Servo drives CMMT-ST, for extra-low voltage

FESTO

Key features

At a glance

- Space-saving servo drive for operating stepper motors and brushless direct current motors
- Extremely economical for positioning tasks and motion solutions with low power requirements up to 300 W
- Primary voltage from 24 ... 48 V DC
- Motor current up to 8 A (peak 10 A)
- 50% more compact than the smallest CMMT-AS
- Options for point-to-point and interpolating motion and for precise positioning
- Bus protocols

- Direct fieldbus integration to major controller manufacturers
- Auto-tuning supports simple commissioning of rotary and linear movements, using mechanical systems from Festo and third-party suppliers
- Integrated safety functions:
  - Safe torque off (STO) up to SIL3/Cat. 3 PL e
  - Safe stop 1 time controlled (SS1-t) when using a suitable external safety relay unit and suitable circuitry for the servo drive
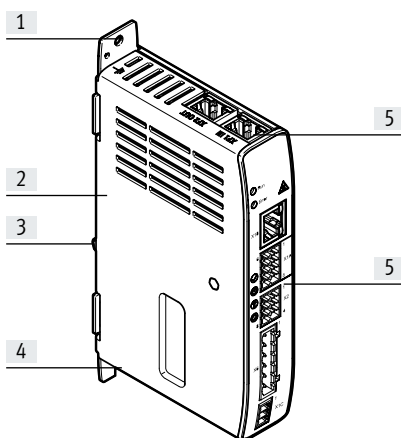- Can be easily combined with the servo drive CMMT-AS and axis mechanisms from Festo

EtherCAT. ➡   **PROFI NET®**   **EtherNet/IP**

Modbus

The technology in detail

[1] Hole for mounting the servo drive on the control cabinet back wall
[2] Housing
[3] Standard mounting via H-rail clamp
[4] Elongated hole for adjustment during mounting
[5] Connections

PositioningDrives
Configuring electromechanical drives

Create the optimum drive package quickly and reliably. PositioningDrives calculates suitable combinations of electric axis, electric motor and servo drive using just a few application details. You can sort the results according to your specifications and obtain all the relevant data including the bill of materials and documentation for the selected combination. This avoids design errors and results in significantly improved energy efficiency for the system.

EtherCAT®, PROFINET®, EtherNet/IP®, are registered trademarks of the respective trademark holder in certain countries.

Key features

Library in EPLAN

EPLAN macros for fast and reliable planning of electrical projects in combination with servo drives, motors and cables. This enables a high level of planning reliability and standardisation of documentation without the need to create symbols, graphics and master data.

Festo Automation Suite
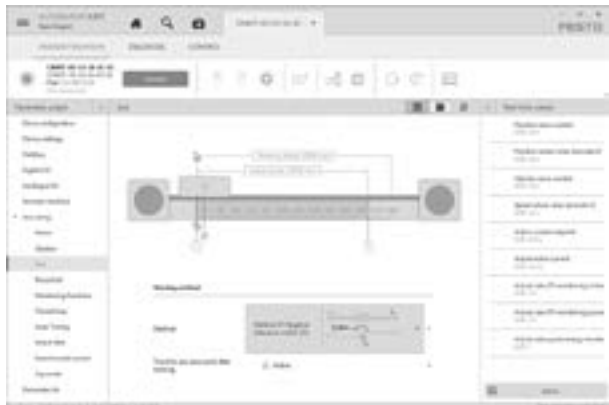
- Parameterisation, programming and commissioning in a clear and user-friendly interface
- Optimum support for complex processes thanks to guided wizards (e.g. for commissioning, drive configuration, etc.)
- Fast access to the required documents and additional information
- Easy integration of electric drives in the controller programming

System overview
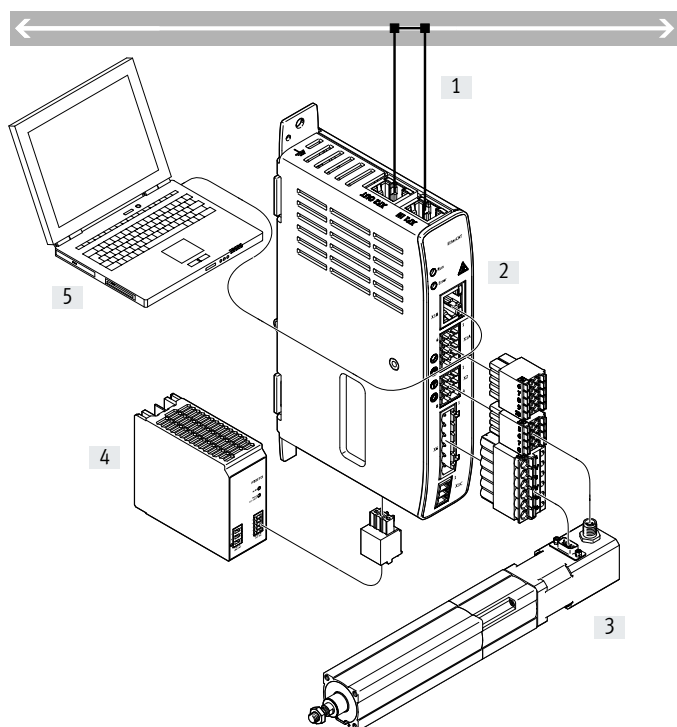
- [1] Bus/network
- [2] Servo drive CMMT-ST
- [3] Stepper motor or EC motor with drive
- [4] Power supply unit(s) for logic and load voltage (PELV)
- [5] PC with Ethernet connection for parameterisation

Type codes

001	Series	
CMMT	Motor controller	

002	Motor type	
ST	Stepper motor ST	

003	Nominal current	
C8	8 A	

004	Nominal input voltage	
1C	24 - 48 V DC	

005	Bus protocol/activation	
EC	EtherCAT®	
EP	EtherNet/IP	
PN	Profinet	

006	Safety function	
S0	Basic safety	

Data sheet

Bus protocols

EtherCAT

PROFINET

EtherNet/IP

Modbus

c(UL)us LISTED

General technical data

Type of mounting	Mounting plate, screwed in
	With H-rail
Display	LED green/yellow/red
Controller operating mode	Cascade controller
	P position controller
	PI speed controller
	PI current regulator for F or M
	Profile operation with record and direct mode
	Interpolating operation via fieldbus
	Synchronised operating modes
	Homing
	Set up mode
	Auto-tuning
	Open-loop operation
Operating mode	Field-oriented closed-loop control
	Position resolution 24 bit/rev.
	Sampling rate 20 kHz
	PWM with 20 kHz
	Real-time data acquisition
	2x input capture (x, v, F)
	2x output trigger (x, v, F)
	1x position encoder input
Adjustable current reduction	Via software
Protective function	I^2t monitoring
	Temperature monitoring
	Current monitoring
	Voltage failure detection
	Following error monitoring
	Software end-position detection
Mounting position	Free convection
	Vertical
Product weight [g]	350

Data sheet

Bus protocols

Interface	EtherCAT	PROFINET RT/IRT	EtherNet/IP	Modbus TCP
Function	Bus connection incoming/outgoing			
Process interfacing	Interpolated mode CSP	AC1: adjustable-speed drives	Adjustable-speed drives	Adjustable-speed drives
	Interpolated mode CSV	AC3: drives with positioning function	Drives with positioning function	Drives with positioning function
	Interpolated mode CST	AC4: synchronous servo application		
	Point-to-point mode PP			
	Point-to-point mode PV			
	Point-to-point mode PT			
	Homing mode HM			
	Record table with 128 entries			
Communication profile	CiA402	PROFIdrive	DriveProfile	DriveProfile
	CoE (CANopen over EtherCAT)	PROFIenergy		
	EoE (Ethernet over EtherCAT)			
	FoE (File over EtherCAT)			
Max. fieldbus transmission rate [Mbps]	100			
Connection type	2 x socket			
Connection technology	RJ45			

Electrical data

Output connection data		
Output voltage range	[V AC]	0 – Input
Nominal output current	[A]	8
Nominal current per phase	[A]	8
Peak current per phase	[A]	10
Max. peak current duration	[s]	3
Nominal power	[W]	300
Peak power	[W]	400
Output frequency	[kHz]	0 … 20
Max. motor cable length[1]	[m]	25
Load voltage DC		
Load voltage range	[V DC]	24 −15% … 48+15%
Max. DC link voltage	[V DC]	60
Logic supply		
Nominal voltage	[V DC]	24 ±15%
Max. current consumption		
Without locking brake	[A]	1
With locking brake	[A]	2
Holding brake		
Max. output current	[A]	1
Max. voltage drop	[V]	1

1) Without external mains filter

Data sheet

Interfaces			
Ethernet			
Function			Parameterisation and commissioning
Protocol			TCP/IP
Position encoder			
Function			Incremental encoder
			BiSS-C
Input/output			
Digital inputs			
	Number		6
	Number of high-speed		2
	Time resolution of high-speed	[µs]	1
	Switching logic		PNP
			NPN
	Properties		Not galvanically isolated
			Freely configurable in some cases
			Safety inputs in some cases
	Specification		Based on IEC 61131-2, type 3
	Working area	[V]	−3 … +30
Digital outputs			
	Number		2
	Number of high-speed		2
	Time resolution of high-speed	[µs]	1
	Switching logic		PNP
			NPN
	Properties		Not galvanically isolated
			Configurable
	Max. current	[mA]	100
Floating switching outputs			
	Number		1
	Max. current	[mA]	100

Data sheet

Safety data

Safety function to EN 61800-5-2	Safe torque off (STO)
	Safe stop 1 (SS1-t)
Performance level (PL) to EN ISO 13849-1	
Safe torque off (STO)	Category 3, PLd (EC motor without diagnostics)
	Category 3, PLe (stepper motor/EC motor with diagnostics)
Safety integrity level (SIL) to EN 62061 and EN 61508	
Safe torque off (STO)	SIL 2 / SILCL 2 (EC motor without diagnostics)
	SIL 3 / SILCL 3 (stepper motor/EC motor with diagnostics)
Certificate issuing authority and no.	German Technical Control Board (TÜV Rheinland) 01/205/5696.00/19
Proof test interval	
Safe torque off (STO)	20 a (stepper motor/EC motor without diagnostics)
Hardware fault tolerance	1

Operating and environmental conditions

|		
Degree of protection		IP20
Ambient temperature	[°C]	0 ... 50
Storage temperature	[°C]	−25 ... +55
Note on ambient temperature		Observe derating with regard to mounting clearance and output current
Relative humidity	[%]	5 ... 90 (non-condensing)
Protection class		III
Overvoltage category		I
Contamination level		2
Max. installation height	[m]	2000
Shock and vibration resistance		To EN 61800-2 and EN 61800-5-1
CE marking (see declaration of conformity)		To EU EMC Directive[1]
		To EU Machinery Directive
		To EU RoHS Directive
Certification		c UL us - Listed (OL)
		RCM trademark
KC marking		KC-EMV
Note on materials		Contains paint-wetting impairment substances
		RoHS-compliant

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
    If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.
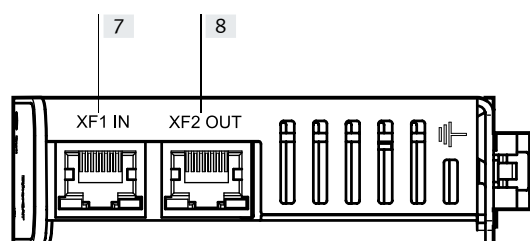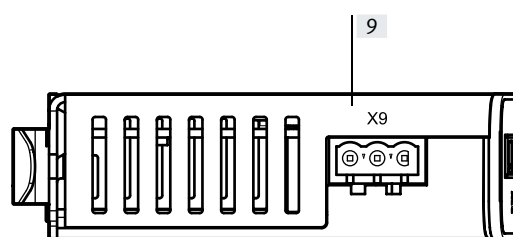
Data sheet

View
Front
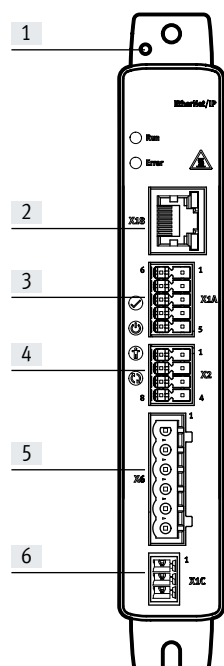
[1] Functional earth connection
[2] [X18] Standard Ethernet
[3] [X1A] I/O interface
[4] [X2] Encoder connection
[5] [X6] Motor connection
[6] [X1C] Connection for the reference switch or limit switch

Top

[7] [XF1 IN] RTE interface port 1
[8] [XF2 OUT] RTE interface port 2

Bottom

[9] [X9] Load and logic voltages

Required derating

Mounting clearances may be required at output currents > 4.6 A to ensure the device reaches at least its specified service life. The mounting clearances required depend on the ambient temperature t and the output current I.
Mounting clearances from 0 mm are possible when several servo drives CMMT-ST are combined. The following characteristic curves show the maximum permissible effective currents for the lateral mounting clearances 0 mm, 3 mm, 10 mm and 15 mm.

———— Mounting clearance 0 mm
–·–·–·– Mounting clearance 3 mm
– – – – Mounting clearance 10 mm
············ Mounting clearance 15 mm
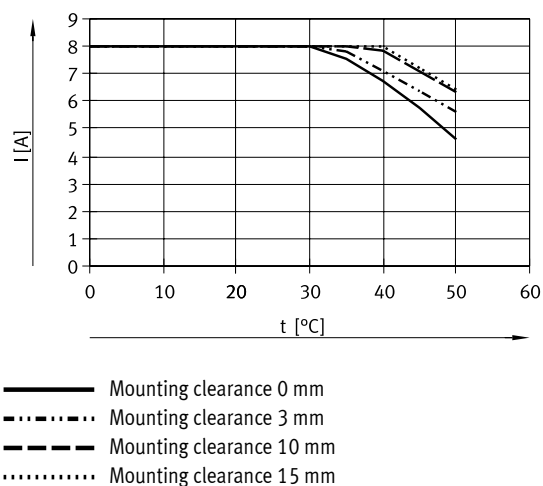
Data sheet

Dimensions

Download CAD data ➔ www.festo.com
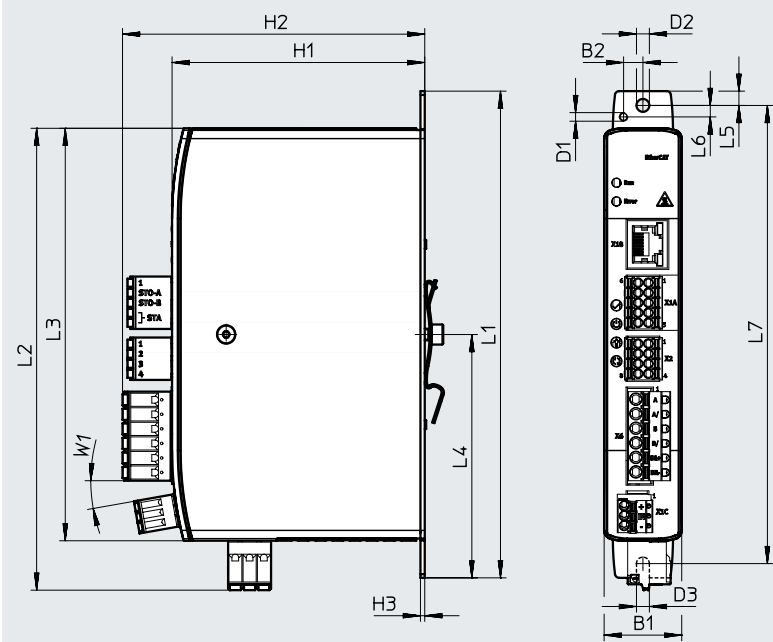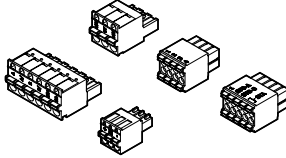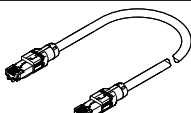
CMMT-ST-C8

Type	B1	B2	D1	D2	D3	H1	H2	H3
CMMT-ST-C8-1C	27	6.8	M3x0.5	4.5	4.5	88.3	105.6	1.5

Type	L1	L2	L3	L4	L5	L6	L7	W1
CMMT-ST-C8-1C	170	161.3	144	85	5	4	160	10

Ordering data

	Description	Bus protocol	Part no.	Type
	The assortment of plugs NEKM (➔ page 11) is included in the scope of delivery of the servo drive	EtherCAT	**8084005**	**CMMT-ST-C8-1C-EC-SO**
		PROFINET RT/IRT	**8084004**	**CMMT-ST-C8-1C-PN-SO**
		EtherNet/IP and Modbus TCP	**8084006**	**CMMT-ST-C8-1C-EP-SO**

Accessories

Ordering data – Accessories

	Description	Part no.	Type
Assortment of plugs			
	• For single wiring connection with single-phase servo drives • Included in the scope of delivery of the servo drive	**8081885**	**NEKM-C-22**

Ordering data – Optional accessories

	Description	Part no.	Type
Connecting cable			
	• Patch cable for the daisy-chain connection of the bus interfaces X19A/B • Ethernet catagory Cat 5e • Not included in the scope of delivery of the servo drive	**8082383**	**NEBC-R3G8-KS-0.2-N-S-R3G8-ET**