SIGMATEK

LASAL ENGINEERING TOOL

EN

CONTENTS

For modern machine manufacturing, clearly constructed and modular software is an essential factor for success.

ALL-IN-ONE

Modularity and reusability are cornerstones for efficient and flexible application development. These properties allow you to quickly program and configure customer-specific machine software.

The object-oriented engineering suite LASAL from SIGMATEK provides you with exactly this simple reusability of modularly constructed application code and the flexibility that comes with it. LASAL unifies all automation tasks on one platform and contributes to significantly reduce development times and time-to-market.

The consistent engineering tool provides clarity and simplifies the handling of modular machine and system concepts. A factor that is increasingly important in the era of the „Internet of Things“. LASAL also supports platform and manufacturer-independent data exchange via OPC UA.

ENGINEERING TOOL LASAL

ONE TOOL FOR ALL AUTOMATION TASKS

LASAL CLASS

Object-oriented programming with graphic representation

LASAL VISU

LASAL SCREEN

Visualization fast and simple

LASAL MOTION

For regulation and control tasks in drive technology

LASAL SAFETY

Safety programming and configuration

LASAL SERVICE

Tools for remote maintenance, simulation, software updates, data exchange

The modern, consistent engineering environment expands the IEC 61131-3 standard with object-oriented programming (OOP) and graphic representation. LASAL enables the modularization of machine functions in the software and therewith mechatronic engineering.

In mechanics, proven constructions are often reused. Thanks to the modular structure of OOP, existing and tested application modules can also be easily reused. The software machine functions (objects) can be assembled in a toolkit system and simply „wired". New characteristics of machine components can therefore be implemented with minimum programming. Creating applications is thereby accelerated.

Parts of an application (machine functions) can be modularly assembled and easily tested. Once created, they can always be reused.

MODULAR AND FLEXIBLE THROUGH OOP

The advantage of OOP is its consistent modularity from the lowest level of the individual functions upwards to the complete project. Machine functions can be developed, tested, added, exchanged – individually or in groups. And when not used, an option can be hidden.

HOT FACTS

CONSISTENT DEVELOPMENT
All automation tasks unified in one software environment

MODULAR OBJECTS
that can be flexibly applied and reused

CLARITY
via graphic representation and efficient extras like the Machine Manager

SUSTAINABLE CODE
through the use of tested encapsulated function blocks with clear interfaces outward

CLEARLY AND QUICKLY TO THE APPLICATION SOFTWARE

Graphic representation of the software components in LASAL encapsulates the complexity of the project and enables clear structuring of the software.

Application Modules Ready-to-use

The motto is „Program less – just configure“. In extensive libraries, tested function components (classes) are available. In addition, ready-to-use application modules called „Add-Ons“ are provided. This simplifies engineering enormously.

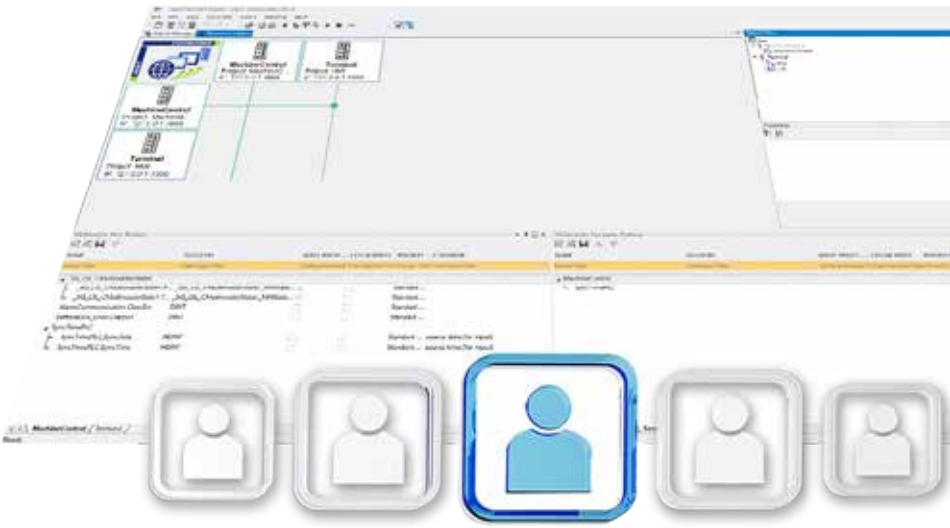
Comfortable Debugging

The rapid development and comprehensive analysis of programs is possible with the integrated debugging tools, such as setting breakpoints, online diagnosis in the network, value changes directly in the network, sending entire command chains with parameters or the first diagnosis without confrontation with code.

MACHINE MANAGER: FOR DISTRIBUTED INTELLIGENCES

Using the Industry 4.0 and Smart Factories approach, small mechatronic units with their own processing intelligence are networked with one another in a flexible complete system. The LASAL Machine Manager enables the clear display of individual software projects. It also regulates the communication between distributed intelligences in a multi-CPU solution: Who can exchange which data with whom? The system configuration can therewith be customized and expanded at any time with optional function units (e.g. handling robots).

The LASAL Machine Manager has the data flow for multi-CPU concepts well in hand.

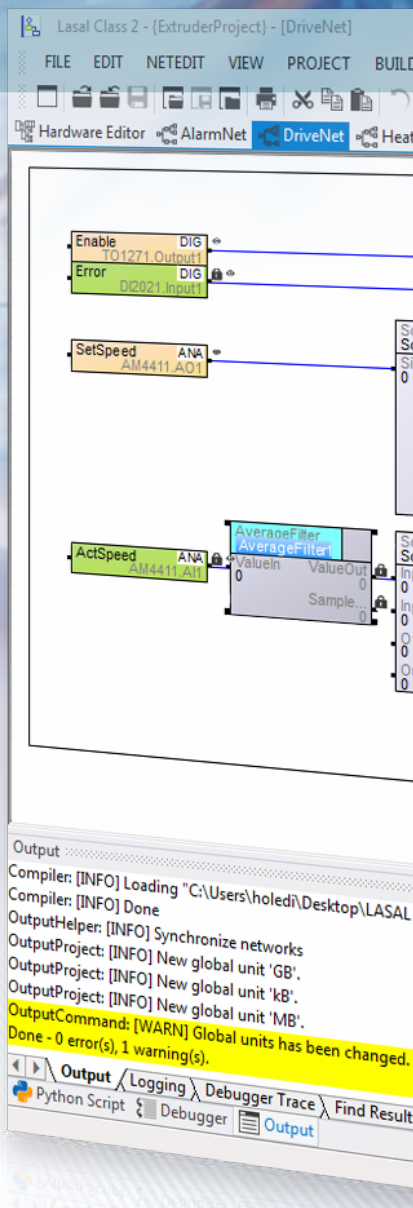


OPC UA

LASAL supports the OPC UA communications protocol. Standardized, manufacturer and platform-independent data exchange in a future-oriented intelligent control network of machines and systems can thus be easily implemented.

LASAL CLASS

PROGRAM CONTROLS WITH OBJECT ORIENTATION



With LASAL CLASS, object-oriented programming is child's play. A consistent operating concept, graphic representation and ready-to-use function modules bring you quickly to your goal – whether the control task is simple or complex.

With LASAL, user-friendliness is the focal point. You can use the advantages of object-oriented programming, such as modularity and simple reusability, without having to come into contact with the complex syntax. The code reads like conventional structured text and you can therefore concentrate on the implementation of the methods (functions). That saves a lot of time and worry.

WORK WITH OBJECTS

With object-oriented programming, the various components of a machine or system are represented in the form of objects. Behind each object, is a class. It is the blueprint of the object and defines the program code and the corresponding data elements. Each class can assume a specific task, for example, measuring and evaluating a temperature, regulation of a valve or controlling a conveyor belt. The classes defined by the programmer are stored in clearly organized libraries.

AN OVERVIEW OF EVERYTHING

Graphic representation provides operator ergonomics with object-oriented programming with LASAL. Using drag & drop, a class is integrated into the object network from the project tree. An instanced, real object is therewith constructed. The objects need only be connected to one another and an application is generated. LASAL CLASS creates all declarations and function bodies automatically. Through graphic representation, you get a complete overview of the project at a glance: the functions, the relation between objects, the data traffic and the interfaces. Complex relationships are therefore more transparent and easier to check or change.

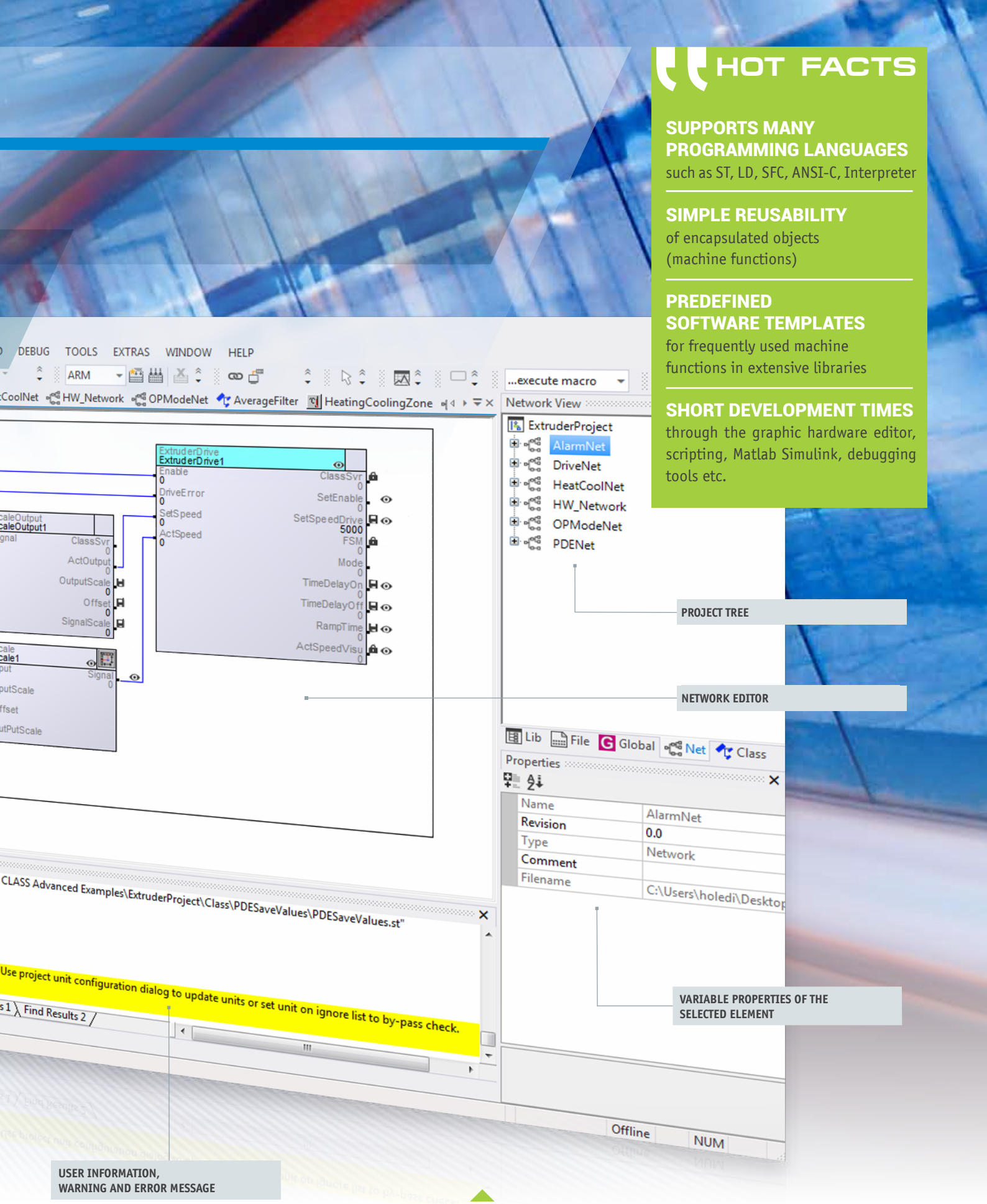
HOT FACTS

SUPPORTS MANY PROGRAMMING LANGUAGES
such as ST, LD, SFC, ANSI-C, Interpreter

SIMPLE REUSABILITY
of encapsulated objects (machine functions)

PREDEFINED SOFTWARE TEMPLATES
for frequently used machine functions in extensive libraries

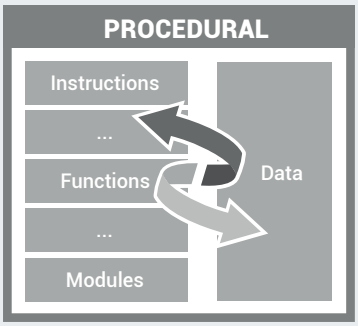
SHORT DEVELOPMENT TIMES
through the graphic hardware editor, scripting, Matlab Simulink, debugging tools etc.



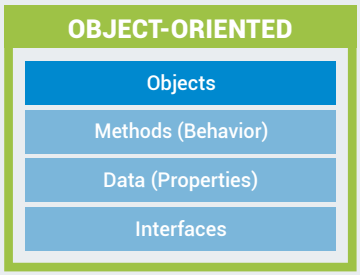
Clear: the objects and their relationships are graphically displayed in the object network.

OBJECT-ORIENTED INSTEAD OF PROCEDURAL

In pure procedural programming, data or variables are managed separately from code. The missing definition, such as how the interaction between code and data is processed can lead to defective programs.



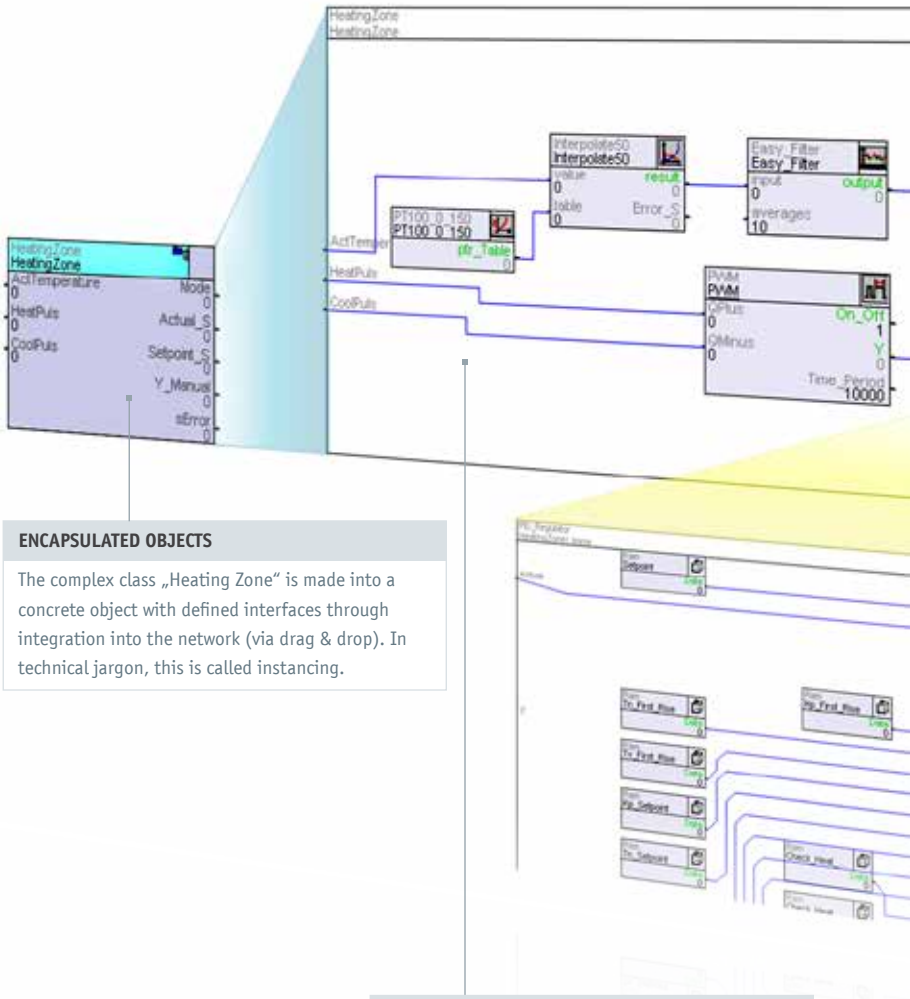
With object-oriented programming (OOP), code and data are combined into logical units and shielded from the outside world, so that unwanted influences are prevented.



Thanks to OOP, sloppily implemented programs with variables written randomly throughout the project making it impossible to predict the effects of a change, are a thing of the past. The variable can only be manipulated via the corresponding method. Clear interfaces are therewith predefined.

INHERITANCE AND AGGREGATION MINIMIZE PROGRAMMING

Using inheritance, an object class can be duplicated and refined or specialized. Inheritance describes a relationship between a general class (base class) and a derived class. A derived class inherits the properties of the base class, but can be modified or expanded with additional information such as attributes or operations. Through aggregation (grouping), individual classes can be combined into a complex class. Tested classes can be clearly stored in libraries and combined into complex program structures using the toolkit principle.

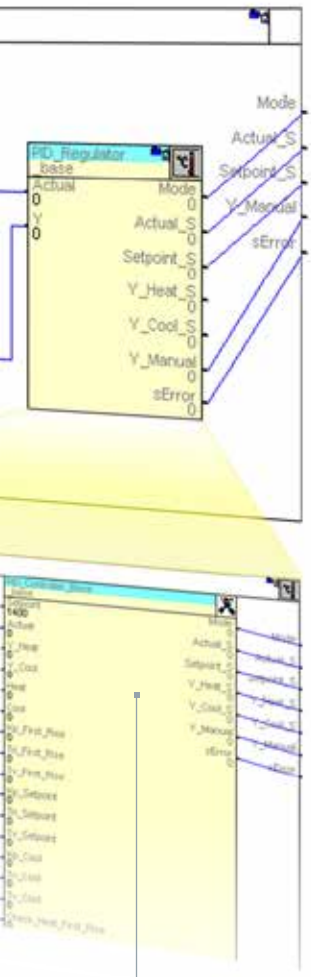


ENCAPSULATED OBJECTS

The complex class „Heating Zone“ is made into a concrete object with defined interfaces through integration into the network (via drag & drop). In technical jargon, this is called instancing.

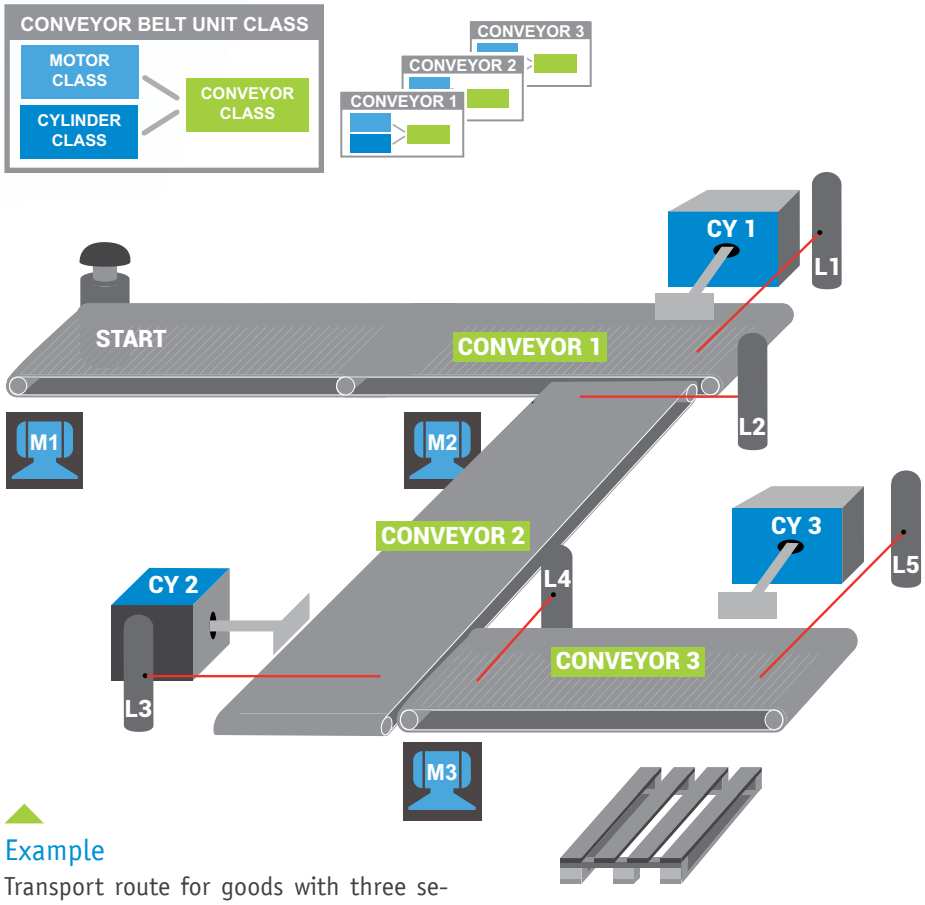
COMPLEX CLASS

The interior of the complex class „Heating Zone“ consists of the base class „PID Regulator“, which via aggregation (grouping), is made into a complex class with additional classes.



BASE CLASS

The base class „PID Regulator“ can also be a complex class. When the base class is changed and expanded, this is called „derivation“.



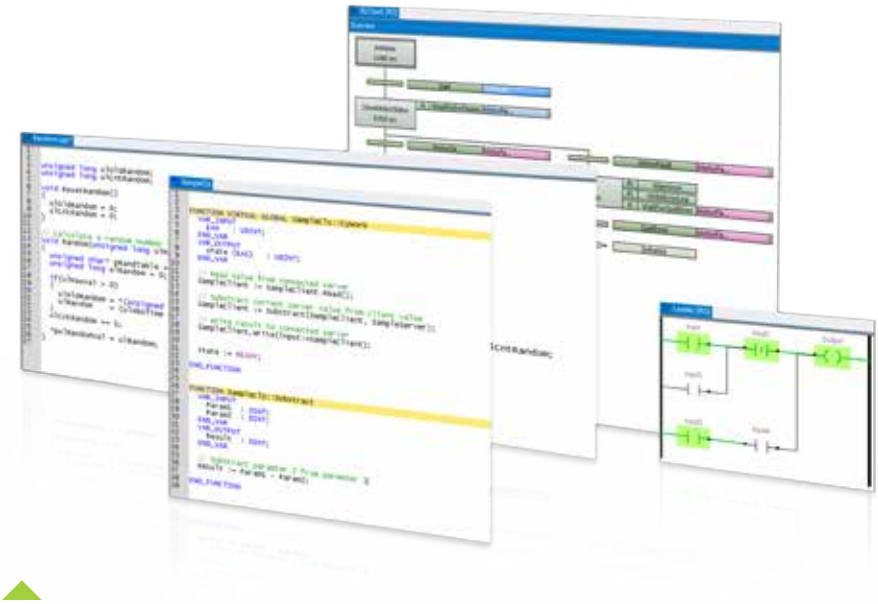
Example

Transport route for goods with three sequential conveyor belts: each conveyor belt is driven by a motor, which has start and stop conditions and a cylinder at the end that pushes the package further. Three classes are therefore modeled: motor and cylinder control, as well as conveyor belt (start/stop conditions). Through aggregation (grouping), a complex class „Conveyor Belt Unit“ can be created from these three classes.

OOP INSIDE

With the techniques „inheritance“, „derivation“ and „aggregation“, it is possible to implement new versions of machine components with minimum programming.

OBJECT-ORIENTED PROGRAMMING IN FAMILIAR LANGUAGES



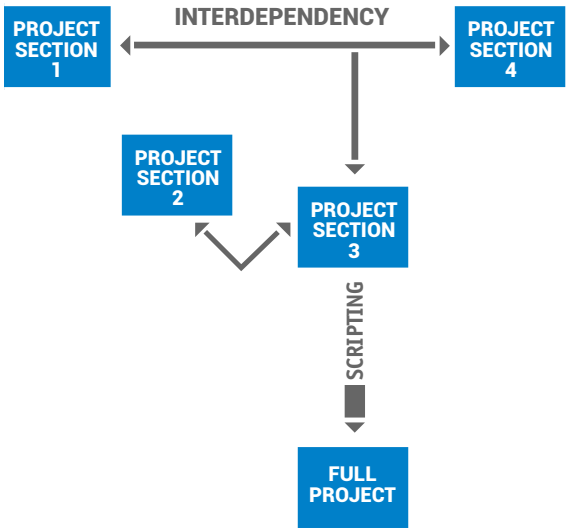
Whether ST, LD, SFC, IL or ANSI-C – you can program in the language that you are familiar with.

With LASAL, the actual program code of an object is implemented in the conventional program languages: structured text (ST), ladder diagram (LD), graphic sequential function chart (SFC) and instruction list (IL) – all four in compliance with the IEC 61131-3 norm – as well as ANSI-C and interpreter. The object-oriented programming methods are therefore available as an integrated extension of the trusted languages.

LASAL Supports Matlab Simulink

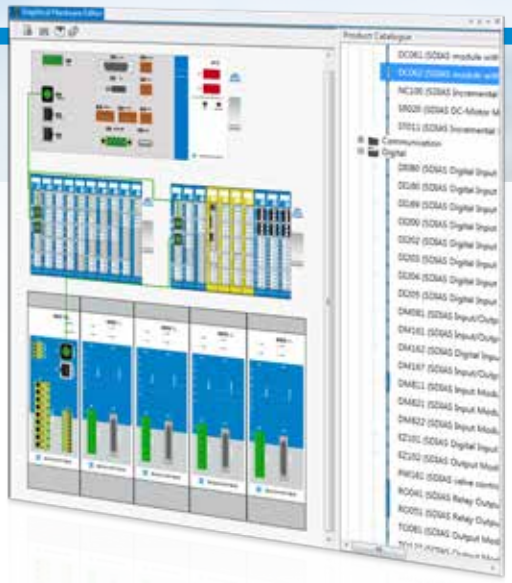
In Matlab Simulink, existing C code models can be directly inserted into LASAL. During import into the engineering tool, the C code is packed into a class automatically. Input and return values are defined by the user; LASAL generates the code automatically. Possible changes in the model can be made in Matlab Simulink and re-imported into the LASAL project with the push of a button.

SOFTWARE DEVELOPED IN A TEAM

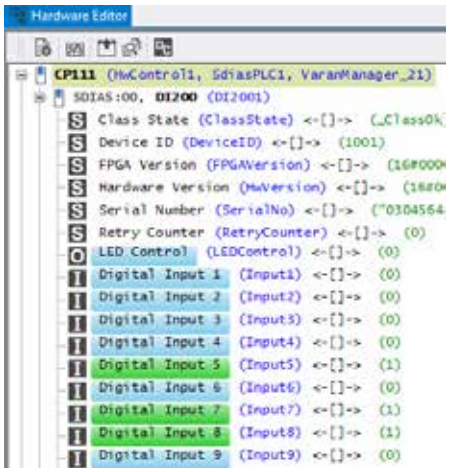


The source code files in LASAL are not managed in data bases. Instead, they are stored in a folder structure as pure text files (file system). This allows a simple connection to version management systems.

The version management allows multi-project and multi-user project structures for working in larger engineering teams: modules or program components can be developed separately and then combined into a complete whole. This increases the flexibility and the time-to-market cycles are shortened.



The graphical hardware editor provides great clarity for project development.



Diagnostic statements can be made with the hardware editor during active operation. Via the colored background, whether modules are in error status is visible at a glance. The online diagnosis is even possible up to the individual I/O points.

HARDWARE EDITOR SIMPLIFIES I/O PROJECTS AND DIAGNOSTICS

The hardware editor is a comfortable tool, which significantly reduces the development and programming time of applications. In addition to the tree display, it is also possible in the graphical editor to reproduce the hardware components analogous to the real control cabinet configuration. This enables simple and efficient project design, parameterization and diagnosis of the hardware elements connected to the control, such as I/Os, interfaces or drives for example. In addition to the hardware, the topology of the bus structures can be well represented with the graphical editor.

Finding and inserting a module is comfortably solved in the hardware editor. Possible control configurations can be run realistically. While comparing the configuration in the LASAL project with the actual hardware in the control, possible deviations are identified.

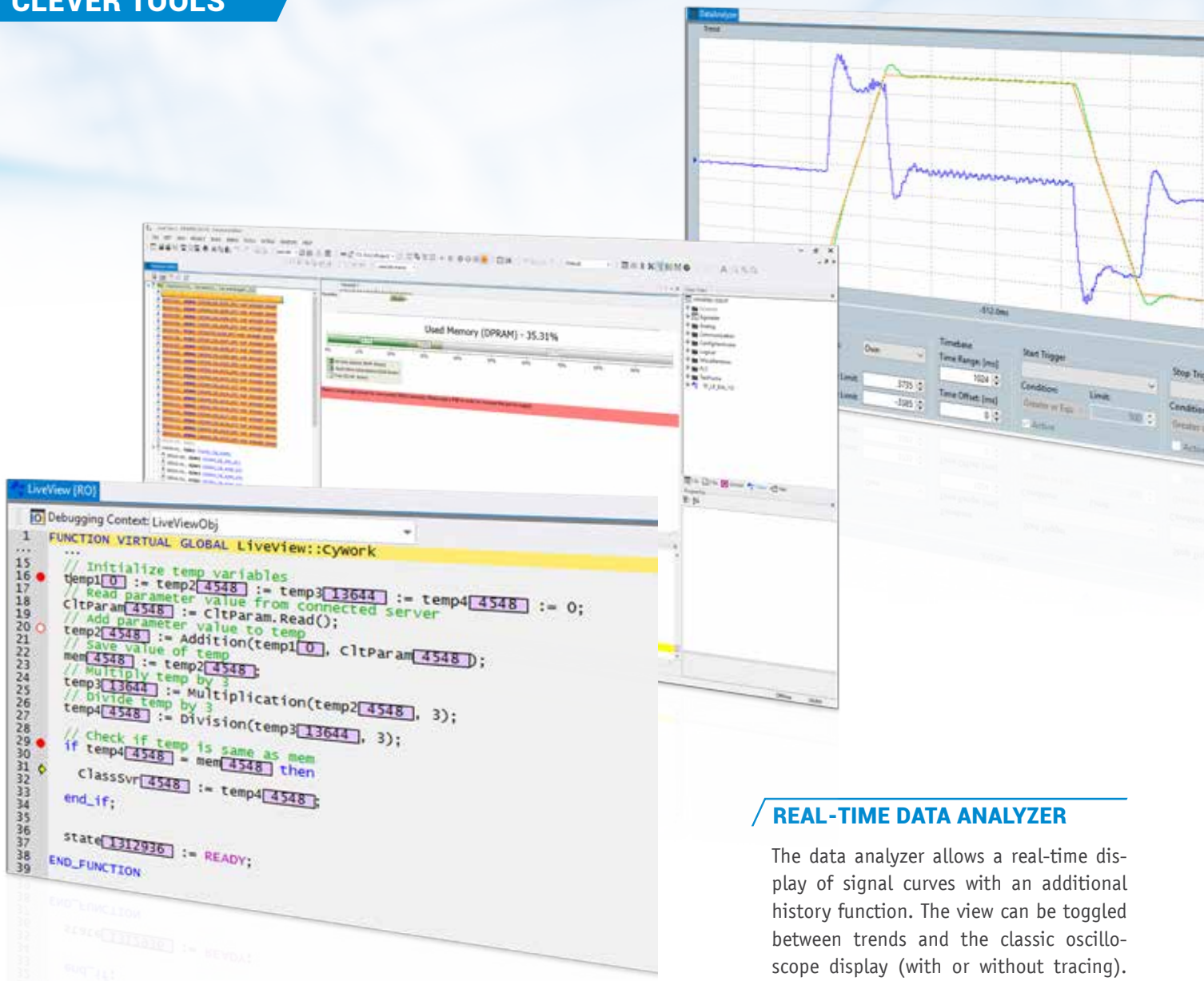
CONTROLLED COMMUNICATION

The communication between the objects is based on client-server technology. This means that the client requests a service, which is provided or processed by the connected server. Read and write instructions are sent over ONE connection. Through this event control, a program component is only then active when it is „initiated“. Unlike conventional systems, the CPU load can be considerably optimized.

Everything Under Control

The real-time operating system maintains control over the tasks to process and ensures that all objects are processed exactly within the specified time slot. The user is also provided with three different task priorities: Real-time, Cyclic and Background.

CLEVER TOOLS



REAL-TIME DATA ANALYZER

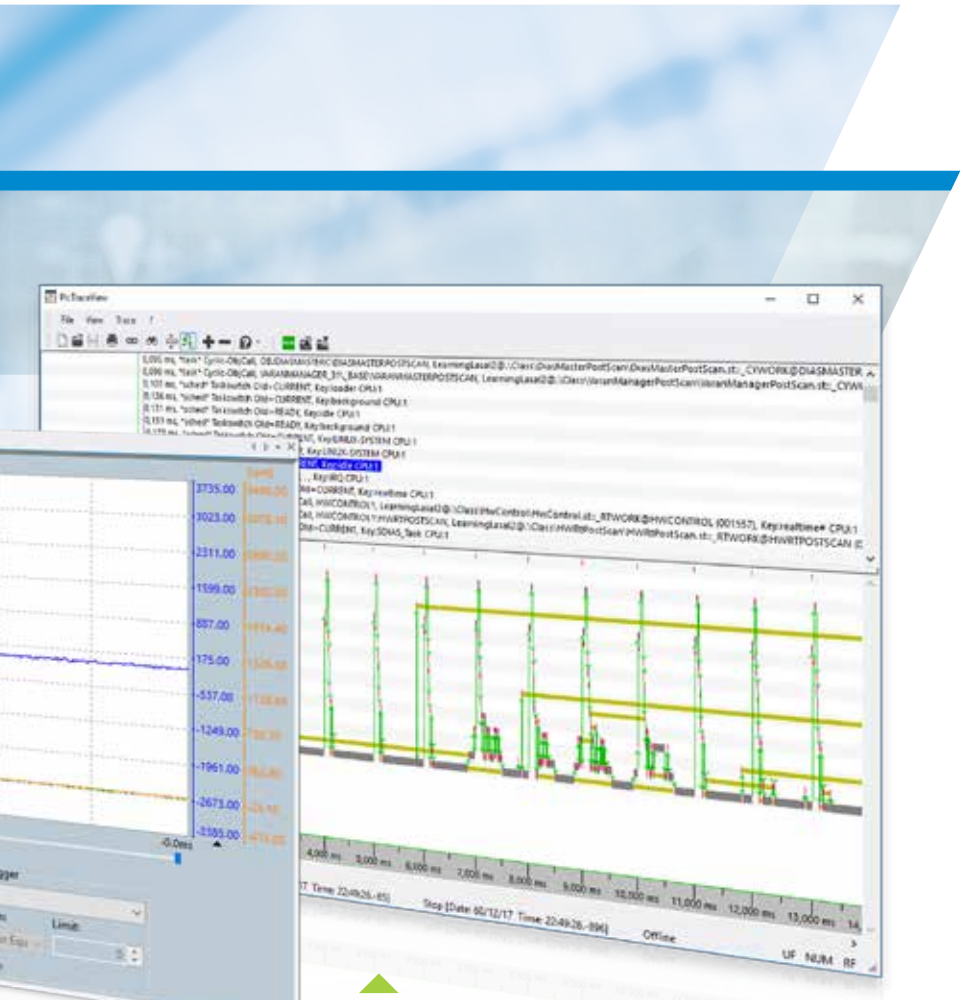
The data analyzer allows a real-time display of signal curves with an additional history function. The view can be toggled between trends and the classic oscilloscope display (with or without tracing). Individual bits can also be recorded from bit fields. Start and stop triggers can also be set and a hold function is integrated.

ONLINE DEBUGGER

With the online debugger, functions such as setting breakpoints and conditional breakpoints, scan counters, single-step processing and forcing are provided. Possible program errors can therewith be found quickly.

RESOURCE CALCULATION

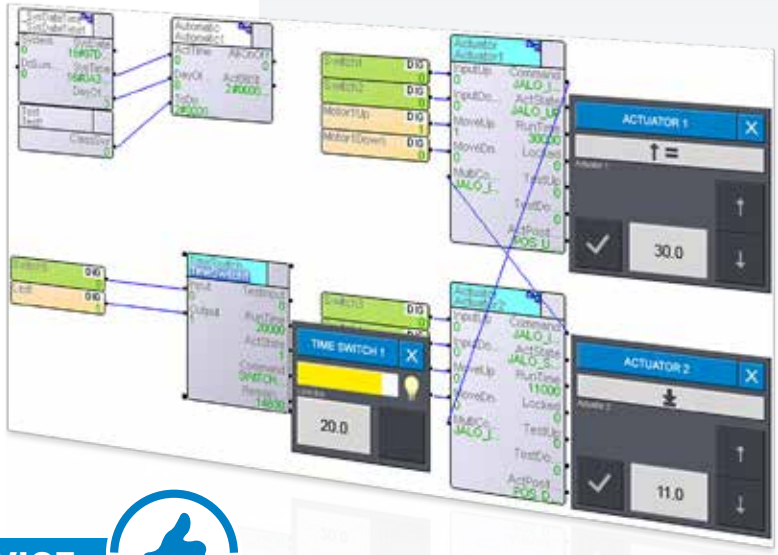
All resources in view: Using the resource calculation for VARAN and S-DIAS modules, consumption data, available memory and total current, including power loss, are clearly displayed.



With the „PLC Trace View“ tool, the time behavior of a project can be recorded. This tool is used to analyze, diagnose or measure the time of the task behavior.

VISUAL OBJECT VIEW

The feature VOV „Visual Object View“ provides the ability to use objects from LASAL SCREEN with all their properties in the programming environment LASAL CLASS. The user can connect visualization objects and the corresponding program code to units. This has the advantage that especially in multi-user project structures, frequently used machine components such as a temperature regulator for example, always look the same – regardless of which software engineer works on the project. With the VOV, system components can be configured offline and visualized or tested over an online connection. Predefined VOV files such as initial start-up or parametrization of axes, controllers and timers can be integrated or edited. Naturally new, individual VOV elements can be created easily and quickly.



ADVANCED DEBUGGING TOOLS

LASAL provides comfortable tools for online diagnostics and testing.

- File Commander
  File operations to/from the control
- RAM Image
  Save/restore remnant data
- PLC Trace View
  Recording of a project’s time response
- PLC Backup & Restore
  Save/restore files and remnant data in the control

LASAL SERVICE

Whether cross-platform data exchange, simulation, loading software updates or worldwide remote access for diagnostics and maintenance – the LASAL SERVICE tools make your life easier: see page 30.

SAVE DEVELOPMENT TIME WITH TEMPLATES & ADD-ONS

„Less programming – more configuring“ is the recipe for success of modern engineering tools like LASAL. You are supported in the implementation of your machine or system software with ready-to-use software and tested function components, which cover a broad range of machines.

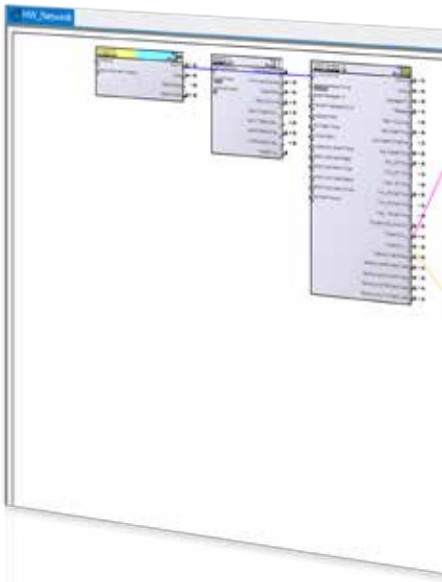
Templates

The extensive LASAL libraries contain for example, function components such as PID regulator, temperature monitoring, complex filter and regulation algorithms, various motion modules and robot kinematics or communication protocols such as Modbus TCP.

Add-Ons

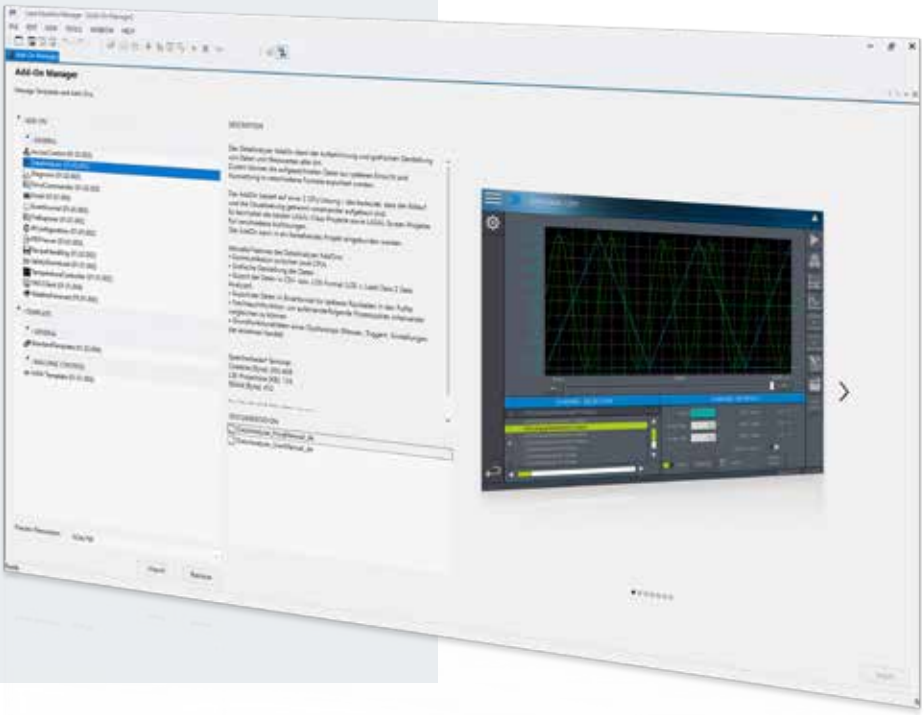
In the LASAL Machine Manager Add-Ons are also available that in addition to the finished sequential control project, also contain the appropriate visualization. Examples thereof are user and recipe management, event journal or data analyzer.

Function components and Add-Ons 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 of up to 70 percent.

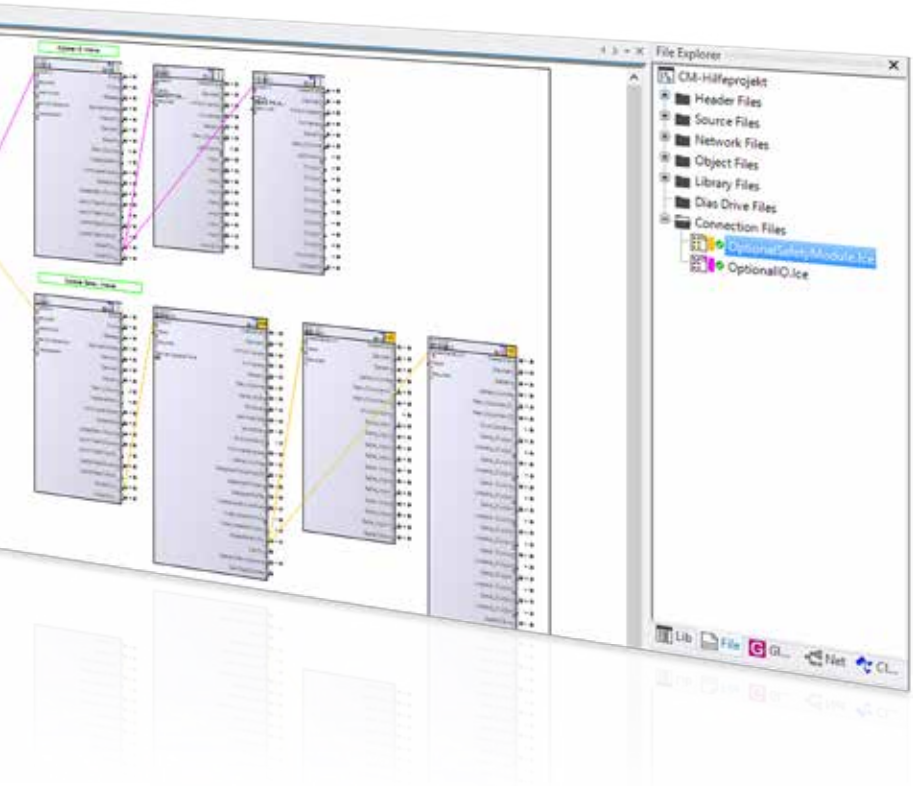


EXAMPLES OF READY-TO-USE TEMPLATES & ADD-ONS

- Control Modules
  PID regulator, operating mode manager, filter algorithm
- Access Control
  Login function and implementation of access authorizations, recipe management
- Data Analyzer
  Oscilloscope for recording multiple channels
- Communication
  OPC UA, VNC
- Robot Kinematics
  Delta, SCARA, portal
- Industry-specific Templates
  Synchronous feed, pick & place, print mark detection, unwinding, separating and grouping



SOFTWARE VARIANTS WITH A BUTTON PUSH



1 PROGRAM – ANY NUMBER OF VARIATIONS

Starting with a base project, different variations of an application can be managed in one project with the variant editor.

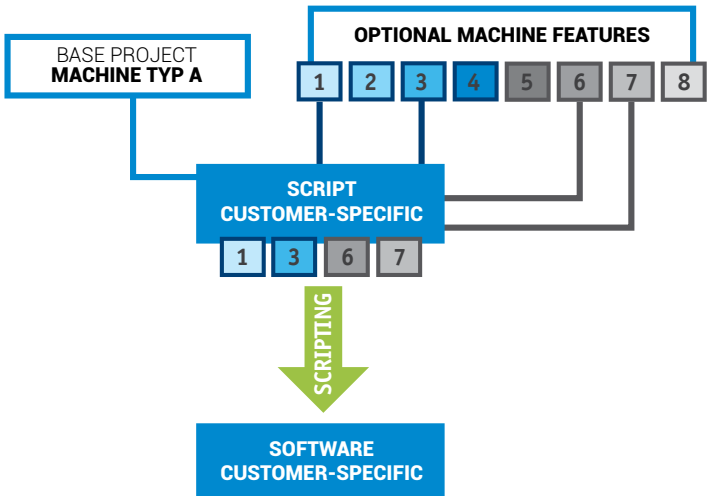
With a simple mouse click, variants can be activated or deactivated. Changeable for example are connections, I/O assignments or initialization values. The relationships between the individual objects can be configured as desired via so-called connection files. Since each variant is an independent file, recompiling is unnecessary. The active configuration need only be loaded into the control.

SCRIPTING: AUTOMATICALLY CREATE PROGRAMS

Based on the encapsulated software component of the OOP, various machine configurations can be easily modeled from a base project. The corresponding software can be automatically generated using the scripting language Python. Similar to the generation of parts lists, the program for the specific machine or system can be generated with the push of a button via scripting.

Example

A customer orders the base type A of a machine. With this type A, he would like to have the optional functions 1, 3, 6 and 7. The application software for this specific machine can be created fully automatically, without requiring the software engineer to manually change a program line. For this purpose, the library containing predefined classes is accessed, which contains all different modules. Starting with the basic program, the specific modules are selected for type A, the desired special functions for the options then added and the fitting application program generated with the push of a button.



HOT FACTS

SIMPLY CONFIGURE
Short development times with configuring instead of programming

QUICKLY READY-TO-USE
Thanks to the extensive graphic library, design templates, predefined controls and Add-Ons

CLARITY
Manage any number of languages in a project; text lists for translation purposes

PRACTICAL FEATURES
Alarm, events and file management, recipe management, etc.

LASAL HMI TOOLS

USER-FRIENDLY VISUALIZATION

Operating and monitoring are essential components of every automation task. With LASAL SCREEN and the web-based LASAL VISUDesigner, comfortable tools for hardware-independent visualization design are provided.

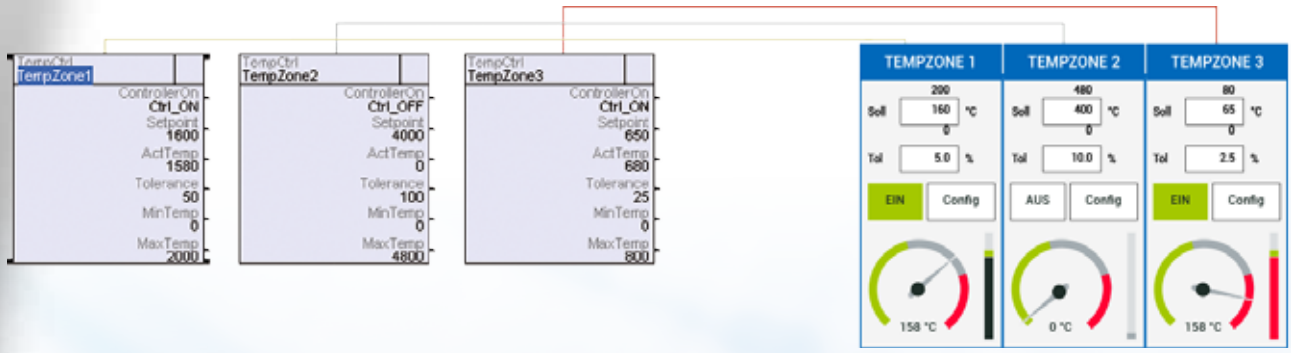
SIMPLE – WITHOUT PROGRAMMING KNOW-HOW

Easily implement complex structures – with the modern LASAL HMI tools, intuitively create operator interfaces through pure configuration. Programming knowledge is not required. The user defines the variables available for the visualization in LASAL CLASS. A LASAL SCREEN or LASAL VISUDesigner project can visualize data from multiple LASAL CLASS projects.

GRAPHIC COMPONENTS

The advantage of object orientation can also be used in the visualization. The LASAL HMI tools provide the options, as in LASAL CLASS, to assemble complex "graphic components" via grouping. Each of these graphic components can be linked with an object in LASAL CLASS.

Individually created components can be placed, scaled as desired and referenced to a corresponding LASAL CLASS object. The display and operation of a temperature regulation zone, for example, is defined only once and then reused for any number of regulation zones.



FLEXIBLE IMAGE DESIGNS

With LASAL SCREEN and the LASAL VISUDesigner, you can easily create the visualization of your application in the corporate design of your company. For project development, modern design templates and a large graphic library are available. In addition, it is also possible to import existing or self-defined graphics (bmp and jpg). Through the definition of a global image and the individual images derived there from, the project development time can be significantly reduced.

Many Features Available

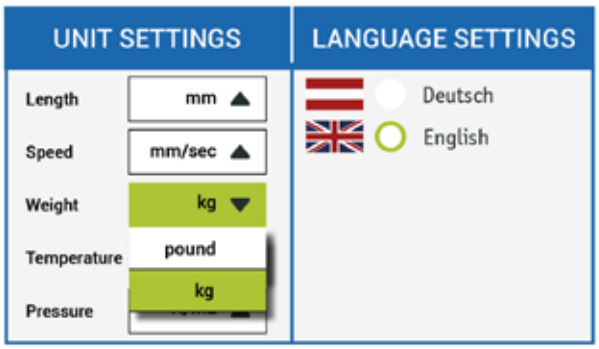
In addition to numerous input and display elements, the HMI tools offer the user a variety of functions such as alarm management, event logbook, trend display, bar diagrams, recipe management etc.

Content and layout are separate from one another and can be easily changed and reused.

CLEVERLY CONVERT LANGUAGE AND UNITS

LASAL SCREEN and the LASAL VISUDesigner can manage any number of languages in one project. Text information is entered in the form of ASCII or Unicode. Individual languages from one project can be reinstalled separately via text lists into an existing machine.

Text lists can be switched in online mode, whereby the units of measurement can be changed. For example, the length in „mm“ is automatically converted to „inches“. The programmer does not have to worry about unit conversion in LASAL CLASS, as all system values are available in the LASAL base unit.



CLEAR TEXT MANAGEMENT

To integrate the appropriate label onto graphic elements, text lists are provided. Any number of lists with individual names can be created. Each text list can be exported separately, edited – for translation into a different language for example – and reimported into the project. The reusability, clarity and simple handling of the texts are thereby increased.

LASAL SCREEN

COMFORTABLE VISUALIZATION DESIGN

HOT FACTS

PRACTICAL
Easy export and import of project components and graphics

VISUALIZATION UNDER WINDOWS
Link to Microsoft Office, e-mail etc.

COMFORTABEL
Several standard graphic functions, integrated designs, an extensive graphics library and Add-Ons

To implement various visualization tasks quickly and easily, with LASAL SCREEN a user-friendly HMI tool is provided.

With LASAL SCREEN, creating a visualization is child's play. For project development, integrated designs and a large graphic pool (library) are available. Complicated programming is eliminated.

Project components such as images, text lists or variables can also be exported and imported with LASAL SCREEN. In addition, user-defined libraries with reusable elements can be created.

VISUALIZATION UNDER WINDOWS

With the DotNetKernel, or „Kernel" in short, the user can visualize individual machine data under Windows. The visualization project created in LASAL SCREEN is interpreted in the Kernel and displayed.

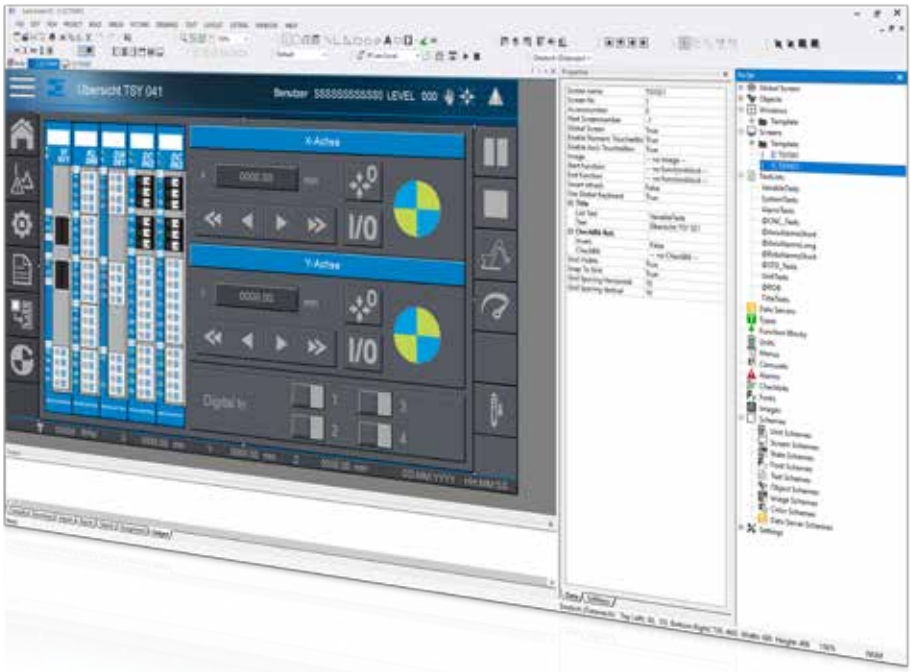
All visualization elements integrated into the LASAL SCREEN editor are supported by the DotNetKernel. Additionally, the entire scope of the Microsoft .NET framework is also available. The integration of user-defined elements, as well as the connection to networks, data banks, Internet, MS Office, e-mail etc. is thereby simplified. The DotNetKernel is based on the .NET framework 3.5 and is implemented in C# using the graphic framework WPF (Windows Presentation Form).

USER-DEFINED GRAPHIC AREA „MYIO"

With „MyIO", the user can specify screen areas in which self-defined visualization elements such as special diagrams can be comfortably integrated. The programmer is thereby supported with completed interfaces – e.g. touch events, redraw method.

QUICKLY READY-TO-USE WITH LASAL ADD-ONS

Application templates are available, which in addition to the finished process control project, also contain the correct visualization. An example of this is login functions and access authorizations, event journal or an oscilloscope for recording multiple channels.



LASAL VISUDesigner

WEB VISUALIZATION 4.0 – OPEN FOR ANYTHING

With the web-based HMI tool, modern platform-independent operating concepts can be created through simple configuration. At the same time, HTML5 specialists have maximum freedom to individualize.

HTML5, CSS3 (Cascading Style Sheets) and JavaScript – the LASAL VISUDesigner is based on current web standards. Modern web technologies enable new operating concepts for efficient and intuitive operation of machines and systems. Using the »svg« file format, (scalable vector graphic), graphic elements can be simply adapted to different screen formats and visualization solutions with variants for diverse target devices easily created.

High-Performance

To date, web visualization in automation has lacked performance. Thanks to the optimized HTML5 browser, the LASAL VISUDesigner enables dynamic visualization that runs fluidly even on smaller processors. Multi-touch interactions are also supported, as is the transfer of process data via OPC UA. Controls from third-party manufacturers can therefore be easily integrated into a smart machine network.

TOOLBOX

- Operating elements can be placed via Drag & Drop
- Extensive library of predefined display and control elements: Buttons, sliders, menus, as well as frequently required functions

USER INFORMATION, WARNING AND ERROR MESSAGE

HOT FACTS

WEB BASED
Hardware-independent visualizations based on HTML5, CSS3, JavaScript

STRONG PERFORMING
Optimized browser ensures fluid visualization concepts even on less powerful hardware

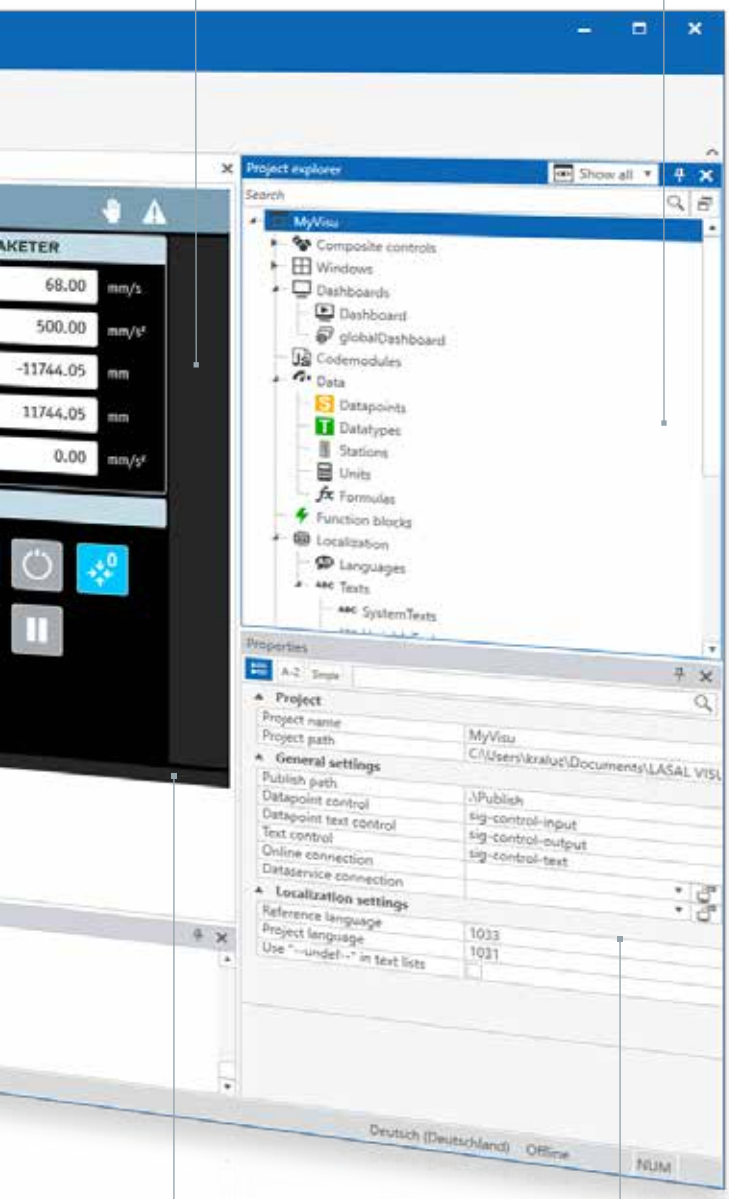
OPEN SOURCE CONTROLS
Many options for individualization and reuse

ONLINE PREVIEW
Test operating concepts directly in the tool

WYSIWYG - WHAT YOU SEE IS WHAT YOU GET

The graphical editor follows the »What you see is what you get« principle. Already during editing, the developer sees the screen mask as it will later appear on the selected target device.

PROJECT TREE



ONLINE / OFFLINE PREVIEW

Via the online preview, the operating concept can be tested since the complete visualization can run over the network connection with the actual machine without an HMI.

VARIABLE PROPERTIES OF THE SELECTED ELEMENT

Content and Logic Separate

Content and layout of the operating surface are in the VISUDesigner completely separated. In the graphical editor, elements can be assembled without extensive programming knowledge using puzzle-like elements (function blocks). The advantages of object orientation are also usable in the visualization. Like the graphic elements, the underlying functions can be reused and modified as desired.

Unlimited freedom

Programming and visualization experts have complete freedom to utilize web technologies: Individually designed graphics, controls, animations, videos and audio files can be easily integrated.

The predefined operating elements are largely open source. You are able to simply implement them, but also adapt and modify them as desired. Existing operating elements can be grouped into 'composite controls'. An example thereof would be recipe management assembled from buttons, input fields and a file explorer. User-defined controls are also easily integrated: So in regard to usability and individual design, anything is possible.

The LASAL VISUDesigner supports working in development teams, including source code management and version control.

LASAL MOTION

HIGH PERFORMANCE TOOL FOR DRIVE TECHNOLOGY

LASAL MOTION simplifies the integration of motion control into the machine and system concept. Predefined, hardware-independent motion templates support you in the modular and yet, fully integrated development of your drive design.

The object orientation enables thinking in drive trains and mechatronic units, which can be flexibly combined depending on the application. LASAL MOTION is seamlessly integrated into the PLC programming and project development tool LASAL CLASS. In addition to the performance, the availability of the machine or system thereby increases.

Efficient Motion Control

Axial movements can be executed using simple data inputs or instructions without any programming. In LASAL CLASS, there are predefined parameter sets for the SIGMATEK DIAS drives and motors – that saves a lot of time, since only user-specific data has to be modified. Alternatively, you can of course store individual parameter sets.

SHORT START-UP AND DIAGNOSTIC TIMES

With the „Motion Diagnostic View“, axes can be comfortably parameterized and started. Commands can be quickly sent and troubleshooting is simple. Graphic representation provides operating comfort and clarity. Start-up and diagnosis of the drive components are also reduced significantly.

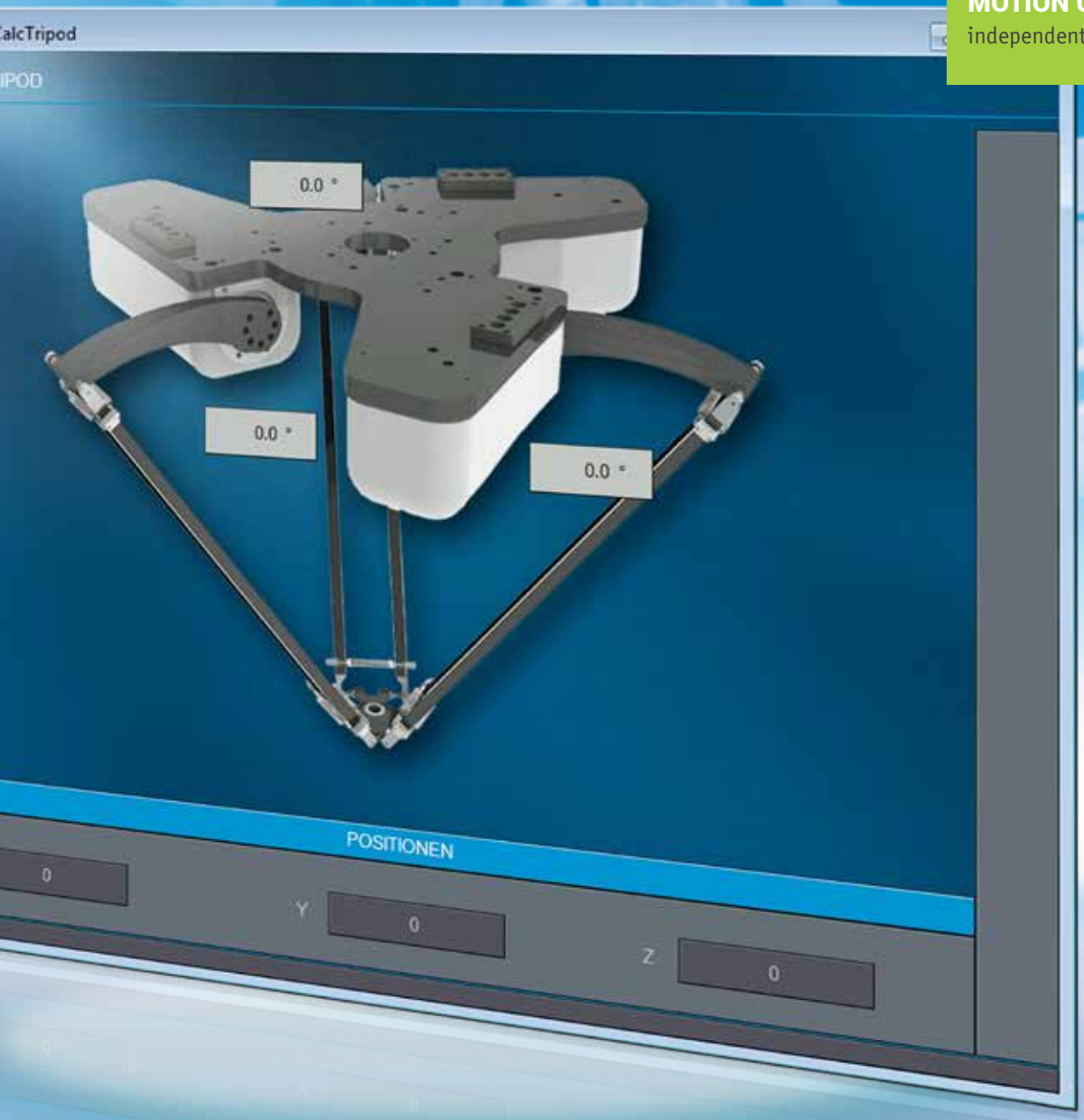
HOT FACTS

AXIS MOVEMENTS
without programming

PLUG & PLAY
Extensive library with motion templates

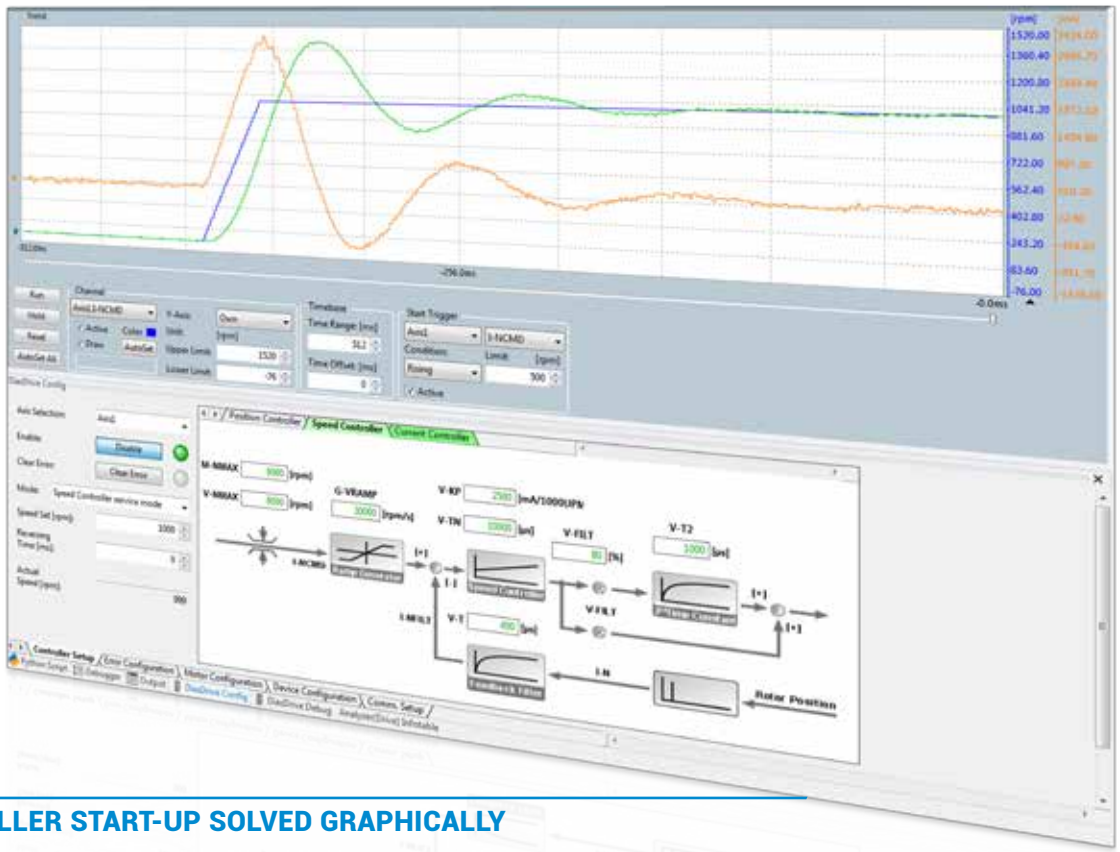
EFFICIENT FEATURES
such as Data Analyzer, Motion Diagnostic View, CAM Designer

MOTION CONTROL
independent of the hardware



INTERNAL DATA ANALYZER

The SIGMATEK DIAS Drives contain an internal data analyzer, with which all configuration and controller data can be collected at a scan rate of up to 62.5 µs. This data is recorded in the converter in real time. With the software tool, they can be displayed in one and the same screen view for analyzing and optimizing the controller behavior.



CONTROLLER START-UP SOLVED GRAPHICALLY

Current, rotation speed and position controller are displayed in the software graphically. All respective control parameters are visible at a glance and can be set individually. The controller can therefore be quickly and easily optimized. The configuration data of the drives are stored in the control system. The drive therefore always has the current parameters and an exchange is possible without effort and a software tool.

READY-TO-USE MOTION OBJECTS AND TEMPLATES

The LASAL MOTION library provides a broad selection of predefined objects and templates for typical motion functions. Motion control tasks can therefore be comfortably implemented, without having to be programed.

The spectrum ranges from simple one to complex multi-axis applications: positioning, cam discs, contouring control with transformations for robot kinematics, CNC functions and synchronization of up to nine axes in a space. Jerk-limited motion profiles or dynamic safety zone monitoring is also included.

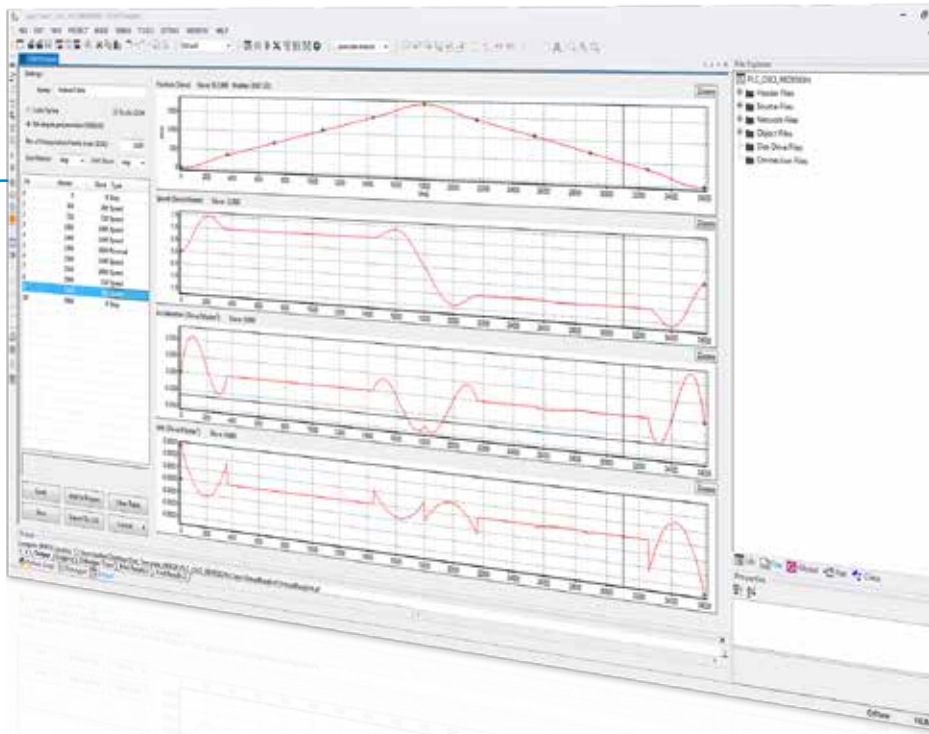
Application technicians can simply integrate the fitting motion components or templates in their project and after setting a few parameters, start the application directly or run a simulation.

SIMULATION

Whether synchronization of axes in a space, CNC code or complex robot kinematics – all motion functions can be easily simulated.

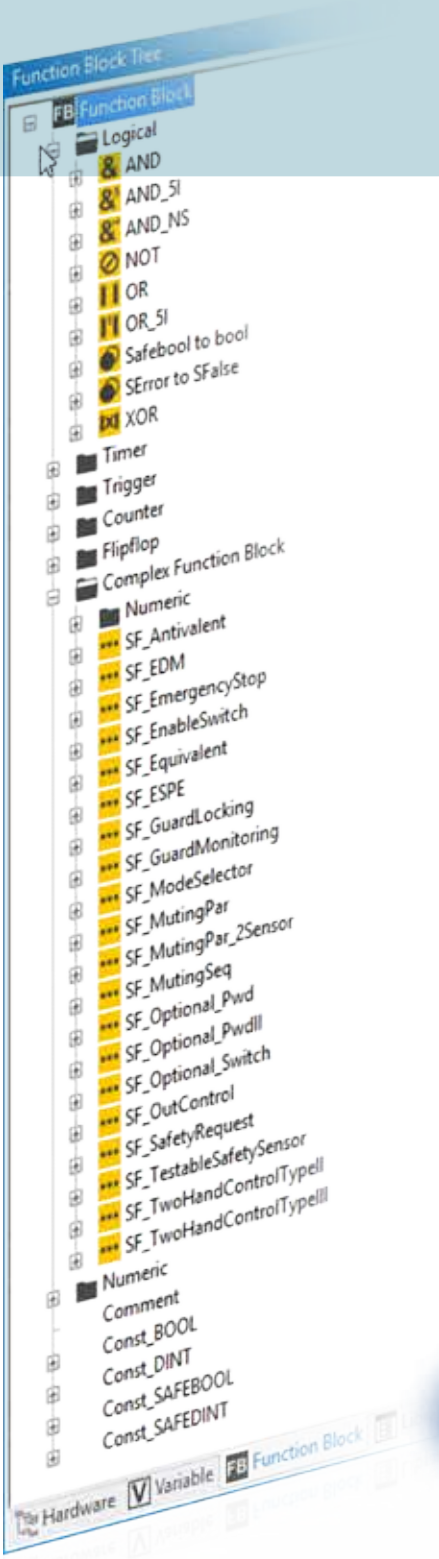
CAM DISC COUPLING WITH THE CAM DESIGNER

With the CAM Designer, calculations for coupling cam discs can be performed comfortably. The user defines master and slave axes as well as the number of interpolation points. Based on this, position, speed, acceleration and jerk curves can be displayed. Various interpolation types are available, so that an exact adaptation to the application is possible.



LASAL SAFETYDesigner

SEAMLESSLY INTEGRATE SAFETY



Safety applications can be easily programmed and configured with the SAFETYDesigner fully integrated into LASAL.

Comfortable and fast – that is how you can implement your Safety application with the LASAL SAFETYDesigner. An extensive library with function blocks is available, with which Safety-oriented processes can be easily configured. You select the appropriate function blocks such as „emergency stop“ or „operation mode select switch“ then place and wire them in the network.

Numerous Safety Function Blocks

In addition to certified standard function blocks such as logic, timer, trigger or counter, the library includes numeric and many typical, complex Safety function blocks – based on the PLCopen standard. Counted among these are for example, functions such as emergency stop, muting par, two-hand control or guard locking.

In the LASAL SAFETY library, numerous function blocks are provided. This increases programming comfort.

Flexible Concepts

In the SIGMATEK Safety concept, multiple Safety controllers with I/Os can be designed and managed per project. Machine options can be administered in one project.

Effort Minimized

The simple operation of the LASAL SAFETYDesigner and clear representation of the project reduce the time and effort for programming, maintenance, diagnostics and especially validation.

SAFE MOTION

With the LASAL SAFETYDesigner, safe motion such as „Safe Position“ or „Safe Speed“ for example, can be implemented comfortably.

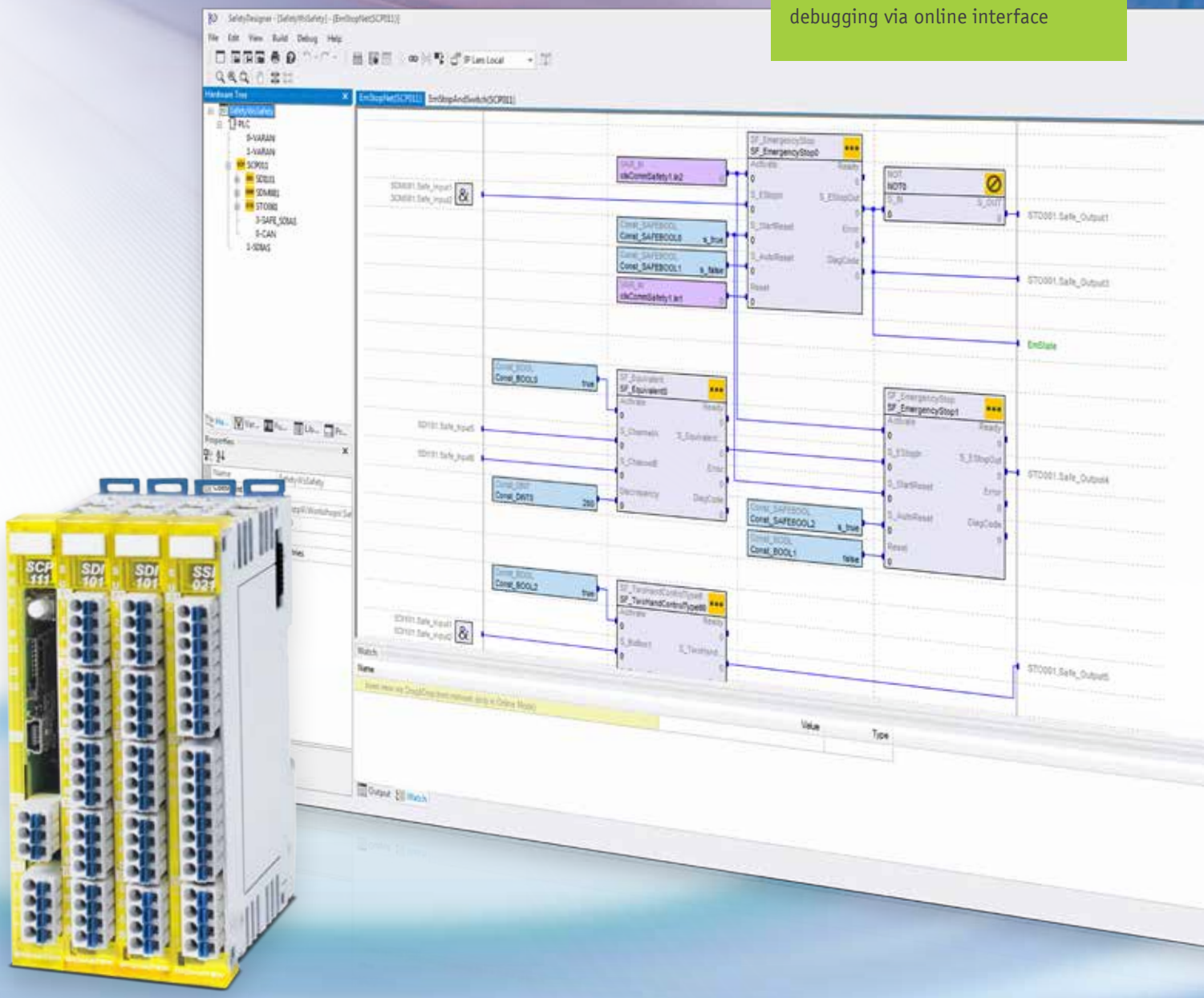
HOT FACTS

INTEGRATED
Simple programming & configuration of the Safety controller

READY-TO-USE SAFETY FUNCTION COMPONENTS
based on PLCopen standard

HIGH COMFORT
Comfortably create logic operations and I/O configurations

ONLINE-STATE DIALOG
Download, online monitoring and debugging via online interface



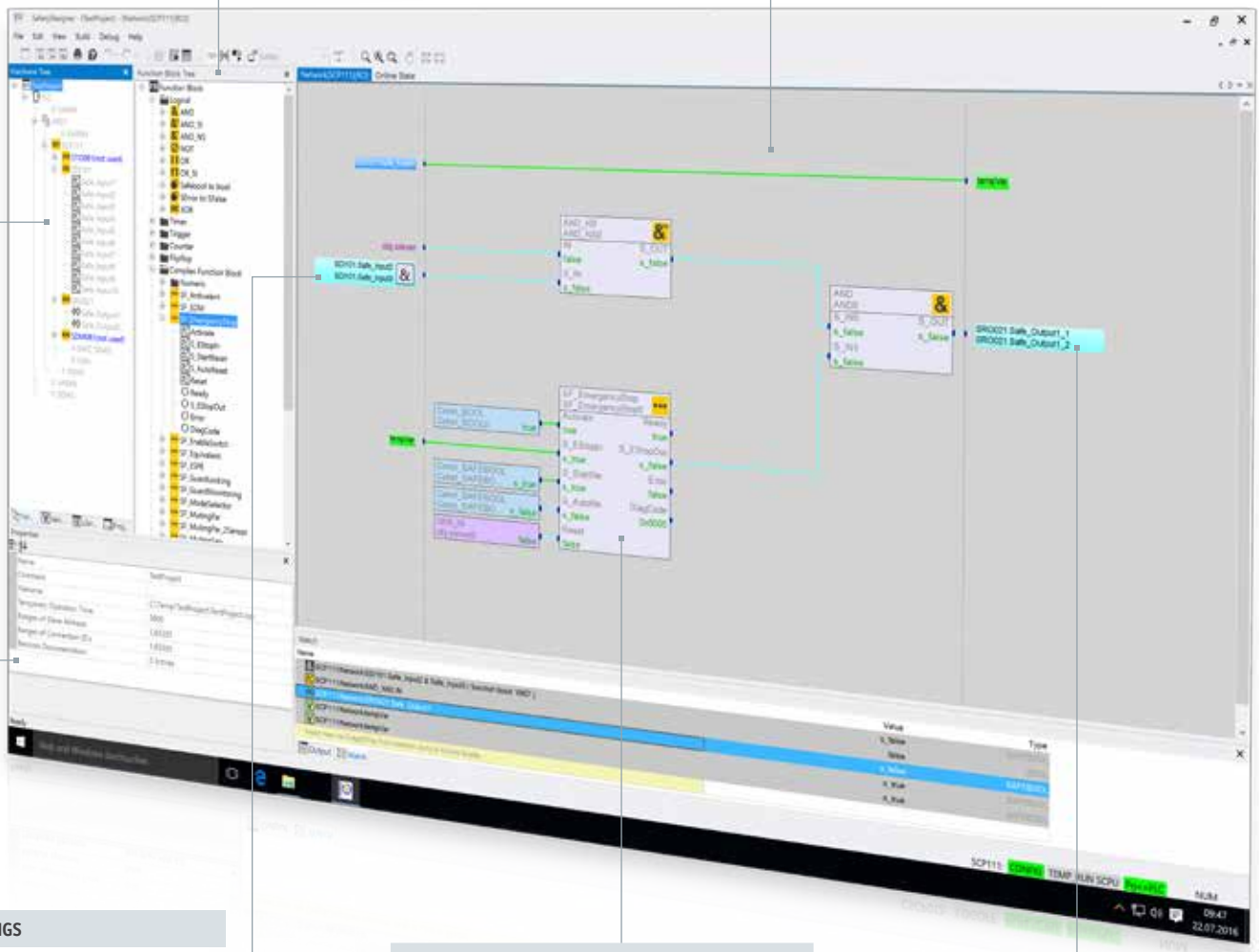
SIMPLE OPERATION AND CLEAR REPRESENTATION

The LASAL SAFETYDesigner offers the same operating comfort as LASAL CLASS. In the graphical editor, function blocks, as well as in and outputs can be freely placed via drag & drop from the project tree. Connections of 2-channel functions are made in the network – also via drag & drop. With the SAFETYDesigner, a connection to a function-oriented control can also be made.

HARDWARE OVERVIEW

PREDEFINED FUNCTION BLOCKS

GRAPHICAL EDITOR



SETTINGS

INPUTS

- Allocation using drag & drop from the hardware tree
- Connection of 2-channel inputs

FUNCTION BLOCKS

- Allocation using drag & drop from the function block tree
- Wiring of predefined function blocks with I/Os, variables, constants and help variables

OUTPUTS

- Allocation using drag & drop from the hardware tree

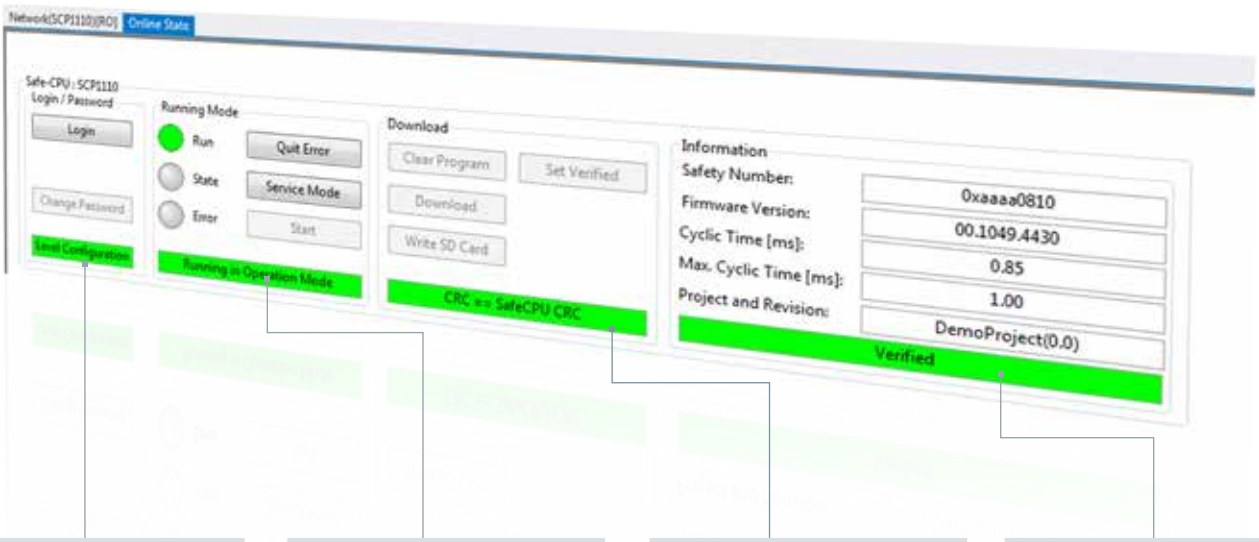
DEBUGGER INTEGRATED

The integrated debugger graphically displays all values and the signal flow. It is also possible to force inputs, outputs and constant values.

With the SAFETYDesigner, a Safety-oriented application can also be implemented for the S-DIAS Safety system as stand-alone solution.

LOGIN AND PROGRAM DOWNLOAD

All online actions of every Safety controller available in a project are centrally listed in the online state dialog. Included in these actions are for example, login, error cancelling or downloading. In addition, status information from the Safety controller as well as diagnostic messages from in- and outputs are displayed.



LOGIN

- Login for debugging, program or firmware download
- Password change

EXECUTION ACTIONS

- Error confirmation
- Service mode (reset)
- Program start (run)

DOWNLOAD ACTIONS

- Delete program
- Download program
- Write to SD card
- Verification

SAFE PLC INFO

- Safety number
- Firmware version
- Cycle time

HOT FACTS

EXCHANGE DATA
manufacturer and platform-independent via OPC UA

WORLDWIDE REMOTE MAINTENANCE
Diagnostics and remote maintenance via web server, as well as VNC client and server

UPDATES SIMPLE
with the Bootdisk Manager

SIMULATION SAVES TIME
Windows-based simulation of control program and visualization

LASAL32.DLL

The LASAL32.dll provides the user with interfaces, through which control data can be accessed and changed in Windows programs.

FTP CLIENT & SERVER

The FTP server provides a folder in the control, in which CPU program files can be stored or read. These files can be retrieved by a SIGMATEK CPU or a third-party device with an FTP client function.

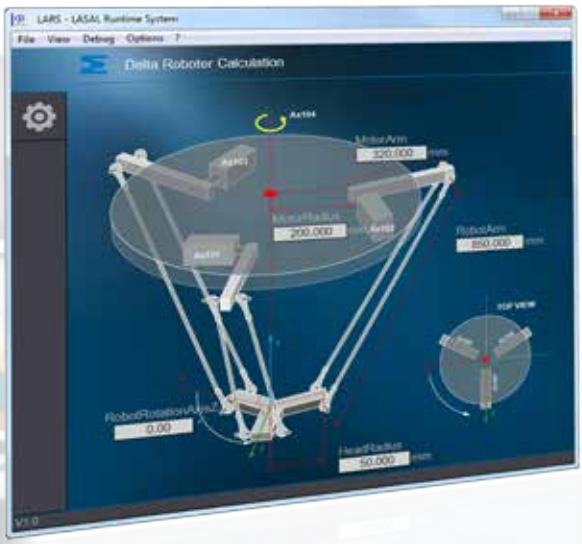
VNC CLIENT & SERVER

SIGMATEK controls support VNC server and VNC client functions. For tablets and smart phones, there are free client apps. The SIGMATEK VNC server has a repeater extension. Data exchange with controls that are protected by firewalls is therefore possible. VNC client and server thereby form a connection to a repeater, which performs the data exchange.

LASAL SERVICE

TOOLS THAT SIMPLIFY ENGINEERING

Whether cross-platform data exchange, simulation, loading of software updates or worldwide remote access for diagnostics and maintenance – LASAL supports you with efficient tools.



LARS SIMULATIONS TOOL

The LASAL Runtime System (LARS) provides a Windows-based simulation of control programs and visualizations, with which LASAL applications can be run without physical hardware. Application areas:

- Test system for application design
- PC-based visualization system

WEBSERVER WITH LRM VIEW

LRMView is an add-on software (Java-Applet) for the control system. It provides the option to display or control the on-site visualization with a standard web browser (password protected). This has the advantage that no additional software must be installed in the computer. The control can therewith be remotely serviced and operated from any PC with an Internet connection.

OPC UA CLIENT & SERVER

The OPC Unified Architecture communications protocol enables manufacturer and platform-independent data exchange, which makes a good choice for implementing Industry 4.0 concepts. OPC UA functions according to the client-server principle and is supported by LASAL. In LASAL CLASS the user can define which process data can be read or written.

BOOTDISK MANAGER

With the Bootdisk Manager integrated into LASAL CLASS, updating the software version of a machine is child's play: simply configure the boot stick, insert it into the control or upload it via online remote maintenance and reboot. Depending on the configuration, the application, visualization, operating system, firmware, configuration or desired files can be updated.

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