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

**YOUR ADVANTAGES IN SIGHT**

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

**For us, Innovation is a 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.
INTEGRATED SYSTEM SOLUTIONS
MODULAR, FLEXIBLE AND FUTURE ORIENTED

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

Our automation system is constructed like a modular toolbox – in hard and software. The compatibility and scalability of the 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 lot sizes.

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 continuous development as well as high quality standards in production.
In automation, we are at home. With over 30 years of industry experience, we can inspire our customers and provide them 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 requirements, have a feeling for trends and quickly turn them into serial products. Naturally, we love technology but our focus is on customer benefit. We listen to our customers intently, are proactive and never lose site of the big picture. This enables us to create tailored industry solutions to meet your needs and help to make your machines and systems fit for use in Smart Factories.
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.

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.

Our customers know that they can count on SIGMATEK. We score with flexibility in development and in applications support. We are always close to the customer: whether 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 wide-ranging 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. This provides you, as the customer, 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 – throughout your machine’s life.
INTEGRATED AUTOMATION SYSTEM
MORE FLEXIBILITY AND HIGHER PRODUCTIVITY FOR YOUR MACHINE

Control and I/O System
Our control system offers the right CPU for any task: compact S-DIAS CPU modules for the DIN rail, industrial PCs or control panels – with high-performance single or multi-core processors. Scalability and consistency means 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 Interface
In the area of human-machine interfaces, a broad product palette is available: from small operating units with 3.5 inch displays to high-resolution touch panels with a display up to 23.8 inches – with different touch screen technologies. The mobile HMIs with wireless technology bring a new dimension in operating freedom. For simple applications, the control panels also perform control tasks in addition to classic visualization. Naturally, customer-specific configurations are possible; for example, HMIs that were especially designed for the specific requirements of the food processing and pharmaceutical industries.

Motion Control
Our modern motion control system convinces: servo drives, motor output stages, motors, gears 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. The precision, dynamics and efficiency of the machine are increased.
**Safety Integrated**
SIGMATEK has Safety fully integrated into the automation solution: Safety controller, Safety I/Os and drives with integrated Safety technology. Programming and project development are simplified. 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. The thin and freely programmable Safety technology simplifies a modular configuration of your machine or system. With the Hot-Swap feature, a machine and system network can be flexibly regrouped – and that during runtime.

**Real-Time Ethernet VARAN**
Integrated, hard real-time communication 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 µs, 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 the engineering times and costs significantly. Thanks to web technologies such as HTML5, CSS3 and JavaScript a modern and flexible visualization is possible.
SIGMATEK – THE SYSTEM

ENGINEERING LEVEL

One Tool for all Automation Tasks

SERVICE & MANAGEMENT LEVEL

OPC UA, LASAL Remote Manager, VNC Client and Server, Webserver, ...

HMI LEVEL

Operating Panels
3,5" – 12,1"

CONTROL LEVEL

Operating Panels
15" – 23,3"

Mobile Panels
One Tool for all Automation Tasks

OPC UA, LASAL Remote Manager, VNC Client and Server, Webserver, ...

CPU Modules
CPU Units
Industrial PCs
Control Panels
Mobile Panels

FIELD LEVEL

I/O System S-DIAS

SAFETY SYSTEM S-DIAS

I/O System P-DIAS

DRIVE LEVEL

DIAS Drives 100

DIAS Drives 300

DIAS Drives 1000

CPU Units
Operating Panels

3,5'' – 12,1''

Operating Panels

15'' – 23,3''
For versatile control tasks, various systems are available: compact CPU modules and units, industrial PCs, as well as control panels. We use single and multi-core processors with high-performance, low loss EDGE2 Technology as well as from Intel®. All controls are scalable and compatible with one another.

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-CPU to the high-performance dual-core CPU (2x 800 MHz).

For especially demanding applications, the CP 731 CPU unit and IPC 221 – equipped with Intel® processors – are available.

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

The software also follows the SIGMATEK idea of integration. 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.
**INDUSTRIAL PC**

- Robust and communicative
  If high computing performance is demanded, our robust and compact industrial PCs with Intel® processors are the right choice. Thanks to the HMI-Link technology, remote panel solutions up to 100 m can be easily implemented with PCs form the 400 series. For queries and storage of large data volumes, as well as an IoT gateway, the PC 521 is ideal.

**CONTROL PANELS**

- Control and Visualization Unified
  The ETV control panels are all-in-one devices. They unify control, visualization and operation in one compact module, and are therewith an efficient solution for simpler applications. The ETV panels, equipped with EDGE Technology processors, are available with 5.7 – 8.4 and 12.1-inch color touch displays. Decentralized solutions can be implemented via the VARAN interface.

- For Mobile Application Areas
  With 8.4 or 10.4 inch touch displays, the mobile control panels were designed for use directly on-site. They are equipped with EDGE2 Technology processors, emergency stop, confirmation button and key switch. The combination of ergonomic design and low weight ensures fatigue-free operation.

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**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
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.

"Program less – simply configure": Our engineering tool LASAL, supports you in the implementation of your machine or system software with preconstructed templates, as well as ready-to-use software components. The extensive libraries contain for example, 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 are login 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. That obviously lets you reduce the development times considerably while at the same time, the software quality increases. Depending on the complexity of your application, you achieve time savings in engineering of up to 70%.

### EXAMPLES FOR READY-TO-USE TEMPLATES & ADD ONS

- **Control Modules**
  - PID regulators, operation mode manager, filter algorithms
- **Organisation & Usability**
  - Login function and implementation of access permissions, recipe management
- **Data Analyzer**
  - Oscilloscope for recording multiple channels
- **Communication**
  - OPC UA, VNC
- **Robot Kinematics**
  - Delta, SCARA, portal
- **Function Templates**
  - Synchronous feed, Pick & Place, printmark recognition, unwinding, separating and grouping

The LASAL Machine Manager ensures clarity in multi-CPU concepts.
The automation technology from SIGMATEK already provides all options for implementing machine concepts 4.0. To meet the demands of “maximum flexibility”, we rely 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 intelligence. 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. The Machine Manager guarantees clear representation of the individual machine components and their dependencies. It therefore acts as the central management for connected controls and manages the data flow: Who may 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 systems – with the OPC UA implementation in LASAL (OPC UA server and client) you are provided with an integrated, platform-independent communication interface. Mapping can be easily configured in LASAL. All this reduces the work for initial start-up and handling, and enables implementation of adaptive production strategies.
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). Our I/O components 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. Through different network topologies (star, line, tree), you have numerous 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 be thereby easily integrated into production lines.

For Harsh Environments

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

Dimensions: 30x175x33 mm (WxHxD)
Highest Packaging Density
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, tool-less assembly of the modules, which can be prefabricated into blocks. Since standard connectors with push-in wiring are used, which can be pre-assembled and easily removed during service, 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 µs. Module status LEDs and signal LEDs directly next to each channel provide clear identification. 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)

HOT FACTS

HIGHLY COMPACT
20 I/Os within a 12.5 mm width

COMFORTABLE
through tool-less DIN rail mounting and push-in wiring

CLARITY
Signal LEDs directly next to each channel

RELIABLE
Modules mechanically interlocked, all contacts with multiple contact points

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

Electro Planning Made Easy
For the S-DIAS product family, EPLAN macros for simple schematics integration are available.
SIGMATEK offers a broad spectrum of panels. While developing our human-machine interfaces, we focused on compact design and comfortable operating features. With the engineering tools LASAL SCREEN and the web-based VISUDesigner, your visualization is quickly ready to go.

Whether operating, control or mobile panels – the HMIs convince with high-resolution color touch screens in classic 4:3 or widescreen format. In addition to resistive touch screens, numerous multi-touch panels (PCT) stand for modernity and an intuitive, safe operating experience.

With the HMIs, you can also select from various sizes: from 3.5” to 23.8” in vertical format. All panels are, of course, fanless and therewith wear-free.

For demanding visualization and operating concepts, our panels with integrated EDGE2 Technology processors are the right choice. For simple applications, all-in-one control panels are also available.

The mobile HMIs of the HBG (without processor), as well as the HGT and HGW series (processor integrated), are predestined for a diversity of applications in robotics, assembly and handling technology. Also for special environmental conditions and branch-specific requirements (food processing and pharmaceutical industry), the right solution is available.
SCALABLE
The right 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 UP TO 100 m

One cable, more power and long distances – those are the advantages of HMI-link technology, which was designed 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 pure hardware solution and is operating system-independent. The HMI-link panels have no internal processor and are therefore more mechanically robust and economic. A possible increase of computing power occurs in the control unit in the cabinet.

FREEDOM REDEFINED: DATA EXCHANGE VIA WLAN

The wireless handheld operating panel HGW 1033 provides you with a new freedom for monitoring, as well as operating directly on-site. Wireless data exchange eliminates cables, which until now, had posed a trip hazard. The 10.1 multi-touch screen provides high operating comfort. In addition, Safety functions are already integrated. Even the Safety data is transmitted via radio signals. Despite the integrated battery pack, the wireless panel weighs only 1,350 g and therefore ensures low-fatigue operating. The battery pack enables up to two hours of continuous operation.

STRONG VISUALIZATION WITH LASAL

With the HMI tool LASAL SCREEN and the new web-based LASAL VISUDesigner (HTML5, CSS3 and JavaScript), you are provided with modern tools for creating visualizations. Predefined design templates and diverse operating and graphical elements simplify project engineering. Integrated features such trend display, text and recipe management, as well as language and unit conversion provide great comfort.
Modern machines and systems require innovative drive technology with maximum flexibility and precision. The economic complete solution from SIGMATEK offers a high degree of freedom to perform motion tasks with your machine.

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 cover a broad performance spectrum and include the most important Safety functions STO (Safe Torque Off) and SS1 (Safe Stop 1) according to SIL 3, PL e, Cat. 4 in the standard variant. The drives can therefore be easily integrated into the Safety concept of the machine.

The drive tasks 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 and servicing are thereby simplified.

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

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 library with predefined modules is available to the user: functions such as absolute, relative and endless positioning, CNC functions as well as coordinated movements and several reference types. In addition, technology modules for synchronization of up to 9 axis in a space, circular interpolation, flying saw, cam discs, cam switches, jerk-limited motion profiles or dynamic Safety zone monitoring are also available. This ensures a significant reduction in programming and testing.
Modular Multi-Axis System

DIAS Drive 100 is a modular servo drive system that was designed for highly dynamic machines in the mid and lower power range (up to 3 kVA). On a module carrier, up to eight drive controllers can be integrated – in an installation space of only 300x155x152 mm (WxHxD). Two power modules, as well as axis modules for 1 or 2 servo drives are available. Drive concepts can therefore be flexibly adapted or scaled to the required number of axes. All common feedback systems can be used. In addition to servo motors, linear, torque and asynchronous motors can also be controlled.

Compact Drive for 1-3 Axes

Up to three drives are integrated into the DIAS Drives of the 300 series and this with the compact dimensions of 158x378x240 mm (WxHxD). The servo drive system is designed for multi-axis applications in a power range from 8 to 14 kVA. Combinations of 10 to 20 A rated and 20 to 40 A peak current are available. High efficiency, reduced power loss and an optimized cooling concept are further arguments for choosing the DIAS Drives 300. Servo, linear, torque and asynchronous motors as well as all conventional feedback systems can be connected.

Super Compact 6-axis Servo Drive

With the DIAS Drive 1000, 6 servo motors can be controlled. The drive regulators share the housing, controller, intermediate circuit and heat sink. This results in a unique compactness of only 212x585x216 mm (WxHxD). The drive is designed for dynamic multi-axis applications. Per axis, a maximum rated current of 5 and 20 A and 10 to 40 A peak current are possible (power range up to 14 kVA). In addition to STO and SS1, SBC (Safe Brake Control) is also integrated into the drive. External plug-in encoder systems provide high flexibility: resolver, EnDat 2.1 and Hiperface DSL.
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

Servo Amplifiers 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 A or 10 A of continuous current at 48 V DC (peak current 15 A 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 2-channel enable input used as an STO Safe Torque Off (SIL 3, Cat. 4, PL e) are also integrated.

Dim. DC 061/062: 12.5x104x72 mm (WxHxD)
Dim. DC 101/102: 25x104x72 mm (WxHxD)

Compactly Control Stepper Motors
The S-DIAS module ST 151 and VST 011 and VST 012 modules are compact power components used to control 2-phase stepper motors. Microstepping (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 ST151 is also equipped with 2 digital and one 2-channel enable input (STO), the VST modules have 4 digital in and outputs each.

Dim. ST 151: 25x104x72 mm (WxHxD)
Dim. VST 011/012: 26x151x121 mm (WxHxD)

Motors for any Motion Task
The synchronous servo motors of the AKM series are power packages for highly dynamic motion tasks: They convince through a high power density with a very large torque to inertial ratio with rotation speeds up to 8,000 rpm. A broad selection of motors with stillstand torques from 0.18 to 53 Nm and peak torques up to 143 Nm is available to choose from. The user can also select different mounting, connection and feedback variations.

Dim. AKM 061/062/101/102: 12.5x104x72 mm (WxHxD)
SAFETY
SIMPLE AND INTEGRATED

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 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 scalably. S-DIAS Safety is TÜV certified and complies with the newest Safety norms (SIL 3, PL e, Cat. 4). The Safety solution scores with uncomplicated installation, as well as comfortable programming with the LASAL SAFETY Designer. This contributes to increasing the efficiency of your machine.

FUNCTIONAL SAFETY
The S-DIAS Safety systems can be seamlessly integrated into the SIGMATEK system architecture. Safe 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 use in the most diverse applications and industries. 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.

Hardware components form the basis of SIGMATEK Safety solutions. They constantly monitor Safety signals to detect possible errors and put the machine in a safe state if necessary. 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

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**ONE BUS FOR STANDARD & SAFETY OR 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 e.g. via WLAN. The Safety systems can be flexibly distributed in the VARAN network. 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 hardware components of the Safety system have a safe core provided by their two-channel construction. 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.

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With Safety Hot Swap, modular machines and system units with emergency stop function can be flexibly grouped and modified.
INTEGRATED 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 simply create the logical connections of Safety-oriented processes. For this purpose, certified standard and Safety function blocks based on the PLCopen standard are available. Examples of these 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.

SAFE DRIVE TECHNOLOGY

In Safety technology, highly dynamic motion control applications require extremely fast reaction times to prevent uncontrolled movements if an error occurs. In the various DIAS Drives series, essential Safety functions such as Safe Stop 1 (SS1), Safe Torque Off (STO) or Save Brake Control (SBC) are already integrated (SIL 3, PL e, Cat. 4).
Flexible and modular machine structures smooth the way to the smart factory. Perfect networking between all components and function units also plays 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 network 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 realized with VARAN.

**PERFORMANCE DATA**

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<table>
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<tr>
<td>Bus cycle times</td>
<td>&lt; 100 µs</td>
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<tr>
<td>Jitter</td>
<td>&lt; 100 ns</td>
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<tr>
<td>1-byte r/w</td>
<td>2.18 µs</td>
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<tr>
<td>16-byte r/w (1 Drive)</td>
<td>5.05 µs</td>
</tr>
<tr>
<td>Asynchronous direct access</td>
<td>128-byte r/w</td>
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**PRECISION IN HARD REAL TIME**

The VARAN bus is based on standard Ethernet physics. The 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 µs and jitter under 100 ns. To perfectly integrate available networks, TCP/IP packets are tunneled.
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 used in the VARAN bus are a maximum payload 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. Non-confirmed 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.

The VARAN bus organizes itself 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 you with a high degree of flexibility – also with later expansion of a machine or system.

On a higher level of abstraction, entire production lines can be divided into individual machine modules, which are each automated with a separate control. The various controls of a production line can be automatically synchronized using the multi-manager structure from VARAN. Data is exchanged between the machine modules, as in every network segment, in hard real time with minimal jitter.

Thanks to the Hot-Plug capability, entire machine components for example, can also be later integrated in or removed from the VARAN network even during operation.
INTEGRATED
One network for the entire machine

HARD REAL TIME
Cycle times under 100 µs

SAFE
Error correction within the same bus cycle

FLEXIBLE
Various network topologies

OPEN
and manufacturer-independent

VARAN SPEAKS SAFETY
VARAN provides the possibility to transmit Safety-oriented data using the Black Channel Principle. The bus system 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, data are coded twice and – together with a timestamp – verified by 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 many of our components. VARAN gateways, which enable the connection of other industrial Ethernet systems such as Profinet, are also available.

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

**ALL-IN-ONE**

LASAL is a highly modern engineering tool that provides all functions for solving automation tasks: PLC programming, visualization, motion control, Safety, service, 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 for modularity and reusability. As in mechanics, where a proven construction is always reused, 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 becomes thereby sustainable.

**GRAPHICAL REPRESENTATION**

Through graphical representation, the clarity of the software 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 shorten the engineering and maintenance times.

**THE FUTURE IN SIGHT**

LASAL can be used on the entire SIGMATEK product palette. The hardware platform can be changed without having to adapt the software. With a view to Industry 4.0, LASAL supports the OPC UA communications protocol. This allows for manufacturer- and platform-independent data exchange.

**READY-TO-USE**

Fast to the software thanks to preconstructed templates as well as ready-to-use and tested add-ons.
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, sequential function chart or in ANSI-C. Ready-to-use application components (classes) reduce engineering enormously: "Program less – simply configure".

With the LASAL SCREEN Editor or the LASAL VISUDesigner, the visualization of your application can be easily created in the corporate design of your company. When creating your project, you can take advantage of design themes and an extensive graphic library. Complex programming is unnecessary. The new LASAL VISUDesigner enables hardware-independent visualization solutions on various HMI devices using current web technology, such as HTML5, CSS3 and JavaScript. Since the optic and logic of the controls are separated, flexibility is increased.

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

LASAL is completed 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.

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.
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 Hotline**
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 who 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 initial start-up, on-site service support or in case 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 first hand. 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 high depth of productivity comes into play.
HIGHLY MODERN AUTOMATION increases the productivity of your machine and makes it more flexible. SHORT DEVELOPMENT TIMES Our experienced team gladly supports you in all phases. INNOVATIVE IDEAS for machine concepts of tomorrow. REDUCE COSTS We make your machine more economic in all areas.

HOT FACTS
Reliable support during the entire product life cycle. Improved engineering processes through an integrated tool. Reusability of software modules. Training and coaching. Fast implementation of technology trends. Creative ideas from our experienced industry experts. Long-term trusting partnerships as the basis for innovations.

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

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