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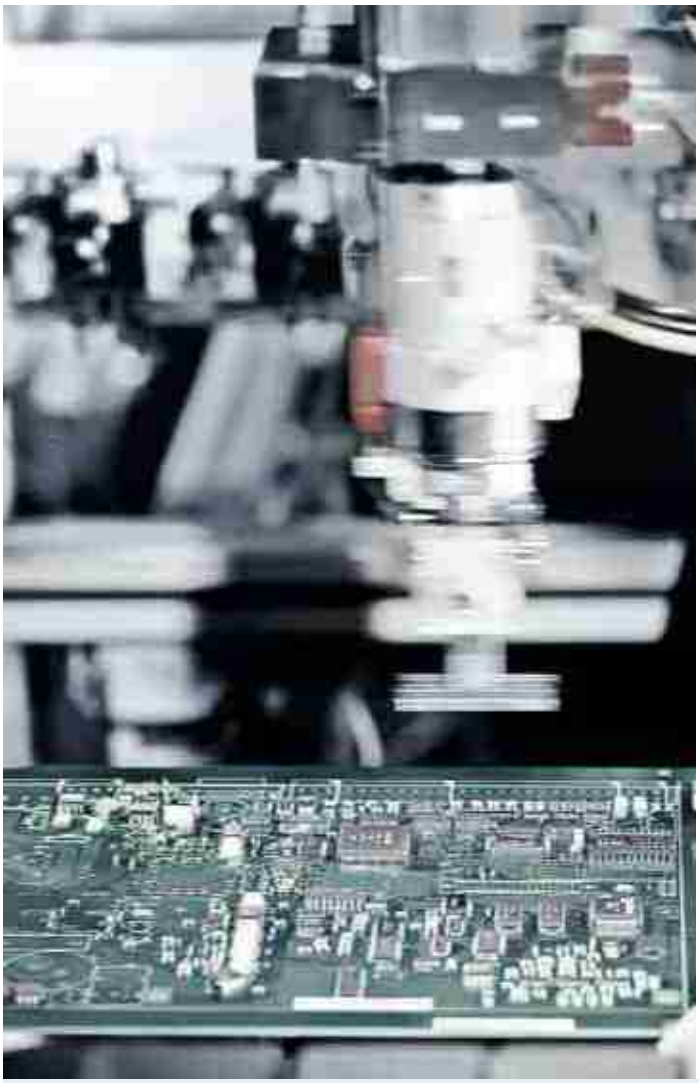
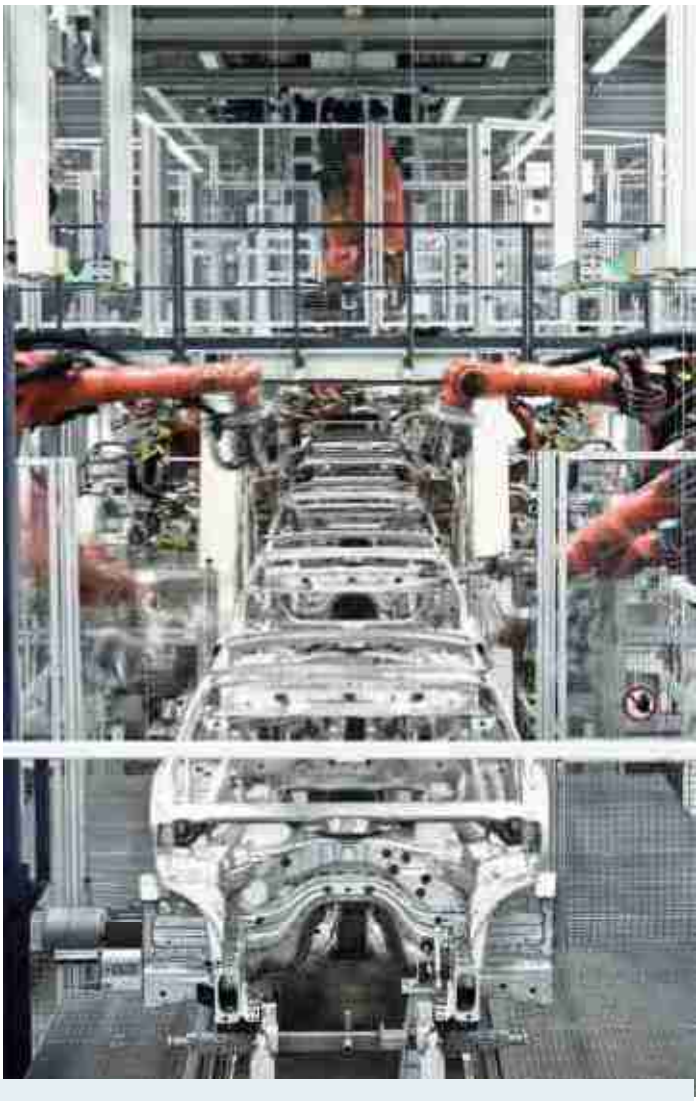
IndraLogic XLC – the powerful PLC system for efficient automation





Shorter time-to-market thanks to faster engineering

Markets are changing faster than ever before. As a machine manufacturer, you want to speed up the implementation of your innovative concepts so that you can quickly exploit market opportunities. Time-to-market is more than a buzzword: Rapid engineering is one of the most critical success factors in global competition. IndraLogic XLC allows you to realize your PLC tasks more quickly, and its highly dynamic process sequences deliver a boost to your productivity.

As a complete system comprising ultramodern PLC, motion control, scaled control system hardware and Ethernet-based real-time communication, IndraLogic XLC opens up new possibilities for you.

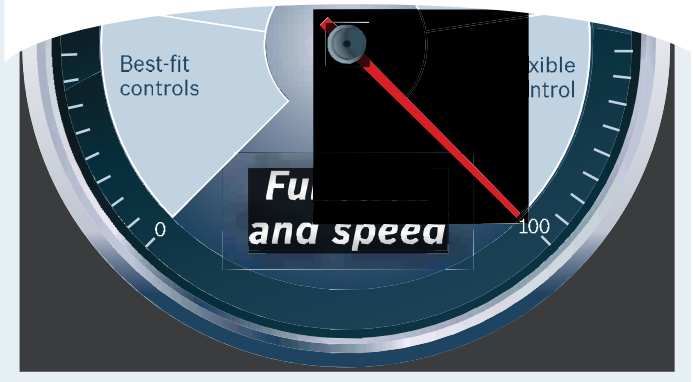
Based on the third generation of IEC 61131-3, the PLC core offers a unique combination of functional diversity and top speed for engineering and plant automation.

The simplified programming of modular machine software saves you time when it comes to producing machine variants. That's because object-oriented language extensions make it easier to reuse sections of a program that has already been written. Any changes are only made once and then simply transferred.

IndraLogic XLC allows you to realize synchronized motion control tasks without additional hardware and software costs. Whatever the performance class, the modular control system hardware with uniform system design and numerous extension options is sure to meet your requirements.

You have complete freedom of choice for the control topology, because the sercos automation bus enables you to integrate IndraLogic XLC flexibly. Combined with the adaptive task system, sercos allows you to respond quickly to new process parameters.

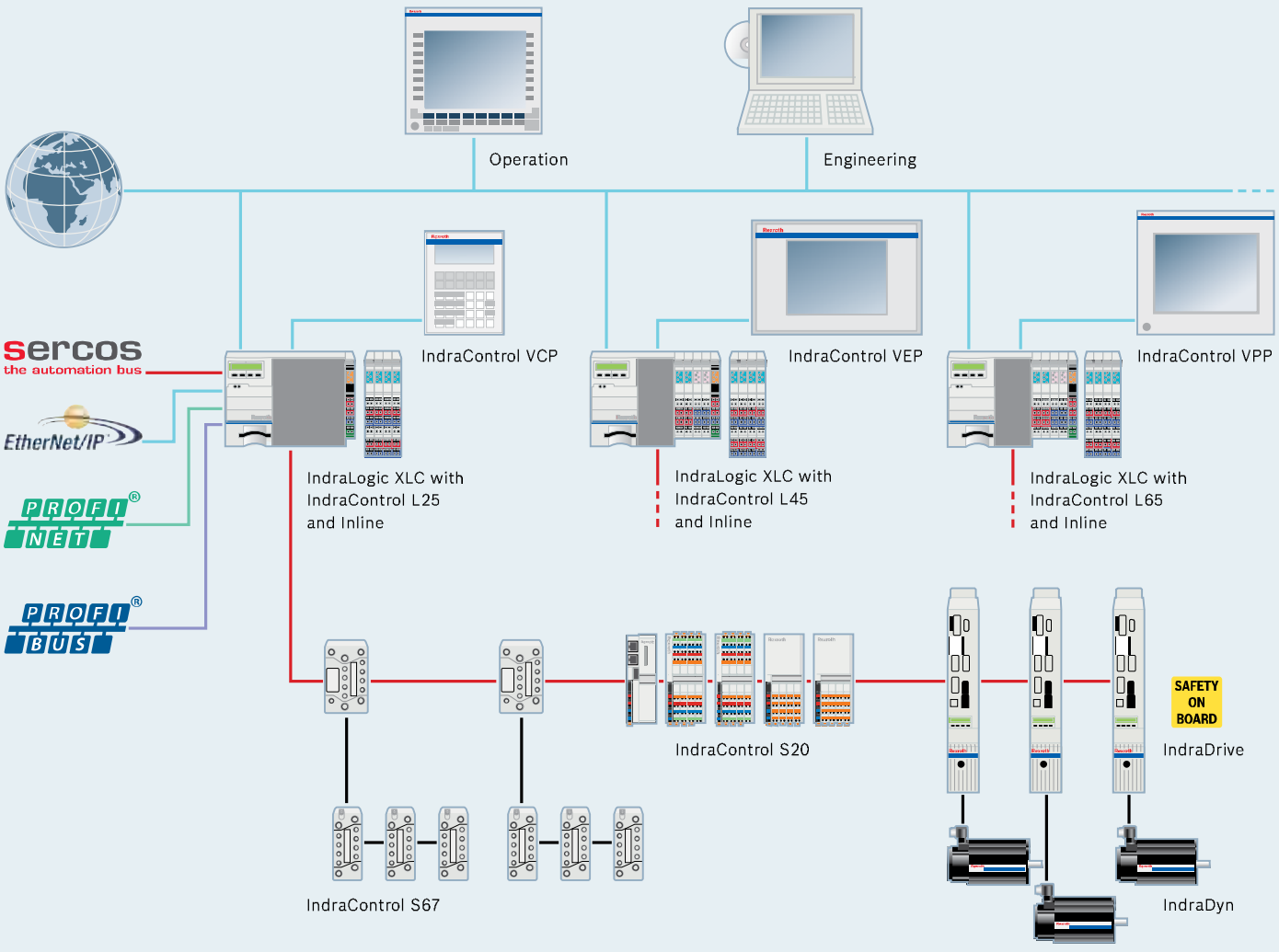
Accelerate commissioning using the intuitive engineering with IndraWorks – the uniform tool for programming, parameterization and diagnosis. Linking it to a version control system enables smooth and efficient team engineering, allowing you to bundle your resources.



- **Rapid realization of all PLC tasks**
- **Ultramodern control system hardware**
- **Ethernet-based real-time communication with sercos**
- **Uniform engineering environment**
- **Open PLC core according to IEC 61131-3 3rd generation**
- **Motion control with axis synchronization**

Ultramodern control system hardware with room for extensions

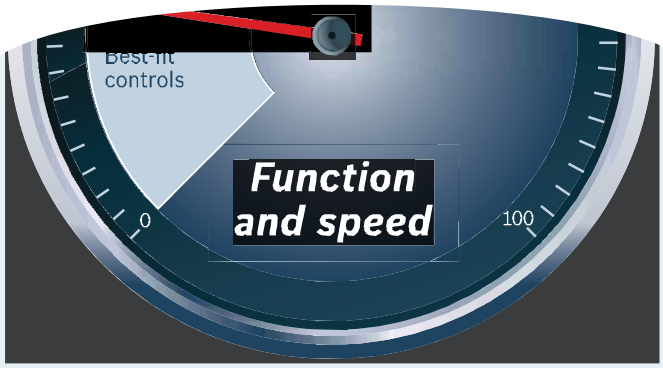
Ultramodern control system hardware and superfast signal processing give you a free choice between central and distributed structures. Modular extensions allow you to tailor IndraLogic XLC particularly easily to your application.



Use ultramodern microprocessor technology and its high clock frequencies to boost your productivity. To ensure that your requirements are covered perfectly, the controller-based IndraControl L hardware is available in three performance levels. Function modules for communication and technology complement your customized control solution.

All process signals can be integrated rapidly and flexibly by means of scalable IP20 and IP67 I/O systems. These are suitable for central and distributed topologies and are integrated using multi-protocol interfaces such as sercos, PROFINET IO, EtherNet/IP or PROFIBUS.

IndraControl V, the comprehensive portfolio of robust and maintenance-free HMI devices, allows you to make the operating and visualization of your systems simple, clear and transparent.



- **IndraControl V – robust and maintenance-free HMI devices**
- **IndraControl L – controller-based hardware offering maximum performance and compact design**

Best-fit controls:
- **Compact, controller-based hardware**
- **Ultramodern processors**
- **Expandable modular system**
- **Extensive I/O portfolio in IP20 and IP67**
- **Extensive range of best-fit HMI devices**

sercos – perfect networking of the future

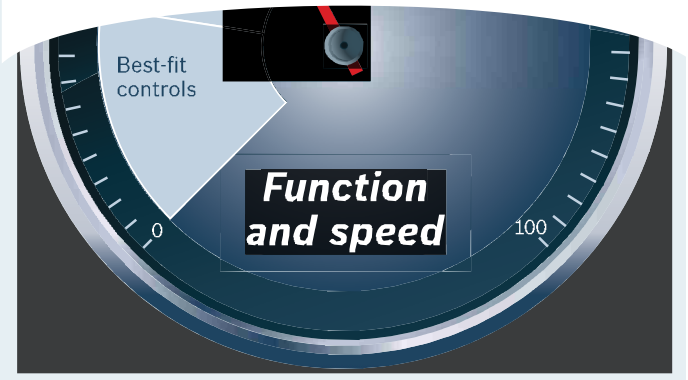
sercos, the open Ethernet-based real-time standard, offers maximum productivity and forward compatibility for machine manufacturers and users. It ensures the fast and transparent exchange of data in all automated applications.

As an open standard, sercos frees you from the restrictions of proprietary systems. Many manufacturers support the global standard with control systems, drives and peripherals. It allows a wide variety of products of different manufacturers to be linked together, reducing the cost of engineering. With its hardware-based real-time mechanisms and minimal cycle times, sercos boosts productivity and delivers absolute transparency.

IndraLogic XLC uses the high data throughput of sercos to respond rapidly to process events. This allows comprehensive diagnoses for maximum system availability and enhanced production quality. The redundant signal transmission of sercos means that the machine can continue working even if a cable fails. Providing maximum flexibility, with sercos you can realize line or ring topologies without the need for expensive additional network technology.

With read and write access, the IP service channel, which is independent of the real-time communication, simplifies the entire engineering process. You can identify all connected participants immediately and include them in the project with a click of the mouse.

When deciding for sercos, you are in good company. More than two million nodes are already proving their value in the field – the networking of the future.



sercos – the automation bus:
- **Flexible and efficient communication in all applications**
- **Maximum performance and short cycle times**
- **Simple configuration**
- **Flexible I/O integration**
- **Large range of field devices of different manufacturers**

◀ **IndraControl L65: Control hardware for IndraLogic XLC systems with sercos real-time communication and Ethernet**

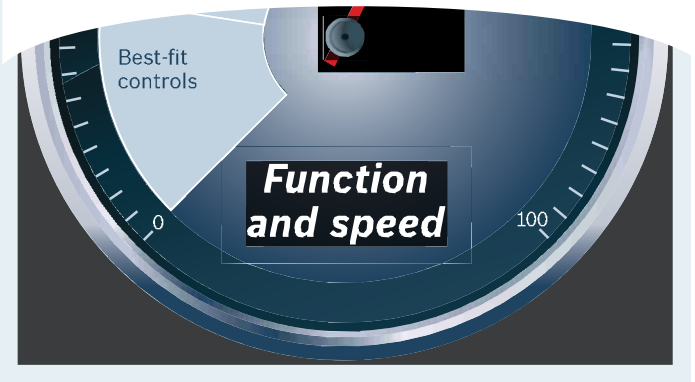
▶ **Systems linked with digital drives and sercos – an example of almost unlimited possibilities (Photo: Miele)**

Faster from the start – an engineering tool for all tasks

Do you want to realize your PLC applications quickly? The integrated engineering tool IndraWorks will lead you safely through the entire project. However demanding your task, in IndraWorks you have all the tools you need in one place.

IndraWorks offers a central project management facility as well as all tools for project planning, programming, commissioning, visualization and diagnosis. User interfaces that you are accustomed to in the Office environment, powerful wizards and extensive online help ensure intuitive operation.

The IndraWorks Project Explorer is the switchboard for one-tool engineering: Just use the mouse to drag all hardware components, PLC and visualization objects into the project. You can then parameterize the objects with dialog support and utilize the extensive diagnostic options at any time. The commissioning tools for devices from 3rd-party manufacturers can be fully integrated over the FDT/DTM interface. The central project data storage enhances data consistency. The framework application provided, Generic Application Template (GAT compact), gives you a proven modular program structure with prepared operating modes even before you write the first line of the program. All you need to do is insert the program code that belongs directly to the application.



Efficient engineering:
- **One-tool engineering**
- **Intuitive user interface**
- **Modular program template (GAT compact)**
- **Team engineering**

Linking to a version control system allows several employees to work on the same project at the same time. IndraWorks prevents conflicts by automatic version management with central data storage and a simple method of tracking changes.

Next-generation PLCs – as varied as your tasks

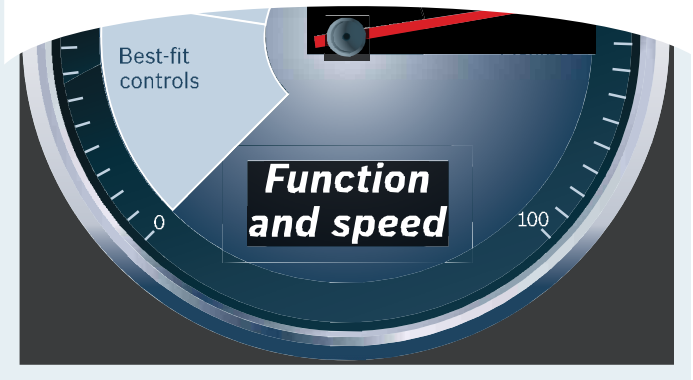
Use the very latest in PLC technology with language extensions for object-oriented programming. You can program efficiently, maximize your program reliability and keep reusing the software modules you have already written.

The user-friendly PLC editor and extensive help functions allow you to concentrate fully on your application. All editors compliant with IEC 61131-3 are available. You can select these freely for each program section:

- Text languages
  - Instruction list (IL)
  - Structured text (ST)
- Graphic languages
  - Sequential functions chart (SFC)
  - Function block diagramm (FBD)
  - Ladder diagram (LD)
  - Continuous function chart (CFC)
- Object-oriented language extensions compliant with IEC 61131-3

An online syntax check helps you identify and remedy errors directly when programming. Fast compilers generate highly efficient machine code for optimal system performance.

To ensure that your application can be commissioned quickly and efficiently, IndraWorks provides powerful debugging functions. Extensive diagnostic tools assist the subsequent optimization, reducing the time taken for commissioning. And that's not all: Your existing PLC code for 1st generation IndraLogic systems can be converted with IndraWorks and reused for IndraLogic XLC.

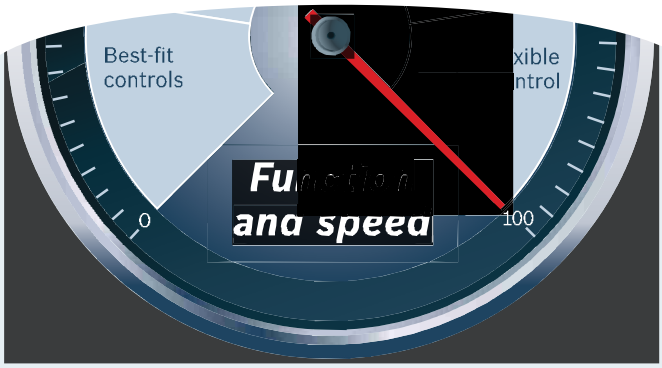


Comprehensive programming:
- **Intelligent editors for time-saving programming**
- **Modular engineering with object orientation**
- **High reusability of software modules**
- **Converter for existing IndraLogic programs**

- **Linear portals for loading and unloading machining centers**
- **Pick & place system for coffee portioning**
- **Bulk goods sorting system in the logistics center of a mail-order wholesaler**

Perfect drive integration for high-precision movements

IndraLogic XLC combines a high-performance PLC system with intelligent motion control functions and highly dynamic drives. This permits synchronized axis movements as well as flexible motion adaptation in on-going operation, boosting productivity.

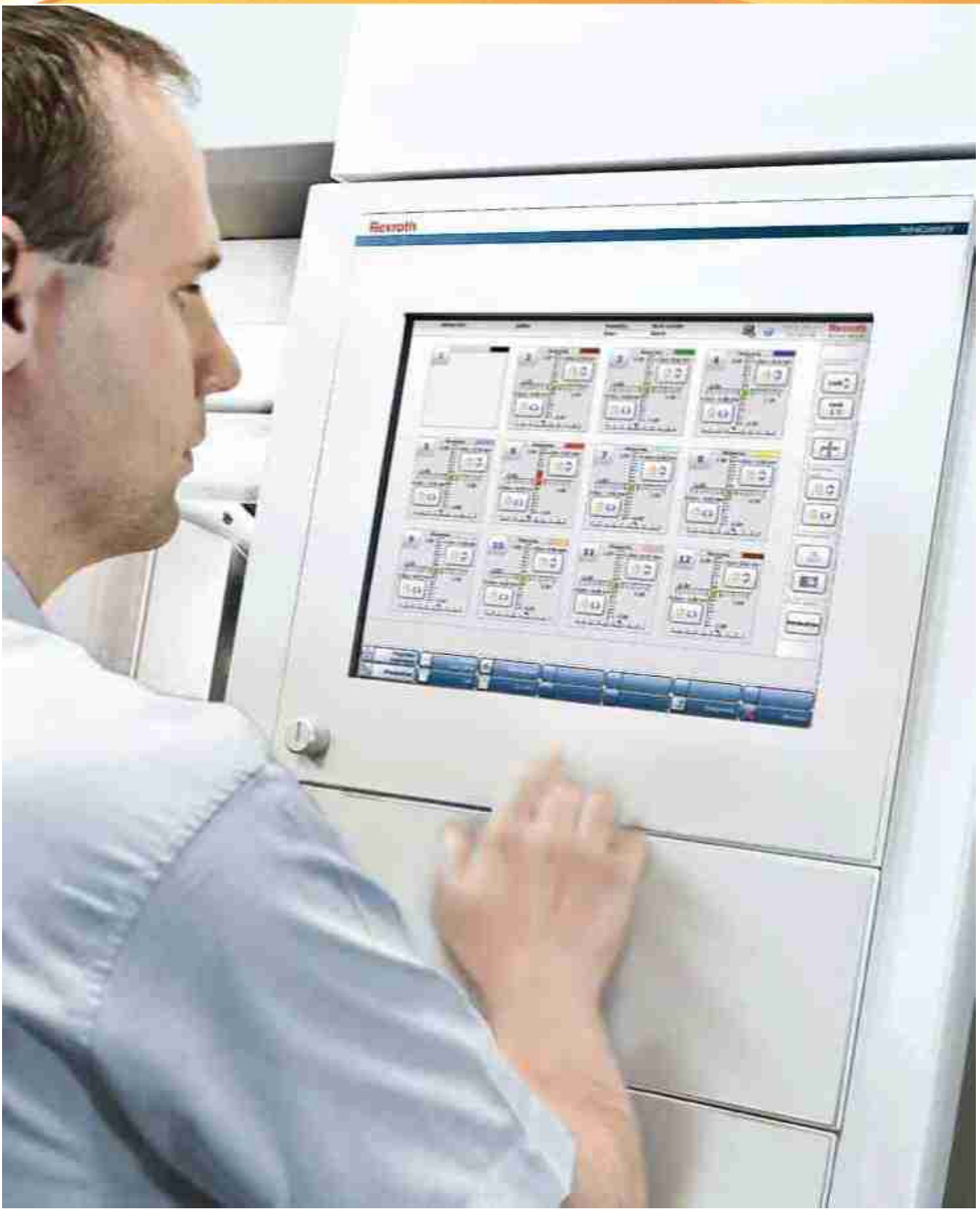


IndraLogic XLC allows you to synchronize up to 64 axes in just one control system, bringing processes into perfect harmony. All processes are transferred to the control system through sercos. The integrated motion logic runtime system considers this immediately when calculating the axis movements. This makes production faster and more precise.

With standardized axis commands, PLCopen function modules for axis control simplify the programming of application software. An extensive module library supplies finished functions for accelerated project planning.

You can produce cams and movement profiles in just a few steps. The program code is generated automatically from your specifications. The patented FlexProfile optimizes the interplay by automatically adjusting the axis movements to changed parameters.

Flexible motion control:
- **Function module appropriate to the application**
- **Motion control in hard real-time**
- **Simple creation of movement profiles and cams**
- **FlexProfile for speedy changeovers**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Everything in sight – it's all about the user interface

The operating and visualization interface is the face of, and a central sales argument for, your machine. It determines the user-friendly operation features and hence acceptance by the user. IndraLogic XLC lets you turn your requirements quickly and transparently into reality.

The wide range of HMI devices means that you have exactly the scope of functions that you need for your application. Choose between handheld and compact operator units, embedded PCs or high-performance PCs.

In IndraWorks, you can use the WinStudio visualization toolbox to create your own individual application screens and all the user masks. Library support allows you to integrate mathematical functions, trend curves and list elements, for example. An extensive graphics library with image objects and the integration of existing. Net and ActiveX controls accelerates the engineering of your HMI solutions.

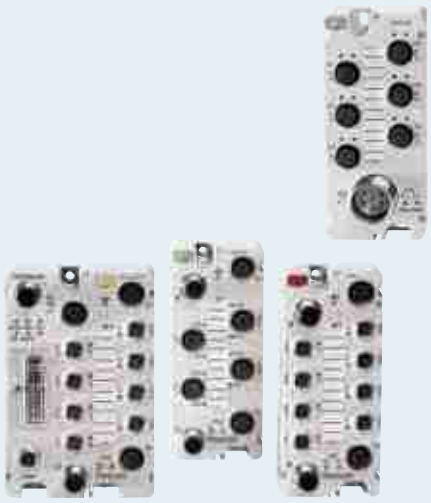
To enable standardized operating interfaces to be realized, the integrated operation desktop supplies a prefabricated visualization frame with default basic functions. There are, for instance, preconfigured button fields for diagnoses, language changes and user management.

- **Extensive HMI device portfolio**
- **HMI project planning integrated into IndraWorks engineering environment**
- **WinStudio visualization toolbox**
- **Operation desktop for ready-to-use operating interfaces**

The systematic way to the right solution

Control systems – IndraControl L

- Top performance in ultra-compact design
- Maintenance-free design with no wearing parts
- Large memory and CompactFlash as removable storage medium
- sercos, PROFIBUS, PROFINET IO, EtherNet/IP and Ethernet communication interfaces integrated
- Local connection of Inline I/O modules without auxiliary couplers
- Simple expansion using function modules for communication and technology



I/O IP20 – Inline

- Scalable I/O system for central or decentralized connection
- Maximum channel selectivity of the digital modules with 2, 3 or 4-wire technology
- Cost-effective solutions with Block I/O modules
- Wide range with analog, function, relay and power modules
- Space-saving design and tool-less assembly
- Flexible connection through permanent wiring and internal voltage supply
- Fieldbus couplers for sercos and other fieldbus systems

IndraLogic XLC comprises a broad range of finely scalable components for complete system solutions. Put together a customized solution to suit your own scope and functions.

◀ I/O IP67 – IndraControl S67

- Modular, ergonomic I/O system for distributed topologies
- Extensive portfolio of I/O and technology modules and fieldbus couplers
- Compact enclosure in IP67
- Ultramodern hardware design supports maximum sensor and actuator signal processing speeds
- Screw assembly
- M8 and M12 signal line connections
- Prefabricated fieldbus, power and sub-bus cables

◀ HMI – IndraControl V

- Economical HMI devices for all areas of application
- Ergonomic manual operator panels
- Controller-based operator terminals
- Embedded PC terminals with touchscreen
- Broad, scalable industrial PC portfolio, from panel PCs through control cabinet PCs with distributed display to complete PC operating units

◀ I/O IP20 – IndraControl S20

- Modular I/O system for decentralized topologies
- Ultrafast signal processing
- System connection over real-time Ethernet
- Optimized for extreme conditions of use
- Particularly robust electro-mechanics
- Tool-less wiring
- Simple station construction and device swap

◀ Drive platform – IndraDrive and IndraDyn

- Compact drive converters and modular inverters for all applications
- Scalable power components with continuous power of up to 630 kW
- Scalable control units for cost-effective complete solutions, maximum performance and precision for all multi-axis applications
- Safety on Board compliant with EN ISO 13849-1, Category 3 PL d and EN 62061 SIL 2 for STO and Safe Motion
- Integrated mains contactor and braking resistor
- Easy to service and maintain

IndraLogic XLC technical specifications

IndraLogic XLC		L25	L45	L65
Controller				
Runtime system	Integrated motion logic system	●	●	●
Multitasking		●	●	●
Data management	Code, data, remanent data, user data	●	●	●
Storage	Boot project	●	●	●
	PLC project as packed archive file	●	●	●
	User data in internal memory and removable storage medium	●	●	●
Support	Function modules	2	4	4
	System events	●	●	●
Probe		●	●	●
User memory	Total: Code, data	12 MB	24 MB	36 MB
Remanent data memory	Total: System, user	256 kB	256 kB	256 kB
On-board diagnosis and settings				
Status display (booting, sercos, test)	Display	●	●	●
Errors, warnings, messages, system reset		●	●	●
Ethernet settings (IP address)		●	●	●
Voltage monitoring, watchdog		●	●	●
Relay output operation		●	●	●
IndraMotion service tool		●	●	●
On-board communication interfaces				
sercos	Real-time Ethernet bus	○	○	○
PROFIBUS	Master	○	●	●
	Slave	○	●	●
PROFINET IO	Controller (master)	○	○	○
	Device (slave)	○	○	○
EtherNet/IP	Scanner (master)	▼	▼	▼
	Adapter (slave)	○	○	○
Ethernet TCP/IP		●	●	●
Control group	Ethernet TCP/UDP/IP	●	●	●
Function modules				
Quantity		2	4	4
Real-time Ethernet/PROFIBUS		○	○	○
Programmable limit switches		○	○	○
Fast I/O		○	○	○
HMI				
IndraControl VCP, VCH	Ethernet TCP/IP, OPC	○	○	○
IndraControl VEP, VEH	Ethernet TCP/IP, OPC	○	○	○
IndraControl VSP, VPP, VSB/VDP, VPB/VDP	Ethernet TCP/IP, OPC	○	○	○
I/O				
On board (integrated in control hardware)				
Fast digital inputs	Interruptible, typically 50 µs	–	8	8
Fast digital outputs	0.5 A, typically 500 µs	–	8	8
Local (can be stacked directly at the controller)				
Fast digital inputs (function module FAST I/O)	Interruptible, typically 40 µs	○	○	○
Fast digital outputs (function module FAST I/O)	0.5 A, typically 70 µs	○	○	○
Inline (digital, analog, relay, technology)	64 bytes, max. 512 I/O	○	○	○

IndraLogic XLC		L25	L45	L65
Distributed via Inline (IP20)				
sercos, PROFIBUS	On board/function module	○	○	○
Distributed IndraControl S20 (IP20)				
sercos, PROFINET IO	On board/function module	○	○	○
Distributed via IndraControl S67				
sercos, PROFIBUS	On board/function module	○	○	○
Logic Control				
PLC runtime system				
IndraLogic 2G kernel	Compliant with IEC 61131-3 with extensions	●	●	●
Program organization	Compliant with IEC 61131-3	●	●	●
Loading and execution of IEC-61131-3 applications		●	●	●
Task management				
Freely configurable tasks (priority 0-20)	Cyclic, free-running, event-controlled, externally event-controlled	10	20	20
Cycle-synchronized processing of the I/O process sequence		●	●	●
sercos synchronized processing of the I/O process sequence		●	●	●
Min. PLC cycle time	Synchronized with system cycle	1 ms	1 ms	1 ms
	Synchronized with sercos cycle	1 ms	0.5 ms	0.25 ms
Min. motion cycle time	Setpoint generator	2 ms	1 ms	1 ms
PLC processing times				
Typical processing time for 1,000 instructions	Command mix (real, integer, Bool etc.)	35 µs	30 µs	5 µs
	Bool operations	20 µs	30 µs	5 µs
	Word operations	20 µs	30 µs	5 µs
Motion Control				
Number of axes	Real, virtual, encoder	16	32	64
Synchronization (ELS – Electronic Line Shaft)	Real axes (servo-drives)	●	●	●
	Virtual axes (virtual masters)	●	●	●
	Encoder axes (real masters)	●	●	●
	Dynamic synchronization	●	●	●
	Master axis cascading	●	●	●
Positioning	Single axis	●	●	●
Electronic gears		●	●	●
Electronic cams	Intermediate point tables (inside drive, max. 1,024 points)	4	4	4
	Electronic motion profile (inside controller, motion profiles with max. 16 segments)	2	2	2
	FlexProfile (inside controller, master/time-based movement profiles with max. 16 segments)	4	4	4
Motion commands compliant to PLCopen (selection)	MC_MoveAbsolute	●	●	●
	MC_MoveRelative	●	●	●
	MC_MoveVelocity	●	●	●
	MC_Home	●	●	●
	MC_CamIn, MC_CamOut	●	●	●
	MC_GearIn, MC_GearOut	●	●	●
Extended motion commands (selection)	MB_ReadListParameter, MB_WriteListParameter	●	●	●
	MB_GearInPos, MB_PhasingSlave	●	●	●
	MB_ClearAxisError, MB_ClearSystemError	●	●	●
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● Standard ○ Optional ▼ In preparation

IndraLogic XLC		L25	L45	L65
Extended System Functions (selection)				
Programmable limit switches		●	●	●
PID controller		●	●	●
Temperature control		●	●	●
Diagnostics				
Status, warning, error	Function modules (software)	●	●	●
	Diagnostic memory parameter access (software)	●	●	●
	Local through display (control hardware)	●	●	●
	Axis monitoring (e.g. power, encoder, limit values)	●	●	●
	Diagnostic memory (64 kB, max. 999 messages)	●	●	●
Debug monitor for IEC applications		●	●	●
Drive Systems				
IndraDrive		●	●	●
IndraDrive Cs		●	●	●
Drive with sercos pack profiles		●	●	●
Master communication	sercos	●	●	●
Engineering and Operation				
IndraWorks		○	○	○
IndraMotion service tool		●	●	●

IndraWorks engineering Technical specifications

System		IndraLogic XLC
IndraWorks		
Basic functions		
Operating system support	Windows XP, Windows 7	●
Framework multilanguage capability		●
Project multilanguage capability		●
Export/import of texts from PLC projects		●
Firmware management		●
Deactivation/parking of drives in the project		●
Automatic detection of drives and I/O participants		●
Online/offline switching		●
Automatic system monitoring	Indication of messages and errors	●
Project comparison		●
Online change		●
Search/replace		●
Cross-references		●
Represents the project as a tree structure		●
Logbook		●
Integration of 3rd-party commissioning tools through FDT/DTM		●
Work with version control (VCS) – software option		
VCS systems supported	Subversion	●
	Microsoft Visual Source Safe	●
Checking in/out of objects		●
Hijacking of objects		●
Object comparison	Device, POE, function module, library, visualization	●
Undo functions		●
Update working copy		●
Show version history		●
Show versioned elements		●
Configuration and project planning		
System configurator		●
Device library for control systems, visualization, peripherals		●
Commissioning wizards		●
Project navigator		●
I/O configurator		●
Fieldbus configurator		●
Axis configurator	Real axes, virtual axes	●
	Encoder axes	●
Drive configurator		●
Project archiving		●
Parameter monitor for control systems and drives		●
Offline parameterization of control systems and drives		●
FlexProfile configurator		●
Cam editor	CamBuilder	○
Extended project handling		●
>>		

● Standard ○ Optional ▼ In preparation

PLC Programming		IndraLogic XLC
Graphic editors		
SFC – sequential function chart	Time monitoring per step	●
	Error analysis	●
	Control flags	●
LD – ladder diagram		●
FBD – function block diagramm		●
CFC – continuous function chart	Auto-routing of connections	●
	Macro possibility for structuring large networks	●
Text editors		
IL – instruction list		●
ST – structured text	Including sequential programming	●
Language elements		
Operators	Compliant with IEC 61131-3	●
Operands	Constants, variables, addresses, functions	●
Bit access		●
Typed pointer		●
Object-oriented language extensions		●
Data types		
Standard according to IEC 61131-3 inc. LREAL		●
User-defined: Arrays, structures, enumerators, aliases, pointers		●
Particular editor features		
Syntax coloring		●
Semantic coloring		●
Multiple undo/redo		●
Context-sensitive input help		●
Context menus		●
Auto-declaration		●
Auto-declaration with type identification		●
Name spaces		●
Auto-complete (Intellisense) for structures, functions, function modules		●
Pre-compile for constant syntax check		●
Folding (overlaying/hiding of program blocks and structures)		●
Extended search and replace		●
Smart coding (auto-complete and auto-format)		●
Library management		
Managed libraries (multiple library versions in one project)		●
License management		●
Programming help		
Offline programming		●
Automatic variable declaration of system components		●
Structures of axis data		●
AXIS_REF (reference to axis data)		●
ML_AXISDATA (direct access to axis data)		●

PLC Programming		IndraLogic XLC
Generic Application Template compact		
Automatic code generation	Program structure	●
	Error handling	●
Wizard-assisted creation, editing, deletion of	Operating modes	●
	Axes	●
	Visualization	●
Online Debugging and Commissioning		
Diagnostics		
Real-time logic analysis		●
Oscilloscope function	Graphic output with zoom function	●
	Indication of signal values of drives	●
	Scaling	●
	Measurement with/without trigger	●
Debugging		
Monitoring variables	Trace	●
Forcing of variables and variable sets		●
Power-Flow	Sequence check	●
Online exchange of function blocks		●
Offline simulation of PLC variables		●
Parameter monitor		●
Writing of variables		●
Breakpoint		●
Single-step mode		●
Single-cycle mode		●
Sequence control (system)		●
Libraries (selection)		
Basic libraries	System functions	●
	Communication	●
	PLCopen	●
	Data handling	●
	Diagnostics	●
	Axis interface	●
Technology libraries	Programmable limit switches	●
	Probe analysis	●
	PID controller	●
	Temperature control	●
HMI engineering		
WinStudio Lite	500 variables	●
WinStudio 1.5 k	1,500 variables	○
WinStudio 4 k	4,000 variables	○
WinStudio 64 k	64,000 variables	○
WinStudio 512 k	512,000 variables	○
VI-Composer		○

● Standard ○ Optional ▼ In preparation

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Rexroth
Bosch Group

Bosch Rexroth AG
Postfach 13 57
97803 Lohr, Germany
Bgm.-Dr.-Nebel-Str. 2
97816 Lohr, Germany
Phone +49 9352 18-0
Fax +49 9352 18-8400
www.boschrexroth.com

Find your local contact person here:
www.boschrexroth.com/addresses

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