



**Bundling expertise to make
the perfect machine**

mechatronic



SIEMENS

We offer a cooperative partnership with an interdisciplinary approach

Increasing competition forces mechanical equipment manufacturers to continuously optimize the productivity of your machines. That means the machines being used need to meet general requirements that become more and more stringent over time: greater productivity, i.e. higher clock rates and availability, higher constant product quality and lower life-cycle costs. Furthermore, many mechanical equipment manufacturers find themselves facing an increasing number of new requirements, such as those demanding more flexible machines which can be rapidly adapted to new products or formats and can be easily integrated into existing plants. Another crucial demand in this context calls for a drastic drop in the development time for machines.



The smart answer to increased requirements

Meeting these high and, in part, new market demands requires new machine concepts or advance development of existing machines. Many of these concepts reflect substantial trends. For instance, in traditional machine manufacturing methods in use until now, specific machine functions were realized through a complicated combination and modification of mechanical components. However, experts are convinced that the increasing market requirements can only be met in future with the use of mechatronics.

Integrated system for more efficient solutions

Mechatronics covers much more than just a mechanical angle. This term signifies the integration of mechanical, electrical and electronic, sensor-related, diagnostic and computing aspects in one integrated system. With mechatronic solutions, for example, motion control is defined through simple parameterization and/or programming of the software. Machine functions are then implemented through servodrives and standardized mechanical components.

An innovative range of products for any industry

Siemens Motion Control solutions meet the toughest demands: all products, systems and services feature the latest technologies, ultimate functionality and outstanding quality. Furthermore, they are also optimally tuned to one another. That way, you are sure to find an economical solution tailored specially to your industry.

A strong team of competent partners

We implement our efficient mechatronic solutions in close cooperation with you as our partner. Your technological expertise and our industry know-how go hand in hand in a team with remarkable innovative drive. In our work with you, we offer services covering everything from the machine concept to realization to production operations. Our goal is to assist you in meeting the requirements of your customers. Our assistance portfolio includes worldwide pre- and after-sales service as well as special services such as application consulting and mechatronic support.

Even so, our partnership does not stop at mere support services. The experience we gain from the cooperation flows into the development of our products and systems – multiplying your benefits!

Products, applications, Mechatronic Support: The three pillars of first-class mechatronic solutions

Our comprehensive range of products and services forms the basis for optimum mechatronic solutions. It enables automation without the need to change systems – from the automation system to the drives to the sensors. Aside from our powerful SINUMERIK® numerical control, we also use our new SIMOTION® motion control system, which is suitable for production machines. Both feature motion control functionality. In addition, we use innovative mechatronic products such as direct drives, linear and torque motors and milling spindles with integrated motors.

Products

Products, systems, solutions – as individual as your requirements

Our range of solutions fulfills a wide variety of requirements:

- Replacement of the line shaft with discrete drives and synchronism / electronic drives functionality, for example, in the printing industry and for machine tools.

Benefits: no need for mechanical components, less maintenance, greater productivity, more flexibility.

- Use of piezoelectric bending transducer modules and their controllers, for example, for circular knitting machines in the textile industry.

Benefits: less mechanical components, more flexibility when changing patterns.

- Electronic roller feed in metalforming, i.e. replacement of mechanically coupled systems.

Benefits: more flexibility in changing formats and higher level of dynamics.

- Use of direct drives (torque), for example, in extruder machines, i.e. replacement of hydraulic drives.

Benefits: lower energy costs, clean, environmentally-friendly technology without leaks and contamination.

- Use of direct drives (linear motors), for example in machine tools, i.e. replacement of ballscrews and mechanical couplings.

Benefits: fewer mechanical components, fewer moving parts for higher speeds and clock rates. Higher productivity.

Applications

Competent application consulting for your industry

The range of products and services offered by Siemens covers all areas of automation engineering – from drives to open- and closed-loop controllers including software systems. Our specialists are familiar with industry requirements from numerous successful projects. Based on this experience, they develop innovative ideas and user-specific machine concepts – hand in hand with mechanical equipment manufacturers. The result is first-class solution packages, customized to fit the individual requirements of each case scenario.

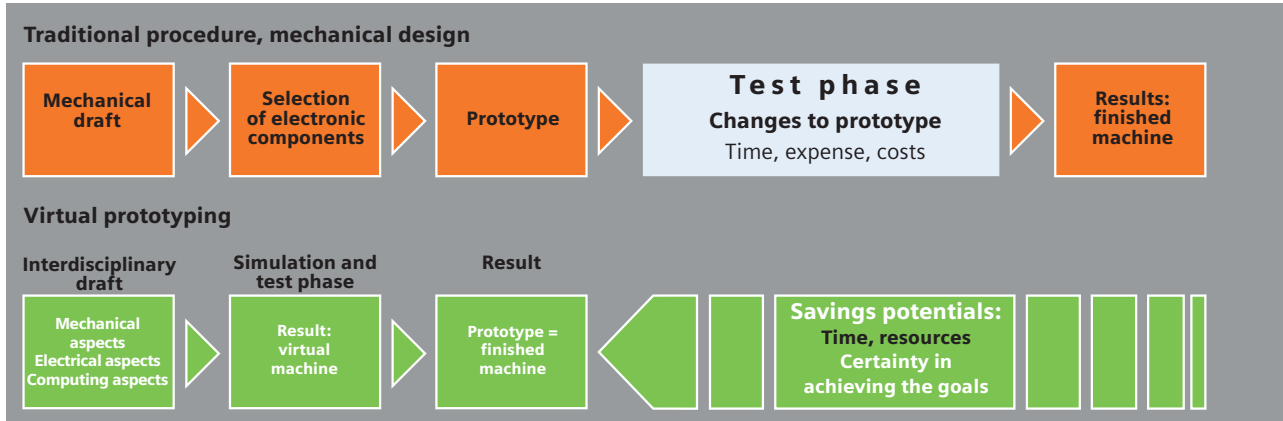
Our mechatronic and application consultants on site accompany projects from the planning phase to commissioning, from the idea to the running machine. They are supported by a series of application centers in Germany, Italy, the USA and China.

Application consulting services include:

- Selection of the optimum solution packages from our product range
- Development and delivery of customer-specific add-ons
- Support for testing and commissioning



Faster development of optimum machines, faster to market



Mechatronic Support

The service for machine design

Our Mechatronic Support service enables a new dimension of cooperation between mechanical equipment manufacturers and Siemens as a partner and supplier of drives and open-loop control technology. In this case, mechanical equipment manufacturers jointly design their machines with experts from Siemens – from the idea, to the concept to the finished machine.

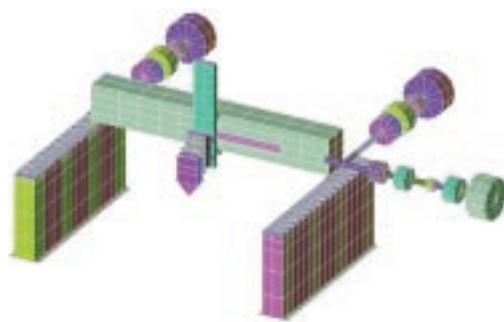
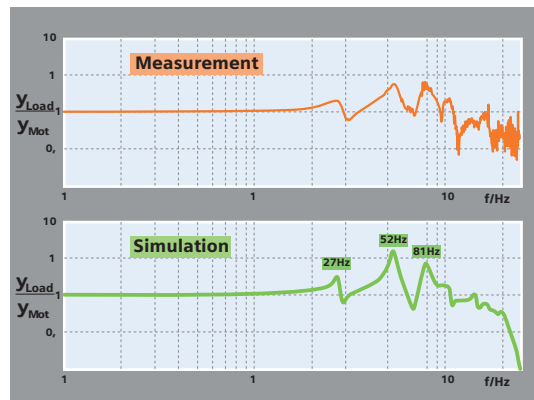
Mechatronic Support offers you a pioneering service for optimizing the precision and productivity of machines – both for existing and newly developed machines:

- Existing machines are analyzed regarding the interaction of their mechanical components and electrical drives. Another recommendable option is to use a simulation to reveal improvement potentials.
- New developments are handled by making models and drafting and simulating the machines (mechanical components, electrical drives and open-loop controls). The simulation allows for virtual testing, modification and optimization of the machines before they are actually built.

The intelligent alternative to "trial and error"

Mechatronic Support allows you to compare new and creative machine concepts with one another and change and optimize them in advance – even with new mechatronic components. The results obtained in this way are verified by the simulation, which provides an exact replica of the conditions of real machines.

Transfer characteristics of mechanical components



... so you can completely meet the expectations of your customers.

For a sharper competitive edge

Our mechatronic approach considerably accelerates the development of efficient machines. That, in turn, cuts the time to market and, consequently, sharpens the competitive edge of both the mechanical equipment manufacturer and the end user.

Improved productivity right from the start

The expertise bundled in our partnerships ensures greater certainty in the development of mature machines. The result is short commissioning times and more productivity right from the start.

More creative concepts

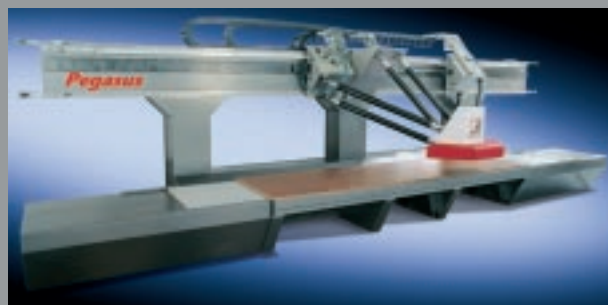
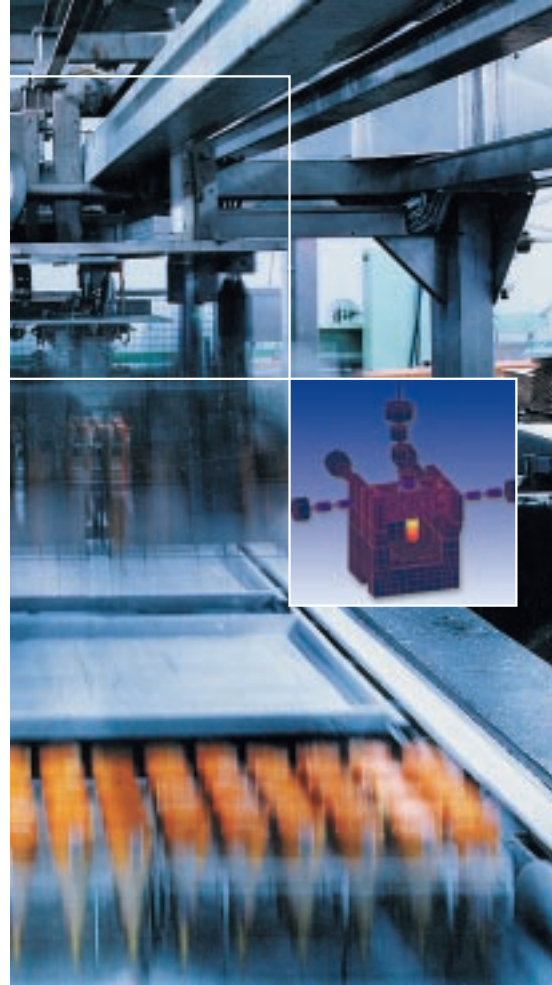
Another advantage of our partnerships is a more creative concept which enables more flexibility in the design of the machines along with an increase in productivity and quality for the end user.

Clear saving potentials

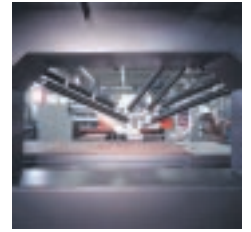
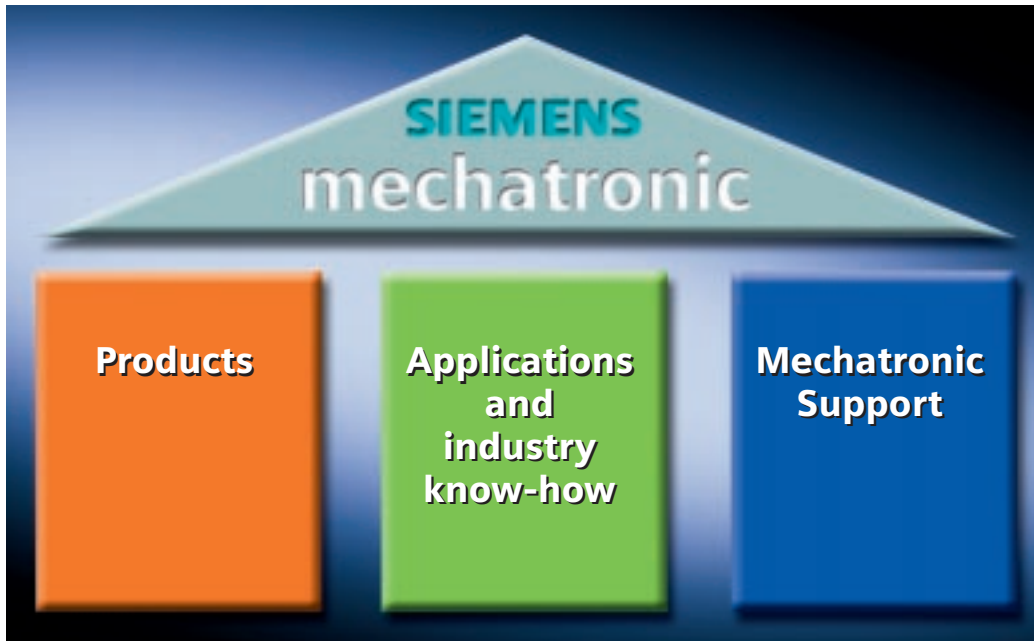
The simulation phase performed by our Mechatronic Support service replaces a number of physical prototypes with one virtual prototype. The advantage is obvious: considerable savings of time and of resources.

Lower life-cycle costs

Mechatronically optimized machines are lighter and more dynamic. Since they have fewer moving parts, they consume less energy, are subject to less wear and tear and are easier to maintain. In other words, your life-cycle costs are less than those for machines developed using traditional methods.



Products, applications, Mechatronic Support: Your formula for success at a glance.



Products

The basis for each of our customized solutions. Select from a comprehensive range of products, systems and services. From drives to open- and closed-loop controllers. Each solution comes equipped with state-of-the-art technology, ultimate functionality and outstanding quality.

Applications and industry know-how

An advantage you can count on: our specialists know your industry based on a number of successful projects. With this background, they develop – in cooperation with your engineers – innovative ideas and user-specific machine concepts which are tailored exactly to your individual needs.

Mechatronic Support

For existing machines, we focus on the interaction between mechanical components and electrical drives to improve the precision and productivity of the machine. For new developments, we perform a complete simulation of the virtual machine. Another advantage you can count on: we test the candidate through and through before building a prototype.

If you want more information on mechatronics, please get in touch with one of our contacts at www.siemens.com/automation/mechatronic

www.siemens.com/automation/mechatronic

Siemens AG

Automation and Drives
Motion Control Systems
P.O. Box 3180
D-91050 Erlangen

The information provided in this brochure contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.