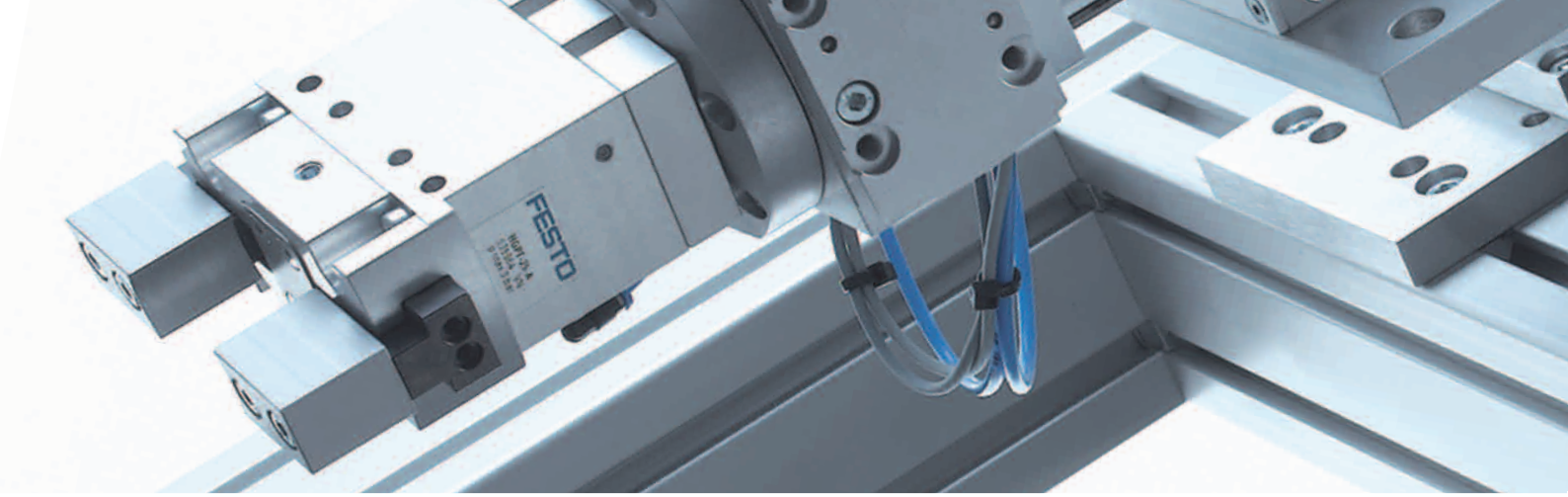

Motors and controllers

The controller and motor portfolio from Festo covers a broad spectrum of servo and stepper motor functions and is optimally matched to all electric drives.

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Servo motor controllers CMMP-AS/CMMS-AS/CMMD-AS and servo motor EMMS-AS

The highly functional controller CMMP-AS is best suited to cam control and highly dynamic movements. The CMMS-AS shows its strengths with standard applications and positioning tasks with I/O connection. The double controller CMMD-AS takes on the task of running two servo motors independently of each other. Combining the internal components significantly increases levels of economic efficiency. They all feature safe and convenient commissioning, SD card slot, programming and parameterisation using software tools.

Servo motor EMMS-AS
One servo motor for three controller types. As a permanently energised, brushless servo motor with eight torque ranges, it is designed for dynamic positioning tasks.

Motor controller CMMO-ST
Simple and rapid selection with 1 order code. Everything matches perfectly thanks also to “WebConfig” and “WebDiag”, the integrated HTML web server for configuration and diagnostics.

Perfect in connection with electric cylinder EPCO

Stepper motor controller CMMS-ST and stepper motor EMMS-ST

Stepper motor technology in a real plug and work package solution: the single axis position controller CMMS-ST combined with the stepper motor, for single and multi-axis handling applications with moving loads of up to 20 kg.

In the ServoLite operating mode the combination of CMMS-ST and EMMS-ST offers a fully fledged closed-loop servo system with maximum operational reliability and fast dynamic response. This sets the stepper motor CMMS-ST apart from conventional controllers.

Stepper motor EMMS-ST
The stepper motor combines a long service life and full positioning functionality with an attractive price. It is designed with a high degree of protection and with a plug system suitable for industrial use, optionally with brake and integrated encoder.

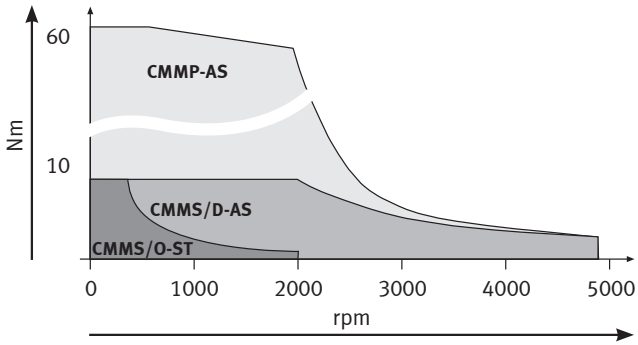
Functions of the CMMx-AS
- SD card for parameters and firmware
- Automatic motor brake
- External braking resistor (optional)
- Jerk-free positioning
- Infinitely variable positioning, closed-loop operation
- Speed adjustment
- Position control
- Power control
- Torque control

Functions of the CMMS-ST
- SD card for parameters and firmware
- Automatic motor brake
- External braking resistor (optional)
- Jerk-free positioning
- Infinitely variable positioning
- Step resolution: full step up to 4000 steps/revolution
- Digital inputs and outputs protected against short circuit, overload and reverse polarity voltages

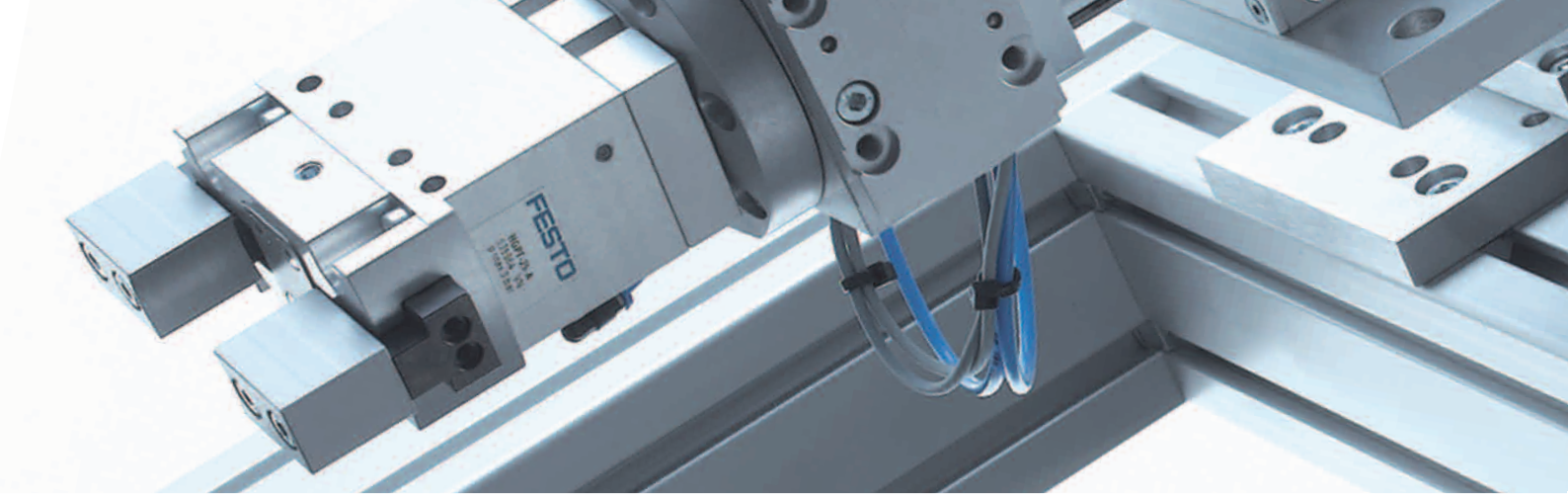
Integrated safety function
- Safe Torque Off (STO) with category 3, PLd integrated
- Additional safety functions can be realised using external components
- Solution examples available
- Safe stop with restart inhibit

The performance ranges of the motors in combination with controllers from Festo

EMMS-AS + CMMP-AS
EMMS-AS + CMMS-AS/CMMD-AS
EMMS-ST + CMMS-ST/CMMO-ST



Motor controller for motor rtype	CMMP-AS servo motor	CMMS-AS/CMMD-AS servo motor	CMMS-ST stepper motor	CMMO-ST stepper motor
Positioning records	255	63	63	7/31
Displacement encoder	Incremental/absolute	Incremental/absolute	Incremental	Incremental
Extended I/O interface	Flexible configuration	4 working modes	4 working modes	Valve or binary profile
Notification of remaining distance	Separate for all positions	1 for n	1 for n	Separate for all positions
Torque reduction	Separate for all positions	No	No	Separate for all positions
Record Linking	With branching	Linear	Linear	Linear
Safe torque off	Cat. 3, PLd (EN 13849), SIL2 (EN 61508)	Cat. 3, PLd (EN 13849), SIL2 (EN 61508)	Cat. 3, SIL (EN 13849), SIL2 (EN 61508)	EN 138449/PLd, EN 61508/SIL2
Primary voltage	100 ... 230 V AC	100 ... 230 V AC	24 ... 75 V DC	24 V DC
Motor current	Single-phase: 2.5 and 5 A Three-phase: 5 and 10 A	CMMS-AS: 4 A (single-phase) CMMD-AS: 2 x 4 A (can be set at up to 2 A/6 A as required)	8 A/Peak 12 A	5.7 A/Peak 8 A
Integrated positioning records	256	64	64	32



Intelligent servo motor MTR-DCI

This innovative servo motor with its wide torque range is ideally suited for positioning tasks. It combines all necessary components in one: motor, gear unit, motor controller and power electronics.

An impressive feature of the MTR-DCI is its minimal wiring thanks to the integration of the controller; only one voltage source and only one fieldbus connection or multi-pin plug are required. The entire commissioning process is performed on-site or from a PC using a simple teach-in function, thanks to an optional LCD screen and clearly structured menus. It is also supported by the FCT (Festo Configuration Tool) software.

Functions
- Compact design with integrated display
- Dirt-resistant profile thanks to smooth surfaces
- Closed-loop operation
- Protection class IP54
- Control via I/O or field bus
- Constant acceleration and braking
- Position control

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Single-field controllers

Position controller SFC-LACI
and the linear motor cylinders DNCE-LAS and DFME-LAS form a ready-to-install solution.

Motor controller SFC-DC
The SFC-DC motor controller together with the mini slide SLTE forms a ready-to-install solution.

Key features:
- Positioning run and teach mode
- Diagnostic function
- Thanks to protection class IP54, the SFC can be mounted close to the drive
- Only one cable required
- SFC motor controller available with or without control panel
- Control via I/O or fieldbus

Both single field controllers are very easy to configure and commission using the FCT software for parameterisation and commissioning.

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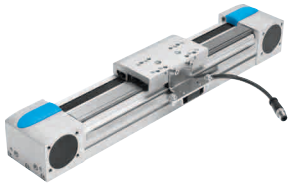
Functional safety

The EC Machinery Directive 2006/42/EC permits numerous safety functions as protective measures for sufficient risk reduction in accordance with the standards DIN EN 61800-5-2 and EN 60204-1. Implementing these safety functions in a practical manner requires different components that can easily be integrated in an overall concept.

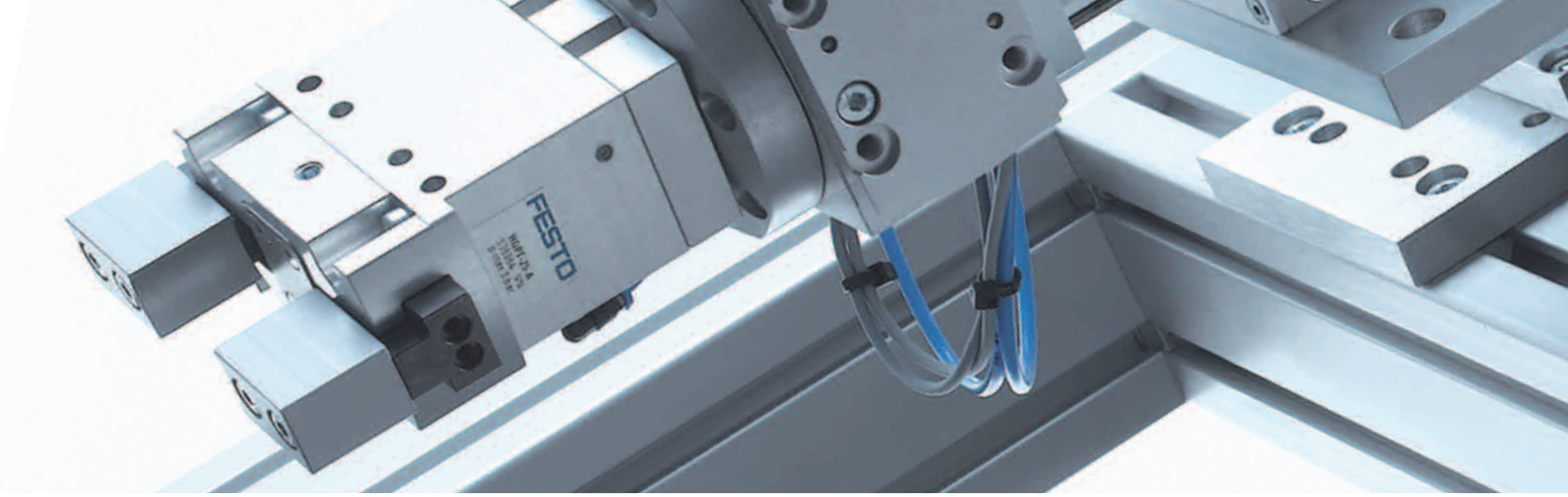
Safety system CMGA
Safely monitors command input devices, safety sensors, safety switches, encoders and measuring systems and processes their input signals in order to guarantee the safe status of a handling unit by using suitable safety-oriented responses. There are numerous preprogrammed application programs for simple configuration. If required, in-house programming is possible.

Motor controller CMM ...
The safety function STO is integrated as standard into all motor controllers in the CMM ... series. This allows easy implementation of the emergency stop requirements with safe stop SS1 up to category 3, PLd. For further requirements, the series CMMP-AS- ... -M3 provides optional safety modules for safety functions up to category 4, PLe.

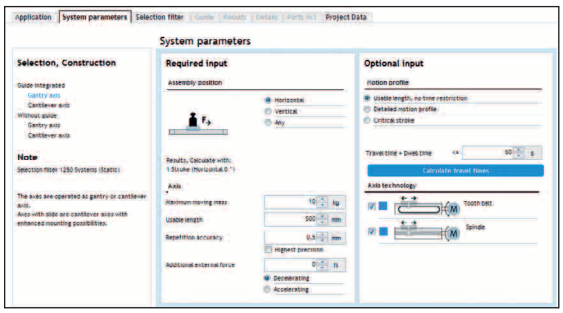


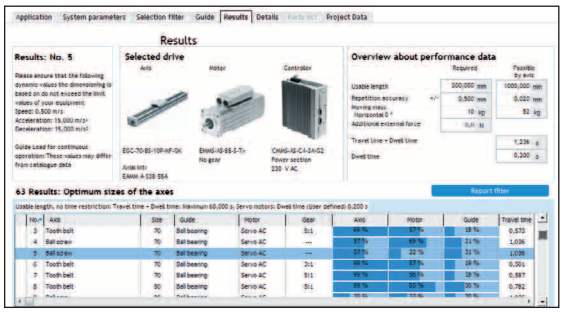
Intelligent solutions for monitoring linear axes
The slide position cannot be monitored directly by the encoder in the motor for safety critical applications since if there is a fault in the motor encoder, a secondary system is required to determine if the axis slide is moving. However, with an external linear displacement encoder mounted directly on the drive the axis slide position can be monitored and the information fed back to a safety system.

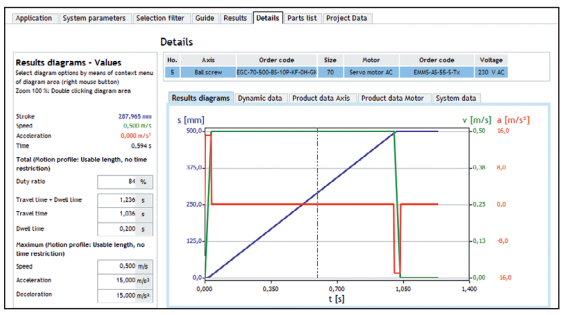
Solution examples
How do I implement safety functions with electric drive technology components? Festo provides solution examples. Descriptions, parts lists, circuit diagrams, application programs and Sistema projects allow fast integration into your safety concept – with the appropriate documentation.
Ask our specialists



Software tools – PositioningDrives for configuring axis systems







The PositioningDrives software tool prevents design errors and improves energy efficiency by helping you to choose the right components. Designing drive mechanics, gear units and motors separately can increase safety factors, and result in oversized electric drive systems and wasted energy.

Toothed belt drives, spindle drives or direct drives, servo motors, stepper motors or DC motors, ball bearing guides or plain-bearing guides – the plethora of options to choose from presents the user with a major challenge: calculation the correct drive package.

PositioningDrives provides support by calculating the ideal combination from the widely coordinated range of electric linear axes, motors, gear units and controllers after a few application data have been entered. The ideal drive package for the respective requirements can then be selected from the list of results.

This is also suitable for third-party motors, once the technical parameters have been entered.

Typical programme interfaces

Application parameters
such as mounting position, load, stroke and precision need to be entered. There is also an option to limit the requested travel time. A preselection of drive and motor technology as well as the required guide variants limits the number of variations and quickly leads to a list of results.

Select the required solution package
Different sorting options are provided for ease of selection. The combination of axis, motor/gear unit and controller is presented graphically; the degree of utilisation of the load factor is shown as a bar graph. One click on the component picture opens the respective documentation in the set language.

Detailed results
The program then provides detailed information such as the motion profile, dynamic load data, product characteristics and a parts list. Full project documentation and data back-up round off the functional scope of PositioningDrives.

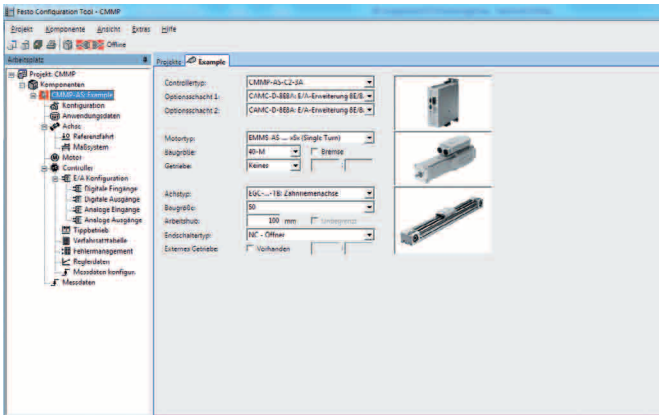
Software tools – Faster project planning, commissioning and operation

More intelligent automation
Festo consistently focuses on continual analysis and identification of potential.

This has resulted in combining the new software platform FHPP with the tried and tested FCT Festo configuration tool. It ensures uniform operation and ideal interface management of all motor controllers, from the fieldbus to the drive system.

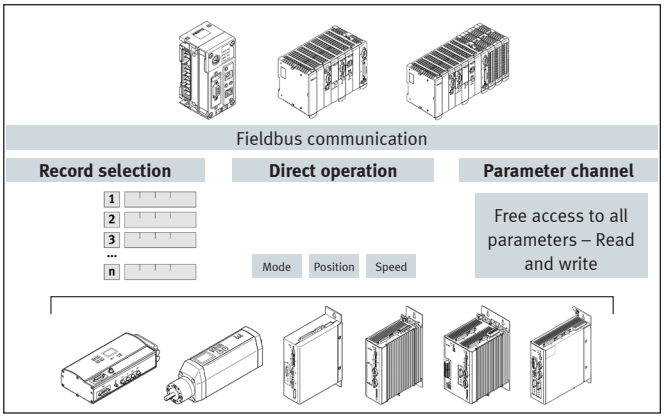
FCT software – Festo Configuration Tool for commissioning

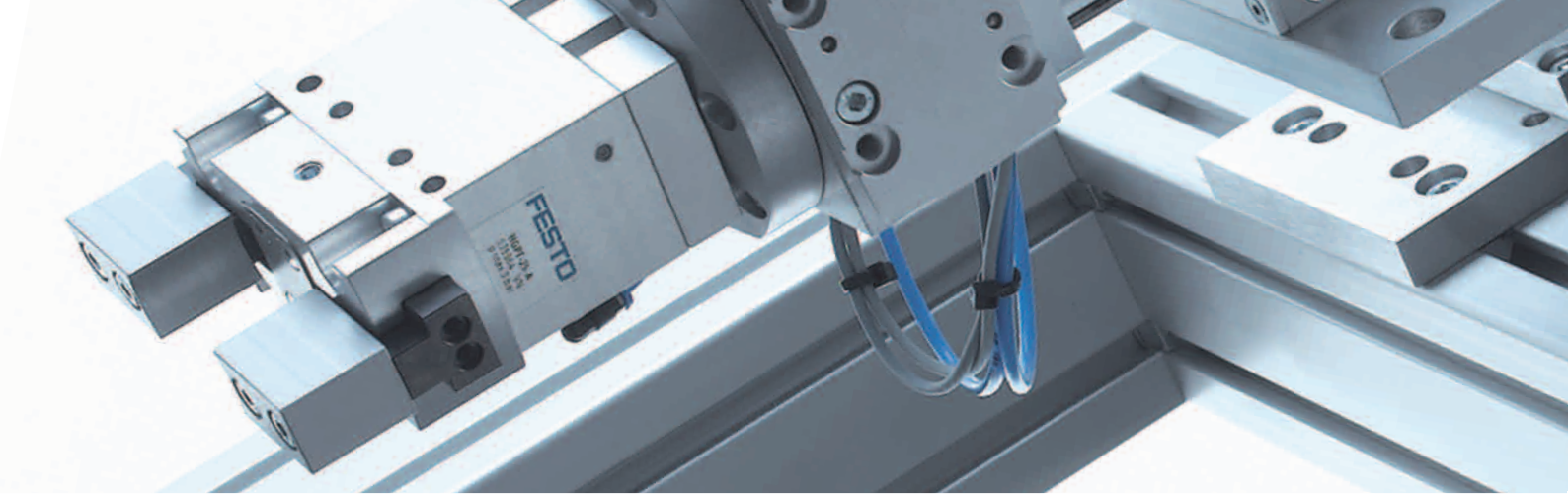
- All the drives in a system can be managed and saved in a common project
- Project and data management for all supported device types
- Easy to use thanks to graphically supported parameter input
- Universal mode of operation for all drives
- Work offline at your desk or online at the machine



FHPP – Festo Handling and Positioning Profile
Festo has developed an optimised data profile, the “Festo Handling and Positioning Profile (FHPP)”, tailored to the target applications for handling and positioning tasks.

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

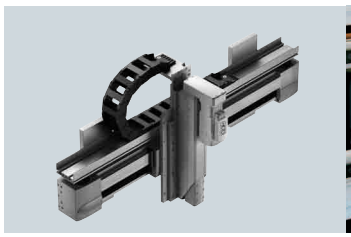


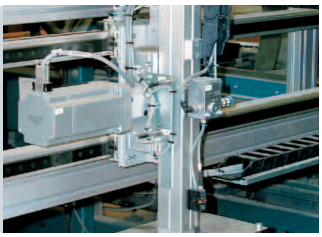


Handling systems from Festo‘s multi-axis modular system

Pick and Place:
Slim, precise, clear design

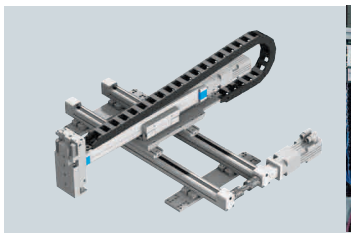
- Horizontal cantilever axes combined with slide units or additional cantilever axes for the Z-movement

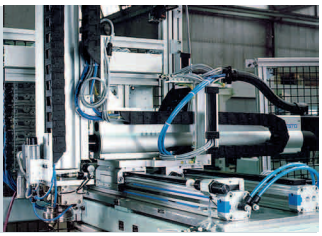




Linear gantries:
Robust for heavy loads and long strokes in 2D

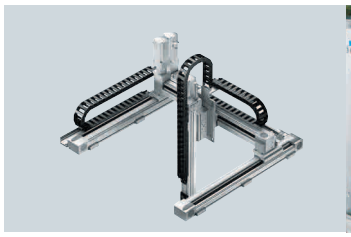
- Horizontal gantry axes combined with slide units or cantilever axes for the Z-movement

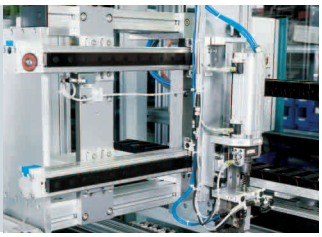




Cantilever:
Compact and extremely sturdy for long strokes

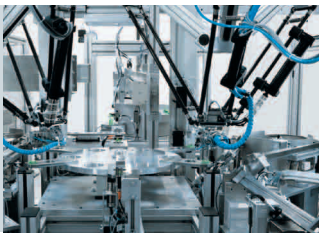
- Two parallel horizontal gantry axes plus one pick and place unit with short Z-stroke, preferably slide units





Three-dimensional gantries:
extremely precise and very robust for heavy loads and long strokes in 3D

- Two horizontal gantry axes plus one horizontal gantry axis placed laterally, as well as any drive for the Z movement, preferably cantilever axes



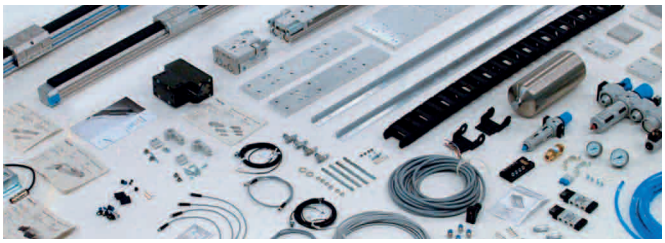
Tripod:
free, precise and extremely dynamic movement in the space, parallel kinematics with electric gantry axes in pyramid form for high rigidity

- Large effective loads with high dynamic response thanks to low moving masses (without motors or axes)

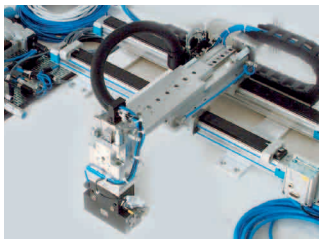
All inclusive benefits – ready-to-install solutions

Build it yourself or have it built for you – it's up to you. But complete systems can save you as much as 50%.

With ready-to-install handling systems you can dispense with virtually all the complex processes involved in the development and construction of such systems. Tell us what your requirements are and we will design, order, commission, test and deliver. If needed, we can also assemble your system and commission it. You concentrate on your core tasks; we take care of the rest. That not only saves times and money, but provides maximum reliability when it comes to function and optimum setup. We offer design engineering, documentation, CAD models, assembly, checking and testing, commissioning and servicing.



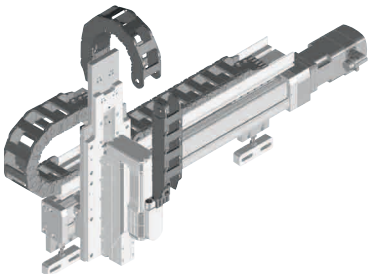
Individually or complete – your choice



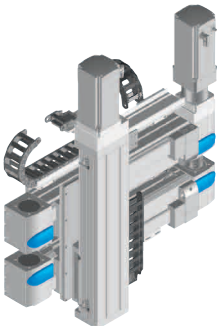
Engineering
Competent engineers support you right from the outset.
- Technical advice
- Expert knowledge based on the latest technological standards
- Management of the entire engineering process
- Constructions from the mechatronic multi-axis modular system

Documentation
Documentation for your handling systems includes:
- Detailed documentation on your handling unit on CD or as a print copy
- Construction drawing as instructions for assembly – Including parts list
- Circuit diagrams in EPLAN or Promis

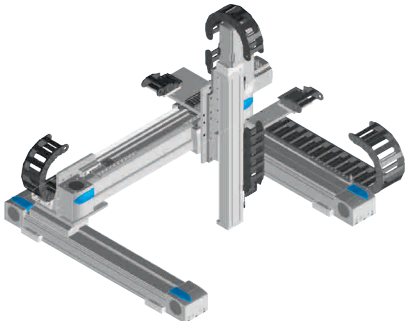
Examples of CAD models from the standard multi-axis modular system



Linear gantry with cantilever axis (Z)



Heavy-duty linear gantry with Duo-toothed belt axis (Y) and spindle axis (Z)



Three-dimensional gantry with toothed belt axis (XY) and spindle axis (Z)