignment

CAN (Head B)

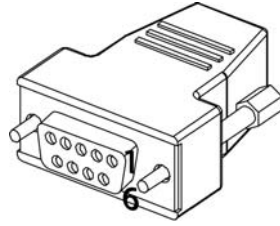


Figure 3-10 MCD EPOS Power/CAN-CAN Cable – Head B

Head B Pin	Cable	Twisted Pair	Signal	Description
1	not connected			
2	CAN 1	1	CAN low	CAN low bus line
3	CAN	1	Gnd	Ground
4	not connected			
5	CAN	1	Shield	Connected to shield and soldered to connector housing
6	not connected			
7	CAN 1	1	CAN high	CAN high bus line
8...9	not connected			
Shield	CAN 1	–	Shield	Shield soldered to connector housing
Remark: pin assignment according to “CiA Draft Standard 102, Version 2.0”				

Table 3-10 MCD EPOS Power/CAN-CAN Cable – Head B, Pin Assignment

Supply Voltage Terminals (Head C)

Head C Lead	Cable	Color	Signal	Description
-	Power	black	Power_Gnd	Ground of supply voltage
+	Power	brown	+V _C	Logic supply voltage +12...+50 VDC (optional)
++	Power	red	+V _{CC}	Power supply voltage +12...+50 VDC

Table 3-11 MCD EPOS Power/CAN-CAN Cable – Head C, Lead Assignment

CAN (Head D)

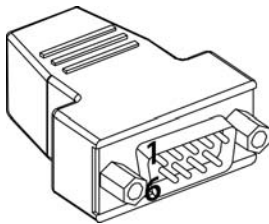


Figure 3-11 MCD EPOS Power/CAN-CAN Cable – Head D

Head B Pin	Cable	Twisted Pair	Signal	Description
1	not connected			
2	CAN 2	1	CAN low	CAN low bus line
3	CAN 2	–	Gnd	Ground
4	not connected			
5	CAN 2	–	Shield	Connected to shield and soldered to connector housing
6	not connected			
7	CAN 2	1	CAN high	CAN high bus line
8...9	not connected			
Shield	CAN 2	–	Shield	Shield soldered to connector housing
Remark: pin assignment according to “CiA Draft Standard 102, Version 2.0”				

Table 3-12 MCD EPOS Power/CAN-CAN Cable – Head D, Pin Assignment

3.3.3 MCD EPOS Signal Cable (326923) – Connector J1

Head A

Head B

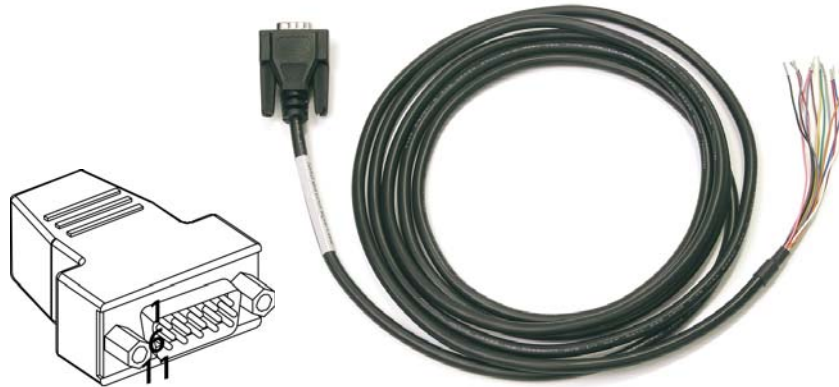


Figure 3-12 MCD EPOS Signal Cable

Specifications		
Signal	Type	14 x AWG 26
	Cross-section	0.14 mm ²
	Length	3 m
Head A	Male D-Sub connector High Density, 15 poles with mounting screws	
Head B	Cable end sleeves 0.14 mm ²	

Table 3-13 MCD EPOS Signal Cable – Specifications

Head A Pin	Head B Pin	Color	Signal	Description
1		white	DigIN7	Digital Input 7 "High Speed Command"
2		brown	DigIN7/	Digital Input 7 "High Speed Command" complement
3		green	DigIN8	Digital Input 8 "High Speed Command"
4		yellow	DigIN8/	Digital Input 8 "High Speed Command" complement
5		grey	D_Gnd	Digital signal ground
6		pink	DigIN1	Digital Input 1 "General Purpose"
7		blue	DigIN2	Digital Input 2 "Home Switch"
8		red	DigIN3	Digital Input 3 "Positive Limit Switch"
9		black	DigIN4	Digital Input 4 "Negative Limit Switch"
10		violet	IN_COM	Common signal for DigIN1...4
11		grey-pink	+V Opto IN	External supply voltage for DigOUT3...4 (+12...+24 VDC)
12		red-blue	DigOUT3	Digital Output 3 "General Purpose"
13		white-green	DigOUT4	Digital Output 4 "General Purpose"
14 / 15		not connected		

Table 3-14 MCD EPOS Signal Cable – Head A, Pin Assignment

3.3.4 MCD EPOS CAN Termination Plug (326925)

Fits all CAN cables featuring a pin assignment according to "CiA Draft Standard 102, Version 2.0" using 9 pole D-Sub connector according to DIN 41652. It will terminate your CAN network with a terminating resistor of 120 Ω .

Head A

Head B



Figure 3-13 MCD EPOS CAN Termination Plug

Head A Pin	Head B Pin	Signal	Description
1	1	–	straight thru wired
2	2	CAN_LOW	CAN low bus line (120 Ω resistor to pin 7)
3	3	–	straight thru wired
4	4	–	straight thru wired
5	5	–	straight thru wired
6	6	–	straight thru wired
7	7	CAN_HIGH	CAN high bus line (120 Ω resistor to pin 2)
8	8	–	straight thru wired
9	9	–	straight thru wired
Remark: pin assignment according to "CiA Draft Standard 102, Version 2.0"			

Table 3-15 MCD EPOS CAN Termination Plug – Pin Assignment

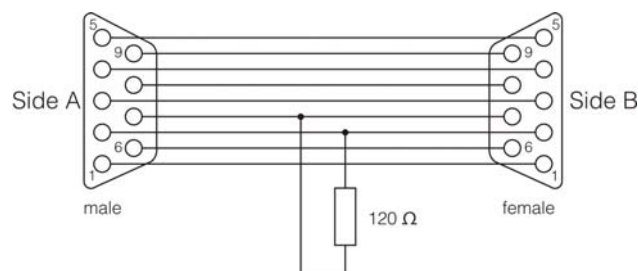


Figure 3-14 MCD EPOS CAN Termination Plug – Wiring Scheme

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