

AUTOMATION SYSTEM





CONTENTS

Company	3
Integrated Solutions	4
Machine Know-how	5
Close Partnerships	6 – 7
Integrated Automation System	8 – 11
Control CPU	12
Industrial PC	13
I/O System	14 – 15
Human Machine Interface	16 – 18
Motion control	19 – 21
Safety	22 – 24
Real-Time Ethernet VARAN	25 – 26
Engineering Tool LASAL	27 – 31
Secure Remote Access	32 – 33
Support, Service - Advantages Compact	34 – 35





YOUR ADVANTAGES IN SIGHT

SIGMATEK is a globally successful company. For more than 30 years, we have been researching, developing and producing automation technology. We offer our customers flexible automation systems from one source, with a "certain added value" in the engineering of machines and systems.

SOLID AND FLEXIBLE STRUCTURES

SIGMATEK was founded in 1988 and is 100 percent privately owned. A flat organizational structure and short decision making process are characteristic of our company. We can therefore quickly and flexibly react to market demands. A first-class range of products, solution expertise, a dedicated team and long-term customer relationships – these are the key factors of our success.

WITH US, INNOVATION HAS TRADITION

We meet any technical challenge. Innovation is the result of our passion for the continuous improvement of products and solutions. Annually, around 18 % of sales revenue is invested in research and development. With us, you get flexible and efficient automation solutions with a future.

Expertise
Support from
our experienced
industry experts

Future-proof
Long-term
availability of
components



SIGMATEK Executive Management: Alexander Melkus and Marianne Kusejko



MODULAR, FLEXIBLE AND FUTURE ORIENTED

INTEGRATED SOLUTIONS

We focus on complete automation solutions: control and drive technology, as well as safety, unified in one integrated engineering environment. Development time is thereby significantly reduced and the performance and flexibility of your machines are increased.

Our automation systems are constructed like a modular toolbox – in hard and software. The compatibility and scalability of their components are just as guaranteed as the long-term availability. This modularity provides you an important competitive edge: You can implement the most varying customer requirements flexibly and efficiently – also with increasingly smaller footprints.

Our product spectrum is always up to date with the latest technology: HMIs, controls, industrial PCs, I/Os, servo drives, motors, real-time Ethernet as well as engineering tools. All components of

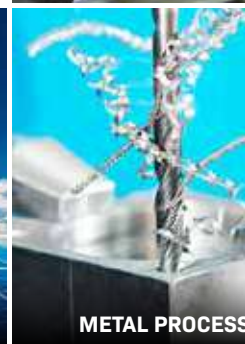
SIGMATEK automation systems are produced in the main facility in Lamprechtshausen, Salzburg. They are the result of consistent research and continued development as well as high-quality standards in production.



PRINTING AND PA



ENERGY



METAL PROCESS

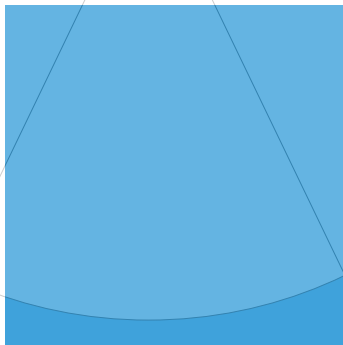
SUCCESSFULLY IN MANY INDUSTRIAL BRANCHES

MACHINE KNOW-HOW

In automation, we are at home. With over 30 years of industry experience, we can inspire our customers and provide comprehensive support in implementing their machine concepts with well-thought-out automation solutions.

SIGMATEK has combined expertise and decades of experience in the most varying application areas and industries. We understand your specific needs, have a feeling for trends and quickly convert them into serial products. Naturally, we love technology. But our focus is on customer benefit. We lis-

ten to our customers intently, are proactive and never lose sight of the big picture. This enables us to create tailored industry solutions, which make your machines and systems fit for use in Smart Factories.



HOT FACTS

MADE IN AUSTRIA

All automation components from one source

BROAD SPECTRUM

The right solution for any demand

SIMPLE ENGINEERING

ONE tool for all tasks

ECONOMIC

Low total costs of ownership through an integrated approach



360°-SOLUTION

Maintenance | Service

Initial Start-up | Test



WE ARE ALWAYS CLOSE TO THE CUSTOMER

CLOSE PARTNERSHIPS

Long-term and successful partnerships are our goal. We want to excite our customers and give them a market advantage with our expertise and know-how. This way we can grow and evolve together.

Anyone who listens to their customers like our sales engineers and knows exactly what they need, finds the right solution faster. Only in a strong partnership based on trust, continuity and transparency, are extraordinary things possible – and that in a short time.

Our customers know that they can count on SIGMATEK. We score with flexibility in development and in applications sup-

port. We are always close to the customer: whether in engineering, initial start-up on-site at OEM customers, employee training or support via remote maintenance using web technologies.

THE RIGHT MIX IS KEY

We meet any challenge and, together with you, find the optimal solution for your application. Standard components, which can be flexibly combined and individually adapted, form the basis of our automation solutions. Through this modularity, you get tailor-made automation components. Our application engineers support you in development with their diverse project experience. Top components are thereby transformed into successful and unique solutions and machines.

Our core expertise lies in complete solutions – especially for fast automation processes, where the combination of performant control, dynamic drive axes, integrated safety technology and modern visualization is essential. As a customer,

you have the advantage of having only one contact partner for all automation questions.

With a complete view of the machine process, we offer you an individual 360°-solution for the entire product life cycle: from finding a solution, project development through the application engineering and initial start-up to service and remote maintenance - as long as your machine lives.



MORE FLEXIBILITY AND HIGHER PRODUCTIVITY FOR YOUR MACHINE

INTEGRATED AUTOMATION SYSTEM



Control and I/O System

Our control system offers the right CPU for any task: Compact S-DIAS CPU modules for the DIN rail – with high-performance single or multi-core processors. Scalability and consistency mean that compatibility with the application software is guaranteed. The I/Os are available in two series: S-DIAS for IP20 and P-DIAS for IP67 requirements. The S-DIAS system impresses with a unique packaging density and is ideal for modular machines with distributed intelligences.



Human-Machine Interfaces

For human-machine interfaces, a broad product palette is available: from small control units with 3.5" displays to high-resolution touch panels with a display up to 23.8" – with different touch screen technologies. The mobile HMIs with wireless technology bring a new dimension in operating freedom. Naturally, customer-specific configurations are possible. For example, HMIs specially designed for the specific requirements of the food processing and pharmaceutical industries.



Motion Control

Our modern motion control system convinces in machine manufacturing: motors, servo drives, AC drives, gears, motor output stages, and software interact perfectly and are seamlessly integrated into the control system. This results in highly dynamic motion sequences from one source. Engineering is simple, since predefined motion components are provided. Precision, dynamics and efficiency of the machine are increased and the time-to-market is reduced.



Safety Integrated

SIGMATEK has safety fully integrated into the automation solution: safety controller, safety I/Os and drives with integrated safety technology. SIGMATEK safety technology is designed to send safety-relevant signals via Black Channel over any communications media. With cable-connected solutions, a single line is sufficient for safety and standard communication. Data can also be sent wirelessly via WLAN, for example. The thin and freely programmable safety technology simplifies the modular configuration of your machine or system.



Real- Ethernet VARAN

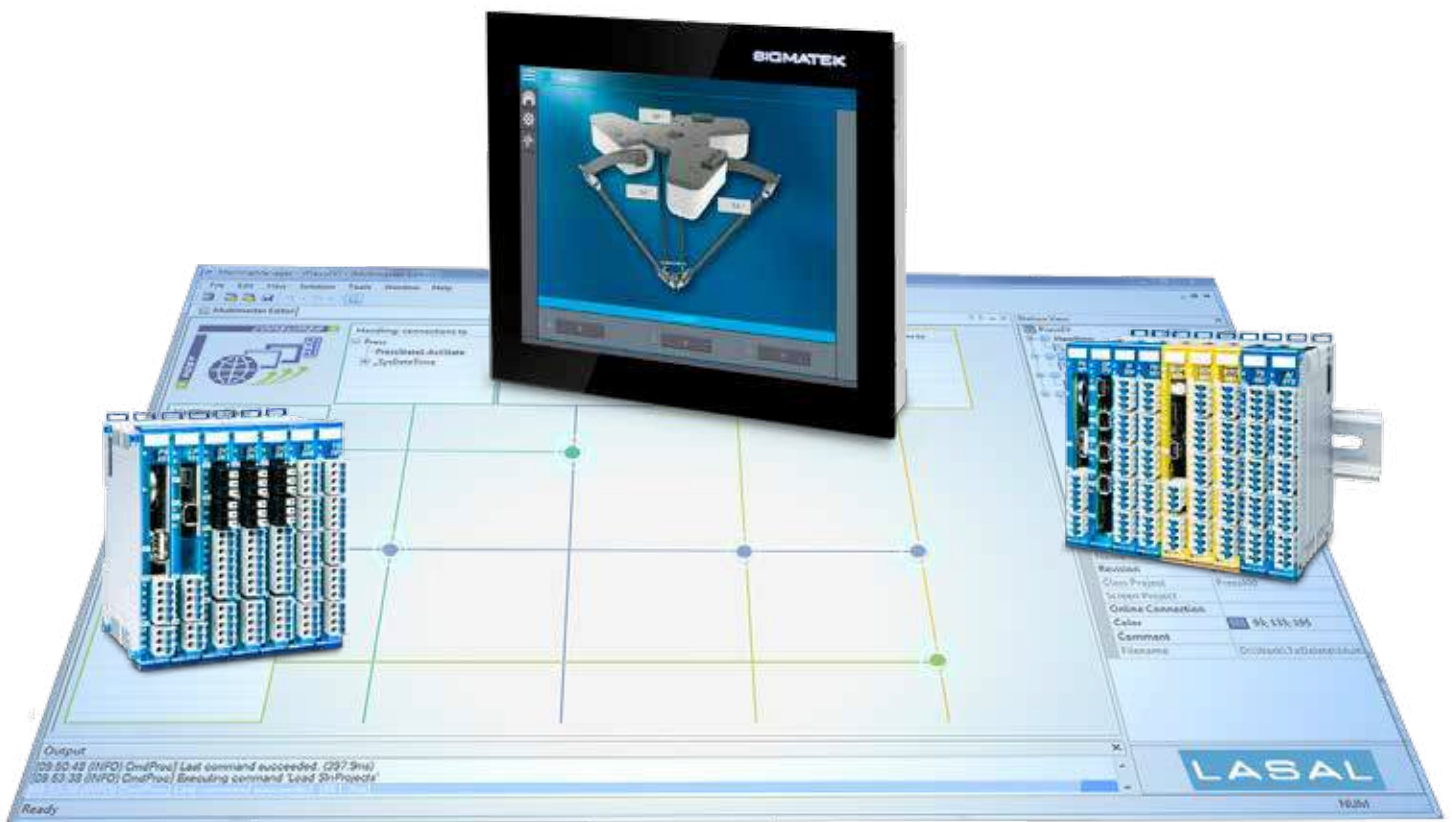
Integrated, hard real-time automation is the key to modern automation systems. The Ethernet technology-based VARAN bus system was designed for flexible and modular machine concepts. With cycle times under 100 μ s, jitter < 100 ns and guaranteed data security, your machines are more productive and precise. Also for project development, VARAN provides complete freedom through various network topologies.



Software Engineering

The all-in-one engineering tool LASAL enables fast and efficient realization of machine concepts: process control, visualization, motion control, safety, diagnostics and service. Already in 2000, SIGMATEK was the first to introduce object-oriented programming to industrial automation. The reusability of the software modules helps to reduce engineering times and costs significantly. Web technologies such as HTML5, CSS3 and JavaScript enable the creation of modern and flexible visualizations.

MULTI-CPU CONCEPTS



The automation technology from SIGMATEK already provides all options for implementing machine concepts 4.0. To meet the demands for "maximum flexibility", we focus on modularity in hard and software and – especially for complex applications – on multi-CPU concepts.

With modular concepts, the machine or system is divided into function units. All units assume the exact task assigned to them and are equipped with their own intelligences. The automation system can therefore be flexibly expanded and adapted to new requirements.

SOFTWARE: BASIS FOR MODULARIZATION

Through the encapsulation of program components, our object-oriented engineering tool LASAL enables modularization of the application software. This is the basis for outsourcing to decentralized intelligences. To manage a

complete solution with distributed intelligences, the "LASAL Machine Manager" is available. It guarantees clear representation of the individual machine components and their dependencies. This acts as the central management for individual controls and manages the data flow: Who can exchange which data with whom. The entire infrastructure for the control programs, such as the operating system and libraries, is centrally managed by the Machine Manager. With this approach, the effort for creating and maintaining software is minimized.

OPC UA

Whether a control computer, ERP, MES, cloud services or third-party manufacturers, with the OPC UA implementation in LASAL (OPC UA server and client), you have an integrated, platform-independent communications interface. Mapping can be easily configured in LASAL. All this reduces the work for initial start-up and handling and enables the implementation of adaptive production strategies.

MODULAR COMPLETE SOLUTION

THE SIGMATEK SYSTEM



ENGINEERING PLATFORM & SERVICE TOOLS



One Tool for all
Automation Tasks



Remote Access: Secure,
web-based remote access



OPC UA, LASAL Remote Manager
VNC-client and -server, Webserver, ...



HMI LEVEL



Operating Panels
3.5" - 12.1"



Operating Panels
15" - 23.3"



Mobile Panels



CONTROL LEVEL



CPU Modules



CPU Units



Industrial PCs



FIELD LEVEL



S-DIAS I/O System



S-DIAS Safety System



P-DIAS I/O System



DRIVE LEVEL



DIAS Drives MDD 2000



AC Drives FDD 3000



Servo Motors

FROM SIMPLE MACHINES TO COMPLEX SYSTEMS

CONTROL CPU

For diverse control tasks, compact CPU modules and units are available. We use efficient single and powerful multi-core processors, with high-performance, low-loss EDGE2 Technology, as well as from Intel®. All controls are scalable and compatible with one another.



CPU: GROW WITH THE TASK

Our CPUs impress with their especially compact construction and flexibility. With the CPU modules from the S-DIAS series, small function units can also be equipped with intelligence and combined into flexible systems or installations, from the economic single-module-CPU to the high-performance dual-core control with EDGE2 technology processor.

For especially demanding applications, high-performance control computers with Intel® processors are available with the CP 731 and CP 733 CPU units.

Using the CPU modules and units for the DIN rail, your machine is ready for Industry 4.0.

HOT FACTS

SCALABLE

The right CPU for any application

INTEGRATED

Compatibility of the application software

COMPACT

Space-saving construction and installation in the control cabinet

SIMPLE

One engineering tool for all tasks

HIGH COMPUTING POWER IN COMPACT PACKAGING

INDUSTRIAL PC

The IPCs from SIGMATEK combine PC technology with industrial usability. They are designed for modern machines with big data and support the OPC-UA communications protocol. Robustness and reliability in 24/7 continuous operation speak for using SIGMATEK IPCs.



ROBUST & COMMUNICATIVE

If high computing performance is demanded, our robust and compact industrial PCs with Intel® processors are the right choice. Remote panel solutions up to 100 m can be easily implemented with the PCs of the 400 series using HMI-Link technology. The PC 521 is available for querying and storing large data volumes, as well as an IoT gateway.

INTEGRATED

The software also follows the SIGMATEK integration concept. Programming is consistent and simple. The hardware platform can be changed without having to adapt the software. The automation system can therefore be easily expanded.

COMPACT, MODULAR, ROBUST I/O SYSTEM

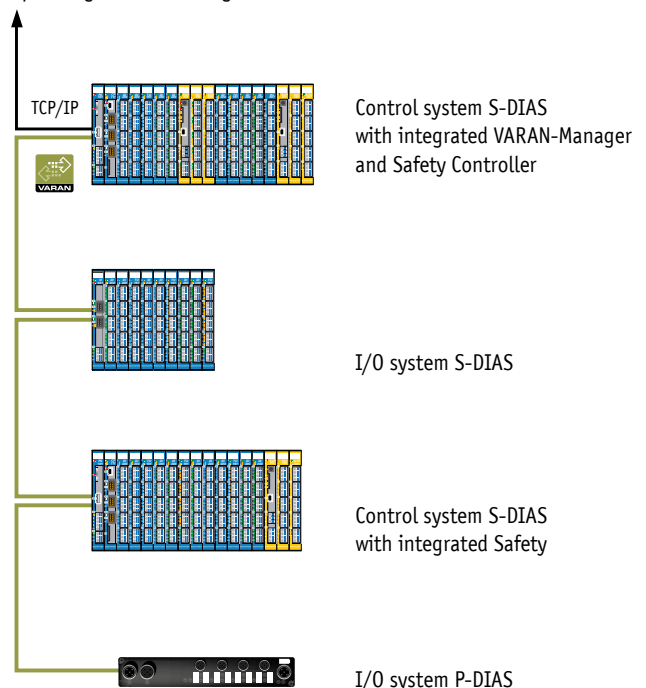
The I/Os are available in two series: the super compact S-DIAS system with standard and safety modules (IP20) and the P-DIAS series (IP67). They can be used modularly and impress with their functional versatility.



With the modular I/O system family, you can meet the requirements for IP20 as well as IP67. Both series can be combined as desired and communicate with one another without limitation and performance loss. A decentralized configuration with multiple module groups is therefore possible, which can be networked through the real-time Ethernet bus VARAN. With different network topologies (star, line, tree), you have many options for designing the modular configuration of your machine concepts.

Our systems are open for communication with third-party components. For this purpose, different interface modules are available. Individual machines can thereby be easily integrated into production lines.

Operating and Monitoring



S-DIAS I/O SYSTEM

Fast signal processing, highest packaging density to date and safety integrated – with the S-DIAS series, you can master the growing complexity of your machines – and that with the same or even reduced control cabinet volume.

S-DIAS comes to you as a complete module solution: DIN rail mount, electronics and bus are unified in one housing. This enables fast, toolless assembly of the modules. Since standard connectors with push-in wiring are used, the installation and wiring times are reduced to a minimum.

Communication is established via the hard real-time capable Ethernet bus VARAN with 100 Mbits/s. Per VARAN bus interface, up to 64 I/O modules with up to 1,280 I/Os can be connected on the DIN rail. The update time is under 60 μ s.

The S-DIAS I/Os are interconnected and mechanically interlocked. The module supply and bus connection were implemented with multi-contacts. The highest mechanical reliability and vibration resistance are thereby reached. Standard and safety modules can be combined as desired.

Dimensions: 12.5x104x72 mm (WxHxD)

P-DIAS I/O SYSTEM

The P-DIAS modules expand the system family in the IP67-protected area. They are ideal for the decentralized configuration of control systems and can be combined with the S-DIAS series as desired. In the field, analog and digital data can be collected or distributed directly outside of the control cabinet.

The connection of peripheral components is made using M8 connectors, optimized for use in harsh operating environments. Flexibility in use is also an essential fea-

MODULE VARIETY

Our many years of experience have produced a variety of modules, which can be modularly combined to create a perfectly tailored solution for any application:

- CPU modules
- Digital in and output
- Analog in and output
- Digital /analog mix
- Counter & position recording
- Motion
- Measuring technology
- Safety (controller, I/Os, relays)
- Bus connection
- Interfaces & splitters
- Special functions



HOT FACTS

HIGHLY COMPACT

20 I/Os within a 12.5 mm width

COMFORTABLE

through toolless DIN rail mounting and push-in wiring

CLEAR

Signal LEDs directly next to the channels

RELIABLE

Modules mechanically interlocked, all contacts with multiple contact points

ELECTRO PLANNING MADE EASY

For the S-DIAS product family, EPLAN macros for simple schematics integration are available.

ture of the P-DIAS modules. The digital modules have 8 channels, which can be freely selected as in or outputs.

Dimensions: 30x75x33 mm (WxHxD)



INTUITIVE OPERATION AND MODERN VISUALIZATION

HUMAN-MACHINE INTERFACE

Whether for classic operation or modern visualization concepts – with the HMIs from SIGMATEK, your machines cut a good figure in any situation. Our human-machine interfaces are compactly designed and fanless. With the engineering tool LASAL SCREEN and the web-based VISUDesigner, your visualization is modern and quickly ready to use.



Whether built-in, swing-arm mounted or mobile panels – our HMIs convince with high-resolution color touch screens in classic 4:3- or widescreen format. Multi-touch panels (PCT technology) stand for modernity and an intuitive, safe operating feel. Of course, you can still find devices with resistive touch screens in our portfolio.

The HMIs are also available in a diversity of sizes: from 3.5" to 23.8" in vertical format. All panels are, of course, fanless and therewith wear-free.

You have the choice between panels with processors and remote operating units without a processor (HMI-Link up to 100 m).

For demanding visualization and operating concepts, our HMIs with integrated EDGE3 Technology processors are the right choice. All HMIs with a processor speak OPC UA.

For a variety of applications in robotics, assembly and handling technology, our mobile HMIs – cable-connected or wireless, are the optimal choice.

Also for special environmental conditions and branch-specific requirements (food processing and pharmaceutical industry), the right HMI solution is available.



HOT FACTS

SCALABLE

The right operating panel for any need

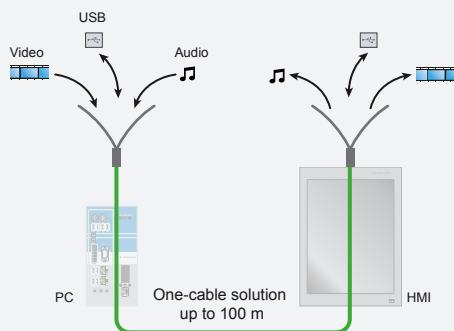
SIMPLE

Comfortable screen design with the all-in-one engineering tool LASAL

ADAPTABLE

Customer-specific housing design possible





HMI-LINK: REMOTE SOLUTIONS FOR UP TO 100 M

One cable, more power and long distances – those are the advantages of HMI-Link technology, which was developed for remote solutions. With a standard Cat5e or Cat6 cable, video, audio and USB signals can be transmitted up to 100 m without loss between operating panels with HMI-Link and the industrial PCs of the 400 series.

HMI-Link is based on a complete hardware solution and is operating system-independent. The HMI-Link panels have no internal main processor and are therefore more mechanically robust and economic. A possible increase in computing power occurs in the CPU located in the control cabinet.



FREEDOM REDEFINED: DATA EXCHANGE VIA WLAN

The wireless handheld operating panels of the HGW 1033 series provide you with new freedom for monitoring, as well as operating directly on-site. Data exchange via WLAN eliminates the cables, which until now, have posed a trip hazard. The 10.1 multi-touch screen provides additional operating comfort.

Wireless panels are available with and without safety functions (SIL 3, PL e). Payload and safety data are transmitted redundantly with 2.4 and 5 GHz, which significantly increases the reliability of the WLAN transmission.

STRONG VISUALIZATION WITH LASAL

With the HMI tool LASAL SCREEN and the web-based VISU Designer (HTML5, CSS3 and JavaScript), you are provided with modern tools for creating visualizations. Predefined design themes and diverse operating and graphic elements simplify project engineering. Integrated features such as alarm and event management, trend display, text and recipe management, as well as language and unit conversion provide great comfort.



FROM POSITIONING TO PATH CONTROL

MOTION CONTROL

Modern machines and systems require innovative drive technology with high flexibility and precision. The economic complete solution from SIGMATEK offers a high degree of freedom to perform motion tasks with your machine.



PREDEFINED MODULES SIMPLIFY MOTION DESIGN

The seamless integration of PLC and motion control results in the improved synchronization of process and motion operations in the machine.

LASAL MOTION provides all drive functions needed for a production machine, from simple one-axis to complex multi-axis applications. A large drive library with ready-to-use motion components is available to the user: Functions such as absolute, relative and endless positioning, CNC functions as well as coordinated movements and several reference types. This includes technology modules for synchronizing up to 9 axes in a group, circular interpolation, flying saw, cam discs, cam switches, jerk-limited motion profiles or dynamic safety zone monitoring. This ensures a significant reduction in programming and testing.

At SIGMATEK, motion control is fully integrated into the control system. Control, drives, motor output stages, motors and software interact perfectly and enable highly dynamic and exact motion sequences from one source.

The DIAS Drives MDD 2000 cover a broad performance spectrum and include many safety functions in the standard model: STO, SS1, SOS, SBC, SLS integrated – all in compliance with SIL 3, PL e, Cat. 4. They can therefore be easily integrated into the safety concept of the machine.

The servo drives were consciously limited to current, speed and position control. All drive parameters and configuration data are stored centrally in the control and automatically reloaded when a servo amplifier is exchanged. The handling during the initial start-up is thereby simplified.

This modern system structure is made possible through the hard real-time Ethernet system VARAN with the shortest cycle times.



DIAS DRIVE MDD 2000

Highly Compact and Modular

The compact multi-axis servo system, with one to three axes, combines high performance and flexibility for controlling servo motors. The supply, power filter, regen resistor, as well as DC-Link circuit are compactly combined. Size 1 (75x240x219 mm) provides 3x 5 A rated- or 3x 15 A peak current and with 150 mm the double-wide size 2 supplies 3x 10 A rated- or 3x 30 A peak current per combined power/axis module (1-/3 phase with 230-480 VAC). The overload factor is up to 300 percent. It can be used as a stand-alone solution or in a network with any number of axis modules in various sizes. The safety functions STO, SS1, SOS, SBC and SLS are already included in the standard features (SIL 3, PL e, Cat. 4). In addition to the Hiperface DSL single cable solution, various encoder types are supported.



SERVO MOTORS DSM5

For any Motion Task

The compact synchronous servo motors of the DSM5 series are equipped with the newest generation of magnet technology. The brushless three-phase motors are ideal for positioning tasks with high demands on dynamics and stability. The DSM5 motors are available in different models. For the encoder system resolver, Hiperface and Hiperface DSL can be used. A broad selection of motors with stillstand torques from 0.19 to 76 Nm and peak torques up to 200 Nm is available to choose from. The user can also select different mounting, connection and feedback variations.



AC DRIVE FDD 3000

Efficient and Reliable

The FDD 3000 AC drives round out the drive portfolio for the low voltage range. Economic asynchronous motors can be precisely controlled with the AC drives. The motion application is thereby more efficient and at the same time, saves energy. These compact units are available in seven sizes. The 1- or 3-phase AC drives (200/240 VAC or 380/480 VAC) cover a power range of 0.37 to 90 kW. With an overload capacity of up to 180 %, the FDD 3000 units are ideal for applications that require high torque for short time. Two safety STO inputs (SIL 3/PL e) ensure a safe stop.



SERVO AXIS MODULES

Servo Amplifier in Pocket Format

The super compact, fully integrated servo amplifier of the S-DIAS DC series, with a rated power of nearly 300 - 480 W, is designed to control synchronous servo motors up to 6 or 10 A of continuous current at 48 V DC (peak current 15 or 20 A). A standard Resolver (DC 061/101) or incremental encoder input (DC 062/102) for position feedback, a 24 V DC output for controlling a holding brake and a two-channel enable input used as an STO (Safe Torque Off), SIL 3, Cat. 4, PL e, are also integrated.

Dimensions:

DC 061/062: 12.5x104x72 mm (WxHxD)

DC 101/102: 25x104x72 mm (WxHxD)

STEPPER MOTOR CARDS

Compactly Control Stepper Motors

The S-DIAS modules ST 151, as well as the VST 011 and VST 012, are ultra-compact function modules used to control two-phase stepper motors. Micro-stepping (64 or 32 steps) is supported. A maximum of 5 A (ST 151 and VST 011) or 10 A (VST 012) of continuous current per motor is possible. The modules have an incremental encoder. The ST 151 is also equipped with two digital and one two-channel enable input (STO), the VST modules have four digital in and outputs each.

Dimensions:

ST 151 25x104x72 mm (WxHxD)

VST 011/012 26x151x121 mm (WxHxD)

HOT FACTS

SIMPLE

Integrated motion control simplifies engineering considerably

COMFORTABLE

Ready-to-use motion components and technology modules

COMPACT

Space-saving installation in the control cabinet

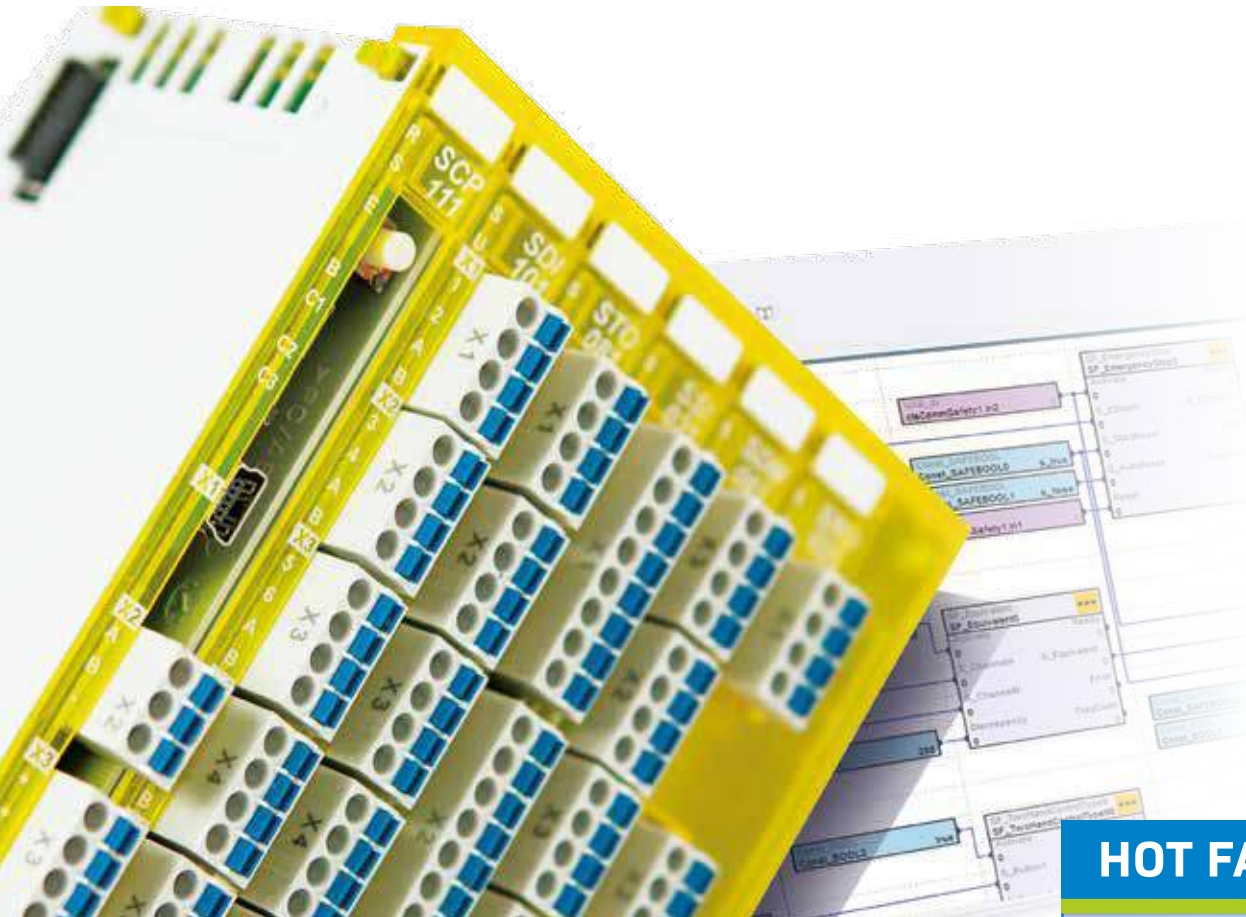
FLEXIBLE

Control of various motors

SIMPLE AND INTEGRATED

SAFETY

Functional safety is completely integrated into the SIGMATEK control system. The S-DIAS Safety components can be flexibly combined with the standard modules of their series. Safety functions are already implemented in the drives as well. The entire system complies with SIL 3 in accordance with IEC 62061 and PL e, Cat. 4 according to EN ISO 13849-1/-2.



For modular and intelligent machines, flexible and programmable safety systems are a basic requirement. With the slim S-DIAS Safety system, you can easily implement safety functions flexibly and scalable. S-DIAS Safety is TÜV certified and complies with the newest safety norms (SIL CL 3, PL e, Cat. 4). The safety solution scores with simple installation, as well as comfortable programming with the LASAL SAFETYDesigner: This contributes to increasing the efficiency of your machine.

Hardware components, which regularly monitor safety signals to detect possible errors and put the machine in a safe status if necessary, form the basis of SIGMATEK safety solutions. Protection for the operator is therefore ensured without affecting the performance of the machine.

HOT FACTS

SIMPLE

Fully integrated safety simplifies engineering

INTEGRATED

One bus system for standard and safety data

COMFORTABLE

Predefined safety function blocks

MODERN AND FLEXIBLE

Wireless safety and Hot Swap provide a high degree of freedom for developing the safety concept

FUNCTIONAL SAFETY

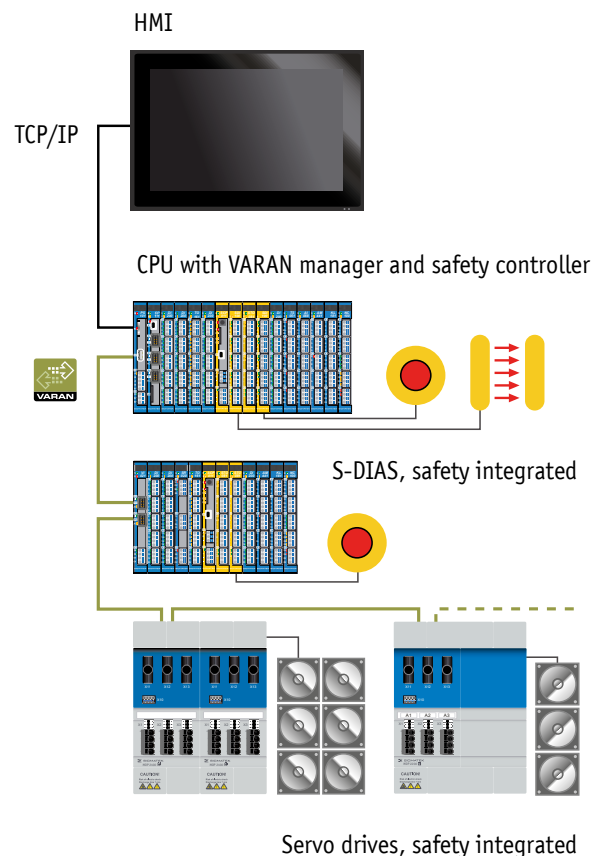
The S-DIAS safety systems can be seamlessly integrated into the SIGMATEK system architecture. Safety and function-oriented components can be combined with each other as needed. This enables individual customization for any requirement. S-DIAS Safety is ideal for applications in most varying branches. If needed, existing systems can also be easily expanded with safety functions. Through complete integration, the shortest reaction times are achieved for signal processing – which are in the range of a few milliseconds.

ONE BUS FOR STANDARD & SAFETY, AS WELL AS WIRELESS TRANSMISSION

For communication, no additional wiring is needed. Standard and safety-relevant data can be exchanged over the hard real-time capable, Ethernet-based VARAN bus, as well as wirelessly via WLAN. For communication between the safety components, the Black Channel principle is used, in which the bus does not assume any safety-relevant tasks but serves as a single-channel data exchange medium only and does not have to be included in safety considerations.

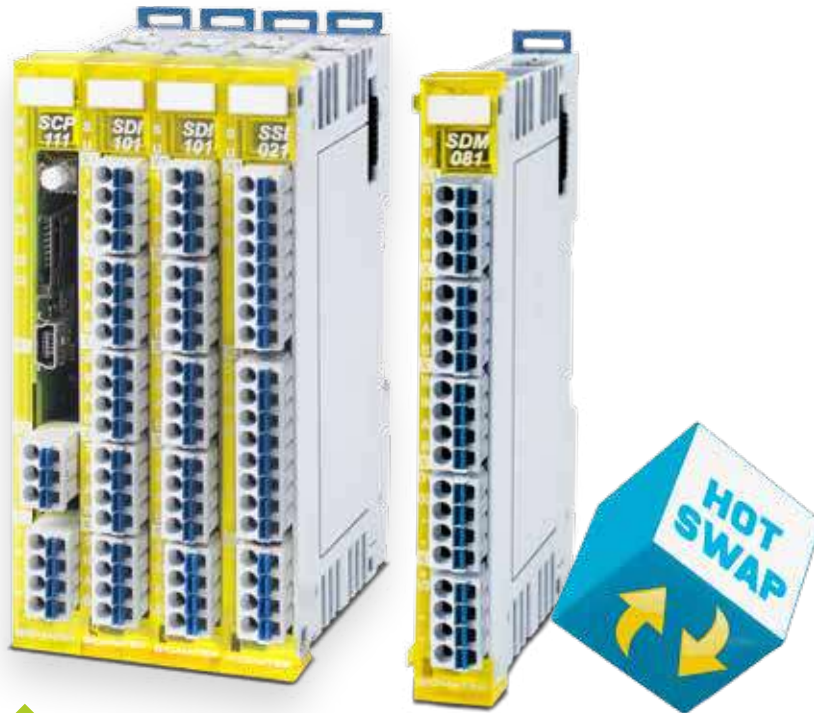
MODULAR SAFETY HARDWARE

The S-DIAS Safety modules are as compact as the standard modules of the series and measure only 12.5x104x72 mm (WxHxD) each. All safety hardware components have a safe core provided by their two-channel structure. The safety controller stores the application and monitors and/or controls the safety in- and outputs. Various safety I/Os, as well as relay outputs, an SSI absolute value encoder and incremental encoder evaluation are available. Safety-relevant requirements can be flexibly implemented, especially since S-DIAS Safety can also be used as a stand-alone solution.

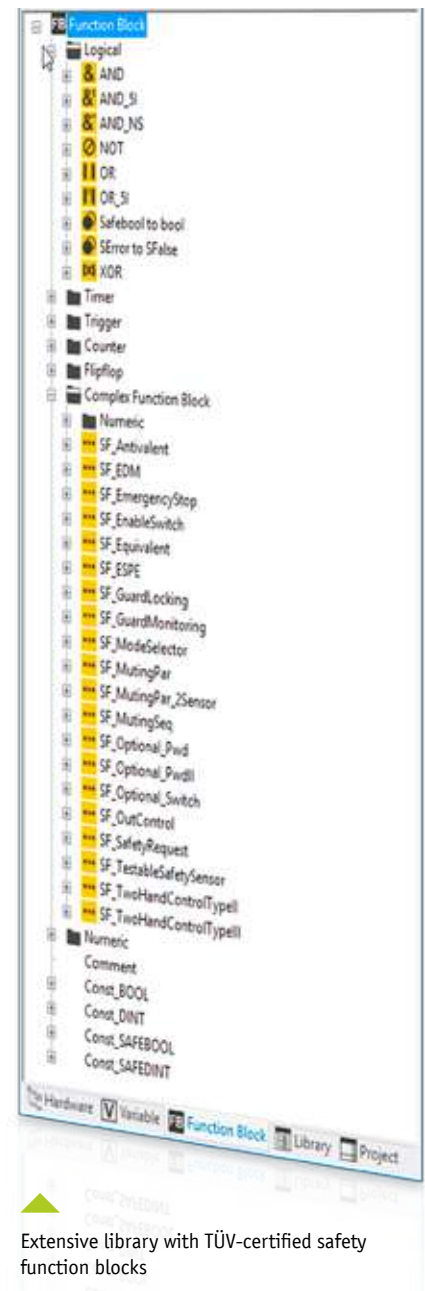


MINI SOLUTION

The safety controller SCP 111 forms, in combination with the digital safety mix module SDM 081, a mini safety system with 6 inputs and 2 outputs – within a control cabinet width of only 25 mm.



With the Safety Hot-Swap, modular machine and system units with an emergency stop function can be modified and flexibly grouped.



Extensive library with TÜV-certified safety function blocks

INTEGRATE SAFETY EASILY AND SEAMLESSLY

For programming and configuration of the safety system, a comfortable tool is provided with the LASAL SAFETYDesigner.

Based on a function library, you can easily create the logical connections of safety-oriented processes. For this purpose, you can utilize certified standard and safety function blocks based on the PLCopen standard. Examples of this are: emergency stop, two-hand control or guard locking.

In the integrated graphical editor, function blocks and I/Os can be easily placed as desired via drag & drop and connected to the function-oriented variables of the PLC. Per project, several safety

controllers can be used. A special feature of the S-DIAS safety system is that independent projects can exchange safety-relevant information.

SAFETY HOT-SWAP

The software-based Hot-Swap feature ensures that modular machine components with their own safety CPUs can be flexibly integrated into the system, logged out and logged back into the machine network at a different location and that during runtime.

CONSISTENT AND FLEXIBLE NETWORKING

REAL-TIME ETHERNET VARAN



HOT FACTS

INTEGRATED

One network for the entire machine

HARD REAL-TIME

Cycle times < 100 μ s

SAFE

Error correction within the same bus cycle

FLEXIBLE

Various network topologies

OPEN

and manufacturer-independent



Flexible and modular machine structures smooth the way to Smart Factory. Perfect communication between all components and function units also play an important role. SIGMATEK relies on the Ethernet bus system VARAN.

The Ethernet technology-based VARAN bus system meets all the demands placed on a modern industrial network in machine automation 4.0. The VARAN connects systems, machines and components from

the management level to the smallest sensor in hard real time. The Ethernet bus system is safe, fast and simple. Even the high demands of drive technology can be implemented with VARAN.

PRECISION IN HARD REAL TIME

The VARAN bus is based on standard Ethernet physics. The VARAN protocol was implemented completely in the FPGA-based hardware. Using the Manager/Client principle, collisions on the bus are avoided. At the start of each bus cycle, the participants are synchronized. Data is exchanged with guaranteed determination at cycle times below 100 μ s and jitter under 100 ns. To perfectly integrate available networks, TCP/IP packets are tunneled.

PERFORMANCE DATA

Bus cycle times	< 100 μ s	
Jitter	< 100 ns	
Isochronous access time	1-byte r/w	2.18 μ s
	16-byte r/w (1 Drive)	5.05 μ s
Asynchronous direct access	128-byte r/w	< 25 μ s

GUARANTEED DATA RELIABILITY

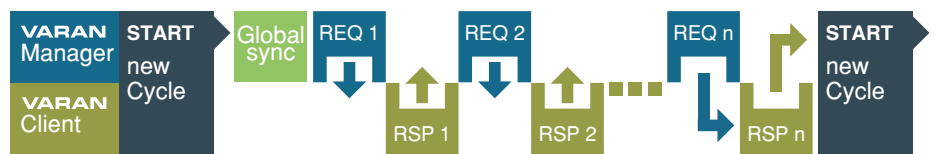
Applications in industrial environments require data security, as well as the highest availability. VARAN provides unique data handling for consistent and safe transmission.

A significant advantage of VARAN, in comparison to other real-time Ethernet bus systems, is the very small packet size. Instead of the long standard Ethernet frames, the packet length for the VARAN bus uses a maximum of 128 bytes. Through

the use of short packets, the probability of communication errors is minimal.

All messages are confirmed by the client components within the same bus cycle. Unconfirmed messages can be repeated within the same bus cycle. The consistency of all process data at the end of the bus cycle is therefore guaranteed. VARAN also provides the unique possibility of asynchronous direct access.

Guaranteed data consistency at the end of each bus cycle: unconfirmed telegrams are repeated in the same bus cycle



FLEXIBLE NETWORK TOPOLOGIES FOR MACHINES 4.0

The VARAN bus organizes itself automatically during the start-up phase. The participant addresses are assigned automatically. Especially with modular machine concepts, complex bus topologies can be constructed easily and flexibly. Line, star and tree structures can be combined as desired. This open architecture provides the user with a high degree of flexibility

– also with later expansion of a machine or system.

Thanks to the Hot-Plug capability, entire machine components, for example, can also be later integrated into or removed from the VARAN network after configuration or during operation.

VARAN SPEAKS SAFETY

VARAN provides the possibility to transmit safety-oriented data using the Black-Channel-principle. The bus system is thereby excluded from the safety assessment and allows safety data to be forwarded over other transport media. The safety

protocol is embedded in the standard VARAN frame. In the VARAN safety telegram, the data and addresses are double-encoded and with a timestamp, verified by a checksum (CRC). Thereby faulty data during communication is clearly detected.

CONNECTIVITY

The SIGMATEK automation world is open. Our system solutions enable platform and manufacturer-independent data exchange via OPC UA. In addition, Ethernet TCP/IP, CAN, Profibus etc. are integrated into the majority of our components. VARAN gateways, which enable the connection of other industrial Ethernet systems such as Profinet are also available.

OPEN STANDARD

VARAN is an open standard and manufacturer-independent. The rights for the real-time Ethernet technology are held by the VARAN User Organization (VNO). All members have unlimited usage rights to VARAN technology.

EFFICIENCY IN THE DEVELOPMENT OF MACHINES

ENGINEERING TOOL LASAL

The modern all-in-one engineering tool LASAL enables the consistent and very flexible implementation of machine applications. Programming and configuration are greatly simplified – development times and time-to-market cycles are reduced significantly.

We have been using object orientation for more than 20 years and are therefore the industry leader. LASAL (IEC 61131-3) is object-oriented from the ground up and

designed as a low-code platform. As the name already states, the low-code development platform stands for less code and less programming.



HOT FACTS

INTEGRATED

ONE engineering tool for all phases of the development process

EFFICIENT AND CLEAR

With object-oriented programming, the highest modularity and reusability are achieved

COMFORTABLE

Numerous ready-to-use function blocks and efficient tools integrated



LASAL CLASS

ALL-IN-ONE

LASAL is a highly modern engineering tool that provides all functions for solving automation tasks: PLC programming, visualization, motion control, safety, diagnosis and remote maintenance.

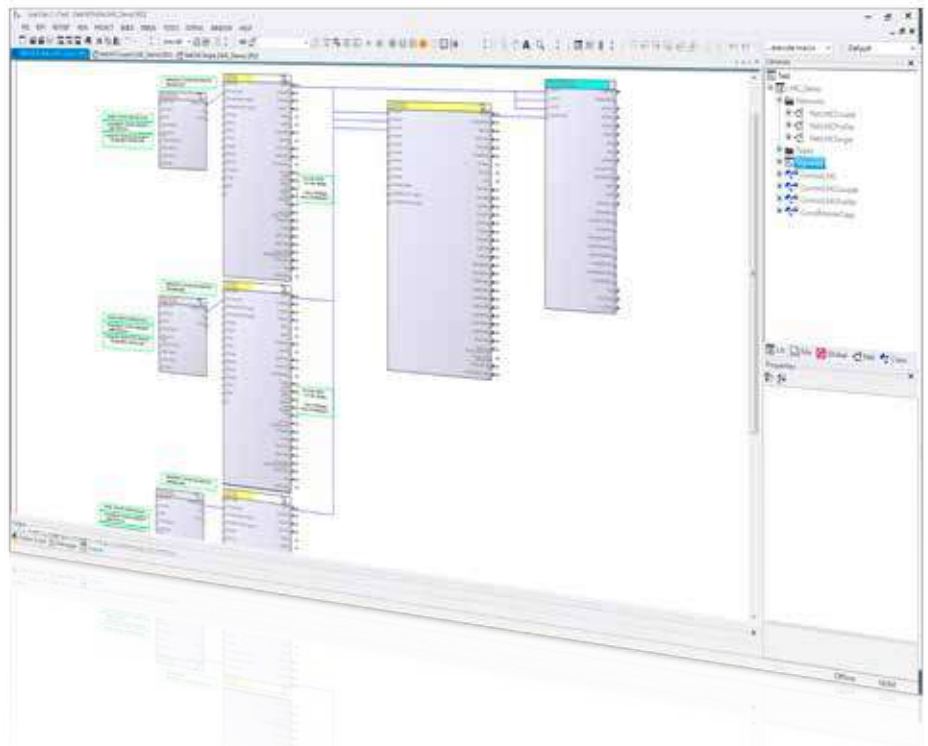
Object-oriented programming with LASAL guarantees you maximum flexibility: Through the object-oriented, modular construction of the software, you can quickly and flexibly react to customer-specific needs. The software modules (objects) can be combined in a toolkit system.

OBJECT ORIENTED

In 2000, SIGMATEK was the first company to integrate object-oriented programming with graphical representation and client-server communication into automation technology. LASAL (IEC 61131-3 standard) also enables the modularization of machine functions in the software and thereby defines a new level of modularity and reusability. As in mechanics, where proven construction is always applied, the modular structure of LASAL enables application components to be easily reused once they have been created and tested without having to test them again. The software is thereby sustainable.

GRAPHICAL REPRESENTATION

Through graphical representation, the clarity is increased. The developer can therefore get a quick overview of the project structure and the relationship between



the individual modules is clarified. Even complex applications can be displayed transparently and clearly. This simplifies the implementation and helps reduce the engineering and maintenance times.

THE FUTURE IN SIGHT

LASAL can be used on the entire SIGMATEK range of products. The hardware platform can be changed without having to adapt the software. In view of Industry 4.0, LASAL supports the OPC UA communications protocol. Manufacturer and platform-independent data exchange are thereby possible.

READY TO USE

Fast software development thanks to ready-made templates and ready-to-use and tested add-ons as well as packages.

SAVE DEVELOPMENT TIME WITH READY-TO-USE TEMPLATES & ADD-ONS

The SIGMATEK system concept provides all control disciplines required for a production machine from one source. As the basis, the complete PLC functionality for tasks such as process control, monitoring, in and output processing and calculations are available.

"Less programming – simply configuring": Our engineering tool LASAL, supports the implementation of your machine or system software with pre-constructed templates, as well as ready-to-use software. The extensive library includes, for example, packages for PID regulators, complex filter and regulation algorithms, various motion modules and robot kinematics.

Add-ons are also provided, which in addition to the finished sequence control

project, also contain the corresponding visualization. An example thereof is log-in functions and access authorizations, event journal or data analyzer.

All these functions are ready-to-use and can be modularly implemented in your application using the toolkit principle. There, it's clear that you can reduce the development times considerably and at the same time, the software quality increases. Depending on the complexity of your application, you achieve time savings in engineering time of up to 70 %.

EXAMPLES OF READY-TO-USE TEMPLATES, PACKAGES & ADD-ONS

■ Control modules

PID-controller, operating mode manager, filter algorithms

■ Organization & usability

Login function and implementation of access permissions, recipe management

■ Data analyzer

Oscilloscope for recording multiple channels

■ Communication

OPC UA, VNC, MQTT

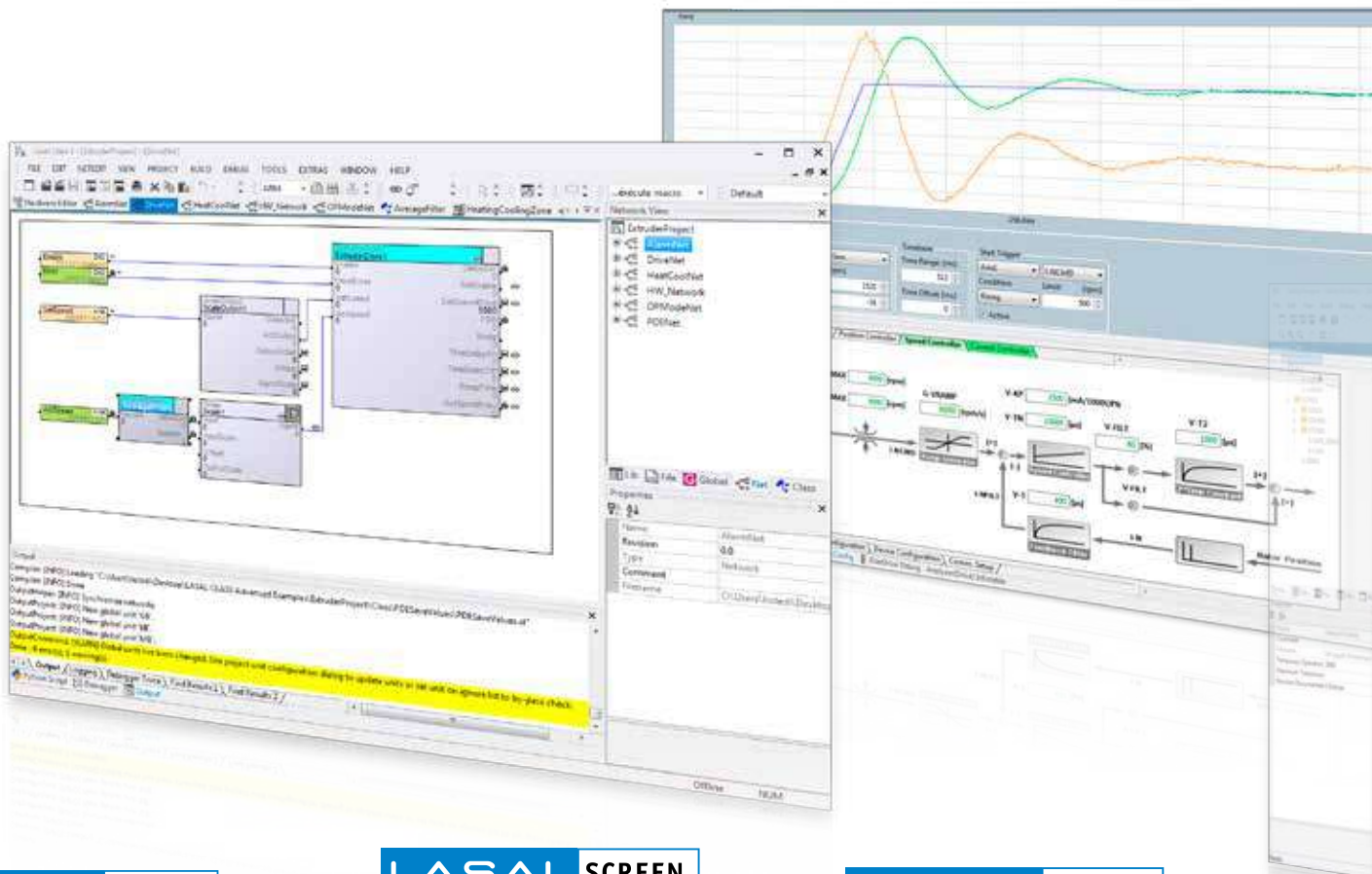
■ Robot kinematics

Delta, SCARA, Portal

■ Function templates

Synchronous feed, Pick&Place, printmark recognition, unwinding, separating and grouping





LASAL CLASS

OBJECT-ORIENTED PROGRAMMING

With LASAL CLASS, the control can be programmed using object orientation. Behind a programming module (called an object), there is a class containing the program code and the corresponding data elements. Each class can assume a specific task, such as controlling a drive for example. The actual program code is written in the conventional IEC 61131-3 languages such as structured text, ladder diagram, SFC, interpreter or in ANSI-C. Ready-to-use application components (classes) reduce engineering enormously: "Program less – simply configure"

LASAL SCREEN

LASAL VISU

TOP VISUALIZATION

With the LASAL SCREEN Editor or LASAL VISU Designer, the visualization of your application can be easily created in the corporate design of your company. Design themes and an extensive graphics library is available to engineer your project. Complicated programming is eliminated. The "newcomer" to the Engineering Suite LASAL, the VISU Designer, enables hardware-independent visualization solutions on different HMI devices using current web technologies such as HTML5, CSS3 and JavaScript. Since the optics and logic of the controls are separate, the flexibility increases.

LASAL MOTION

FLEXIBLE MOTION DESIGNS

Motion control is seamlessly integrated into the control system. LASAL MOTION simplifies every drive technology task. Numerous servo drives from SIGMATEK as well as external products are provided as objects to simplify usage. Axis movements can be executed using simple data inputs or instructions without any programming. For frequently required functions, the LASAL drive library provides a large selection of pre-constructed motion function components - from positioning to synchronization of up to nine axes in a group.



LASAL SAFETY

INTEGRATE SAFETY

The full integration of the SAFETY Designer into the LASAL engineering toolkit simplifies the programming and configuration of the safety controller. Logic operations and I/O configurations can be created comfortably. Predefined function blocks simplify the implementation of the safety application and its maintenance.

LASAL SERVICE

FIRST CLASS CONNECTIVITY

LASAL is rounded out with an extensive service package. Remote maintenance, software updates and inter-platform data exchange are comfortably performed using the LASAL SERVICE tools: Web server, Remote Manager, OPC UA, FTP as well as VNC Client and Server. This includes USB boot stick updates, simulation with LARS etc.

FEATURES THAT CONVINC

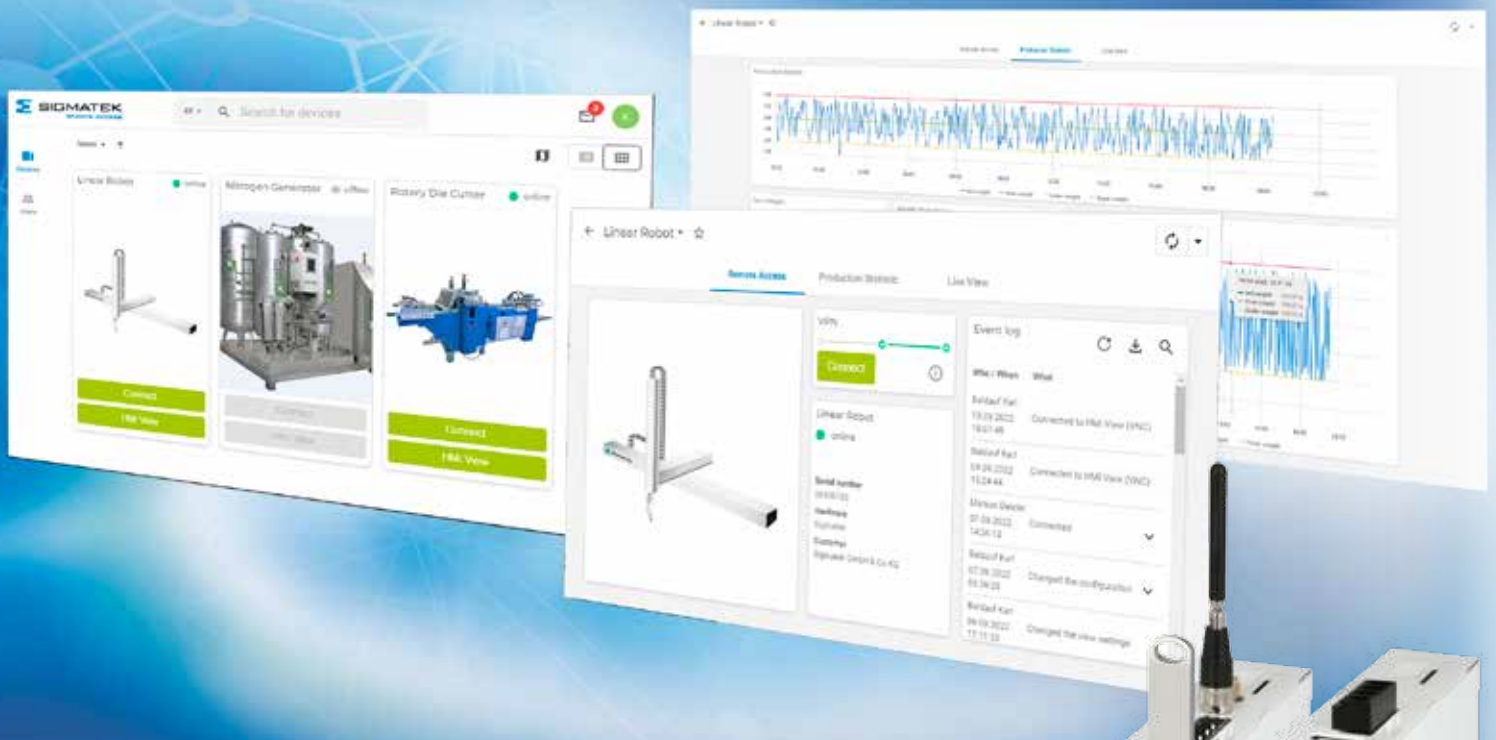
Efficient and comfortable tools support you in programming and troubleshooting: Online debugger, real-time data analyzer, Trace-View of the CPU tasks. Using the scripting language Python, software can be automatically generated for different variations of a certain machine type.



CLOUD PLATFORM WITH VPN CONNECTION

SECURE REMOTE ACCESS

Remote access options increase your machine's availability. With the SIGMATEK "Remote Access Platform" (RAP), you're provided with a modern web-based cloud platform for secure remote access options.



With the safe "Remote Access Platform (RAP), you operated the machine or system visualization over a VNC or web view – as if you were directly onsite.

SECURE OVER VPN

Over a secure VPN connection, actions such as monitoring, debugging, maintenance as well as alarms, reporting or updates can be performed in the central cloud platform – at any time, regardless of location. You get deep data insights for improving your services.

The connection to the RAP can be made via the "Remote Access Router" (RAR) and with the operating system expansion "Remote Access Embedded" (RAE), which can be run on any SIGMATEK CPU.

INTUITIVE AND FLEXIBLE

The user interfaces are directly managed via the browser. Operating is highly intuitive and simple. You have options for personalization and can configure user-defined views for individual machines or customers. In the clearly organized user interface, the Admin, Portal, Fleet manager and Studio sectors are provided.

In the Portal, all threads come together. Here, you will find the overview of all machines – in lists or a card view – where the connection is made via VPN and data reports are accessed. Devices and machines are added and configured in the Fleet manager.



READY-TO-USE

With the USB stick included with delivery, the RA-router (RAR) can be easily connected to the Remote Access Platform (RAP) and configured.

HOT FACTS

EFFICIENT REMOTE MAINTENANCE

Machine monitoring and maintenance – anytime and from any location

DIRECT ACCESS OVER VPN

Safe connection with machines over a central platform

BROWSER-BASED CLOUD PLATFORM

Manage user interfaces and directly access operating elements via the browser

In the Studio, machine views (machine cards), as well as dashboards are configured.

Comprehensive management of user roles and access rights, with two-factor authentication capability, ensure that each operator – customer, partner of service team – can be assigned specific rights.

BIG DATA IN THE CLOUD

With “Cloud Logging”, you can call machine data from the PLC automatically, send it safely to the cloud and access it via dashboards. E-mail notifications of important events in your applications can be set up via “Cloud Notify”.

MOBILE WITH CONNECT APP

SIGMATEK Connect is your mobile entrance to the Remote Access Platform. Using the app, the entire remote machine service management process is even more simple. SIGMATEK Connect enables safe and easy remote access to your machines and systems – from any mobile end device.



ALWAYS IN VIEW

With the SIGMATEK Connect app, you can comfortably monitor and service your machines and systems from anywhere via smartphone or tablet.



CLOUD LOGGING

Gain deep insights into your machine – automatically retrieve data and store it in the cloud:

- Easily configure and manage data tags
- Data connection via OPC UA and Modbus TCP
- Track machine data in real time on clearly organized dashboards
- Display of recorded data on individual machine pages
- Comfortably create and evaluate data reports with ready-to-use templates and widgets



CLOUD NOTIFY

Receive e-mail or push notifications with real-time updates on important machine warnings, alarms or events:

- Data connection via OPC UA and Modbus TCP
- The central alarm system is managed on the platform
- Define an unlimited number of triggers
- Manage the alarm messages of all machines

CUSTOMER ORIENTED AND RELIABLE

SUPPORT AND SERVICE

We concentrate on your wishes and needs. In addition to our many years of experience in machine building and automation expertise, we bring the concept of service into the partnership – for the entire life cycle of your machine.



ENGINEERING SUPPORT

Together with you, we develop your project to a successful conclusion – of course, on-site as well. With our engineers and technicians, your machine or system is in the best hands: whether finding solutions, project development, engineering, initial start-up or service. Our goal is to create added value in all phases of the project.

SUPPORT HOT-LINE

When you need a fast answer to a technical question, our support is there for you around the clock. You will not get an automated response, rather a competent contact person will personally address your concerns.

IN USE WORLDWIDE

Your machines should run like clockwork and produce with maximum performance. Regardless of where you deliver your machine, we are there when you need us. Whether for an initial start-up, on-site service support or in the event of an emergency. We go everywhere – and fast.

PRACTICE-ORIENTED TRAINING

Regardless of whether you need a first glimpse into control technology or are interested in specific topics, in our practice-oriented training you acquire the necessary technical knowledge firsthand. The modularly constructed seminars are customized to various practical requirements.

FAST DELIVERY OF SPARE PARTS

Spare parts and repairs are always urgent. Therefore it is important to us, even after several years, to be able to deliver you the correct spare parts as fast as possible. Naturally, our extensive production depth also comes into play.

HOT FACTS

HIGHLY MODERN AUTOMATION

Increase the productivity of your machine and makes it more flexible

SHORT DEVELOPMENT TIMES

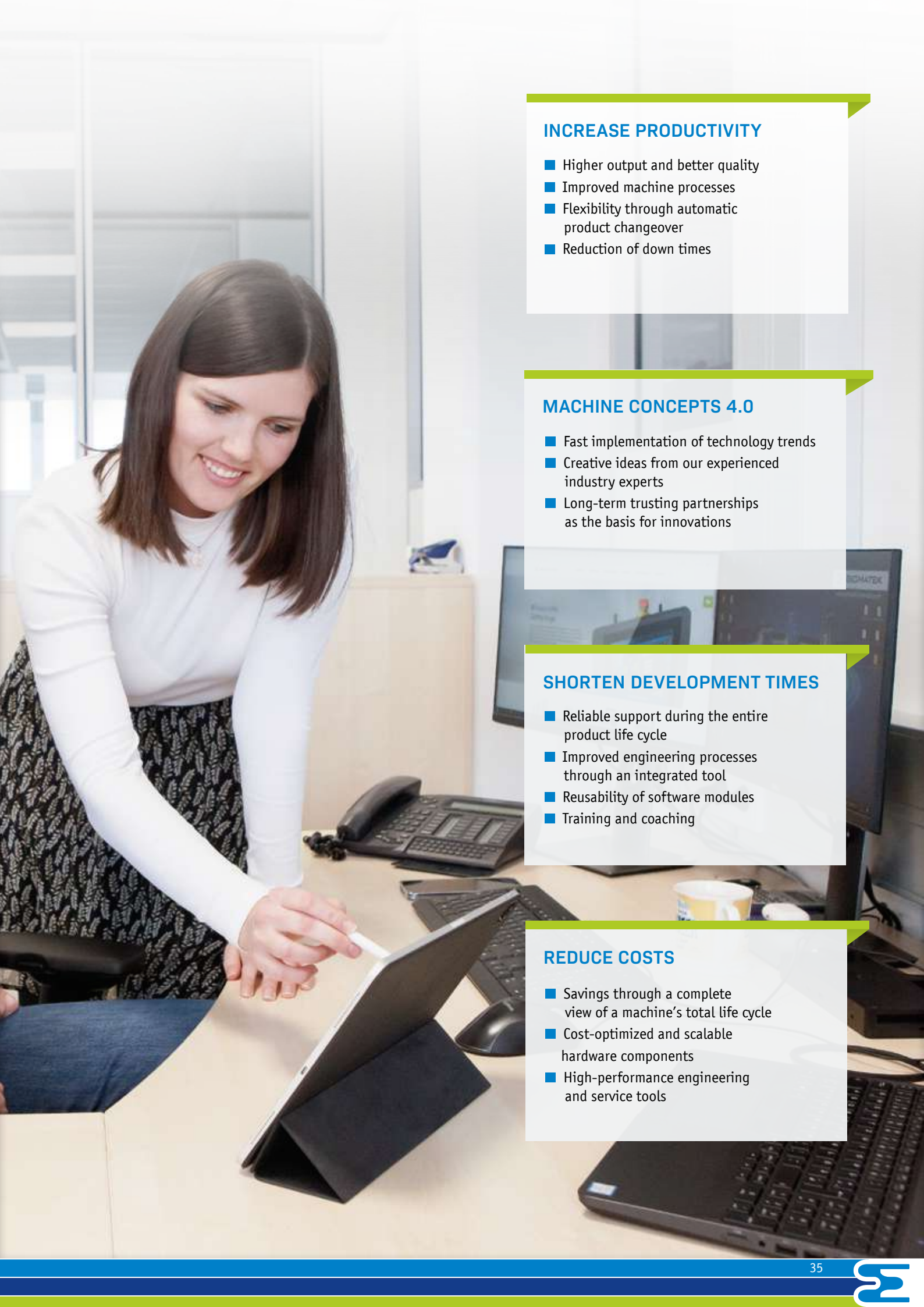
Our experienced team supports you in all phases

INNOVATIVE IDEAS

For machine concepts of tomorrow

REDUCE COSTS

We make your machine more economic in all areas



INCREASE PRODUCTIVITY

- Higher output and better quality
- Improved machine processes
- Flexibility through automatic product changeover
- Reduction of down times

MACHINE CONCEPTS 4.0

- Fast implementation of technology trends
- Creative ideas from our experienced industry experts
- Long-term trusting partnerships as the basis for innovations

SHORTEN DEVELOPMENT TIMES

- Reliable support during the entire product life cycle
- Improved engineering processes through an integrated tool
- Reusability of software modules
- Training and coaching

REDUCE COSTS

- Savings through a complete view of a machine's total life cycle
- Cost-optimized and scalable hardware components
- High-performance engineering and service tools

INTERNATIONAL



AUSTRIA – CORPORATE HEADQUARTERS

SIGMATEK GmbH & Co KG
5112 Lamprechtshausen
Sigmatekstraße 1
Tel. +43 6274 43 21-0
Fax +43 6274 43 21-18
www.sigmatek-automation.com
office@sigmatek.at



CHINA

SIGMATEK Automation CO., Ltd
315040 Ningbo · Room 805,
Building A, No. 555, Jingjia Road
Tel. +86 574 87 75 30 85
Fax +86 574 87 75 30 65
www.sigmatek-automation.cn
office@sigmatek-automation.cn



GERMANY

SIGMATEK GMBH
76829 Landau
Marie-Curie-Straße 9
Tel. +49 6341 94 21-0
Fax +49 6341 94 21-21
www.sigmatek-automation.com
office@sigmatek.de



BELGIUM

SigmaControl B.V.
2992 LC Barendrecht
Tel. +32 329 770 07
www.sigmacontrol.eu
office@sigmacontrol.eu



FINLAND

SARLIN Oy Ab
01610 Vantaa
Tel. +358 105 50 40 00
www.sarlin.com
asiakaspalvelu@sarlin.com



ITALY

SIGMA MOTION SRL
36075 Montecchio Maggiore (VI)
Tel. +39 0444 60 75 75
www.sigmamotion.it
info@sigmamotion.it



JAPAN

SUMITOMO HEAVY INDUSTRIES, LTD.
Mechatronics Division
141-6025 Tokyo
Tel. +81 3 67 37 25 32
www.shi-mechatronics.jp
ryuji.nakajima@shi-g.com



GREAT BRITAIN

SIGMATEK Automation UK Limited
24 Old Queen Street
London, SW1H 9HP
Tel. +44 115 922 24 33
www.sigmatek-automation.co.uk
office@sigmatek-automation.co.uk



KOREA

SIGMATEK Automation Korea CO., Ltd
08500 Seoul · 4th floor, Digital Industrial Bldg 169-28
Gasan digital 2-ro Geumcheon-gu
Tel. +82 2 867 15 66
Fax +82 70 82 44 44 88
www.sigmatek-automation.kr
office@sigmatek-automation.kr



SWITZERLAND

SIGMATEK Schweiz AG
8308 Illnau-Effretikon
Schmittestrasse 9
Tel. +41 52 354 50 50
Fax +41 52 354 50 51
www.sigmatek-automation.ch
office@sigmatek.ch



NETHERLANDS

SigmaControl B.V.
2992 LC Barendrecht
Tel. +31 180 69 57 77
www.sigmacontrol.eu
office@sigmacontrol.eu



PORTUGAL

Plasdan Automation & Add-On Systems
2430-379 Marinha Grande
Tel. +351 244 57 21 10
www.plasdan.pt
info@plasdan.pt



SWEDEN

SIGBI Automation AB
254 64 Helsingborg
Tel. +46 42 654 00
www.sigmatek.se
info@sigmatek.se



SOUTH AFRICA

Anytech (PTY) Ltd.
2169
Tel. +27 11 708 19 92
www.anytech.co.za
info@anytech.co.za



USA

SIGMATEK U.S. Automation, Inc.
44133 North Royalton, Ohio
10147 Royalton Rd., Suite N.
Tel. +1 440 582 12 66
Fax +1 440 582 14 76
www.sigmatek-automation.us
office@sigmatek.us



THAILAND

SCM Allianz Co. Ltd.
10400 Bangkok
Tel. +66 2 615 48 88
www.scma.co.th
contact@scma.co.th



TURKEY

Dedem Mekatronik
35477 Menderes – İzmir
Tel. +90 232 47 21 848
www.dedemmekatronik.com
satis@dedemmekatronik.com