Motor controllers CMMS-ST, for stepper motors

FESTO

Motor controllers CMMS-ST, for stepper motors

Key features

Performance characteristics

Compactness

- Small dimensions
- Full integration of all components for controller and power section, including RS232 and CANopen interface
- Integrated brake chopper
- Integrated EMC filters
- Automatic actuation for a holding brake
- Adheres to the current CE and EN standards without additional external measures (motor cable length of up to 15 m)

Motion control

- Can be operated as a torque, speed or position controller
- Integrated positioning controller
- Time-optimised (trapezoidal) or jerk-free (S-shaped) positioning
- Absolute and relative movements
- Point-to-point positioning with and without approximate positioning
- Position synchronisation
- Electronic gear unit
- 63 position sets
- 8 travel profiles
- Wide range of homing methods

Fieldbus interfaces

Integrated:

CANopen

Optional:

PROFIBUS

DeviceNet

Input/output

- Freely programmable I/Os
- High-resolution 12-bit analogue input
- Jog/teach mode
- Simple linking to a higher-level controller via I/O or fieldbus
- Synchronous operation
- Master/slave mode

Integrated sequence control

- Automatic sequence of position sets without a higher-level controller
- Linear and cyclic position sequences
- Adjustable delay times

Integrated safety functions

- The motor controller CMMS-ST support "Safe Torque off (STO)" and "Safe Stop 1 (SS1)" functions with protection against unexpected startup in accordance with EN 61800-5-2
- Protection against unexpected start-up
- Two-channel disconnection of the output stage
- Shorter response times in the event of an error

Interpolating multi-axis movement

- With a suitable controller, the CMMS-ST can perform path movements with interpolation via CANopen. The controller specifies setpoint position values in a fixed time pattern to this end. In between, the servo positioning controller independently interpolates the data values between two data points.

Motor controllers CMMS-ST, for stepper motors

Key features

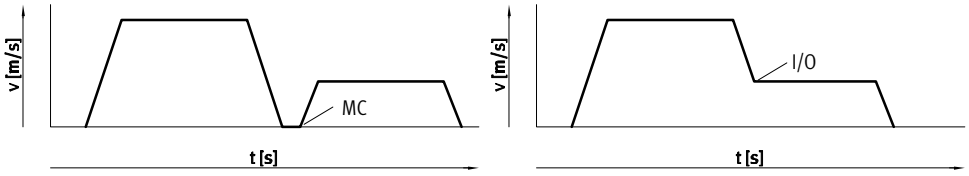
Performance characteristics

Servo mode

- Encoder option (closed loop), in other words no step losses, following errors are corrected

Travel program

- Linking of any number of position sets into a travel program
- Step criteria for the travel program possible via digital inputs, for example
  MC – motion complete
  I/O – digital inputs



Library for EPLAN

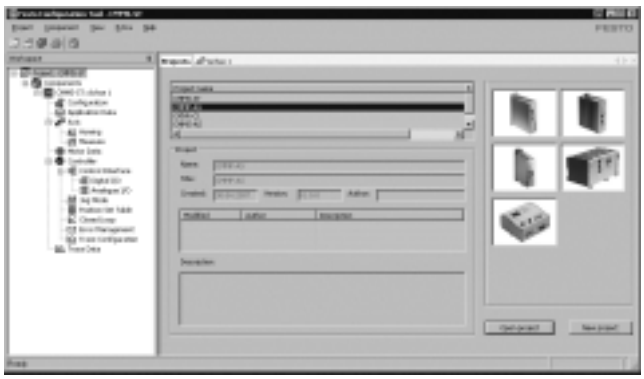
EPLAN macros for fast and reliable planning of electrical projects in combination with motor controllers, motors and cables. This enables a high level of planning reliability, standardisation of documentation, no need to create symbols, graphics and master data.

Motor controllers CMMS-ST, for stepper motors

Key features

FCT software – Festo Configuration Tool

Software platform for electric drives from Festo



- All drives in a system can be managed and archived in a common project
- Project and data management for all supported device types
- Simple to use thanks to graphically-supported parameter entry
- Universal mode of operation for all drives
- Working offline at your desk or online at the machine

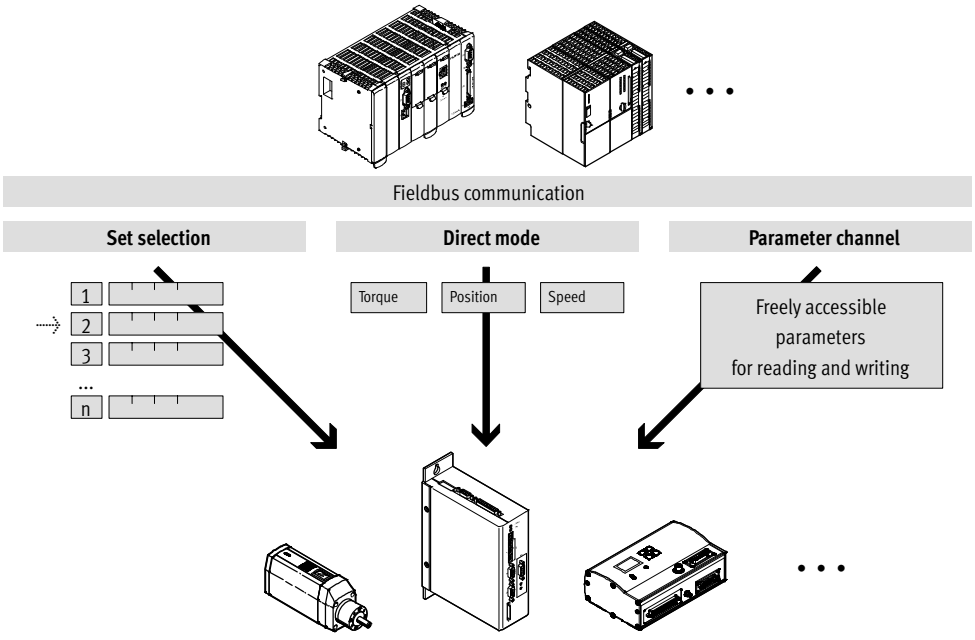
FHPP – Festo Handling and Positioning Profile

Optimised data profile

Festo has developed an optimised data profile, the "Festo Handling and Positioning Profile (FHPP)", that is tailored to handling and positioning applications.

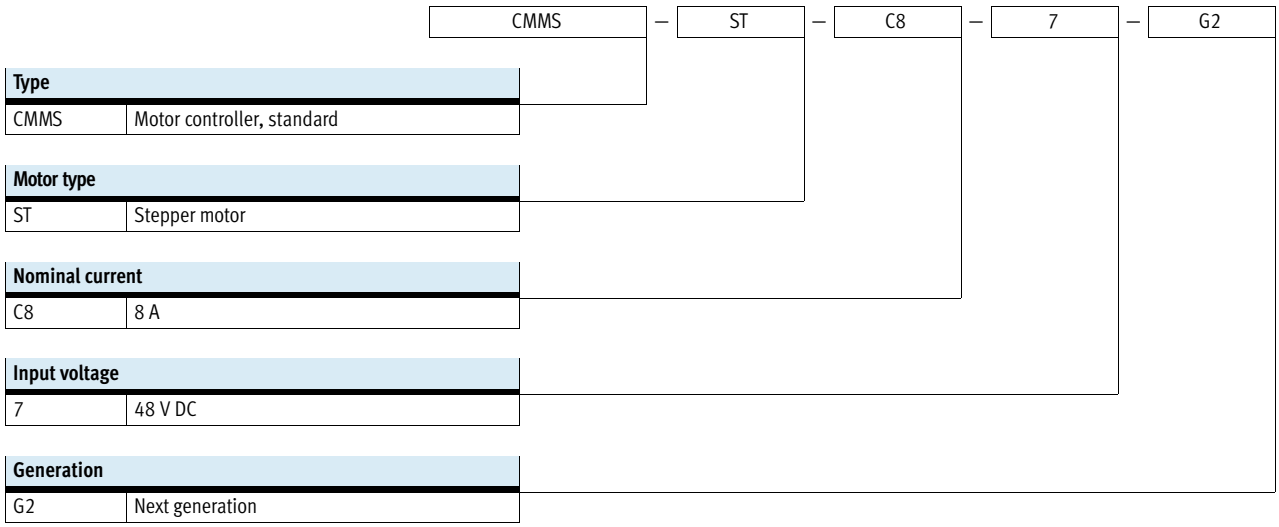
The FHPP data profile permits the actuation of Festo motor controllers, using a fieldbus interface, via standardised control and status bytes.

The following are defined, among others:
- Operating modes
- I/O data structure
- Parameter objects
- Sequence control



Motor controllers CMMS-ST, for stepper motors

Type codes



Type	
CMMS	Motor controller, standard

Motor type	
ST	Stepper motor

Nominal current	
C8	8 A

Input voltage	
7	48 V DC

Generation	
G2	Next generation

Motor controllers CMMS-ST, for stepper motors

Technical data

Fieldbus interfaces

General technical data		
Type of mounting		Screwed to a mounting plate
Operating mode		PWM MOSFET power amplifier
Motor actuation		Sinusoidal current impressing
Cycle rate	[kHz]	Constant 50
Rotary position generator		Encoder
Display		7-segment display
Parameterisation interface		RS232 (9,600 ... 115,000 bits/s)
Encoder interface input		As speed/position specification for the slave drive in synchronous mode
		RS422
Encoder interface output		Setpoint specification for downstream slave drive
Brake resistor, integrated	[Ω]	17
Pulse power of braking resistor	[kVA]	0.5
Bus terminating resistor		Integrated
Impedance of setpoint input	[kΩ]	20
Number of analogue outputs		1
Operating range of analogue outputs	[V]	±10
Characteristics of digital logic outputs		Freely configurable in some cases
Number of analogue inputs		1
Operating range of analogue inputs	[V]	±10
Mains filter		Integrated
Product weight	[g]	900

Technical data – Fieldbus interface					
Interfaces		I/O	CANopen	PROFIBUS DP	DeviceNet
Communication profile		–	DS301, FHPP	DP-V0 / FHPP	FHPP
		–	DS301, DSP402	–	
Max. fieldbus transmission rate	[Mbit/s]	–	1	12	0.5
Interface	Integrated	■	■	–	–
	Optional	–	–	■ → 11	■ → 11

Function blocks for PLC programming				
Programming software	Controller manufacturer	Interfaces		
		CANopen	PROFIBUS DP	DeviceNet
CoDeSys	Festo	■	■	■
	Beckhoff			
	Other manufacturers			
RSLogix5000	Rockwell Automation	–	–	■
Step 7	Siemens	–	■	–

Electrical data		
Output connection data		
Output voltage range	[V AC]	0 V up to input voltage
Nominal current setting		Via software
Max. peak current duration	[s]	2
Max. intermediate circuit voltage	[V DC]	48
Output frequency	[Hz]	0 ... 2000
Load supply		
Nominal voltage	[V DC]	24 ... 48
Nominal current	[A]	8
Peak current	[A]	12
Logic supply		
Nominal voltage	[V DC]	24 ±20%
Nominal current	[A]	0.2
Max. current of digital logic outputs	[mA]	100

Safety characteristics	
Safety function to EN 61800-5-2	Safe torque off (STO)
Performance Level (PL) to EN ISO 13849-1	Category 3, Performance Level d
Safety integrity level (SIL) to EN 61800-5-2, EN 62061, EN 61508	SIL 2
MTTFd	STO/2521 years
PFH	4.53 x 10^{-8}
Approval	BIA
Certificate issuing authority	BG MFS 09031
CE marking (see declaration of conformity)	To EU EMC Directive[1)]
	To EC Machinery Directive

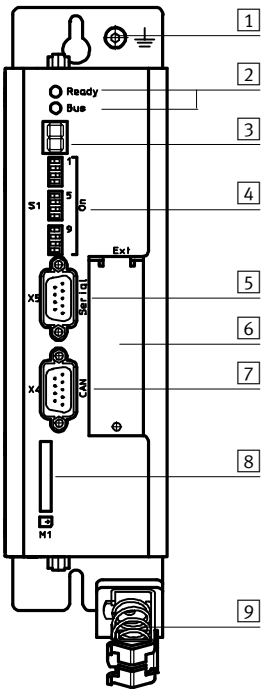
1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Operating and environmental conditions		
Digital logic outputs		Not galvanically isolated
Logic inputs		Galvanically connected to logic potential
Degree of protection		IP20
Protective function		I^2t monitoring
		Intermediate circuit over/undervoltage
		Output stage short circuit
		Standstill monitoring
		Temperature monitoring
Degree of contamination		2
Ambient temperature	[°C]	0 ... +50
Storage temperature	[°C]	−25 ... +70
Relative air humidity	[%]	0 ... 90 (non-condensing)
CE marking (see declaration of conformity)		To EU Low Voltage Directive
		To EU EMC Directive[1)]
		To EU Machinery Directive
Approval		c UL - Recognised (OL)
		UL listed (OL)
		C-Tick
Note on materials		RoHS-compliant

1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

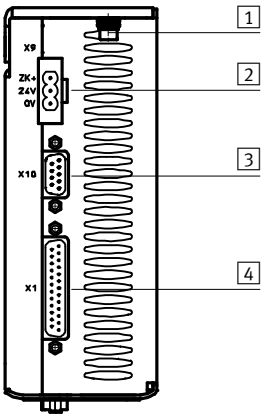
View of motor controller

From the front



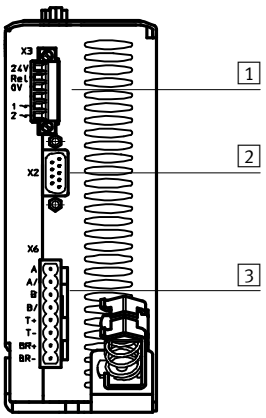
1 Earthing
2 Ready/bus LED
3 Status display
4 Fieldbus settings and boot loader
5 X5 Interface: RS232/RS485
6 X4 Technology module slot
7 Interface: CAN bus
8 SD memory card
9 Screened connection

From above



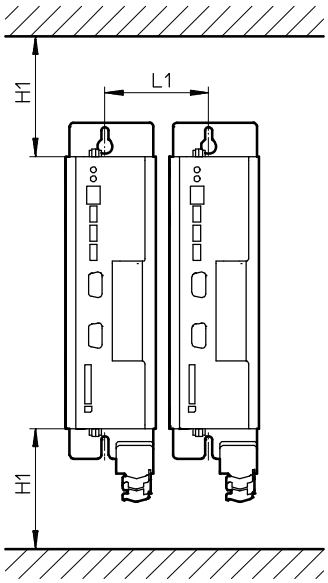
1 Earthing screw
2 X9 Power supply
3 X10 Incremental encoder interface (bidirectional)
4 X1 I/O interface

From underneath



1 X3 Safe stop
2 X2 Increment encoder input for motor
3 X6 Motor connection

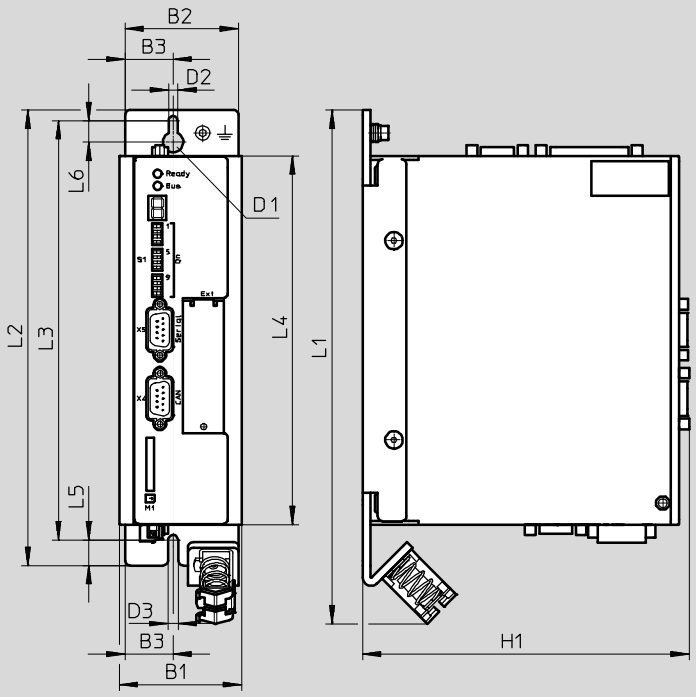
Installation clearance for motor controller



H1	L1
100	69

Dimensions

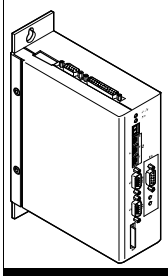
Download CAD data ➔ **www.festo.com**



Type	B1	B2	B3	D1 ∅	D2 ∅	D3 ∅	H1
CMMS-ST	60	56	24	10	4.5	5	161

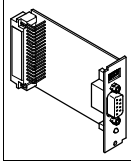
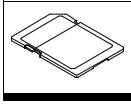
Type	L1	L2	L3	L4	L5	L6
CMMS-ST	252	224	206.25	181	12.5	15.75

Ordering data

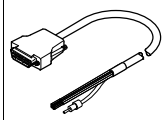
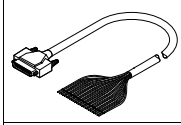
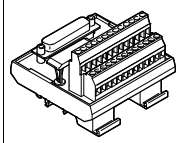
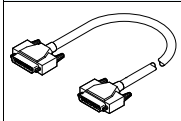
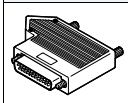
	Description	Part No.	Type
	The plug assortment NEKM (➔ 12) and the operator package (➔ 13) are included in the scope of delivery of the motor controller.	**572211**	**CMMS-ST-C8-7-G2**

Accessories

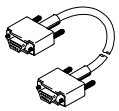
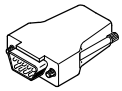
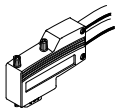
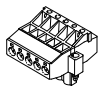
Ordering data – Plug-in cards

	Description	Part No.	Type
	Interface module, for PROFIBUS interface	**547450**	**CAMC-PB**
	Interface module, for DeviceNet interface	**547451**	**CAMC-DN**
	Memory card, for data backup and firmware download	**1436343**	**CAMC-M-S-F10-V1**

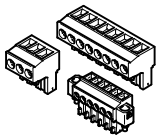
Ordering data – Connection options from I/O interface to controller

	Description	Cable length [m]	Part No.	Type
Control cable				
	• For I/O interface to any controller • Recommended for analogue signals since the cable is shielded	2.5	**552254**	**NEBC-S1G25-K-2.5-N-LE26**
	• For I/O interface to any controller • Cannot be used if the incremental encoder interface (X10 plug) is in use	3.2	**8001373**	**NEBC-S1G25-K-3.2-N-LE25**
Connection block				
	Ensures simple and clear wiring. The connection to the motor controller is established via the connecting cable NEBC-S1G25-K-...	–	**8001371**	**NEFC-S1G25-C2W25-S7**
Connecting cable				
	Connects the motor controller to the connection block	1.0	**8001374**	**NEBC-S1G25-K-1.0-N-S1G25**
		2.0	**8001375**	**NEBC-S1G25-K-2.0-N-S1G25**
		5.0	**8001376**	**NEBC-S1G25-K-5.0-N-S1G25**
Plug connector				
	25-pin Sub-D plug. Each wire can be individually assembled using screw terminals	–	**8001372**	**NEFC-S1G25-C2W25-S6**

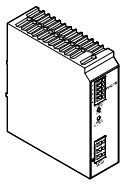
Ordering data – Cables and plugs

	Description	Cable length [m]	Part No.	Type
Programming cable				
	–	1.5	**160786**	**PS1-ZK11-NULLMODEM-1,5M**
Encoder plug				
	For incremental encoder interface	–	**564264**	**NECC-A-S-S1G9-C2M**
Plug connector				
	For PROFIBUS interface	–	**533780**	**FBS-SUB-9-WS-PB-K**
	For CANopen interface	–	**533783**	**FBS-SUB-9-WS-CO-K**
	For DeviceNet interface	–	**525635**	**FBSD-KL-2X5POL**

Ordering data – Plug assortment

	Description	Part No.	Type
	• Comprising plug for power supply, motor connection and safety function • The plug assortment is included in the scope of delivery of the motor controller	**547452**	**NEKM-C-1**

Ordering data – Power supply units

	Description	Input voltage range [V AC]	Nominal output voltage [V DC]	Nominal output current [A]	Part No.	Type
	Power supply for motor controller	100 ... 240	24	5	**2247681**	**CACN-3A-1-5**
				10	**2247682**	**CACN-3A-1-10**
			48	5	**2247683**	**CACN-3A-7-5**
				10	**2247684**	**CACN-3A-7-10**
				20	**2247685**	**CACN-11A-7-20**

Note

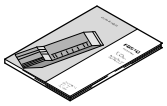
If a common power supply unit is used to supply the power section and the control section, the voltage tolerances for the supply to the control section cannot be maintained at high braking power. This can result in damage to the control section.

Always use separate power supply units to supply the power section and the control section.

Ordering data – Software and documentation

	Description	Part No.	Type
	Operator package contains: – CD-ROM – With user documentation for the CMMS-ST, in de, en, es, fr, it – With FCT (Festo Configuration Tool) configuration software, in de, en – Brief description The package is included in the scope of delivery	**573960**	**GSIB-CMMS-ST-G2-ML**

Ordering data – Documentation[1)]

	Language	For motor controller Part No.	Type		Festo Handling and Positioning Profile (FHPP) for the motor controller range CMM... Part No.	Type
	DE	**573124**	**P.BE-CMMS-ST-G2-HW-DE**		**555695**	**P.BE-CMM-FHPP-SW-DE**
	EN	**573125**	**P.BE-CMMS-ST-G2-HW-EN**		**555696**	**P.BE-CMM-FHPP-SW-EN**
	ES	**573126**	**P.BE-CMMS-ST-G2-HW-ES**		**555697**	**P.BE-CMM-FHPP-SW-ES**
	FR	**573127**	**P.BE-CMMS-ST-G2-HW-FR**		**555698**	**P.BE-CMM-FHPP-SW-FR**
	IT	**573128**	**P.BE-CMMS-ST-G2-HW-IT**		**555699**	**P.BE-CMM-FHPP-SW-IT**
		For CANopen interface			For PROFIBUS interface	
	DE	**554351**	**P.BE-CMMS-FHPP-CO-SW-DE**		**554345**	**P.BE-CMMS-FHPP-PB-SW-DE**
	EN	**554352**	**P.BE-CMMS-FHPP-CO-SW-EN**		**554346**	**P.BE-CMMS-FHPP-PB-SW-EN**
	ES	**554353**	**P.BE-CMMS-FHPP-CO-SW-ES**		**554347**	**P.BE-CMMS-FHPP-PB-SW-ES**
	FR	**554354**	**P.BE-CMMS-FHPP-CO-SW-FR**		**554348**	**P.BE-CMMS-FHPP-PB-SW-FR**
	IT	**554355**	**P.BE-CMMS-FHPP-CO-SW-IT**		**554349**	**P.BE-CMMS-FHPP-PB-SW-IT**
		For DeviceNet interface				
	DE	**554357**	**P.BE-CMMS-FHPP-DN-SW-DE**			
	EN	**554358**	**P.BE-CMMS-FHPP-DN-SW-EN**			
	ES	**554359**	**P.BE-CMMS-FHPP-DN-SW-ES**			
	FR	**554360**	**P.BE-CMMS-FHPP-DN-SW-FR**			
	IT	**554361**	**P.BE-CMMS-FHPP-DN-SW-IT**			

1) User documentation in paper form is not included in the scope of delivery