

Accessories Manual

Motion Control

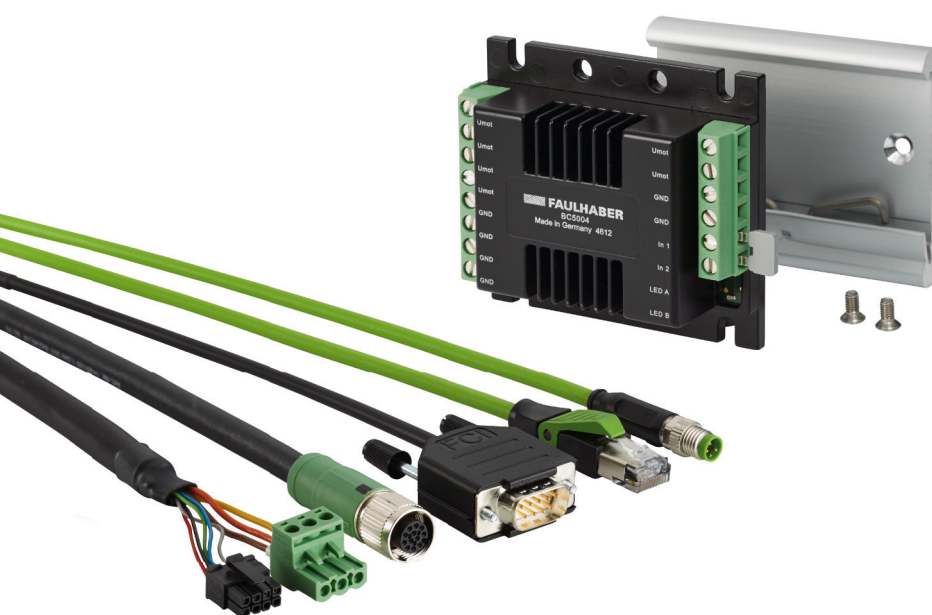
MC 5010

MC 5005

MC 5004

MC 5004 P STO

MCS



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Daimlerstr. 23 / 25 · 71101 Schönaich

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The relevant regulations regarding safety engineering
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when using the software.

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About this document

1 About this document

1.1 Validity of this document

This document describes:

- Technical data of the accessory
- Purpose of the accessory
- Dimensions of the accessory

This document is intended for use by trained specialists authorised to perform installation and electrical connection of the product.

All data in this document relate to the standard versions of the Faulhaber products. Changes relating to customer-specific versions can be found in the data sheet.

1.2 Associated documents

For certain operations during commissioning and operation of FAULHABER products additional information from the following manuals is useful:

Manual	Description
Technical Manuals	Guide for installation and use of the respective FAULHABER Motion Controller

These manuals can be downloaded in pdf format from the Internet page www.faulhaber.com/manuals.

1.3 Symbols and designations



NOTICE!
Risk of damage.

- ▶ Measures for avoidance



Instructions for understanding or optimising the operational procedures

- ✓ Pre-requirement for a requested action
- 1. First step for a requested action
 - ↳ Result of a step
- 2. Second step of a requested action
 - ↳ Result of an action
- ▶ Request for a single-step action

About this document

1.4 List of abbreviations

Abbreviation	Meaning
AC	Alternating Current
AES	Absolute encoder
AGND	Analogue Ground
AnIn	Analogue Input
BC	Braking chopper
BL	Brushless
CE marking	Graphical symbol indicating that product complies with EU law
CO	CANopen
COM	Communication Equipment
CAN	Controller Area Network
DC	Direct Current
DIN	Designation for round connectors
DigIn	Digital input
DigOut	Digital output
D–	USB data cable
D+	USB data cable
EGND	Electronic Ground
EMC	Electromagnetic compatibility
ET	EtherCAT (Ethernet for Control Automation Technology)
GND	Ground
Hall	Hall sensors
ID	USB-type identifier
I/O	Input/Output
LM	Linear Motor
MB1	Motherboard with one controller port (only in combination with MC 5004 STO)
MB4	Motherboard with four controller ports (only in combination with MC 5004 STO)
MC	Motion Controller
MCS	Motion Control System
Mot	Motor
M12	Metric ISO thread
n.c.	not connected
PC	Personal Computer
Pin	Pin assignment
RJ	Registered Jack (standardised female connector)
RS	Recommended Standard
RxD	Receive Data
STO	Safe Torque Off
TxD	Transmit data

About this document

Abbreviation	Meaning
U	Voltage
USB	Universal Serial Bus
V	Volt
VBUS	USB supply
V3.0 Controller	Controller version 3.0

2 Safety

2.1 Safety instructions

**NOTICE!**

Electrostatic discharges can damage the electronics.

- ▶ Wear conductive work clothes.
- ▶ Wear an earthed wristband.

**NOTICE!**

Inserting and withdrawing connectors whilst the device is live can damage the electronics.

- ▶ Do not insert or withdraw connectors whilst the device is live.

**NOTICE!**

When attaching accessories to the device, using the wrong tools can damage the device.

- ▶ Use appropriate tools.

2.2 EC directives on product safety

- ▶ The following EC directives on product safety must be observed.
- ▶ If the Motion Controller is being used outside the EU, international, national and regional directives must be also observed.

Machinery Directive (2006/42/EC)

Because of their small size, no serious threats to life or physical condition can normally be expected from electric miniature drives. Therefore the Machinery Directive does not apply to our products. The products described here are not "incomplete machines". Therefore installation instructions are not normally issued by FAULHABER.

Low Voltage Directive (2014/35/EU)

The Low Voltage Directive applies for all electrical equipment with a nominal voltage of 75 to 1500 V DC and 50 to 1000 V AC. The products described in this technical manual do not fall within the scope of this directive, since they are intended for lower voltages.

EMC Directive (2014/30/EU)

The directive concerning electromagnetic compatibility (EMC) applies to all electrical and electronic devices, installations and systems sold to an end user. In addition, CE marking can be undertaken for built-in components according to the EMC Directive. Conformity with the directive is documented in the Declaration of Conformity.

Accessory products

3 Accessory products

3.1 Connection cable

The MB4 motherboard or a suitable customer-specific controller environment must be used for connection of peripheral components to an MC 5004.

Tab. 1: MC 50xx connection cable

Article no.	Article designation	Cable length
6501.00224	MC 50xx cable, USB 2.0 connectors A-MINI B	1000 mm
6501.00268	MC 50xx cable, V3.0-RS232	300 mm
6501.00269	MC 50xx cable, V3.0-CAN	300 mm
6501.00274	MC 50xx cable, V3.0-EtherCAT, RJ45-RJ45	2000 mm
6501.00278	MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (circuit board connection)	100 mm
6501.00279	MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (motherboard connection)	250 mm
6501.00272	MC 5004 cable, EtherCAT, V3.0-connectors RJ45-RJ45 straight (circuit board connection)	200 mm
6501.00265	MC 50xx cable, V3.0-DC supply	2000 mm
6501.00262	MC 5010 cable, V3.0-BL phase (3274...BP4/4490...B/BS)	2000 mm
6501.00263	MC 5010 cable, V3.0-3274...BP4 Hall sensors	2000 mm
6501.00264	MC 50xx cable, V3.0-BL Hall sensors + phases	2000 mm
6501.00241	MC 50xx cable, V3.0-2264...BP4, BX4 AES	300 mm
6501.00275	Adapter cable for encoder HEDS	130 mm
6501.00267	MC 50xx cable, V3.0-IE3, IE2, IEH2, IER3, IERS3, HEDS	2000 mm
6501.00266	MC 50xx cable, V3.0 - IEH3	2000 mm
6501.00252	MC 50xx cable, V3.0-IE3L, IER3L, IERS3L, HEDL	2000 mm
6501.00327	MC 50xx cable, V3.0-BHx Hall sensors + IEM3	300 mm
6501.00328	MC 50xx cable, V3.0-BHx phases	300 mm

Tab. 2: MCS connection cable

Article no.	Article designation	Cable length
6501.00270	MCS cable, EtherCAT, connectors M8-M8, straight	1500 mm
6501.00210	MCS cable, EtherCAT, connectors M8-M8, angled	1500 mm
6501.00271	MCS cable, EtherCAT, connectors M8-RJ45, straight	1500 mm
6501.00211	MCS cable, EtherCAT, connectors M8-RJ45, angled	1500 mm
6501.00255	MCS supply cable, connectors M12, 4-pin, straight	1500 mm
6501.00256	MCS supply cable, connectors M12, 4-pin, angled	1500 mm
6501.00257	MCS I/O cable, connectors M12, 12-pin, straight	1500 mm
6501.00258	MCS I/O cable, connectors M12, 12-pin, angled	1500 mm

Accessory products

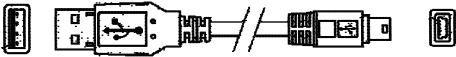
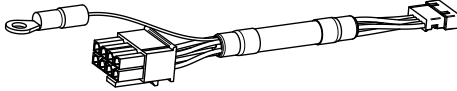
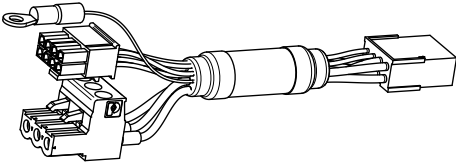
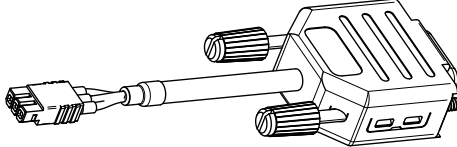
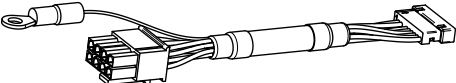
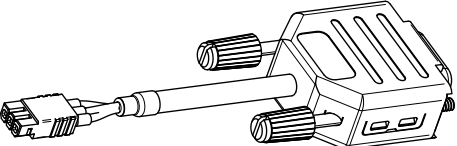
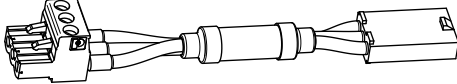

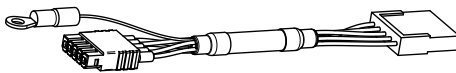

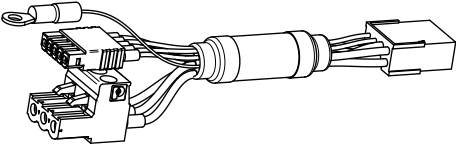
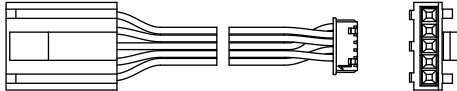
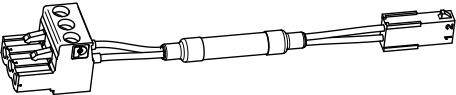
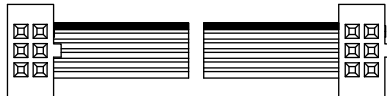
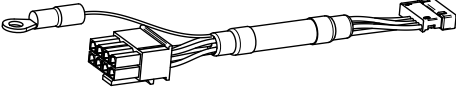
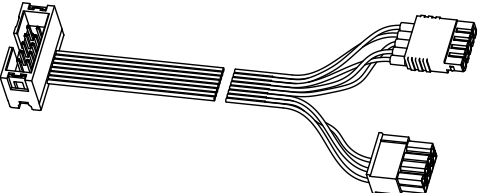
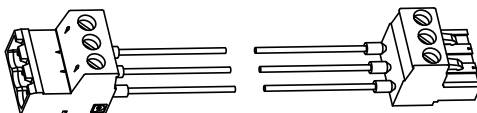
<p>6501.00224 MC 50xx cable, USB 2.0 connectors A-MINI B, 1000 mm</p> 	<p>6501.00267 MC 50xx cable, V3.0-IE3, IE2, IEH2, IER3, IERS3, HED5, 2000 mm</p> 
<p>6501.00241 MC 50xx cable, V3.0-BX4 AES, 300 mm</p> 	<p>6501.00268 MC 50xx cable, V3.0-RS232, 300 mm</p> 
<p>6501.00252 MC 50xx cable, V3.0-IE3L, IER3L, HEDL, 2000 mm</p> 	<p>6501.00269 MC 50xx cable, V3.0-CANopen, 300 mm</p> 
<p>6501.00262 MC 5010 cable, V3.0-BL phase (3274...BP4/4490...B/BS), 2000 mm</p> 	<p>6501.00272 MC 5004 cable, EtherCAT, V3.0-connectors RJ45-RJ45 straight (circuit board connection), 200 mm</p> 
<p>6501.00263 MC 5010 cable, V3.0-3274...BP4 Hall, 2000 mm</p> 	<p>6501.00274 MC 50xx cable, V3.0-EtherCAT, RJ45-RJ45, 2000 mm</p> 
<p>6501.00264 MC 50xx cable, V3.0-BL Hall + phases, 2000 mm</p> 	<p>6501.00275 Adapter cable HED5, 130 mm</p> 
<p>6501.00265 MC 50xx cable, V3.0-DC supply, 2000 mm</p> 	<p>6501.00278 MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (circuit board connection), 100 mm</p> <p>6501.00279 MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (motherboard connection), 250 mm</p> 
<p>6501.00266 MC 50xx cable, V3.0-IEH3, 2000 mm</p> 	
<p>6501.00327 MC 50xx cable, V3.0-BHx Hall + IEM3, 300 mm</p> 	<p>6501.00328 MC 50xx cable, V3.0-BHx phases, 300 mm</p> 

Fig. 1: Connection cables overview

Accessory products

3.2 Combinatorics connection cable

3.2.1 DC motors series CR/CXR

	IE2	IE3 / IER3 / IERS3	IE3L / IER3L / IERS3L	HEDS	HEDL
Motor option:	5268	5268	5268	5268	5268
Encoder option:	2655	3807	5418	Standard	5431
Connection cable					
6501.00265	x	x	x	x	x
6501.00267	x	x		x	
6501.00275				x	
6501.00252			x		x

3.2.2 Series SR DC-Motors

	IE2	IEH2	IEH3
Option Motor + Encoder:	2655	2655	Standard
Encoder multi-adapter			
6501.00323	x	x	x



Details can be found in chap. 3.4.2.5, p. 29.

3.2.3 BL motors series B/BHS

	analogue Hall	IE2	IE3	IE3L	HEDS	HEDL
Motor option:	K3141	K313 / K2971	K1838 / K2971	K1838 / K2971	K312 / K2971	K312 / K2971
Encoder option:	–	2655	3807	5418	Standard	5431
Connection cable						
6501.00267		x	x		x	
6501.00252				x		x
6501.00264	x	x	x	x	x	x
6501.00275					x	

Accessory products

3.2.4 BL motors series BX4

	Analogue Hall	IE3 / IER3 / IERS3	IE3L / IER3L / IERS3L	AES
Option Motor:	3692 / 3830	3592	5419	3830
Option Encoder:	–	3592	5419	–
Connection cable				
6501.00267		x		
6501.00252			x	
6501.00264	x	x	x	
6501.00241				x

3.2.5 BL motors series BP4

3.2.5.1 3274...BP4

	analogue Hall	IE3 / IER3 / IERS3	IE3L / IER3L / IERS3L
Motor option:	3692/5438	5438	5438
Encoder option:	–	3807	5418
Connection cable			
6501.00267		x	
6501.00252			x
6501.00262	x	x	x
6501.00263	x	x	x
6501.00275			

3.2.5.2 2264...BP4

	analogue Hall	IE3 / IER3 / IERS3	IE3L / IER3L / IERS3L
Motor option:	3692/3830	3830	3830
Encoder option:	–	3807	5418
Connection cable			
6501.00267		x	
6501.00252			x
6501.00264	x	x	x

Accessory products

3.2.6 BL motors series BHx

	Phases	IEM3
Option Motor + Encoder:	K3682	K3682
Connection cable		
6501.00327		x
6501.00328	x	

3.2.7 BL motors series BXT

	Digital Hall	IE3/IER3/IER53	IE3L/IER3L/IER53L
Option Motor:	3830	3830	3830
Option Encoder:	–	3807	5418
Connection cable			
6501.00264	x	x	x
6501.00267		x	
6501.00252			x

3.2.8 BL motors series 4490

	analogue Hall	IE3	IE3L	HEDS	HEDL
Motor option:	K3142	K1838 + K2972	K1838 + K2972	K312 + K2972	K312 + K2972
Encoder option:	–	3807	5418	Standard	5431
Connection cable					
6501.00267		x		x	
6501.00252			x		x
6501.00262	x	x	x	x	x
6501.00263	x	x	x	x	x
6501.00275				x	

3.2.9 BL motors series LM

	analogue Hall
Motor option:	K3098 ^{a)} K3113 ^{b)}
Connection cable	
6501.00264	x x

a) Only in combination with LM1247-...-01, LM1483-...-01 or LM2070-...-01

b) Only in combination with LM1247-...-11 LM1483-...-11 or LM2070-...-11

Accessory products

3.2.10 Explanation of the special numbers

Motor option for connecting to the MC V3.0 via extension cable

Special number	Field of application	Description	Cable length	Cross-section	Number of wires	Connector manufacturer	Connector
5268	CR/CXR	Single strands	Radial: 150 mm from motor middle Axial: 160 mm from cover	AWG 22	2	MOLEX	Connector: 43025-0200 Crimp: 43030-0008
2655	SR/CXR	Flat cable	150 mm	–	–	–	.Special connector: RM 1.25 mm
3692	22xx...BX4 (without 2250...BX4 S) 32xx...BX4 2264/3274 BP4	Analogue Hall sensors	–	–	–	–	–
3830	22xx...BX4 22xx...BX4 AES 22xx...BX4 CxD 32xx...BX4 32xx...BX4 AES 2264 BP4 2214...BXT R/H 3216...BXT R/H 4221...BXT R/H	Ribbon cables/ single strands	22xx...BX4: 175 mm 22xx...BX4 AES: 162 mm 22xx...BX4 CxD: 158 mm 32xx...BX4: 184 mm 32xx...BX4 AES: 170 mm 2264...BP4: 200 mm 22/32/42BXT: 300 mm	22BX4: AWG 26 32BX4: AWG 22 2264BP4: AWG 26/22 2214BXT: AWG 26 3216BXT: AWG 20/26 4221BXT: AWG 20/26	8	MOLEX	Connector: 43025-0800 Crimp: 43030-0007
5438	3274...BP4	Single strands	200 mm from motor middle	AWG 26/22	8	MOLEX	Motor: Connector: 39-01-4030 Crimp: 42750-1212 Sensors: Connector: 43654-0500 Crimp: 43030-0010
K3141	1226S...B 1628T...B 2036U...B 2057S...B/BHS 2444S...B 3056K...B 3564K...B	Single strands	300 mm	AWG 20-24 AWG 26-30	8	MOLEX	Connector: 43025-0800 Crimp: 43030-0007 Crimp: 43030-0010

Accessory products

Special number	Field of application	Description	Cable length	Cross-section	Number of wires	Connector manufacturer	Connector
K3142	4490H...B/BS	Single strands	300 mm from motor middle	AWG 16 AWG 26-30	Motor: 3 Sensor: 5	MOLEX	Motor: Connector: 39-01-4030 Crimp: 42750-3212 Sensors: Connector: 43654-0500 Crimp: 43030-0010
K1838	2444S...B 3056K...B 3564K...B 4490H...B/BS	Single strands, second shaft end for combination with IE3	–	–	–	–	–
K312	1628...B 2036...B 2057...B/BHS 2444...B 3056...B 3564...B 4490...B/BS	Single strands, second shaft end for combinations with HEDS/HEDL	–	–	–	–	–
K313	1628...B 2036...B 2057...B/BHS 2444...B	Single strands, second shaft end for combination with IE2	–	–	–	–	–
K2971	2036U...B 2057S...B/BHS 2444S...B 3056K...B 3564K...B	Single strands	300 mm from motor middle	Crimp: AWG 20-24 Crimp: AWG 26-30	Motor: 3 Sensor: 5	MOLEX	Connector: 43025-0800 Motor: Crimp: 43030-0007 Sensors: Crimp: 43030-0010
K2972	4490H...B/BS	Single strands	300 mm from motor middle	Crimp: AWG 16 Crimp: AWG 26-30	Motor: 3 Sensor: 5	MOLEX	Motor: Connector: 39-01-4030 Crimp: 45750-3212 Sensors: Connector: 43654-0500 Crimp: 43030-0010
K3098	Linear Motor LM1247...01 LM1483...01 LM2070...01	Single strands	200 mm	Crimp: AWG 20-24 Crimp: AWG 26-30	Motor: 3 Sensor: 5	MOLEX	Connector: 43025-0800 Motor: Crimp: 43030-0007 Sensors: Crimp: 43030-0010
K3113	1247...01 1483...01 2070...01	Single strands	250...261 mm	Crimp: AWG 26-30	Motor: 3 Sensor: 5	MOLEX	Connector: 43025-0800

Accessory products

Special number	Field of application	Description	Cable length	Cross-section	Number of wires	Connector manufacturer	Connector
K3682	1660...BHT 1660...BHS	Motor:					
		Single strands	300 mm	AWG 24	3	Phoenix	Connector: 1757022
		Sensors/encoders:					
		Flat cable	300 mm	AWG 28	Sensor: 5 Encoder: 3	Pancon	Connector: DIN 41651

Encoder option for connecting to the MC V3.0 via extension cable

Special number	Field of application	Description	Cable length	Cross-section	Number of wires	Connector manufacturer	Connector
2655	SR/CXR	Flat cable	150 mm	–	–	–	.Special connector: RM 1.25 mm
3807	IE3/IER3/IER53	Flat cable	–	AWG 28	6	PicoBlade	51021-0600
5418	IE3L/IER3L/IER53L	Flat cable, not for use with BX4	155 mm from motor middle	AWG 28	10	MOLEX	Connector: 51021-1000 Crimp: 50058-8000
5431	HEDL	Flat cable	150 mm from motor middle	AWG 28	10	MOLEX	Connector: 51021-1000 Crimp: 50058-8000

Motor/encoder combination for connecting to the MC V3.0 via extension cable

Special number	Field of application	Description	Cable length	Cross-section	Number of wires	Connector manufacturer	Connector
3592	22xx...BX4 + IE3 32xx...BX4 + IE3	Flat cable	162/170 mm from motor middle	Motor: AWG 22/26 Encoder: AWG 28	Motor: 8 Encoder: 6	MOLEX	Motor: Connector: 43025-0800 Crimp: 43030-0010 Encoder: Connector: 51021-0600 Crimp: 50058-8000
5419	22xx...BX4 + IER3 L 32xx...BX4 + IER3 L	Flat cable	22xx...BX4: 150 mm 32xx...BX4: 170 mm	Motor: 22xx...BX4: AWG 26 32xx...BX4: AWG22 Encoder: AWG 28	Motor: 8 Encoder: 10	MOLEX PicoBlade	Motor: Connector: 43025-0800 Crimp: 43030-0010 Crimp: 43030-0007 Encoder: Connector: 51021-1000 Crimp: 50058-8000

Accessory products

3.3 Pin assignment of the connection cables

3.3.1 MC 50xx cable, USB 2.0 connectors A-MINI B

6501.00224 MC 50xx cable, USB 2.0 connectors A-MINI B			
Function	Wire colour	Controller X1	USB 2.0
VBUS	red	Pin 1	Pin 1
D-	white	Pin 2	Pin 2
D+	Green	Pin 3	Pin 3
GND	Black	Pin 4	Pin 5
ID	not connected	not connected	Pin 4

3.3.2 MC 50xx cable, V3.0-RS232

6501.00268 MC 50xx cable, V3.0-RS232			
Function	Wire colour	Controller X2	D-Sub
			Pin 1
RxD	Brown	Pin 2	Pin 2
TxD	red	Pin 1	Pin 3
			Pin 4
GND	Black	Pin 3	Pin 5
			Pin 6
			Pin 7
			Pin 8
			Pin 9

3.3.3 MC 50xx cable, V3.0-CANopen

6501.00269 MC 50xx cable, V3.0-CANopen			
Function	Wire colour	Controller X2	D-Sub
			Pin 1
CAN low	Brown	Pin 2	Pin 2
GND	Black	Pin 3	Pin 3
			Pin 4
			Pin 5
			Pin 6
CAN high	red	Pin 1	Pin 7
			Pin 8
			Pin 9

Accessory products

3.3.4 MC 50xx cable, V3.0-EtherCAT, RJ45-RJ45

6501.00274	MC 50xx cable, V3.0-EtherCAT, RJ45-RJ45
Function	IN / OUT
TxD+	Pin 1
TxD-	Pin 2
RxD+	Pin 3
	Pin 4
	Pin 5
RxD-	Pin 6
	Pin 7
	Pin 8

3.3.5 MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (circuit board connection)

6501.00278	MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (circuit board connection)
Function	IN / OUT
TxD+	Pin 1
TxD-	Pin 2
RxD+	Pin 3
	Pin 4
	Pin 5
RxD-	Pin 6

3.3.6 MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (motherboard connection)

6501.00279	MC 5004 ribbon cable, V3.0-EtherCAT, DIN-DIN (motherboard connection)
Function	IN / OUT
TxD+	Pin 1
TxD-	Pin 2
RxD+	Pin 3
	Pin 4
	Pin 5
RxD-	Pin 6

Accessory products

3.3.7 MC 5004 cable, EtherCAT, V3.0 connectors RJ45-RJ45 straight (circuit board connection)

6501.00272 MC 5004 cable, EtherCAT, V3.0 connectors RJ45-RJ45 straight (circuit board connection)	
Function	IN / OUT
TxD+	Pin 1
TxD-	Pin 2
RxD+	Pin 3
	Pin 4
	Pin 5
RxD-	Pin 6
	Pin 7
	Pin 8

3.3.8 MC 50xx cable, V3.0-DC supply

6501.00265 MC 50xx cable, V3.0-DC supply			
Function	Wire colour	Controller M1	Motor
Motor +	red	Pin 1	Pin 1
Motor -	Black	Pin 2	Pin 2
n.c.	-	Pin 3	

3.3.9 MC 5010 cable, V3.0-BL phase (3274...BP4/4490...B/BS)

6501.00262 MC 5010 cable, V3.0-BL phase (3274...BP4/4490...B/BS)			
Function	Wire colour	Controller M1	Motor
Phase C	Black	Pin 3	Pin 1
Phase B	Green	Pin 2	Pin 2
Phase A	white	Pin 1	Pin 3

3.3.10 MC 5010 cable, V3.0-3274...BP4 Hall

6501.00263 MC 5010 cable, V3.0-3274...BP4 Hall			
Function	Wire colour	Controller M2	Sensors
GND	Black	Pin 2	Pin 1
U _{DD}	red	Pin 1	Pin 2
Hall C	Yellow	Pin 5	Pin 3
Hall B	Orange	Pin 4	Pin 4
Hall A	Brown	Pin 3	Pin 5

Accessory products

3.3.11 MC 50xx cable, V3.0-BL Hall + phases

6501.00264 MC 50xx cable, V3.0-BL Hall + phases			
Function	Wire colour	Controller M1	Motor/sensors
Phase C	Yellow	Pin 3	Pin 1
Phase B	Orange	Pin 2	Pin 2
Phase A	Brown	Pin 1	Pin 3

3.3.12 MC 50xx cable, V3.0-BX4 AES

6501.00241 MC 50xx cable, V3.0-BX4 AES				
Function	Wire colour	Controller M3	Controller M1	Motor/Encoder
Phase C	Yellow		Pin 3	Pin 1
Phase B	Orange		Pin 2	Pin 2
Phase A	Brown		Pin 1	Pin 3
GND	Black	Pin 2		Pin 4
U _{DD}	red	Pin 1		Pin 5
CLK	Grey	Pin 8		Pin 6
CS	Blue	Pin 4		Pin 7
DATA	Green	Pin 6		Pin 8

3.3.13 Adapter cable HEDS

6501.00275 Adapter cable HEDS			
Function	Wire colour	6501.00267	Encoders
n.c.	-	Pin 1	
GND	Brown	Pin 3	Pin 1
Channel I	Grey	Pin 2	Pin 2
Channel A	Green	Pin 6	Pin 3
U _{DD}	Orange	Pin 4	Pin 4
Channel B	Blue	Pin 5	Pin 5

For use only in conjunction with cable 6501.00267 (see chap. 3.3.14, p. 21).

Accessory products

3.3.14 MC 50xx cable, V3.0-IE3, IE2, IEH2, IER3, IERS3, HEDS

6501.00267 MC 50xx cable, V3.0-IE3, IE2, IEH2, IER3, IERS3, HEDS			
Function	Wire colour	Controller M3	Encoders
n.c.	-	-	Pin 1
Channel I	Yellow	Pin 8	Pin 2
GND	Black	Pin 2	Pin 3
U _{DD}	red	Pin 1	Pin 4
Channel B	Orange	Pin 6	Pin 5
Channel A	Brown	Pin 4	Pin 6

Not for use in conjunction with SR motors.

3.3.15 MC 50xx cable, V3.0 - IEH3

6501.00266 MC 50xx cable, V3.0 - IEH3			
Function	Wire colour	Controller M3	Encoders
n.c.			
GND	Black	Pin 2	Pin 4
U _{DD}	red	Pin 1	Pin 5
Channel B	Orange	Pin 6	Pin 6
Channel A	Brown	Pin 4	Pin 7
Channel I	Yellow	Pin 8	Pin 8

Not for use in conjunction with SR motors.

3.3.16 MC 50xx cable, V3.0-IE3L, HEDL

6501.00252 MC 50xx cable, V3.0-IE3L, HEDL			
Function	Wire colour	Controller M3	Motor/Encoder
n.c.	-	-	Pin 1
U _{DD}	red	Pin 1	Pin 2
GND	Black	Pin 2	Pin 3
n.c.	-	-	Pin 4
Channel A	Green	Pin 3	Pin 5
Channel A	Brown	Pin 4	Pin 6
Channel B	Blue	Pin 5	Pin 7
Channel B	Orange	Pin 6	Pin 8
Index	Violet	Pin 7	Pin 9
Index	Yellow	Pin 8	Pin 10

Accessory products

3.3.17 MC50xx cable, V3.0-BHx Hall + IEM3

6501.00327 MC 50xx cable, V3.0-BHx Hall + IEM3			
Function	Controller M2	Controller M3 Encoder	Encoder/sensors
GND	Pin 2		Pin 1
U _{DD}	Pin 1		Pin 2
Hall C	Pin 5		Pin 3
Hall B	Pin 4		Pin 4
Hall A	Pin 3		Pin 5
Channel B		Pin 6	Pin 6
Channel A		Pin 4	Pin 7
Channel I		Pin 8	Pin 8

3.3.18 MC50xx cable, V3.0-BHx phases

6501.00328 MC50xx cable, V3.0-BHx phases			
Function	Wire colour	Controller M1	Motor
Phase C	Yellow	Pin 3	Pin 1
Phase B	Orange	Pin 2	Pin 2
Phase A	Brown	Pin 1	Pin 3

3.3.19 MC 50xx cable, V3.0-LM motor

6501.00264 MC 50xx cable, V3.0-LM motor				
Function	Wire colour	Controller M2	Controller M1	Motor/sensors
Phase C	Yellow		Pin 1	Pin 1
Phase B	Orange		Pin 2	Pin 2
Phase A	Brown		Pin 3	Pin 3
GND	Black	Pin 2		Pin 4
U _{DD}	red	Pin 1		Pin 5
Hall C	Grey	Pin 5		Pin 6
Hall B	Blue	Pin 4		Pin 7
Hall A	Green	Pin 3		Pin 8

Accessory products

3.3.20 MCS cable, EtherCAT, connectors M8-M8

6501.00270 (straight) MCS cable, EtherCAT, connectors M8-M8 6501.00210 (angled)	
Function	IN / OUT
TxD+	Pin 1
RxD+	Pin 2
TxD-	Pin 3
RxD-	Pin 4

Manufacturer's proof of origin:

6501.00270: Murr Elektronik, article 7000-89701-7910150

6501.00210: Murr Elektronik, article 7000-89771-7910150

3.3.21 MCS cable, EtherCAT, connectors M8-RJ45

6501.00271 (straight) MCS cable, EtherCAT, connectors M8-RJ45 6501.00211 (angled)	
Function	IN / OUT
TxD+	Pin 1
RxD+	Pin 2
TxD-	Pin 3
RxD-	Pin 4

Manufacturer's proof of origin:

6501.00271: Murr Elektronik, article 7000-89721-7910150

6501.00211: Murr Elektronik, article 7000-89781-7910150

3.3.22 MCS supply cable, connectors M12, 4-pin

6501.00255 (straight) MCS supply cable, connectors M12, 4-pin 6501.00256 (angled)		
Function	Wire colour	MCS X1
GND	brown	Pin 1
U _p	white	Pin 2
U _{mot}	blue	Pin 3
EGND	black	Pin 4

Manufacturer's proof of origin:

6501.00255: Phoenix Contact, article 1536285

6501.00256: Phoenix Contact, article 1536405

Accessory products

3.3.23 MCS I/O cable, connectors M12, 12-pin

6501.00257 (straight) MCS I/O connector, connectors M12, 12-pin 6501.00258 (angled)		
Function	Wire colour	MCS X2
GND	brown	Pin 1
CAN_L /RxD	blue	Pin 2
CAN_H /TxD	white	Pin 3
U _{DD}	green	Pin 4
DigOut 1	pink	Pin 5
DigOut 2	yellow	Pin 6
DigIn 1	black	Pin 7
DigIn 2	grey	Pin 8
DigIn 3	red	Pin 9
AnIn 1	violet	Pin 10
AGND	grey/pink	Pin 11
AnIn 2	red/blue	Pin 12
EGND	-	Screen

Manufacturer's proof of origin:

6501.00257: Phoenix Contact, article 1430129

6501.00258: Phoenix Contact, article 1430161

Accessory products

3.4 Connector sets and other accessories

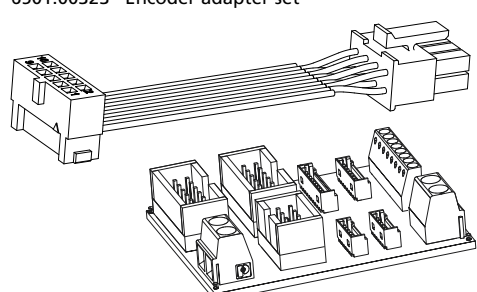
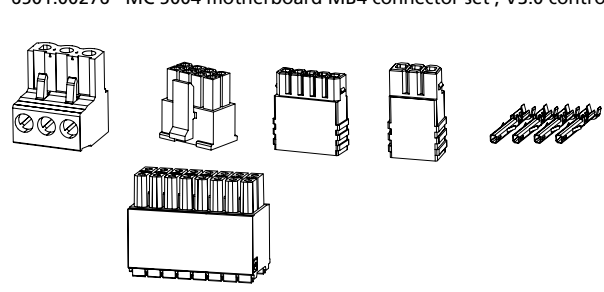
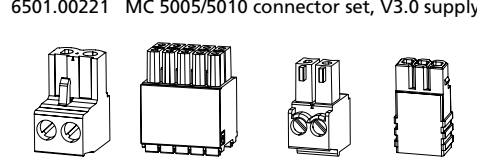
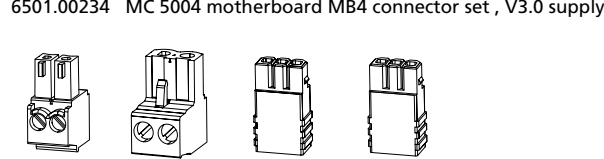
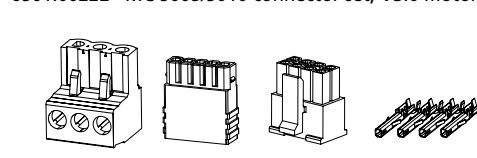
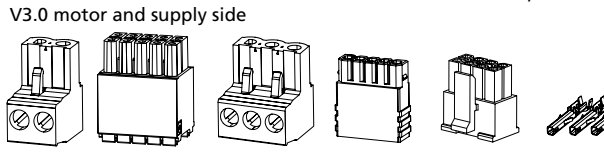
<p>6501.00323 Encoder adapter set</p> 	<p>6501.00276 MC 5004 motherboard MB4 connector set , V3.0 controller</p> 
<p>6501.00221 MC 5005/5010 connector set, V3.0 supply side</p> 	<p>6501.00234 MC 5004 motherboard MB4 connector set , V3.0 supply side</p> 
<p>6501.00222 MC 5005/5010 connector set, V3.0 motor side</p> 	<p>6501.00312 MC 5004 STO motherboard MB1 connector set, V3.0 motor and supply side</p> 

Fig. 2: Overview of the connector and adapter sets

Accessory products

3.4.1 Connector sets

3.4.1.1 MC 50xx connector set, V3.0 supply side

6501.00221	MC 5005/5010 connector set, V3.0 motor side
X2	Communication
X3	I / O
X4	MC power supply
X5	Motor power supply

Manufacturer's proof of origin:

X2: Phoenix Contact, article 1778845

X3: Phoenix Contact, article 1790137

X4: Phoenix Contact, article 1840366

X5: Phoenix Contact, article 1754449

3.4.1.2 MC 5005/5010 connector set, V3.0 motor side

6501.00222	MC 5005/5010 connector set, V3.0 motor side
M1	Power supply for motor
M2	Sensors
M3	Encoder

Manufacturer's proof of origin:

M1: Phoenix Contact, article 1754465

M2: Phoenix Contact, article 1778861

M3: Molex, article 43025-0800 (housing) + 43030-0010 (contacts)

3.4.1.3 MC 5004 motherboard MB4 connector set, V3.0 supply side

6501.00234	MC 5004 motherboard MB4 connector set, V3.0 supply side
COM	Communication
X4	Motherboard power supply
X5	Motor power supply

Manufacturer's proof of origin:

COM: Phoenix Contact, article 1778845

X4: Phoenix Contact, article 1840366

X5: Phoenix Contact, article 1754449

Accessory products

3.4.1.4 MC 5004 motherboard MB4 connector set, V3.0 controller

6501.00276	MC 5004 motherboard MB4 connector set, V3.0 controller
M1	Power supply for motor
M2	Sensors
M3	Encoder
X2	Communication
X3	I/O

Manufacturer's proof of origin:

M1: Phoenix Contact, article 1754465

M2: Phoenix Contact, article 1778861

M3: Molex, article 43025-0800 (housing) + 43030-0010 (contacts)

X2: Phoenix Contact, article 1778845

X3: Phoenix Contact, article 1790166

3.4.1.5 MC 5004 STO motherboard MB1 connector set, V3.0 motor and supply side

6501.00312	MC 5004 STO motherboard MB1 connector set, V3.0 motor and supply side
M1	Power supply for motor
M1_1	Combi-connection for motor phases and sensors
M2	Sensors
M3	Encoder
X2 / X2_1	Communication (RS232 / CAN)
X3	I/O
X5	Voltage supply for motor and controller
X6	STO

Manufacturer's proof of origin:

M1: Phoenix Contact, article 1754465

M1_1 / M3: Molex, article 43025-0800 (housing) + 43030-0010 (contacts)

M2: Phoenix Contact, article 1778861

X2 / X2_1: Phoenix Contact, article 1778845

X3: Phoenix Contact, article 1790140

X5: Phoenix Contact, article 1754449

X6: Phoenix Contact, article 1790124

Accessory products

3.4.2 Other accessories

3.4.2.1 MC 5004 motherboard MB4, vertical connector

Article no.:

6500.01681

Function:

Basic module to accept and combine up to four MC 5004 Motion Controller circuit boards in multi-axis applications. Vertical orientation of the connectors, reduced wiring requirement.

Manufacturer's proof of origin:

Socket connectors at the controller connection slots: Fischer, item BL 6 50



Detailed descriptions of the connectors and connections can be found in the current version of the corresponding Technical Manual.

3.4.2.2 MC 5004 motherboard MB4, horizontal connector

Article no.:

6500.01676

Function:

Basic module to accept and combine up to four MC 5004 Motion Controller circuit boards in multi-axis applications. Horizontal orientation of the connectors, reduced wiring requirement.

Manufacturer's proof of origin:

Socket connectors at the controller connection slots: Fischer, item BL 6 50



Detailed descriptions of the connectors and connections can be found in the current version of the corresponding Technical Manual.

3.4.2.3 MC 5004 STO motherboard MB1, vertical connector

Article no.:

6500.01715

Function:

Basic module to accept and combine one MC 5004 STO Motion Controller circuit board in single-axis application. Vertical orientation of the connectors, reduced wiring requirement.

Manufacturer's proof of origin:

Socket connectors at the controller connection slots: Fischer, item BL 6 50



Detailed descriptions of the connectors and connections can be found in the current version of the MC 5004 STO Installation Instructions.

3.4.2.4 MC 5005/5010 top-hat rail installation set

Article no.:

6501.00223

Function:

Top-hat rail clip including 2 M3x6 screws for attaching the Motion Controller to the installation set. Comfortable installation aid for installing the Controller, e. g. in control cabinets.

Accessory products

3.4.2.5 MC 50xx encoder adapter set

6501.00323	MC 50xx encoder adapter set	
Function	Adapter X10	Controller M3
n.c.	Pin 1	
U _{DD}	Pin 2	Pin 1
GND	Pin 3	Pin 2
Channel A	Pin 4	Pin 3
Channel A	Pin 5	Pin 4
Channel B	Pin 6	Pin 5
Channel B	Pin 7	Pin 6
Channel I	Pin 8	Pin 7
Channel I	Pin 9	Pin 8
n.c.	Pin 10	

Function:

Multi-functional adapter for connection of standard versions of various types of encoder to the MC 5005/5010 Motion Controller and/or the MB4 MC 5004 or MB1 MC 5004 STO motherboard.

3.4.2.6 MCS programmable adapter, RS232/CAN

Article no.:

6501.00283

Function:

Interface adapter for parameterising a Motion Control system via PC / Motion Manager 6.

3.4.2.7 Programmable adapter MCS, USB

Article no.:

6501.00284

Function:

Interface adapter for parameterising a Motion Control system via PC / Motion Manager 6. For use only in conjunction with interface variant RS232.

3.4.2.8 BC 5004 Brake Chopper

Article no.:

6501.00134

Function:

The function of the BC 5004 Brake Chopper is to limit the supply voltage at 4-quadrant controller and other connected devices such as programmable adapters or power supply units.

Troubleshooting

4 Troubleshooting

If unexpected malfunctions occur during operation according to the intended use, please contact your support partner.

Warranty

5 Warranty

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