EtherCAT
Our goal is to enable more flexibility in your machine design and ensuring your machine users the necessary productivity and efficiency in production, thereby giving your machines a competitive edge.

That is why the focus of our development is not just the entire system of a machine, but also the added value that we make available to our customers with the modularization of machines, the scalability of components and flexible technology blocks.

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Our concept enables the production of up to 180 tubular pouches every minute. We pack at top speed – universally and reliably. Baumüller attaches great importance to the harmonious operation of horizontally or vertically configured machines. That is why we use movable as well as stationary processing at the individual stations. This allows us to optimize the process with a view to the overall results.

**Characteristics**

- Variable processing speed
- Defined sealing position
- Slip compensation
- Dynamic start-of-fill control
- Synchronous operation or sealing time optimization
- Extended temperature control
- Individually adjustable separation
- Coupling of additional modules possible

**Customer benefits**

- Parameters are speed independent.
- You specify the beginning and end of the bag.
- Smooth machine motion protects the machine’s mechanical components
- No double bags or empty bags
- Speed optimization or quality optimization
- Short warm up time, no overheating
- Single bags or a line of bags separated by a perforated seam
- Triggering of cutters, printers, etc.
Your benefits — fast and efficient software creation

Each application is unique, but that doesn’t mean the whole thing should be totally reinvented from scratch — on the contrary. The whole idea behind modular engineering is to reuse the tried-and-true tested modules and concentrate on the specific task at hand.

- One engineering template, adapted specifically for your plant
- Scalable in functional scope and drive power
- One customized solution from a combination of standard solutions
- Optimized in terms of time and cost
Bags are more than just flexible transport containers for packaging. They are also a portable advertising medium produced in the billions that we are exposed to countless times every day. To meet the enormous demand for various formats, a bag manufacturing system often results in its own high-speed line so that the individual processing stations can be optimally synchronized. The coordination of all stations requires different kinds of drives with harmonious and dynamic strengths.

Characteristics
- Highly dynamic motors
- Multiple dancer control
- Punching as a concurrent process
- Continuous operation of unwinder
- Optimized out-feed product bundles

Customer benefits
- Quiet machine operation at high cycle rates
- Dynamic buffer inside the machine
- High cycle rate with high precision
- Energy efficient, saves material and system resources
- No separation required in downstream process
Your benefits — DSD — Dynamic servo motors

Based on their acceleration capability, these servo motors for highly dynamic applications provide top-flight start-stop characteristics. Thanks to their low inertia, you get an excellent acceleration profile, even at low power input.

- Wide range of power, and speed-torque characteristics allows optimization for a high cycle rate
- Minimal cogging torque provides extremely smooth operating characteristics.
- Available integrated drive option enhances rapid response time.

- Maximum dynamic response due to excellent torque/inertial mass ratio
- High overload capability
- Smooth housing surface — not easily soiled
- Sleek, uniform housing design
- Almost no cogging effect
- Permanent magnet synchronous servo motors
- Main connection via terminal box or connector
- IP65 degree of protection, regardless of cooling method
- Encoders: resolver, SinCos encoder (optional)
- All types available with optional brake

The DSD series is available in an uncooled, air-cooled and a water-cooled version.
Personalization is becoming increasingly important in modern mailing systems. In addition to the content, the format of the message is an important aspect. We use intelligent systems to ensure that machines are extremely flexible so that setup and job changeover times are minimized. With the help of Baumüller’s engineering framework ProMaster you can finish the machine configuration, parameterization and programming in the shortest amount of time.

**Characteristics**
- Variable processing speeds
- Defined cutting position
- Electrically generated synchronized motion
- Synchronization of additional modules
- Taking advantage of reusable technology modules

**Customer benefits**
- Calculation of cam profiles independent of format and speed
- Registration control
- Incorporation of data matrix and barcode reader systems
- Data matrix and barcode reader system monitoring
- Reducing commissioning times and time to market
Your benefits — Configuration management

Programmers of automated machines need powerful tools to create application software. Engineering keys upon the technical definition of machine functionality. Thanks to ProMaster, the Engineering Framework from Baumüller, you can now focus on your core competence on the task at hand and reduce the time required to create your machine software, while also significantly lowering costs.

- A single development environment for all automation tasks from simple motion all the way to safety
- Integrated engineering
- Shared project database
- Modularity and reusability
- Uniform operation and display
- Decreased complexity
- Less time and effort required for application development

Amongst others, the following technology modules are available for envelope
Extruder — Mechatronic integration management

Simple, compact and energy-efficient — with a sensorless synchronous operation and integrated thrust bearings with internal spline connections, which can handle axial forces of up to 470 kN, we provide optimal solutions for the screw. Energy-efficient direct drives can reduce the lifecycle costs of the machine while also enabling a compact machine configuration.

Characteristics
- Sensorless synchronous operation
- Torque controlled output in all operating modes
- Availability of water cooled and air cooled motors/drives
- Energy efficient high torque motors
- Optional integrated thrust bearing
- Integrated motor and drive temperature control with in-drive PLC option
- Control of dosing function
- Speed ratio control with speed take-up
- Screw release function in controller

Customer benefits
- No need for an encoder, thus improving economy
- System solutions up to 315 kW
- No gearbox, low-energy, maintenance-free
- Reduced load on controller
- High level of modularity and flexibility
- Prevent sudden release of pretensioned screws, thus preventing damage to screw heads
Your benefits — Mechatronic integration

With its comprehensive product range, Baumüller offers system solutions up to 315 kW, thus allowing you to outfit entire machine families without hydraulics. Based on our many years of experience and innovative strength, we provide tailor-made drives solutions for extrusion processes.

- Scalable in functional scope and drive power
- System supplier with an extensive product range
- Comprehensive industry specific expertise

We also provide solutions for downstream processes, such as blown film installations, including components such as direct drives with minimum torque ripple or a hollow shaft to allow media flow through the motor. Our comprehensive line of servo motors and converters contributes directly to the profitability and performance of the complete system.

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Injection molding machine – Energy efficiency

Short cycle times, the highest precision and energy-efficient drives. When it comes to hybrid or all-electric injection molding machines, we work with the machine manufacturer to set decisive industry trends through jointly developed concepts. The drives from Baumüller for injection molding and blow molding machines enable consistent quality and ensure optimal process data.

Characteristics
- Peak load converters for high overloads
- High-torque motors with hollow shafts
- Software templates to reduce the load on the controller
- Highly dynamic axes for handling applications
- Linear motors for part ejection function
- Availability of water cooled and air cooled motors/drives
- Energy efficient high-torque motors
- Wide array of field buses
- Configuration management with ProMaster, easy engineering
- Scalable safety functions up to SIL3 level according to EN ISO 13849 or PLe according to EN 62061
- Screw release function in controller
- Safety module with integrated parameter memory

Customer benefits
- Increased productivity
- Utilization of braking energy
- Optimized for industry requirements
- System solutions up to 315 kW
- Improved process quality
- Easy data handling during servicing as controller parameters are stored both at module level and within the controller itself
- Can be easily upgraded to include the highest level of safety functions such as safety-limited position and ensuring machine safety in accordance with current standards
- Prevent sudden release of pretensioned screws, thus preventing damage to screw heads
Your benefits — Energy efficiency

It is imperative that manufacturers utilize technologies from knowledgeable system providers. Bau-müller serves as your smart solutions provider with offerings such as water cooled motors and drives that are optimized for peak loads. Stainless steel cooling channels ensure years of trouble free operation in your manufacturing environment.

- Scalable in functional scope and drive power
- System supplier with an extensive product range
- Mechanical frictional losses are reduced
- No auxiliary power systems required
- Cost savings
- Reduced lifecycle costs

All-hydraulic machines

Hybrid and electric machines

- Water cooling in cabinet or as push through technology
- Externally spline shaft option

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PCB manufacturing —
Linear motors

The miniaturization of circuit boards and the resulting increased complexity means that the extremely accurate positioning of electronic components is essential. Baumüller linear motors lay the groundwork for this: They make it possible to position the drills used in PCB drilling machines with micrometer precision. The fully automatic station is configured without a complicated special machine construction and with only a minimal assembly effort via plug & play. This reduces your R&D costs. By using direct linear motors, multiple drill heads or milling cutters can be moved synchronously or independently of one another.

Characteristics
- Direct linear motion
- Zero backlash
- High dynamic performance
- High repeat accuracy
- Programmable motion profile
- Modular system
- Eliminates mechanical transmission elements
- 2 ½ D – CNC functionality using coordinated motion conforming to PLCopen

Customer benefits
- Offset compensation of X/Y axes
- High productivity
- Format flexibility
- No compressed air connection required
- Lower R&D costs
- Improved product quality
- Reduced lifecycle costs
- Smaller machine footprint
- Short time to market due to CNC functionality within the IEC 61131 range of standards
**Your benefits — Baumüller direct linear drives**

Conventional solutions (spindles, belts, chain drives, and pneumatic drives) are being replaced in growing numbers by direct linear motor technology. Our linear motors are designed using scalable, modular system components. You can select a power rating, geometry, and design to suit your requirements and create varying lengths of travel by joining segments in series. Thus, depending on the application, you can create virtually maintenance free systems with low upkeep costs.

**Baumüller linear motors – The secrets of their success:**

- The tried-and-tested drive control technology used in Baumüller rotary drive systems can be used for linear motor systems without restriction.
- Modular system with various motor frame sizes and lengths
- Designed to give maximum performance with feed forces of up to 14,750 N and speeds at up to 10 m/s
- Plug & play solutions: minimize R&D and assembly costs
- Various winding designs for all motor sizes to ensure optimum velocity adjustment
- Carbon-fiber lamination of the primary section, optional for the secondary
- Up to IP65 degree of protection for all motor components
- Motor winding protected against thermal overload by means of integrated temperature sensors (KTY84 thermistors and thermal switches)
- Highly flexible, strain-relieved, and shielded power cable feed
- Repeat accuracy to 2 μm

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600 tons in one-second cycles – press force alone isn’t everything. Lift, velocity, and pressure profiles are just as important. A solution with the latest control and drive technology is the impetus for a generational change: With faster response times and adjustable pressure profiles, Baumüller can help you achieve new production quality with high cycle rates. In addition to optimizing the pressing process, we value the energy recovery just as much as safety, because these kinds of systems can lead to dangerous situations that have to be recognized and remedied well before they can occur.

Characteristics
- Recycling of braking energy
- Use of energy efficient high-torque motors
- Electric direct drive
- Programmable motion profile
- Reduced system equipment weight
- Integrated safety system (optional)
- Connection of additional capacitor units
- Scalable safety functions up to SIL3 level according to EN ISO 13849 or PLe according to EN 62061
- Selection of safe function via EtherCAT FS0E or safety local IOs

Customer benefits
- Increasing energy efficiency
- No gearbox required, resulting in: reduced noise emission; no compressed air or hydraulic connections
- Flexibility
- No installation of additional equipment is required
- Drop-in replacement, future oriented design concept
- Reduction of supply peaks, thus also reducing utility charges
- Less cabling required
- Reduction in commissioning costs
Your benefits – Integrated automation solution combines safety and profitability

Additional expenses incurred with a separate machine control and safety control system can be reduced by integrating the safety component into a safe automation solution. With this integrated system safety concept, Baumüller focuses as the coordination center for all the machine automation processes. Whereas classic concepts rely on additional safety components such as emergency stop devices, Baumüller has opted for an integrated solution. Such a solution requires automation components that are scalable and equipped with sophisticated safety functions. The result is an integrated safety concept that is ideal for centralized, distributed, and hybrid automation structures.

Characteristics of integrated safety

- Easy implementation of safety oriented functions
- PLCopen Safety compliant programming environment with certified libraries
- Universal integration of the safety solution in ProMaster
- Combines standard technology and safety technology
- Scalable for simple to complex machines
- Compliance with (future) applicable standards
- Lower system costs (total cost consideration)
- Faster response times in the system
- Easier commissioning and effective diagnostics
- Simplified certification of safety applications
In sheet paper processing, whether this involves printing or other processing steps, the precise material flow becomes even more important at higher speeds. Baumüller supports the upper limits, for example, of up to 20,000 sheets per hour with the required dynamic and software functions. If your requirements for the material to be processed should ever change, the transition should be completed quickly and smoothly.

**Characteristics**
- Variable processing speed
- Defined sheet position
- Acceleration, stack overlap, and separation can be adjusted individually
- Coupling of additional machine modules is possible
- Modules can be implemented standalone then added to the system
- Provides highly dynamic compensating motions
- Includes sheet feeding with registration control

**Customer benefits**
- Gripper optimization regardless of main machine speed
- Smooth machine motion protects the machine’s mechanical components
- Speed and quality optimization creates less waste-paper
- Can be integrated into your system via field bus or, for retrofits, through real master axis function
- Fast commissioning, easy changeover
- Integration of additional functions into the motion sequence
- Format and material independence
Your benefits — format flexibility

You have built your system based on a modular concept. In doing so, you have combined new machines from our function blocks and are now focusing on project specific requirements. Feeding and stacking are synchronized to your downstream stations, giving you the flexibility you need to handle different formats.

- Scalable in functional performance and drive power
- Synchronized with downstream processes
- Flexible handling of different formats

The following processes have been implemented using our technology:

- Feeding
- Alignment
- Acceleration
- Transfer
- Overlap stacking and/or vertical stacking
- Sheet deceleration
- Stack lift drives

The gripper retrieves a feed element of variable dimensions from a variable location and places it in a dynamically defined position. Our stacker performs this task in reverse order. Thus, we ensure subsequent processing in a defined manner.
In the converting sector, a highly synchronized yet flexible structure of the servomotor and drive solutions is required to an increasing degree. Baumüller supports this in the converting market with its own solutions, e.g. in laminating machines, which require the perfect balance between speed and accuracy. With EtherCAT, 100 servo axes can be processed in 0.0001 seconds, for example, which means in 0.1 ms, or 1000 digital inputs/outputs distributed over 100 nodes in 0.03 ms, and on and on... You can also profit from the virtually limitless communication possibilities offered by EtherCAT.

Characteristics
- Freely definable machine speed and sheet lengths
- Synchronized motion profile by means of cams in compliance with VDI motion rules
- Multi-function system can be created using libraries

Customer benefits
- Fast retrofit times increase machine availability
- Jerk-free, fully synchronized motion profile provides smooth machine operation, protecting your mechanical system
- Modular concept enables a system equipped to suit customer requirements
- Reproducible quality
Your benefits — Synchronism with EtherCAT

Modern machine constructs can be classified into centralized, distributed or hybrid topologies. Regardless of topology, the automation system must be capable of addressing the high performance demands of today’s machines. EtherCAT technology has become the established standard on the market as the critical link between automation components. EtherCAT is impressive in its outstanding performance and ease of use. Configuration is performed automatically via the ProMaster Engineering Framework.

The following example highlights the outstanding performance of EtherCAT:

The comparative configuration comprises 40 axes, each having 20 bytes of input and output data, 50 I/O stations with a total of 560 bus terminals, 2,000 digital I/O, and 200 analog I/O. The network is spread out over a total distance of 500 m. Despite the small cycle time of only 276 µs, 56% of bandwidth remains for other use such as TCP/IP services.

* Expected. Calculated with formulas from Ethernet Powerlink Spec. 2.0, App.3.

EtherCAT excels with

- High speed real-time Ethernet for machine and process automation
- Full Ethernet compatibility
- Highest possible synchronicity between power units using distributed clocks
- International standardized, certified FSoE safety protocol up to SIL3
- Outstanding real-time properties at low cost (jitter << 1 µs)
- More than 1700 member companies in the EtherCAT Technology Group

The system bus for Baumüller components is EtherCAT
Because of the flexibility and optimizations of the setup time, more and more direct drives are being used in printing machines. This is the case for both sheet-fed or reel-fed machines, whose system limits continue to increase: for example, more than 20,000 sheets per hour or more than 70,000 pages per hour in reel-fed printing. Baumüller made single-drive technology in printing applications into standard business in various areas early on. Because of the special design of our motors, we can reduce the number of mechanical components on the axes and even eliminate the need for gears.

**Characteristics**
- Variable processing speed
- Defined belt tension or sheet position
- Coupling of additional machine modules possible
- Can be implemented as a standalone module
- Limited number of parameters
- Highly dynamic compensating motions and cams
- Synchronous motions (for example, back-step sequence or continuous transport)
- Control panel

**Customer benefits**
- Less vibration, smooth machine motion protects the machine’s mechanical components
- Speed optimization, quality optimization means less paper waste
- Can be integrated into your system via field bus or, for retrofits, through real master axis function
- Registration controlled operation
- Format flexibility
- Fast commissioning, easy changeover
- Access to all parameters, record up and down load easy operation and parameter setting, no laptop or software needed during servicing
Your benefits — DST — Direct, accurate and flexible

High-torque synchronous motors for applications with the most extreme torque requirements, even with axial loads.

- One engineering template for your system assembled from our standard software blocks
- Scalable in functional scope and drive power
- One customized solution from a combination of standard solutions

The following processes have been implemented using our technology:

- Retraction and extension
- Synchronization
- Compensating motions
- Registration control and monitoring
- Belt tension control
- Winding and unwinding

Advantages:

- No redundant bearings
- Frame length is minimized
- No wearing parts
- Axial rotor movement possible

Differences compared to the complete motor:

- Final assembly at customer’s facility
- IP00 degree of protection
- Encoder mounting and bearing on load side

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The five fingers turn our hand into a universal tool. Nearly all processes in automated production equipment can also be depicted with five basic movements.

### Characteristics
- Variable feed rate synchronization
- Selectable reference position
- Adjustable feed profile
- Synchronized embedded processes
- Rotary crosscutter: variable number of blades for each circumference
- Optional (multiple) dancer control
- Consideration of varying reel diameters
- Limited number of parameters
- Efficient sizing

### Customer benefits
- Encoder from your feed drive acts as virtual master position sensor
- Cutting position can be defined in addition to product length
- Fast cutter blade position return enables shorter cutting interval
- Product separation is possible
- Can be integrated into your system via field bus or used as a standalone module
- Additional working range can be covered with one drive
- Fast commissioning, easy changeover
- Shorter development times
Your benefits with Baumüller — Drive configuration made easy

Configure your complete drive systems with sizemaXX — with the interactive sizemaXX design wizard, Baumüller has taken drive sizing software to another level. Baumüller’s sizemaXX software, allows users to size up to six drives on a common bus, providing just the right drive solution for their specific application.

- One engineering template for your system assembled from our blocks
- Scalable in functional scope and drive power
- One customized solution from a combination of standard solutions

Old drive times 1.5 — just to be sure?
- The drive is clearly oversized; the motor inertia is too high.
- The dynamic response of the machine is severely degraded.

Buy and give it a try?
- You buy the wrong motor.
- Returns, late delivery, redundant engineering effort, stress...

Incomplete data?
- The manufacturer tries to help and makes a calculation without taking into account all pertinent data, but this results in an inadequate or barely tolerable solution!
- Your total design becomes suspect, no guarantee of performance, no way to ensure changes will result in improvement.

You relinquish the responsibility and send all machine details to the outside
- The manufacturer develops a custom solution for you, but this requires a commitment on the part of the manufacturer which may later vanish.
- You have sent all machine details to the outside and have now relinquished design control of your equipment.

One tool...
- that’s easy to operate
- that documents your machine configuration
- that has a complete data base of all Baumüller components
- that automatically updates this database
- that exports and prints out data, models, and calculations
- that generates a bill of materials
- that has an interface to ProMaster and can import motion profiles from ProCAM

sizemaXX is a free service of Baumüller
With the ProMaster Engineering Framework, up to 50% of software engineering can be optimized depending on the application. Shorter time to market means greater added value for users. The use of innovative tools provides a sustainable cost reduction and increases profitability.
Skillfully combined

Our libraries build upon each other and are perfectly tailored to your automation tasks from start to finish. Specific interfaces make it easier to combine different blocks. Your acquired expertise can be stored and managed in your own libraries and reused at any time. The use of international standards and technology specific extensions from Baumüller guarantees that your investment will be fully protected.

Intelligent use of functional building blocks
- Engineering from a machine perspective decreases complexity
- Comprehensive library concept ensures fast and efficient software creation
- PLCopen compliant Motion Control and Safety blocks
- Investment protection through use of PLCopen standards
- Fast application configuration by combining blocks and modules
- Optimized engineering in terms of time and cost
Automation solutions
Planning & development
Project management
Hardware & software engineering
Control cabinet design
Sheet metal solutions
Components
Electrical installation
Commissioning
Expansion of existing systems
Technical support worldwide
Assembly
Training
Service
Maintenance
Repair
Retrofit

You can contact us on our Service Hotline +49 (0)911 5432 – 133 twenty-four hours a day on 365 days of the year.

Cooperation with development partners, who contribute to the entire solution in a system-oriented way, is a precondition if you want to concentrate on your own competencies in the field of machine building. If your automation partner supports you during the realization of your system concept, you receive the development, project management and the optimal adaptation of a drive solution from one source.

From the plastics to the packaging industry, from the textile to the printing industry, Baumüller is an innovative system partner of the capital goods industry. We provide solutions for automation, electrical and drive engineering throughout the entire life cycle of a plant.

It goes without saying that in addition to our complete package consisting of engineering, installation, commissioning and services, we offer customer service with perfect coverage – namely anywhere in the world and at any time.

We are the partner for your success.
Planning & development
Baumüller is an innovative development partner of machine builders. Already in the early product development stages, we concept and develop an economical and technologically future-proof plant together with you.

Project management
Our project leaders ensure the implementation of turnkey equipment.

Hardware & software engineering
From the dimensioning via cabling to air conditioning of your control cabinets, we design your hardware taking account of all design and manufacturing options that are technologically innovative, user-oriented and as economical as possible.

Control cabinet design & sheet metal solutions
From sheet pieces to completely wired control cabinets, Baumüller has realized individual solutions for well-known machine and plant builders as well as for medical and electro engineering for years. In order to meet the needs and requirements of the capital goods industry of demand-oriented products, as a competent system partner we offer everything from one source. From planning to construction, over sheet metal production and series wiring up to assembly and installation on site – worldwide. Our control cabinet design is certified according to UL 508a.

Electrical installation & Commissioning
You construct the mechanics of your system, we design and install the electronics. Whether inhouse or worldwide at your customer’s site – with our software solutions and drive technologies we set your machine ideas in motion. For the worldwide installation and commissioning of your systems, we always take account of the respective country-specific standards.

Expansion of existing systems
Innovative and customer-specific products require state-of-the-art production methods and machine functions. Using an adaptation or expansion of your existing machine architecture, you quickly achieve an increased flexibility and availability of your systems – while allowing you to estimate your expenses and manage your investments.

Technical support worldwide
Whether it is remote diagnosis and remote maintenance using telecommunication or the Internet, through our 24-hour hotline or our contact partners at branch offices onsite in more than 40 locations worldwide – the experts from Baumüller provide full explanations to all your questions concerning automation and drive solutions.

Assembly
The Nürmont Installations GmbH & Co. KG has over twenty years of experience in the field of assembly and relocation of machines and plants. Nürmont operates globally and offers solutions from one source. Beginning with project planning up to after sales service – also as a main contractor – Nürmont covers all relevant services in the assembly and relocation field. Together with logistics, special part manufacturing and electrical assembly, as well as commissioning and service support.

Training
Only with well-trained employees you can quickly respond to challenges. We offer training onsite and in our training center. On the basics of electrical drive engineering, on maintenance of switching stations, controllers and drives, and on selective troubleshooting in the broader range of printing technology and drive engineering. In cooperation with you, we create a flexible training program that is specifically tailored to the training needs of your employees.

Service
The correct repair and spare parts must instantly be available to immediately remedy a failure of your system. In cooperation with you, we develop an extensive service plan and make a technically sound and cost-optimized selection of components that you should keep on hand. We ensure the functional state of your stock of spare parts and deliver components that are missing in an emergency – day and night via express.

Maintenance
A professionally maintained machine means safety. Safeguarded production and safety for your employees. Our Condition Monitoring Systems, for example, recognize in advance possible causes of failure and increase the availability of your machine.

Repair
The extensive experience, our know-how, as well as the technical equipment of our worldwide subsidiaries are the basis for high quality repair of your electronical units and electrical machines, from exchanging broken parts up to general overhauls – independent of the manufacturer.

Retrofit
We retrofit existing systems with up-to-date drive systems, control cabinets and user interfaces, so that your system can execute a failure-free, state-of-the-art production. With a retrofit of your existing machine architecture, you are able to achieve higher system flexibility and availability in a very short time.
Automation — Software

Engineering Framework
- One development environment for all components
- Integrated engineering
- Shared project database
- Uniform operation and display
- Included in ProMaster Safety

PROPROG 4
- Programming in the IEC languages according to IEC 61131-3
- STL, LAD, ST, FBD, IL
- Online mode with option to modify program
- Extensive diagnostics and debugging support
- Standalone or included in ProMaster

ProSafety
- Configuration of safety application
- Safety function blocks according to PLCopen Safety
- Validation of safety application
- Documentation of safety application
- Included in ProMaster Safety

ProDrive
- Simple configuration and operation of b maXX drives
- Integrated motor database and oscilloscope function
- Browser supported controller structure
- Graphics based operating screens
- Standalone or included in ProMaster

ProCAM
- Editing and management of electronic cams
- Laws of motion according to VDI 2143
- Interactive visualization of drive characteristics
- Support for motion optimization
- Included in ProMaster

ProEtherCAT/ProCANopen
- Configuration of field bus systems
- Semi-automated parameterization
- Linking of communication variables
- Configuration check
- Included in ProMaster

ProPLC
- Graphics based configuration of the b maXX controller PLC
- Declaration of I/O assignment
- Catalog selection of components used
- Semi-automated configuration
- Included in ProMaster

ProViz
- Web-based display
- Display showing distributed structures
- Shared project base data using standard applications
- Long-term availability due to use of web technologies
- Option of using high-level programming on the display page
### Automation — Products

#### Control center, Diagnostics
- Control center
- Diagnostics

#### Engineering Framework
- **ProMaster**
  - ProViz
  - PROPROG4
  - ProSafety
  - ProDrive
  - ProCAM
  - ProEtherCAT
  - ProPLC

#### Automation software
- **ProMaster**
  - GDM / DSM
  - LIM

#### Communication
- **EtherCAT Technology Group**
- **CANopen**

#### Operation
- **b maXX HMI Touchpanels**

#### Controller
- **b maXX-drivePLC**
- **b maXX-PLC02-Safe**
- **b maXX-controllerPLC**
- **b maXX-PCC03**

#### Actuators, Sensors
- Drive I/O
- Bus coupler
- Safe I/O
- Standard I/O
- Encoder

#### Servo converter, Frequency converter
- **b maXX 5500**
- **b maXX 5000**
- **b maXX 4000**
- **b maXX 3000**
- **b maXX 2000**
- **b maXX 1000**

#### Motors
- **DS2**
- **DA**
- **DST**
- **GDM / DSM**
- **LIM**

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