

## Measuring modules CPX-CMIX

**FESTO**



Key features

At a glance

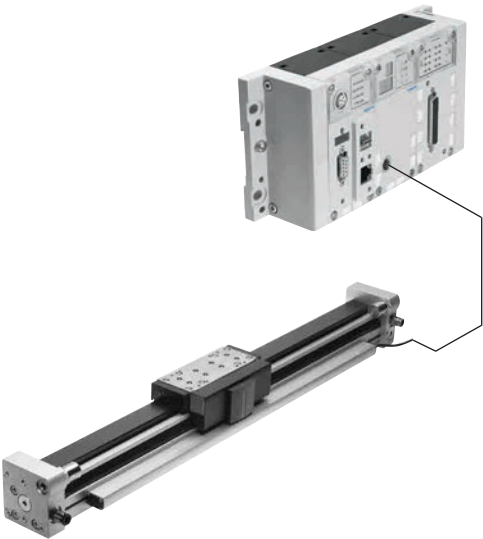
Movement and measurement in one, as an integral component of the valve terminal CPX – the modular peripheral system for decentralised automation tasks. The modular design means that valves, digital inputs and outputs, positioning modules, end-position controllers and measuring modules, as appropriate to the application, can be combined in almost any way on the terminal CPX.

- Advantages:
- Pneumatics and electrics – movement and measurement on one platform
  - Innovative measurement technology – piston rod drives, rodless drives, rotary drives
  - Actuation via fieldbus
  - Remote maintenance, remote diagnostics, web server, SMS and e-mail alerts are all possible via TCP/IP
  - Modules can be quickly exchanged and expanded without altering the wiring

Retracting/advancing and measuring in one work step	Time and space-saving	Process reliability	Reduced system costs
Fully digital data acquisition and transmission means pneumatic cylinders can now be used as sensors. With very high repetition accuracy and incorporating both analogue and digital measuring sensors.	Electrical peripherals enable the highly efficient measuring module to be seamlessly and compactly integrated into existing control environments. The new component is tailored to a tried-and-tested system and is quick and easy to commission.	All process steps are measured and documented, which significantly improves quality. The adjustable contact force (via pressure regulator) also increases the precision of the "displacement sensor".	As with all modules in the electrical terminal CPX, easy functional integration in fieldbus/Ethernet networks is a matter of course.

Drives to use

Linear drives DGCI



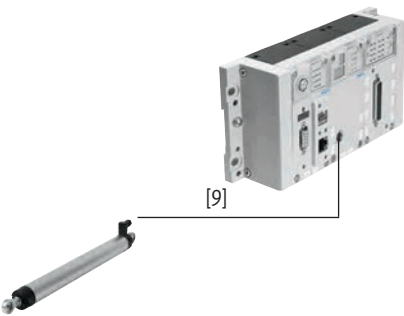
- The measuring signal of the linear drive DGCI supplies a CAN signal. This signal is read directly into the CPX-CMIX module
- The measuring system measures absolute values, in other words the actual position is immediately available for the controller after the system is switched on

Technical data		
Linearity error <sup>1)</sup>	[%]	< ±0.02, min. ±50µm
Resolution	[mm]	0.01
Repetition accuracy <sup>2)</sup>	[mm]	±0.01/±0.02
Hysteresis	[µm]	< 4
Max. temperature coefficient	[ppm/°K]	15
Smallest measurable speed	[mm/s]	10

1) Always refers to max. stroke.  
2) Stroke ≤ 1000 mm/stroke > 1000 mm

Key features

Drives to use  
Displacement encoder MME

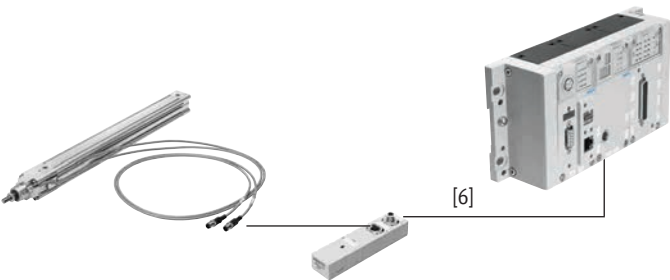


- The measuring signal of the displacement encoder MME supplies a CAN signal. This signal is read directly into the CPX-CMIX module
- The measuring system measures absolute values, in other words the actual position is immediately available for the controller after the system is switched on

Technical data		
Linearity error <sup>1)</sup>	[%]	< ±0.01, min. ±40µm
Resolution	[mm]	0.01
Repetition accuracy <sup>2)</sup>	[mm]	±0.01/±0.02
Hysteresis	[µm]	< 4
Max. temperature coefficient	[ppm/°K]	15
Smallest measurable speed	[mm/s]	10

1) Always refers to max. stroke.  
2) Stroke ≤ 1000 mm/stroke > 1000 mm

Linear drives DNCI

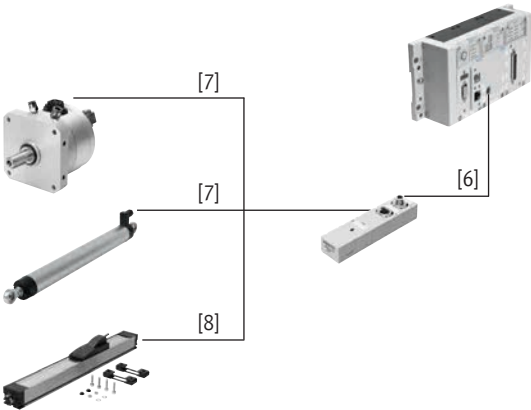


- The measuring signal of the linear drive DNCI is an incremental signal. This signal is converted to a CAN signal in the sensor interface CASM-S-D3-R7. The converted signal is then read into the CPX-CMIX module
- The measuring system does not measure absolute values, so must be homed after it is switched on. The actual position is available for the controller once this has been done

Technical data		
Linearity error		
Strokes up to 500 mm	[mm]	< ±0.08
Strokes up to 1000 mm	[mm]	< ±0.09
Strokes over 1000 mm	[mm]	< ±0.11
Resolution	[mm]	0.01
Repetition accuracy	[mm]	< ±0.02
Hysteresis	[mm]	< 0.03
Smallest measurable speed	[mm/s]	10

Key features

**Drives to use**  
Swivel modules DSMI or potentiometers MLO-POT



- The measuring systems supply an analogue measuring signal. This signal is converted to a CAN signal in the sensor interface CASM-S-D2-R3. The converted signal is then read into the CPX-CMIX module
  - Potentiometers measure absolute values, in other words the actual position is immediately available for the controller after the potentiometer is switched on
- Other potentiometers can be used, in which case the following must be noted:
- The connection resistance of the potentiometer must be 3 ... 20 kΩ
  - Poorer potentiometer values for linearity and temperature coefficient will decrease the accuracy of the measured value
  - A special cable must be used for connection to the sensor interface

Technical data								
Measuring length	[mm]	100	150	225	300	360	450	500
Linearity error								
MLO-POT	[%]	±0.1	±0.08	±0.07	±0.06	±0.05	±0.05	±0.05
DSMI <sup>1)</sup>	[%]	< ±0.25						
Resolution								
MLO-POT	[mm]	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
DSMI	[°]	< ±0.1						
Repetition accuracy								
MLO-POT	[mm]	±0.01	±0.01	±0.01	±0.01	±0.02	±0.02	±0.02
DSMI	[°]	< ±0.1						
Smallest measurable speed	[mm/s]	3	5	7	9	11	14	15
Temperature coefficient	[ppm/°K]	5						

Measuring length	[mm]	600	750	1000	1250	1500	1750	2000
Linearity error								
MLO-POT	[%]	±0.05	±0.04	±0.04	±0.03	±0.03	±0.03	±0.02
DSMI <sup>1)</sup>	[%]	< ±0.25						
Resolution								
MLO-POT	[mm]	±0.01	±0.02	±0.02	±0.02	±0.03	±0.03	±0.03
DSMI	[°]	< ±0.1						
Repetition accuracy								
MLO-POT	[mm]	±0.02	±0.03	±0.03	±0.04	±0.05	±0.06	±0.07
DSMI	[°]	< ±0.1						
Smallest measurable speed	[mm/s]	18	23	31	38	46	53	61
Temperature coefficient	[ppm/°K]	5						

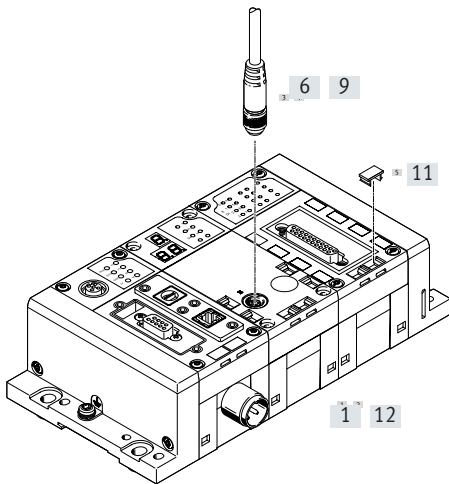
1) Refers to max. swivel angle

## Type codes and peripherals overview

### Type codes

001	Series	003	Axes
CPX-CMIX	Measuring module for electrical terminal	1	One
002	Function module		
M1	Measuring unit		

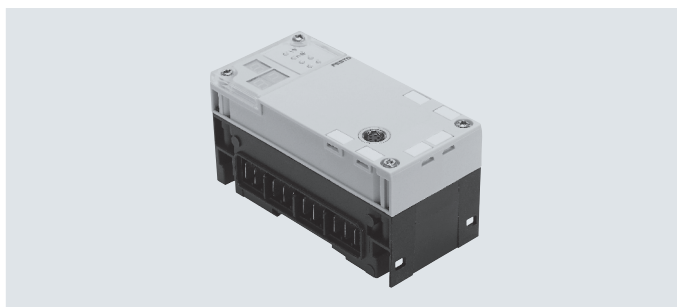
### Peripherals overview



Accessories			
Type	Description		→ Page/Internet
[1] Measuring module CPX-CMIX	Integrated in the CPX terminal. Screws for mounting on the polymer interlinking block are included in the scope of delivery		6
[6] Connecting cable KVI-CP-3	For connecting the measuring module CPX-CMIX and sensor interface CASM		8
[11] Inscription label IBS	For labelling the modules		8
[12] Interlinking block CPX-GE	Connects the individual modules. Two versions are available: polymer or metal interlinking block.		9
– Screws CPX-M-M3	For mounting on the metal interlinking block		8
– Connecting cable NEBC-P1W4-...	For connecting the sensor interface CASM and swivel module DSMI or potentiometer LWG		nebc
– Connecting cable NEBC-A1W3-...	For connecting the sensor interface CASM and potentiometer TLF		nebc
[9] Connecting cable NEBP-M16W6-...	For connecting the measuring module CPX-CMIX and displacement encoder MME		8

## Data sheet

The measuring module CPX-CMIX is intended exclusively for use in valve terminals CPX.



### General technical data

#### Operating voltage

Operating voltage range	[V DC]	18 ... 30
Nominal operating voltage	[V DC]	24
Current consumption at nominal operating voltage	[mA]	80
Short circuit protection		Yes
Power failure buffering	[ms]	10

Number of axis strings		1
Axes per string		1
Length of connecting cable to axis	[m]	≤ 30
Max. number of modules		9
Display		7-segment display

Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8

Diagnostics	Channel and module-oriented
	Via local 7-segment display
	Undervoltage of modules
	Undervoltage of measuring system

Status indication	Power load
	Error

#### Control interface

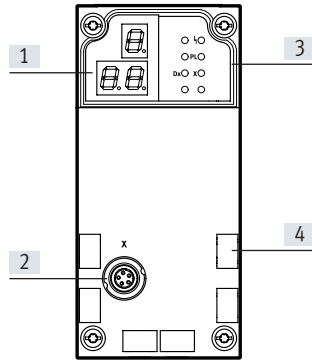
Data	CAN bus with Festo protocol
	Digital
Electrical connection	5-pin
	M9
	Socket

Materials: housing			Reinforced PA
Note on materials			RoHS-compliant
PWIS conformity			VDMA24364-B2-L
Product weight		[g]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

## Data sheet

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

## Connection and display components



- [1] 3-digit display
- [2] Control interface
- [3] Status LEDs
- [4] Inscription labels

## Pin allocation – Control interface

	Pin	Signal	Designation
	1	+24 V	Nominal operating voltage
	2	+24 V	Load voltage
	3	0 V	Ground
	4	CAN_H	CAN high
	5	CAN_L	CAN low
	Housing	Shielding	Cable shielding

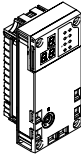
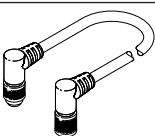
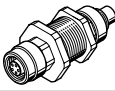
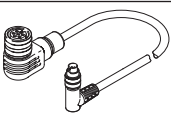
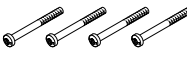
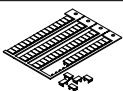

## Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. number of CMIX modules
CPX-CEC...	–	9
CPX-FB6	INTERBUS	2
CPX-FB11	DeviceNet <sup>1)</sup>	9
CPX-FB13	PROFIBUS <sup>2)</sup>	9
CPX-FB14	CANopen	5
CPX-FB23-24	CC-LINK	5 (as function module F23)
		9 (as functional module F24)
CPX-FB33	PROFINET RT, M12	9
CPX-M-FB34	PROFINET RT, RJ45	9
CPX-M-FB35	PROFINET RT, SCRJ	9
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-FB43	PROFINET RT, M12	9
CPX-M-FB44	PROFINET RT, RJ45	9
CPX-M-FB45	PROFINET RT, SCRJ	9

1) As of revision 20 (R20)

2) As of revision 23 (R23)

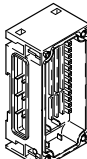

## Accessories

Ordering data		Brief description		Part no.	Type
Measuring module					
	Order code in the CPX configurator: T23		567417	CPX-CMIX-M1-1	
Connecting cables					
	Connecting cable with angled plug and angled socket	0.25 m	540327	KVI-CP-3-WS-WD-0.25	
		0.5 m	540328	KVI-CP-3-WS-WD-0.5	
		2 m	540329	KVI-CP-3-WS-WD-2	
		5 m	540330	KVI-CP-3-WS-WD-5	
		8 m	540331	KVI-CP-3-WS-WD-8	
	Connecting cable with straight plug and straight socket	2 m	540332	KVI-CP-3-GS-GD-2	
		5 m	540333	KVI-CP-3-GS-GD-5	
8 m		540334	KVI-CP-3-GS-GD-8		
	Connecting component for control cabinet through-feed		543252	KVI-CP-3-SSD	
	For displacement encoder MME: Connection between displacement encoder MME and measuring module CPX-CMIX	2 m	575898	NEBP-M16W6-K-2-M9W5	
Screws					
	For mounting on the metal interlinking block		550219	CPX-M-M3X22-4X	
Inscription labels					
	Inscription labels 6x10, in frames	64 pieces	18576	IBS-6X10	
User documentation					
	Description of measuring module CPX-CMIX <sup>1)</sup>	German	567053	P.BE-CPX-CMIX-DE	
		English	567054	P.BE-CPX-CMIX-EN	
		Spanish	567055	P.BE-CPX-CMIX-ES	
		French	567056	P.BE-CPX-CMIX-FR	
		Italian	567057	P.BE-CPX-CMIX-IT	

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



## Accessories

Ordering data				
Brief description			Part no.	Type
Polymer interlinking block as extension block				
	Without power supply	–	195742	CPX-GE-EV
	With additional supply for outputs	M18 – 4-pin	195744	CPX-GE-EV-Z
		7/8" – 5-pin	541248	CPX-GE-EV-Z-7/8-5POL
		7/8" – 4-pin	541250	CPX-GE-EV-Z-7/8-4POL
	With additional power supply for valves	M18 – 4-pin	533577	CPX-GE-EV-V
		7/8" – 4-pin	541252	CPX-GE-EV-V-7/8-4POL
Tie rods				
	For expansion using an interlinking block	1 module	525418	CPX-ZA-1-E

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