

# Integrating Rockwell Automation with Festo



SILVER  
Technology Partner

A ROCKWELL AUTOMATION PARTNER

**FESTO**



## Festo and Rockwell Automation

Festo has been a recognized partner of Rockwell Automation for nearly two decades, starting with the Pyramid Solutions Program in the early 90's to the Encompass program of today. We have a long history of integrating control technology into valve manifolds, with many “firsts” to our credit:

- Integrated valve manifold technology
- Embedded SLC PLC into valve manifold
- Custom serial bus embedded through-out valve manifold, pneumatics and I/O

This is trend setting technology and establishes Festo as an innovator among our competition. Combined with Rockwell Automation technology, we can provide customers with numerous benefits such as time savings, component reduction, and improved diagnostics and commissioning.

Please contact Festo when considering an automation supplier for valve interfaces, safety valves, valve controllers, vision devices or other related automation products, to interface with your Rockwell Automation control system.

You can review the samples of our Encompass referenced products below, or browse our 30,000+ automation components on our website, [www.festo.com](http://www.festo.com).



### Valve Interfaces - Pneumatic

The Festo CPX/MPA pneumatic valve manifold provides the widest array of functionality of any manifold in the industry, including proportional and directional valves, analog and digital I/O, and hybrid motion solutions. Compatible with EtherNet/IP and DeviceNet.



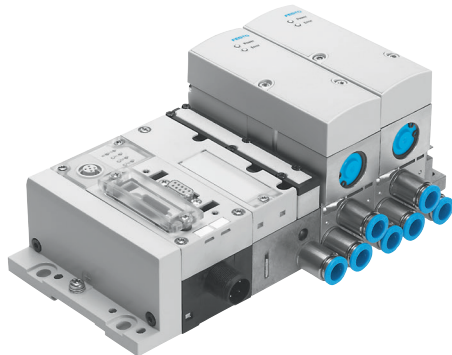
### Process Instruments

The SFAW measures and monitors the flow, volume and temperature of liquid media in piping or valve terminals.



### Safety – Valves

The Festo MS6-SV is a safety dump valve (CAT4, pl “e”, Sil 3) with an integrated soft-start function. Can be interfaced with any Rockwell safety output device.



### Valve Controllers – Pneumatic

The Festo VPPM/MPA can provide up to 16 proportional pressure regulators on one network interface. Compatible with EtherNet/IP and DeviceNet.

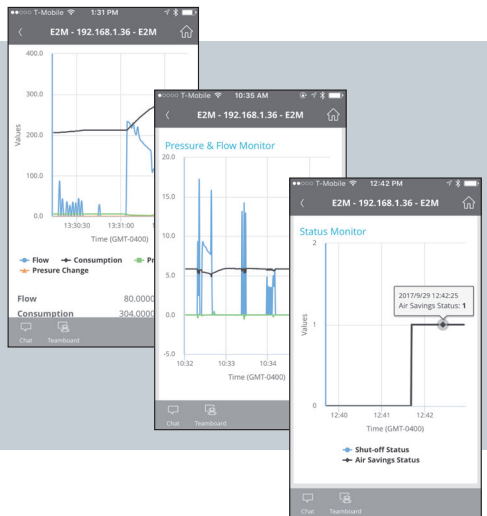
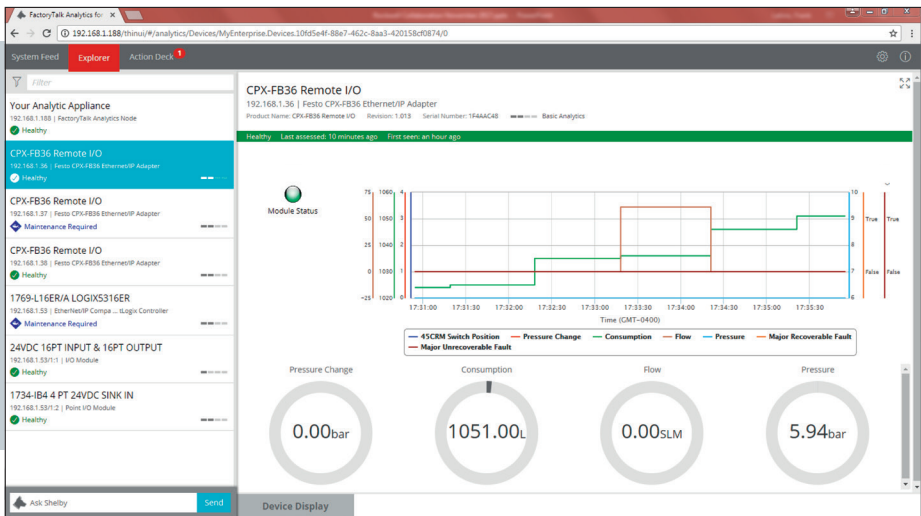
## Industry 4.0 – always a finger on the pulse thanks to complete networking and partnerships

Many concepts from the past have been overtaken by the fourth industrial revolution: business models, partnerships, customer interfaces, value chains, and even the traditional automation pyramid – all are undergoing huge change. As an innovator and trendsetter in fieldbus technology, Festo will make a major contribution to reshaping the future with new concepts for Industry 4.0. This includes new products, cloud services, apps, as well as a new online shop with comprehensive, integrated engineering concepts. This will ensure that, in the medium term, data will be available seamlessly and globally on all user devices.

This is how the condition of Festo pneumatic products is displayed within Shelby/Device Analytics



Integration of Festo products as a module for the mobile application TeamONE



### Integration into the IoT environment from Rockwell

Rockwell offers several approaches for networking the Internet of Things for industrial devices, machinery and systems and for making effective use of the resulting data: Device Analytics and TeamONE. Festo supports both approaches in this early phase with pilot projects.

### Device analytics and “Shelby Appliance”

Shelby works as a kind of black box and does not require configuration. Like the Festo IoT gateway, it automatically scans all devices that are connected and prepared for communication. It then sends their data as telegrams to higher-level units and services. Shelby cyclically calls the devices approximately once per minute, and offers dashboards and advanced diagnostic functions.

### TeamONE

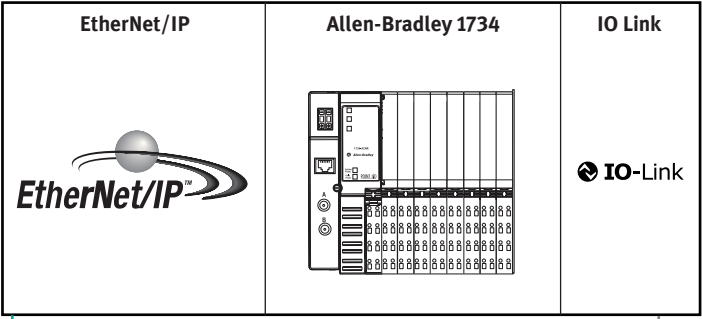
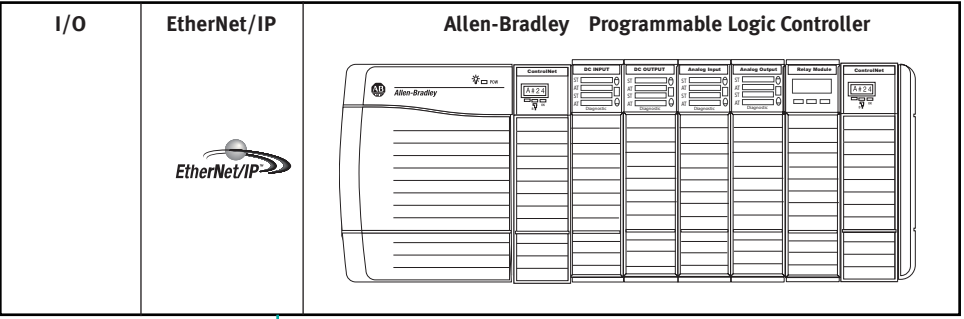
With TeamONE, preventive maintenance tasks can be organized into teams and all necessary data from devices in a system/machine can be displayed. This speeds up troubleshooting. TeamONE is made available as a free app. Festo devices are integrated via an embedded prototype module within this app. All the relevant values of the Festo devices can be displayed, as the small mobile phone screenshots in the picture indicate.

Software support tools

- Festo offers a variety of software for commissioning, testing, diagnosing, configuring and visualization of devices:
  - Festo Maintenance Tool (CPX-FMT)
  - Festo Automation Suite
  - Festo Field Device Tool (FFT)
  - Add-on Instructions for a variety of configuration needs
- The Festo Maintenance Tool for CPX can export parameter configuration data to Studio 5000 via **L5K**

FACTORY ZONE

Complete automation systems with Rockwell integration

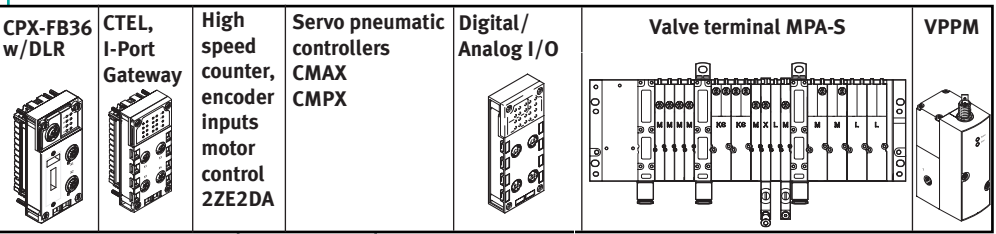


CPX/MPA valve terminal

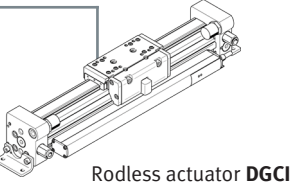
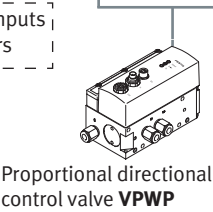
EtherNet/IP

EtherNet/IP

IO-Link



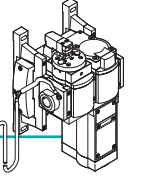
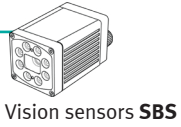
Ex. Encoder inputs and DC motors



Onboard proportional pressure regulator

Only with CIP safety

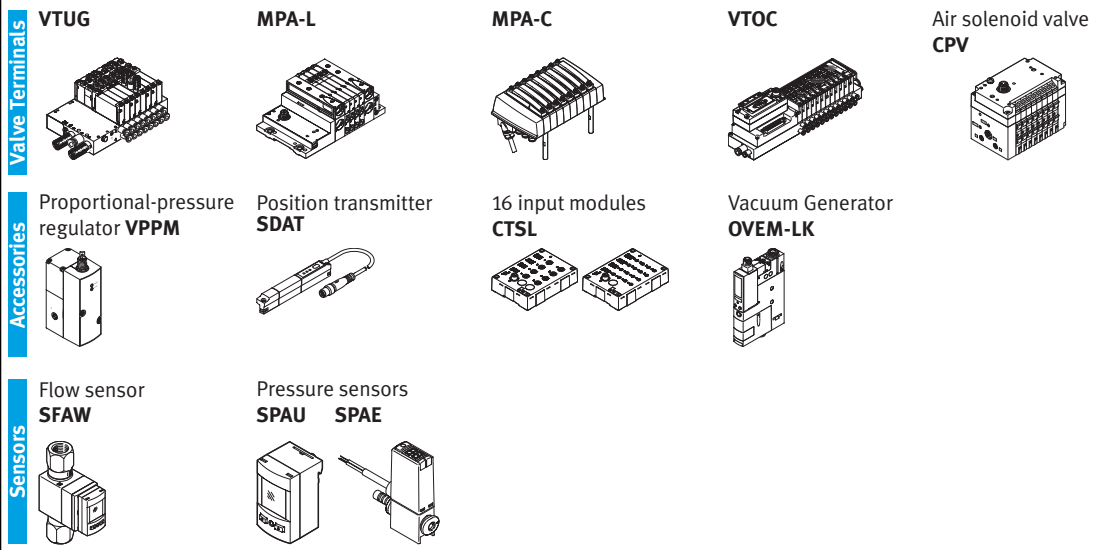
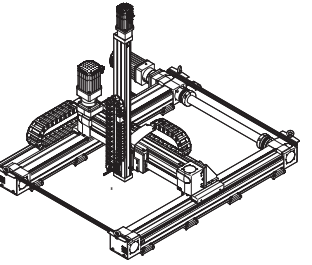
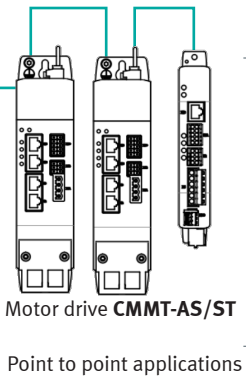
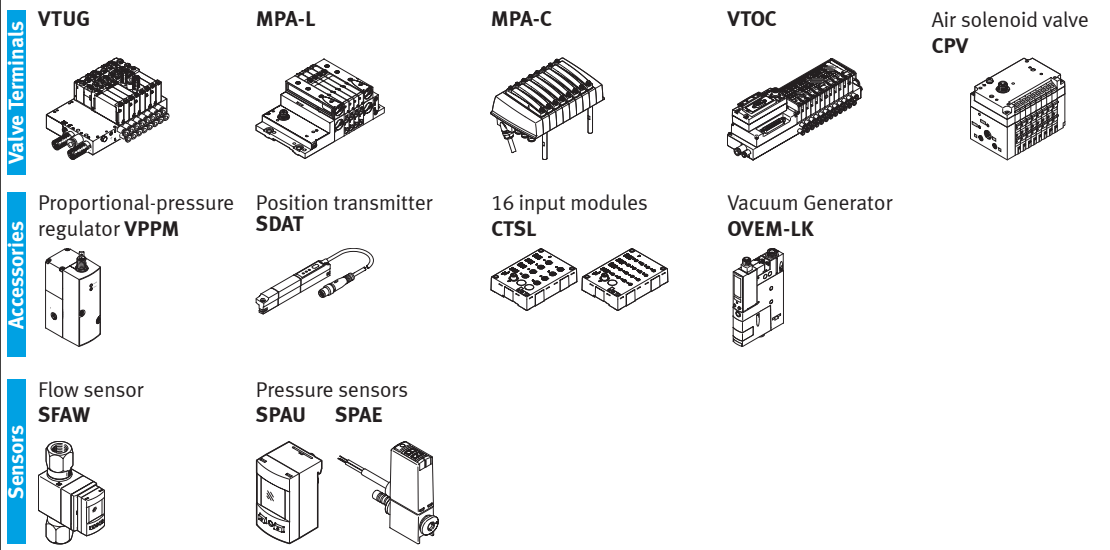
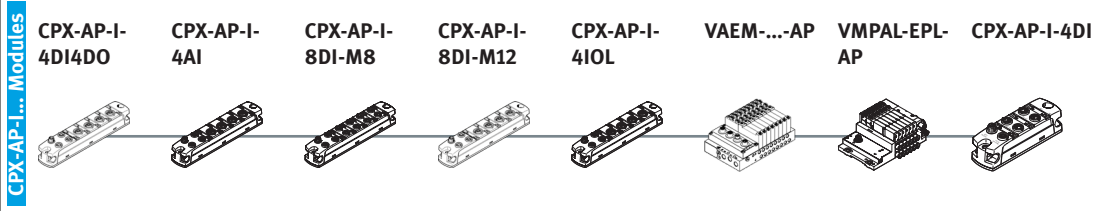
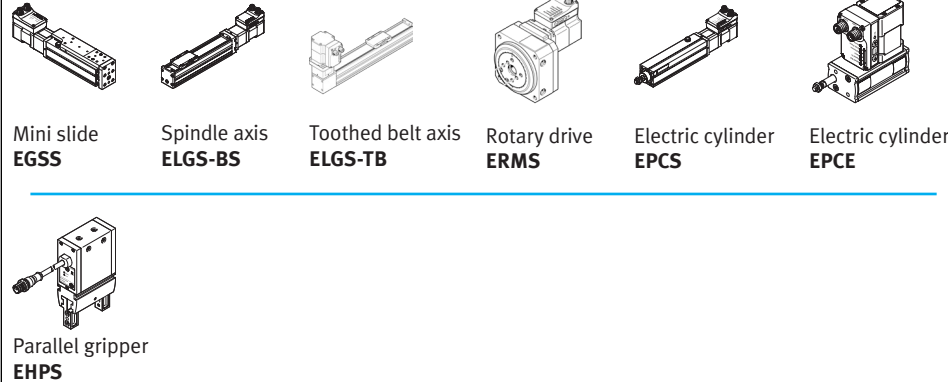
EtherNet/IP



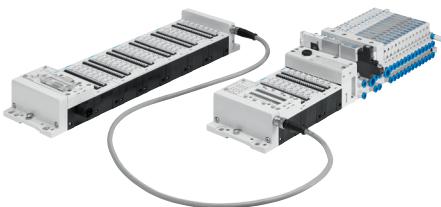
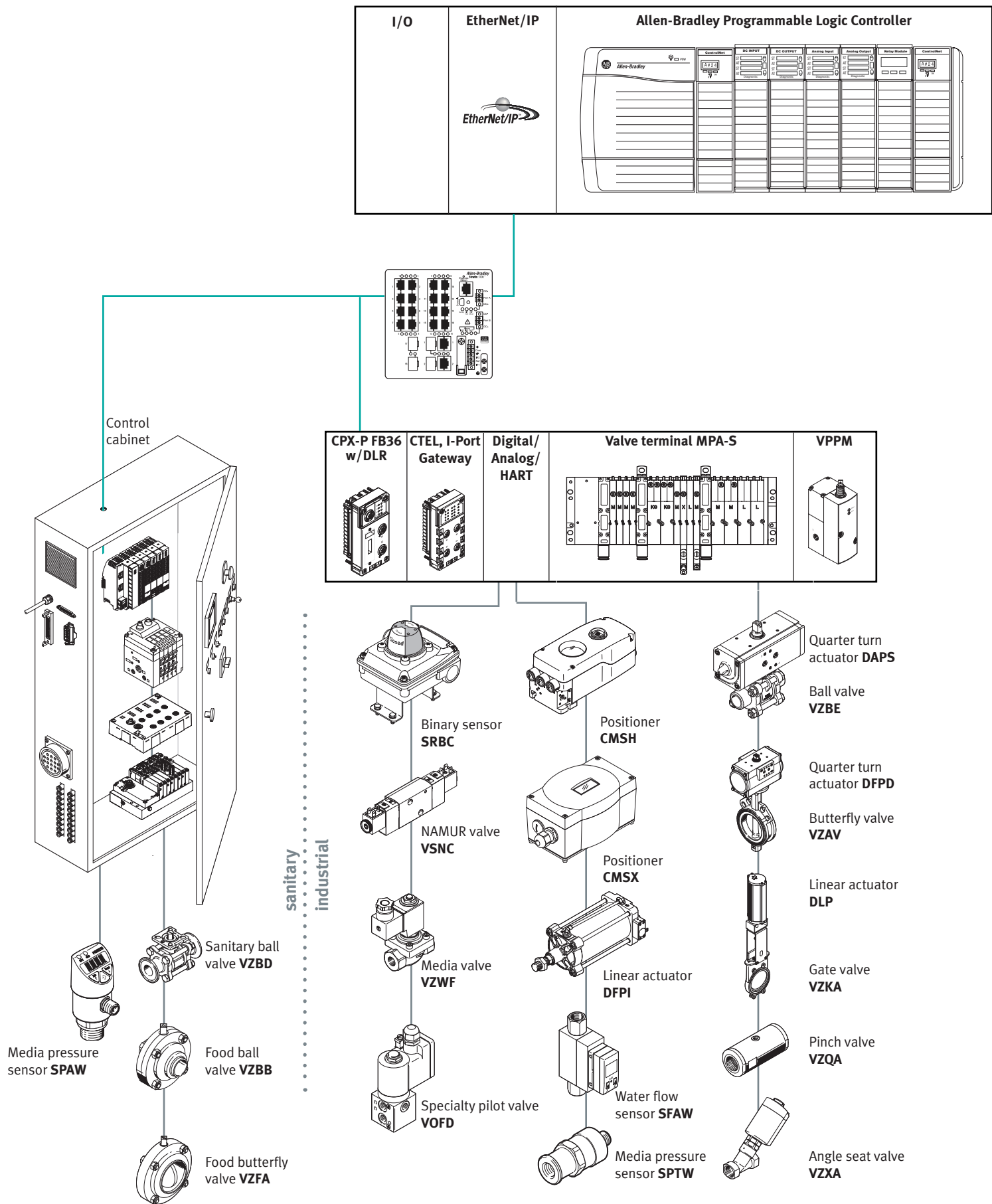
Ex. Allen-Bradley ArmorBlock Guard Safety I/O



Simplified Motion Series







Industry leading diagnostic capability

Error reporting including:

- Under voltage
- Short circuit
- Broken wire
- Out of range signal

Diagnostics available via:

- Integrated web server
- Festo Maintenance Tool software
- Status bits mapped as standard inputs
- Standard Rockwell CIP messages

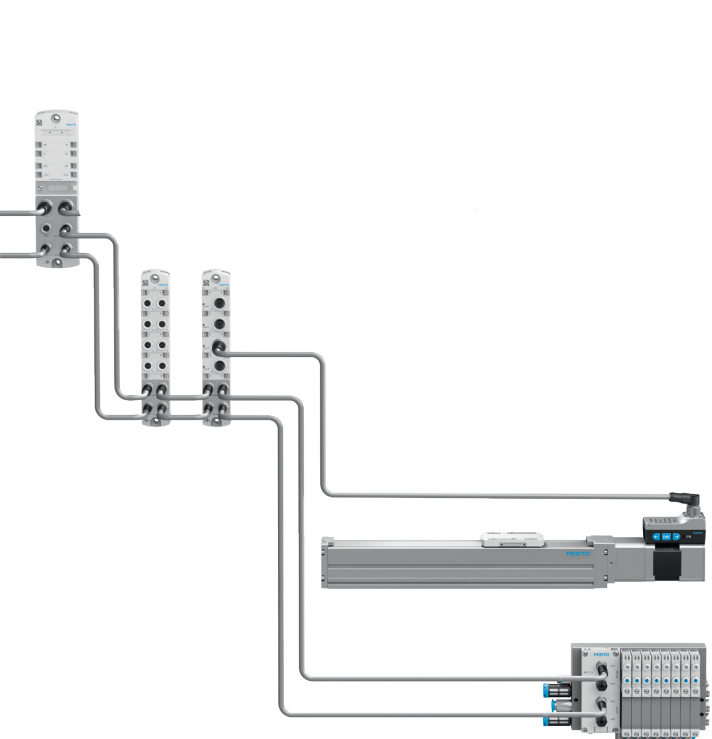
Industry leading range of supported I/O types

- 24 V DC inputs/outputs
- High speed counter with motor control modes
- Analog inputs/thermocouple/RTD/outputs

Industry leading flexibility

- DLR and QuickConnect support
- Up to 512 solenoids with one EtherNet/IP node
- On-board proportional pressure regulators
- On-board pressure transducers
- Flexible pressure and voltage zones allow you to support multiple safe machine zones
- Pressure regulators, flow controls, hot swap plates and individual supply plates available at each valve
- Integrated silencers save space and cost
- Long manifolds can be bisected by a flexible connector allowing large assemblies to fit in standard control cabinets
- Configurable parameters for I/O, valves and more

CPX-AP-I-EP: Bus node for EtherNet/IP distributed I/O and pneumatics



Industry leading flexibility

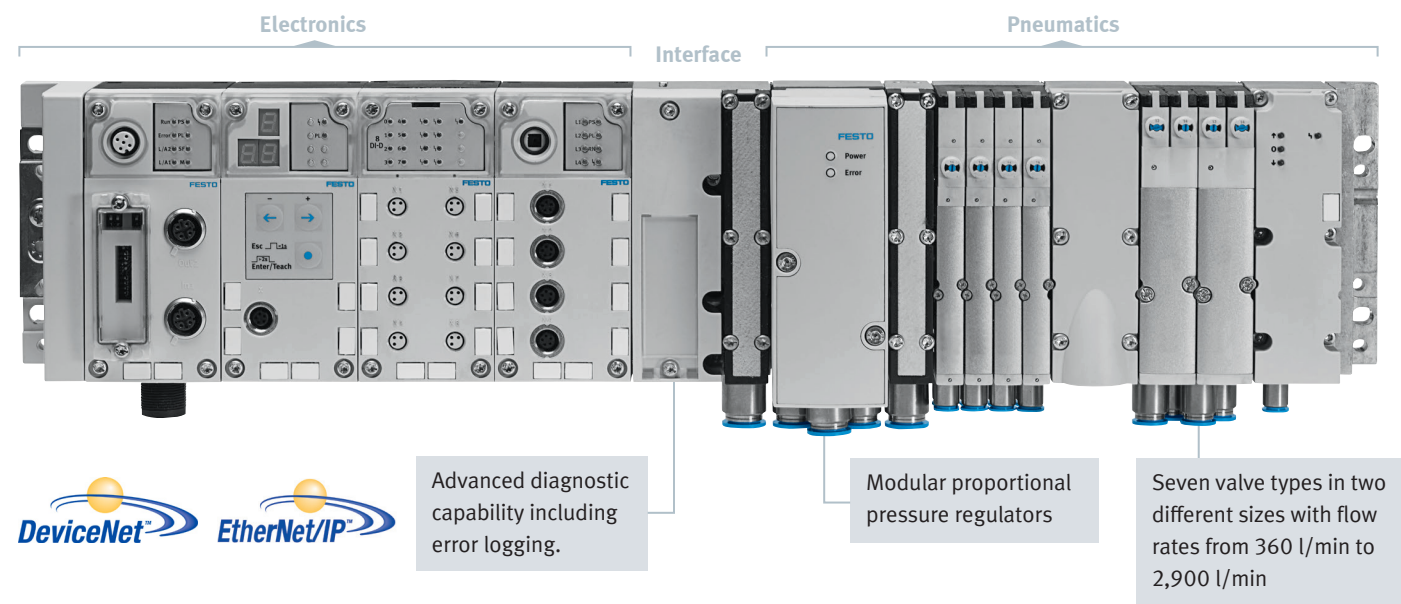
- Plug and Work. Bus node automatically recognizes configuration
- L5X export function automatically creates:
  - Generic Ethernet set-up
  - Configuration data for Forward-Open message
  - Meaningful Tag Names and data types to match function
  - Ladder logic to transfer data
  - Data-structure for diagnostics
- L5X facilitates disaster recovery situations, all data in PLC project
- Fixed I/O sizes possible to allow add-on modules without reconfiguration
- Web Server for easy parameterizing, diagnostics, firmware upgrade, L5X export

Industry leading platform for distributed pneumatics and I/O

- DLR and QuickConnect support
- Up to 80 modules (500 theoretically), 2kbytes of I/O
- Modules for pneumatics, I/O, IO-Link
- Fast cycle time << 1ms (500us typ for many modules)
- Up to 15m between modules (50m capable)
- Detailed diagnostics
- Power distribution daisy chained, plus Isolated for multiple supplies
- Bring pneumatics closer to actuators for increased performance



CPX/MPA Valve terminal components overview



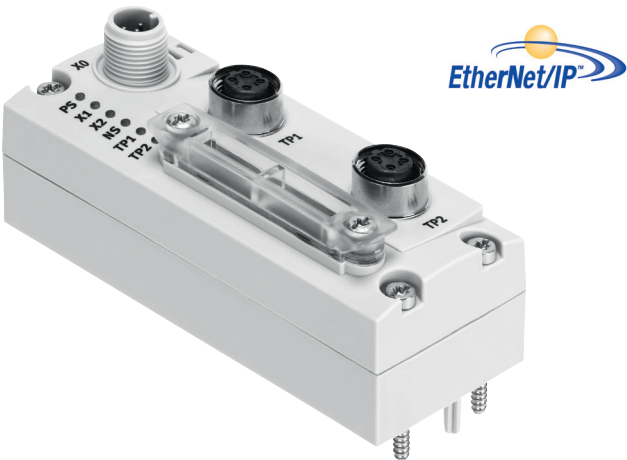
EtherNet/IP or DeviceNet

- Up to 9 I/O modules
- Digital I/O
- Analog I/O (0-10V & 4-20mA)
- Thermocouple
- RTD
- Pneumatic pressure transducers
- High speed counter
- Motion control interfaces
- I-Port and CPI master modules for connection to remote valve terminals

Wide variety of pneumatic functions

- 3/2, 5/2, 5/3 valve functions.
- Sandwich pressure regulators
- Sandwich flow controls
- Hot swap plates
- Pressure zones
- Voltage zones
- Sensor valves
- Safety valves
- Soft start valves

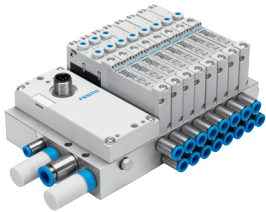
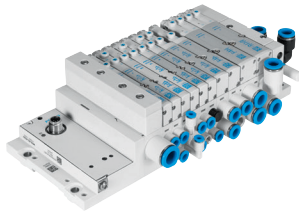

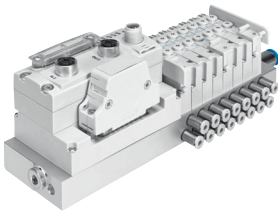




CTEU-EP EtherNet/IP Gateway



Features

- Two EtherNet/IP ports with DLR (device level ring)
- Option for Hazardous locations
- QuickConnect
- Web server support
- 1 ms RPI timing
- AUX power with isolation
- IP65/67
- Up to 64 bytes in/64 bytes out
- Other protocols supported
- Diagnostic capability
  - Under voltage
  - Short circuit

Overview: selected valve terminals/IO-Link and peripheral products





Valve terminal VTUG	Valve terminal MPA-L	Valve terminal MPA-C	Valve terminal VTOC
			
<ul style="list-style-type: none"><li>• Low cost fixed grid valve manifold</li><li>• Up to 24 valves and 48 solenoid coils</li><li>• Flow rate from 150-780 l/min.</li><li>• Special features for cabinet installation</li><li>• 3 valve sizes</li><li>• Option for Hazardous locations</li></ul>	<ul style="list-style-type: none"><li>• Modular, low cost, light weight valve terminal</li><li>• Up to 32 valves and 32 solenoid coils</li><li>• 3 different sizes possible on a single manifold</li><li>• Flow rate from 150-900 l/min.</li><li>• Sandwich regulators and multiple pressure zones</li></ul>	<ul style="list-style-type: none"><li>• Modular, clean design valve terminal for food applications.</li><li>• Up to 32 valves and 32 solenoid coils</li><li>• Flow rate from 150-680 l/min.</li><li>• Multiple pressure zones</li></ul>	<ul style="list-style-type: none"><li>• Small, fixed grid valve terminal for pilot valve applications.</li><li>• Up to 24 valves and 48 solenoid coils</li><li>• Flow rate 10 l/min.</li><li>• Multiple pressure zones</li></ul>
Valve terminal CPV	Safety valve MS6-SV	Proportional-pressure regulator VPPM	Position transmitter SDAT
			
<ul style="list-style-type: none"><li>• Compact, high flow valve terminal.</li><li>• Up to 8 valves and 16 solenoid coils</li><li>• Flow rate from 400-1600 l/min.</li><li>• Multiple pressure zones, cabinet mounting options</li><li>• 3 valve sizes</li></ul>	<p>Performance Level E safety valve with integrated soft start.</p> <ul style="list-style-type: none"><li>• Inexpensive: PL c, maximum safety: PL e</li><li>• Integrated soft-start function</li><li>• Flow rate: up to 16,500 l/min.</li></ul>	<p>The VPPM has the capacity to adapt precisely, for maximum flexibility with regard to electronic, pneumatic and mechanical components.</p> <ul style="list-style-type: none"><li>• Proportional pressure regulator available in three sizes and three pressure ranges.</li><li>• Flow rates from 1400—7000 l/min.</li></ul>	<p>Transmitter solutions for large and small drives</p> <ul style="list-style-type: none"><li>• High repetition accuracy</li><li>• Programmable IO-Link/switching output</li><li>• Five sensing ranges to match the most important standard strokes</li><li>• Analogue current output, switching output and IO-Link combined in a single unit</li></ul>


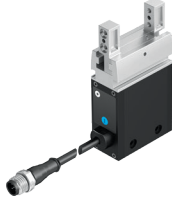
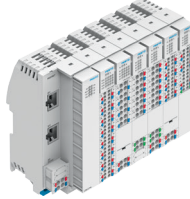

CAPC Splitter

Allows one CTEU to control two devices

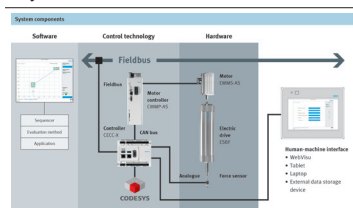


Overview: selected media valves, actuators, sensors and positioners

<b>AC servo drive CMMT-AS</b>	<b>Low voltage servo drive CMMT-ST</b>	<b>ServoLite drive CMMO-ST</b>	<b>Integrated servo motor EMCA</b>
			
<ul style="list-style-type: none"><li>• One of the most compact AC servo drives on the market</li><li>• Power from 350 W to 6000 W</li><li>• Control via EtherNet/IP, PROFINET, EtherCAT, Modbus TCP or digital I/O</li><li>• Record table including position, force and speed control with sophisticated sequencing</li><li>• AOI available</li></ul>	<ul style="list-style-type: none"><li>• Low-cost, compact servo drive</li><li>• Supports 24...48 V DC motors</li><li>• Control via EtherNet/IP, PROFINET, EtherCAT, Modbus TCP or digital I/O</li><li>• Record table including position, force and speed control with sophisticated sequencing</li><li>• AOI available</li></ul>	<ul style="list-style-type: none"><li>• Low-cost, compact servo drive</li><li>• Supports 24 V DC motors</li><li>• Control via IO-Link, Modbus TCP or digital I/O</li><li>• Record table including position, force and speed control with sophisticated sequencing</li><li>• AOI and IODD available</li></ul>	<ul style="list-style-type: none"><li>• Low-cost, compact servo drive</li><li>• Brushless 24 V DC</li><li>• Control via EtherNet/IP, PROFINET, EtherCAT, Modbus TCP or digital I/O</li><li>• Record table including position, force and speed control with sophisticated sequencing</li><li>• AOI available</li></ul>
<b>Simplified Motion Series SMS</b>	<b>Electric parallel gripper EHPS</b>	<b>Remote I/O terminals CPX-E</b>	<b>Vision sensors SBS</b>

			
<ul style="list-style-type: none"><li>• End-to-end positioning</li><li>• Pressing</li><li>• Adjustable speed and force</li><li>• Control via digital I/O or IO-Link</li><li>• Easy wiring and configuration saves time</li><li>• Integrated motor reduces cabinet space requirements</li></ul>	<ul style="list-style-type: none"><li>• Compact gripper with integrated motor and drive</li><li>• Adjustable speed and force</li><li>• Control via digital I/O or IO-Link</li><li>• Easy wiring and configuration saves time</li></ul>	<ul style="list-style-type: none"><li>• Easily extend PLC functionality, including modules for IO-Link master, digital I/O, analog I/O and fast counters</li><li>• Control via EtherNet/IP, PROFINET, EtherCAT, Modbus TCP or PROFIBUS</li></ul>	<ul style="list-style-type: none"><li>• Detect part presence, orientation, length, position and more</li><li>• 1D/2D code reader, OCR</li><li>• Integrated lighting and lenses</li><li>• Powerful and fast software</li><li>• Robust housing with IP67 protection</li></ul>

Servo press kit  
YJKP



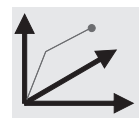
- Modular system including servo press software, electric cylinder ESBF, servo motor and drive, force sensor, motion controller and required accessories
- Less expensive than conventional servo press systems
- Ideal for product assembly and quality assurance
- AOI available

Applications for electric drives - connection to EtherNet/IP





Festo – your partner for every stage of the process automation sequence





Your palletizing, clamping parts, pick & place or package sorting application determines the solution – that holds true for control technology, too. Festo's control architecture is designed to meet your needs in three ways:

- Tailored to your application
- Ideal for integration into your overall coordinating/control systems
- Optimally designed for drive activation systems, whether electric, servopneumatic or pneumatic



With EtherNet/IP fieldbus communication **only point-to-point motions are possible**

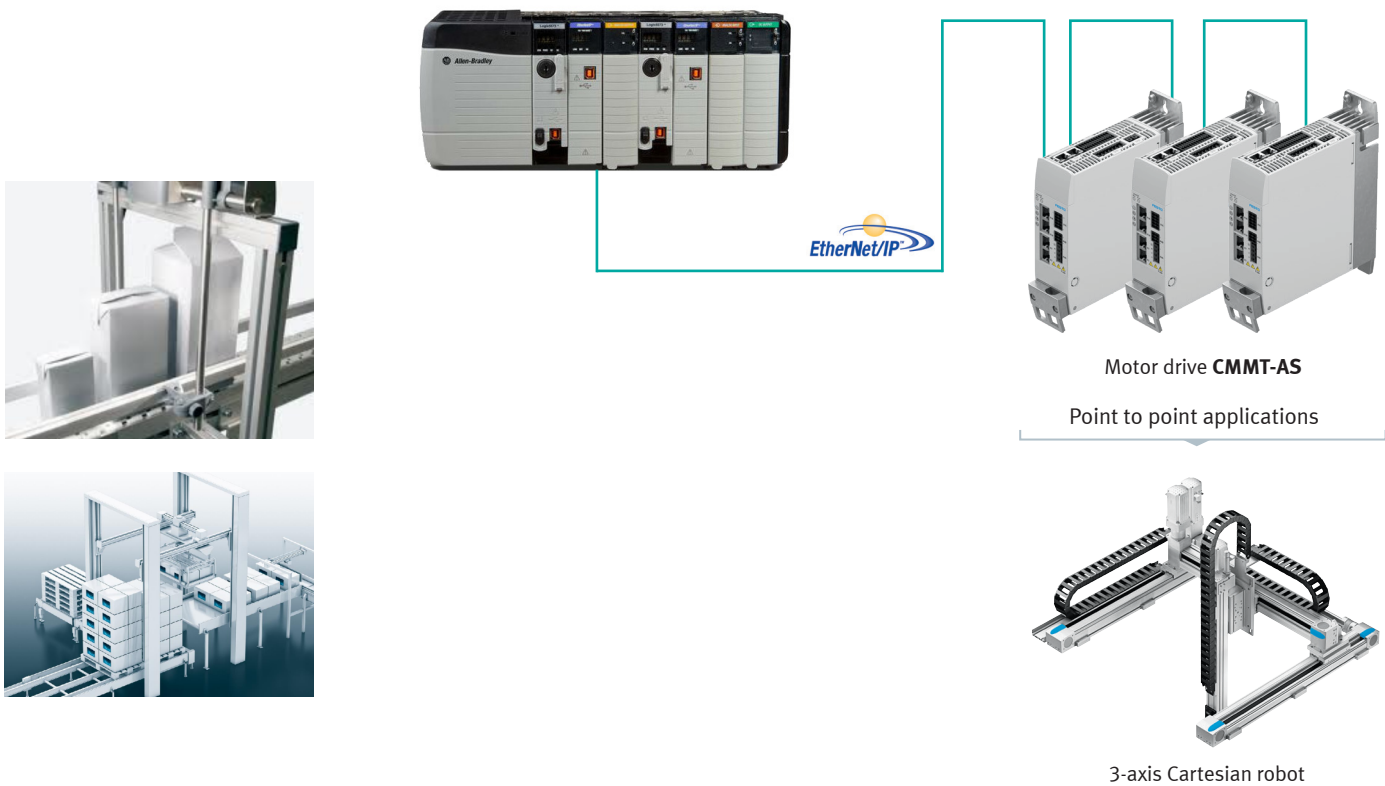
<b>Ball valve assemblies KVZB</b>	<b>Butterfly valve assemblies KVZA</b>	<b>Positioner CMSH/ CMSX</b>	<b>Controlled linear actuator DFPI</b>
			
<ul style="list-style-type: none"><li>• Threaded, sanitary and flanged connections</li><li>• Assembled and tested with single or double acting actuator</li><li>• ISO/Namur/VDI/VDE interfaces for accessories</li><li>• Suitable for outdoor, hazardous locations and certain washdown environments</li><li>• Suitable for wide range of fluids and inert gases</li></ul>	<ul style="list-style-type: none"><li>• Wafer and lug style according to ANSI standard B16.5</li><li>• Assembled and tested with single or double acting actuator</li><li>• ISO/NAMUR/VDI/VDE interface for accessories</li><li>• Bi-directional bubble-tight shut off</li><li>• Media pressure up to 230 psi</li><li>• Sizes: 1-1/2" to 12" DN40 to DN300</li></ul>	<ul style="list-style-type: none"><li>• Closed loop positioner for control of quarter turn actuators</li><li>• Auto-teaching speeds up commissioning</li><li>• Energy-efficient: no compressed air consumption when at rest</li><li>• Feedback signal as standard</li><li>• Configurable safety position in case of power failure</li><li>• Available with HART, UL and Hazardous locations</li></ul>	<ul style="list-style-type: none"><li>• Actuator for all linear operated process valves</li><li>• Position sensing via built-in displacement encoder</li><li>• With optional integrated positioner and valve block</li><li>• Position feedback via analogue 4...20 mA for simple diagnostics</li></ul>

<b>Angle seat valve VZXA</b>	<b>Pinch valve VZQA</b>	<b>Solenoid media valves VZWf</b>	<b>Media pressure sensor SPAw</b>
			
<ul style="list-style-type: none"><li>• Modular design simplifies maintenance</li><li>• Unique interface allows actuator removal while valve is under pressure</li><li>• Optical position indicator clearly shows valve position</li><li>• Lifetime of at least 1 million cycles for standard media</li><li>• Available in normally closed, normally open and double acting</li></ul>	<ul style="list-style-type: none"><li>• Compact design makes it one of the smallest automated valves on the market</li><li>• Quick and easy replacement of seal cartridge</li><li>• Full bore with no dead space</li><li>• Lifetime of at least 500,000 cycles for standard media</li><li>• Available with FDA approved materials and sanitary connections</li></ul>	<ul style="list-style-type: none"><li>• No pneumatics needed</li><li>• No differential pressure required for operation</li><li>• Rated to 90 or 150 psi depending on size</li><li>• Lifetime of at least 2 million cycles for standard media</li><li>• Available with multiple diaphragm materials</li></ul>	<ul style="list-style-type: none"><li>• Monitor pressure of pneumatics, hydraulics, water, gases and cooling media</li><li>• Stainless body and measurement element</li><li>• High-quality display for free configuration of outputs</li><li>• Easy to operate: housing rotatable 320, display at 45 angle</li><li>• Accurate to 1% of full scale</li><li>• Repeatable to 0.1% of full scale</li></ul>

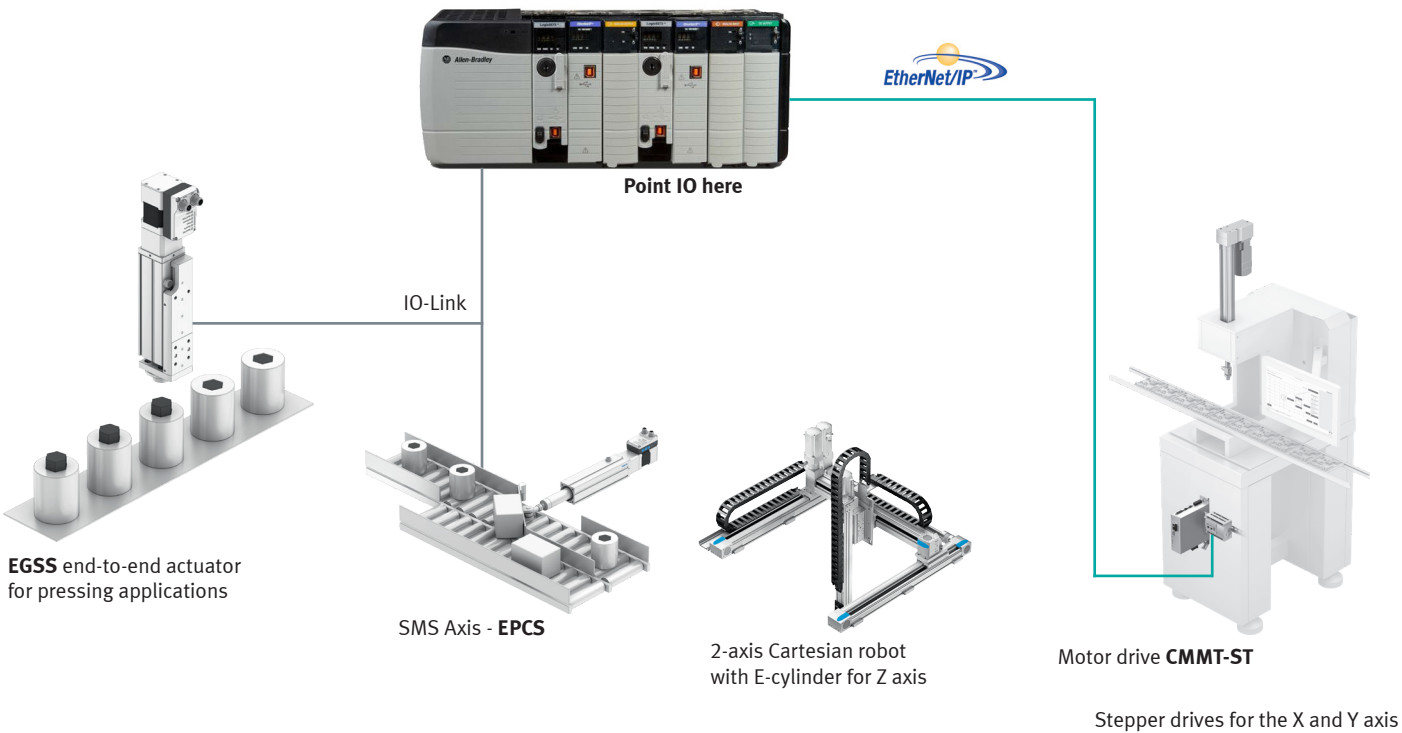
More information can be found on our website: [www.festo.us/processproducts](http://www.festo.us/processproducts)



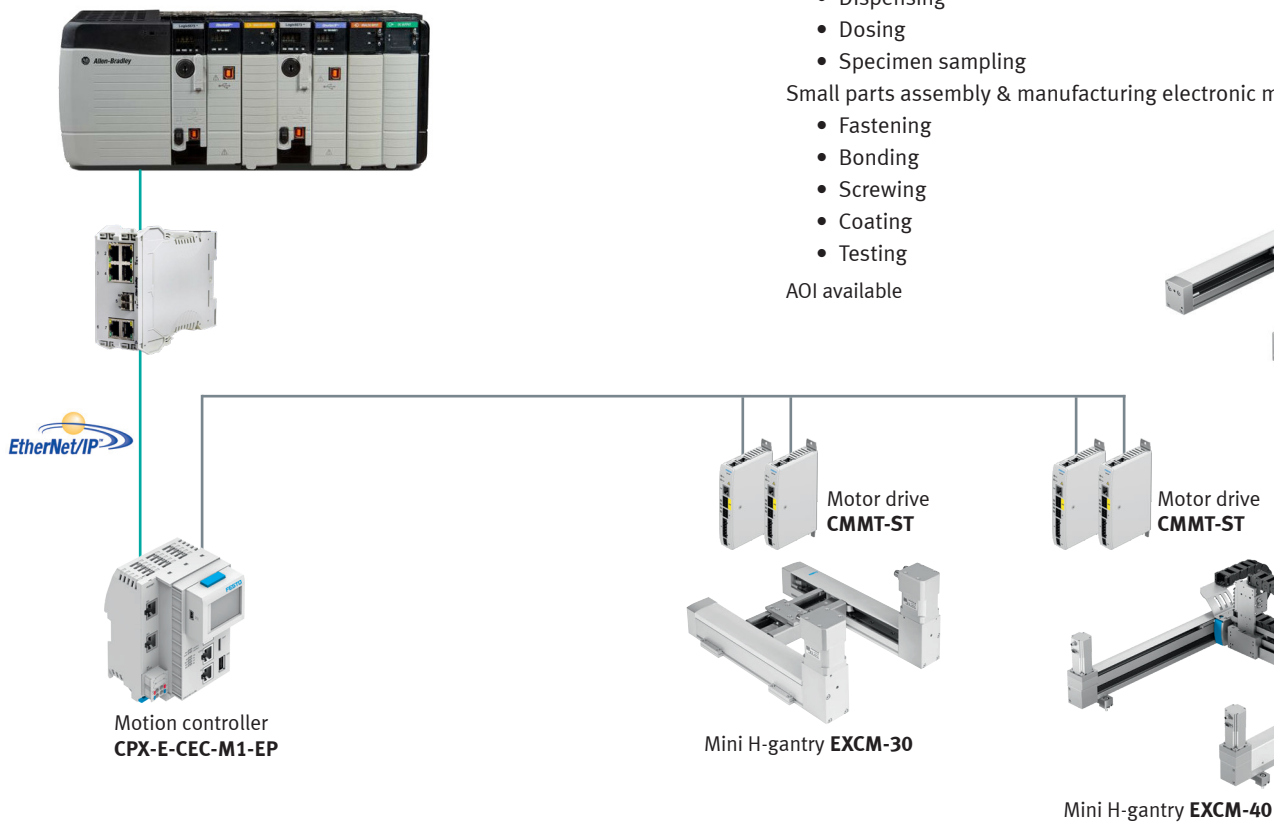
Automated format adjustments and material handling systems



Pressing parts into assembly



Desktop automation - Fully electric or hybrid solutions



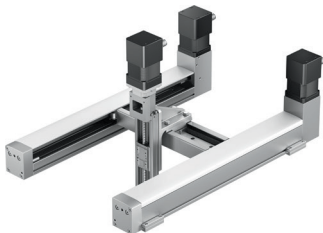
Life sciences – microplate handling solutions

- Dispensing
- Dosing
- Specimen sampling

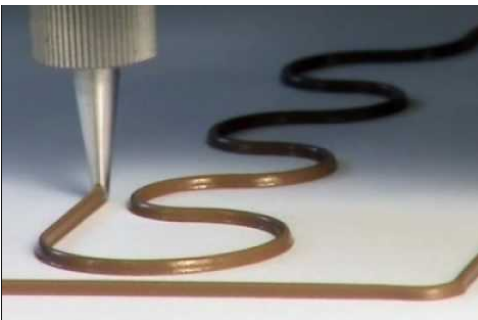
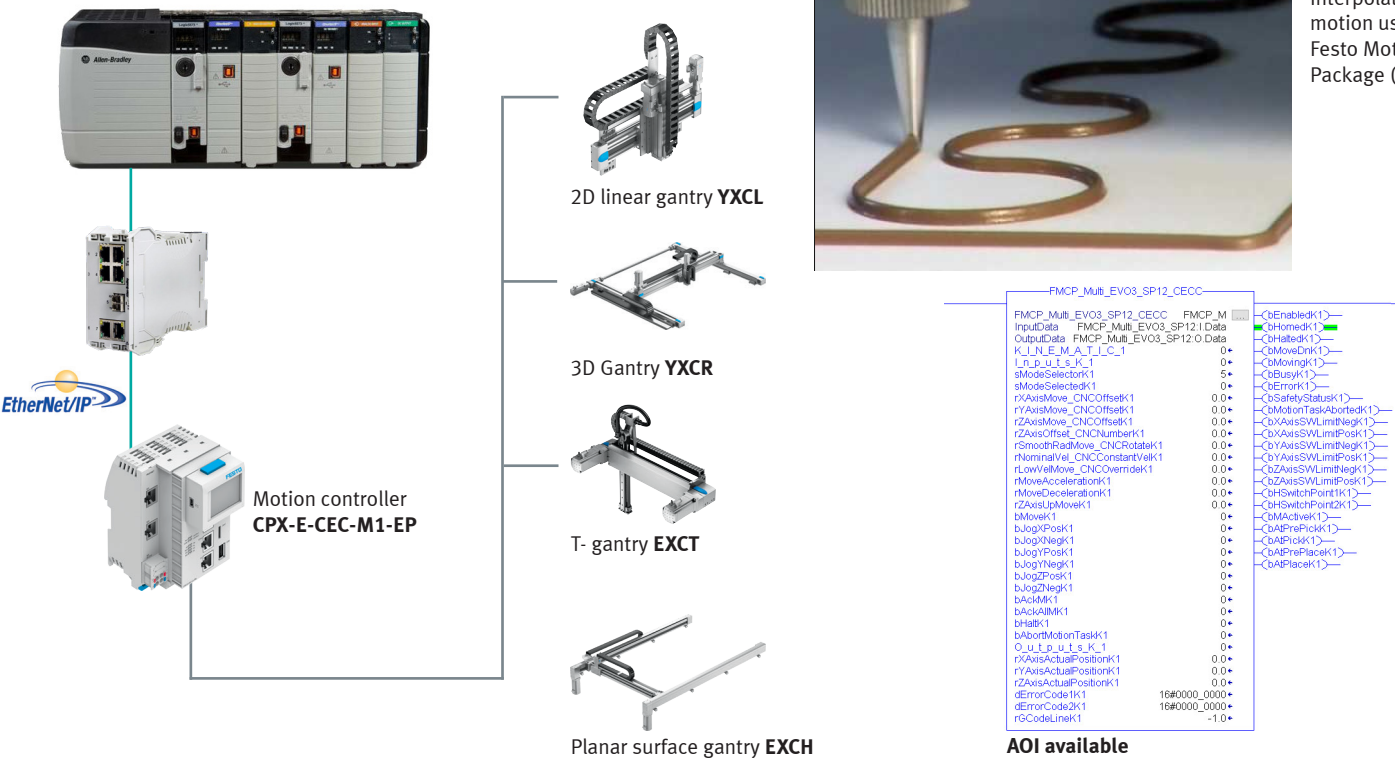
Small parts assembly & manufacturing electronic module processing

- Fastening
- Bonding
- Screwing
- Coating
- Testing

AOI available



Dispensing/engraving/surface inspection



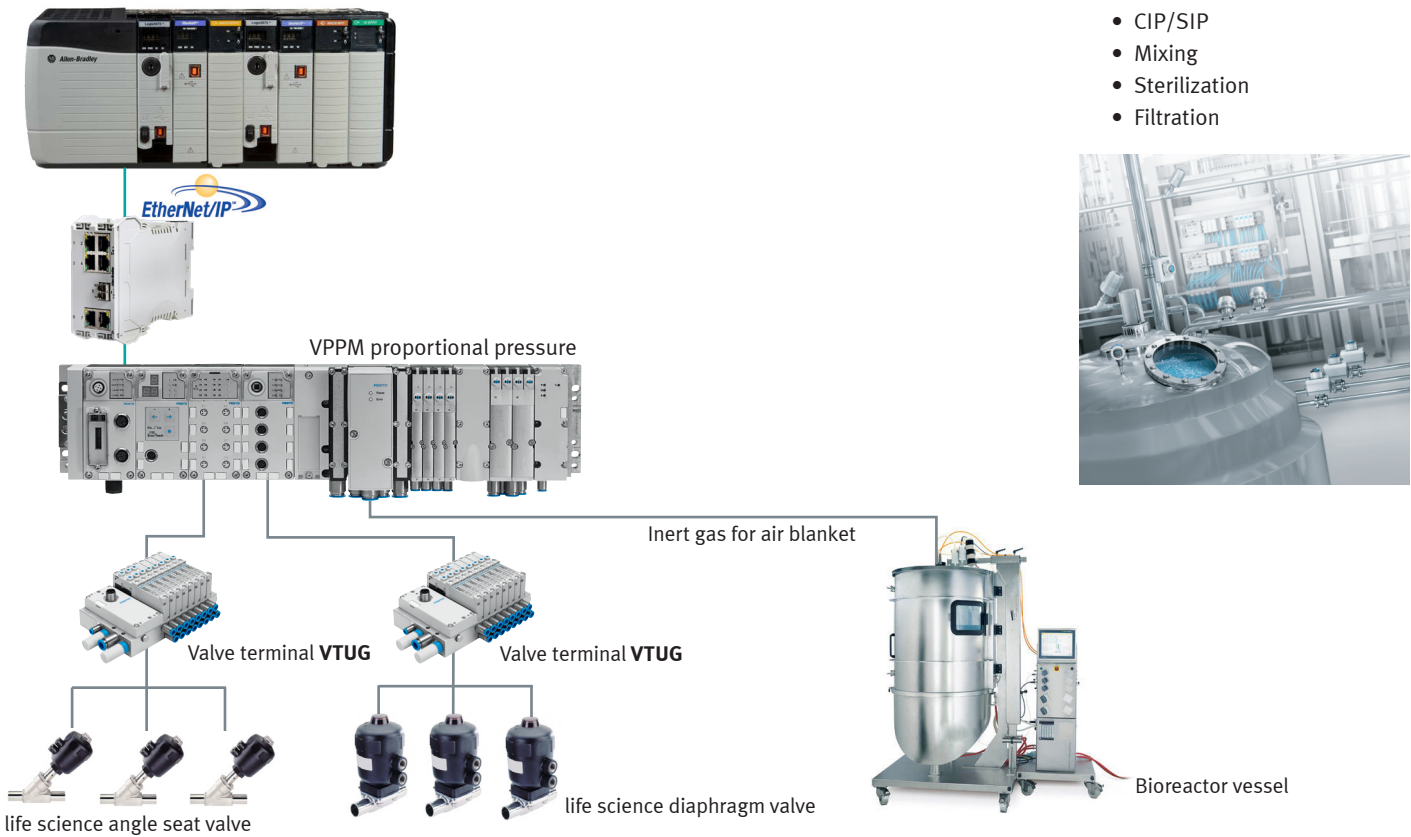
Interpolated 2D/3D motion using the Festo Motion Control Package (FMCP)

FMCP_Multi_EV03_SP12_CEC		
FMCP_Multi_EV03_SP12_CEC	FMCP_M	
InputData FMCP_Multi_EV03_SP12_I Data		
OutputData FMCP_Multi_EV03_SP12_O Data		
K_U_N_E_M_A_T_I_C_1	0.0	-bEnabledK1
L_n_U_L_S_K_1	0.0	-bOnHoldK1
sModeSelectorK1	0.0	-bMoveDrnk1
sModeSelectedK1	0.0	-bMovingK1
rXAxisMove_CNCOffsetK1	0.0	-bEasyK1
rYAxisMove_CNCOffsetK1	0.0	-bErrorK1
rZAxisMove_CNCOffsetK1	0.0	-bSafetyStatusK1
rZAxisOffset_CNCNumberK1	0.0	-bMotionTaskAbortK1
rSmoothRadMove_CNCRotatK1	0.0	-bXAxisSWLimitNegK1
rNominalVel_CNCConstantVelK1	0.0	-bXAxisSWLimitPosK1
rLowVelMove_CNCOverideK1	0.0	-bYAxisSWLimitNegK1
rMoveAccelerationK1	0.0	-bYAxisSWLimitPosK1
rMoveDecelerationK1	0.0	-bZAxisSWLimitNegK1
rZAxisUpMoveK1	0.0	-bZAxisSWLimitPosK1
bMoveK1	0.0	-bSwitchPoint1K1
bJogXPosK1	0.0	-bSwitchPoint2K1
bJogXNegK1	0.0	-bMActiveK1
bJogYPosK1	0.0	-bAPrePickK1
bJogYNegK1	0.0	-bAPickK1
bJogZPosK1	0.0	-bAPrePlaceK1
bJogZNegK1	0.0	-bAPlaceK1
bAckMk1	0.0	
bAckMk1	0.0	
bHaltK1	0.0	
bAbortMotionTaskK1	0.0	
O_U_L_P_U_L_S_K_1	0.0	
rXAxisActualPositionK1	0.0	
rYAxisActualPositionK1	0.0	
rZAxisActualPositionK1	0.0	
dErrorCode1K1	16#0000_0000	
dErrorCodes2K1	16#0000_0000	
rGCodeLineK1	-1.0	

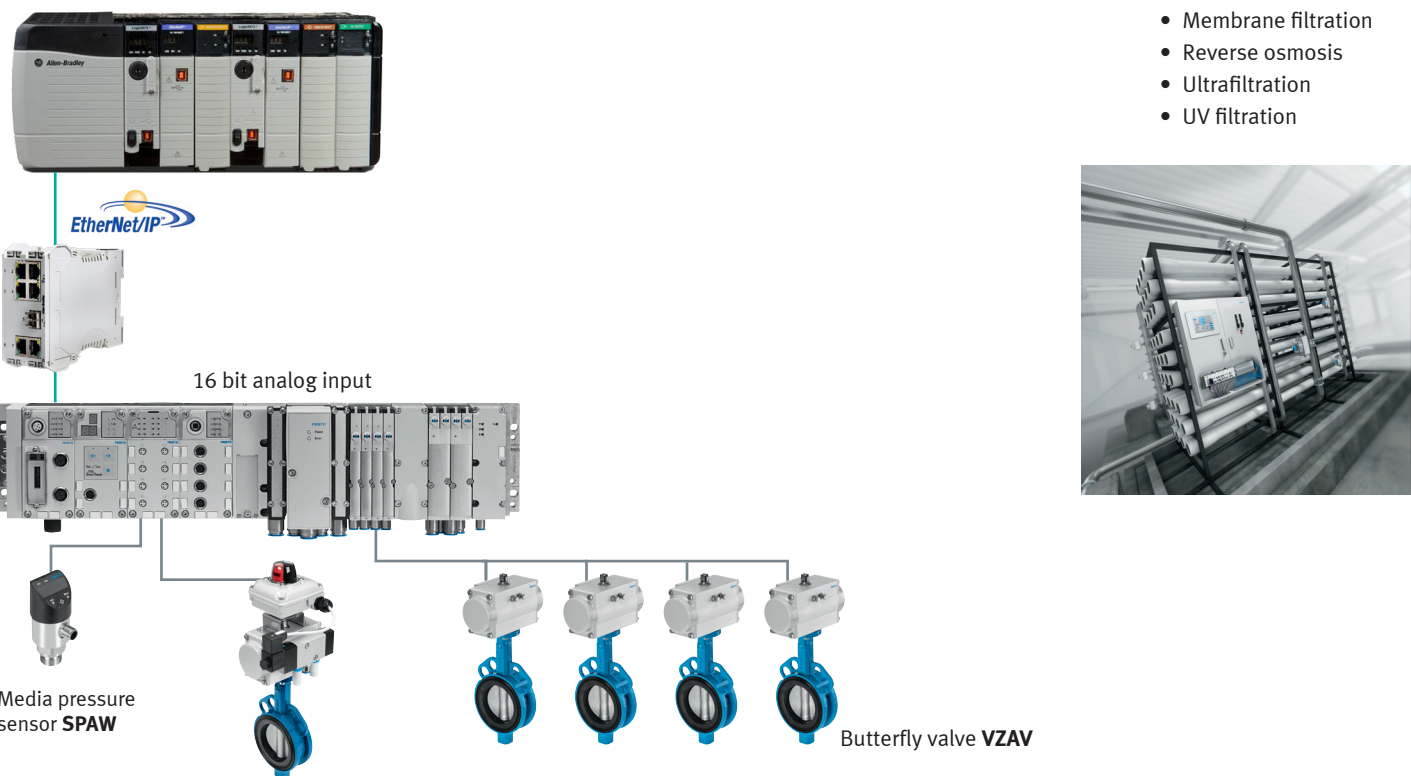
AOI available



Decentralized process control



Skid based process control



Festo Support

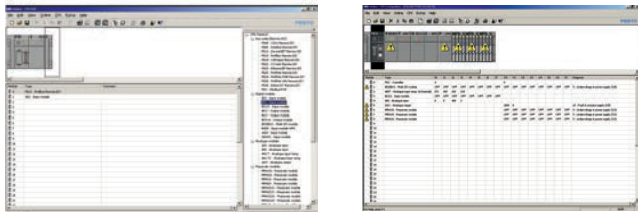
We're there to offer support whenever you need us online or in person. This applies to all phases, from engineering to operation and beyond. We listen to you and we help you to keep your processes running optimally and without downtimes. When it matters most, we provide help quickly.

**Festo online engineering tools allow you to confidently design solutions, regardless of your level of expertise. With these tools, you can quickly create a valid configuration, accurately select a component, generate required documentation, and perform essential calculations. Get more value from your industrial automation projects by leveraging Festo technology and expertise!**

Festo Maintenance Tool CPX-FMT

The CPX-FMT is a helpful tool for commissioning, configuration and extended diagnosis of a CPX valve terminal. If Industrial Ethernet fieldbus nodes like EtherNet/IP, ProfiNet and Modbus/TCP are used, CPX-FMT can directly communicate with the CPX terminal via Ethernet connection. This tool can export an L5K file for Logix 5000. Parameters and tag descriptions can be stored in any Logix project.

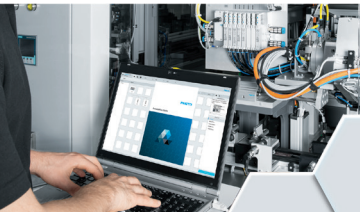
→ [www.festo.us/support](http://www.festo.us/support)



Festo Automation Suite

The PC-based Festo Automation Suite software combines the parameterization, programming and maintenance of Festo components in one program. It enables the entire drive package, from the mechanical system to the controller, to be commissioned. Perfect for making industrial automation simple and seamless.

→ [www.festo.us/automationsuite](http://www.festo.us/automationsuite)



Electric Motion Sizing

This sizing and simulation tool helps you to find the right electric or electromechanical servo drive for your application. The calculation is performed on the basis of a small number of parameters like mass, stroke/travel distance and cycle time, and promptly tells you which solution is the most economical for your requirements, whether servo drive and motor or servo drive, motor and mechanical system.

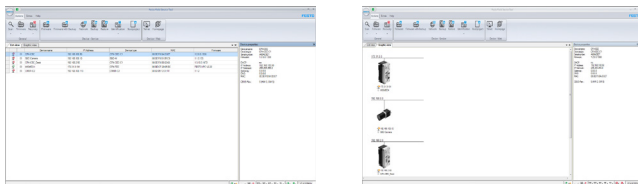
→ [www.festo.us/EMS](http://www.festo.us/EMS)



Festo Field Device Tool FFT

The Festo Field Device Tool includes various services for all Ethernet-based Festo field devices. It supports, among other features, the update of firmware files to selected devices from Festo.

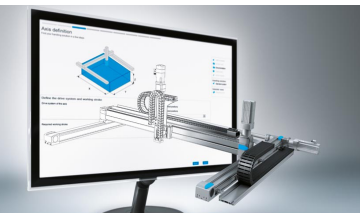
→ [www.festo.us/support](http://www.festo.us/support)



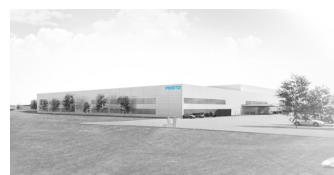
Handling Guide Online HGO

HGO is an online configuration tool for sizing Cartesian robots. Easily size one, two and three-axis Cartesian robots in minutes. Benefits of using HGO include: receive quote in 48 hours, CAD model and complete bill of materials available immediately and order with a single part number.

→ [www.festo.us/HGO](http://www.festo.us/HGO)



# Festo - Your partner in automation



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