Antonio Gordillo | IMA Marketing

Controllers

Welcome

INSPIRING INNOVATIONS

Agenda

- General overview
- PLC Logic
- Inline
- Axioline
- RFC
- PLCnext Control
- Software PLC
- Software
- PLCnext Technology
- PLCnext Control

PHOENIX CONTACT
INSPIRING INNOVATIONS

Headquarter Phoenix Contact Bloomberg Germany

General Overview

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Business Area Industry Management and Automation

Current trends

Digitalization

Globalization

Flexibilization

Industrie 4.0

We provide communicative and adaptable automation solutions to ensure long-term market success for both us and our customers.

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Business Area Industry Management and Automation

Chances and challenges

Openness

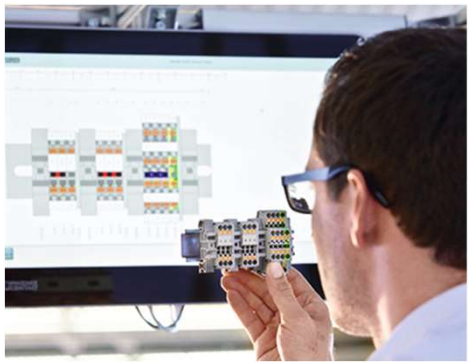
Customized implementation of applications based on an open ecosystem.

Cyber security

Protection of industrial systems against cyber attacks and viruses.

Cloud services and software

Unlimited interconnection and use of virtual services.



Digital product

Digital product descriptions for smart engineering services.

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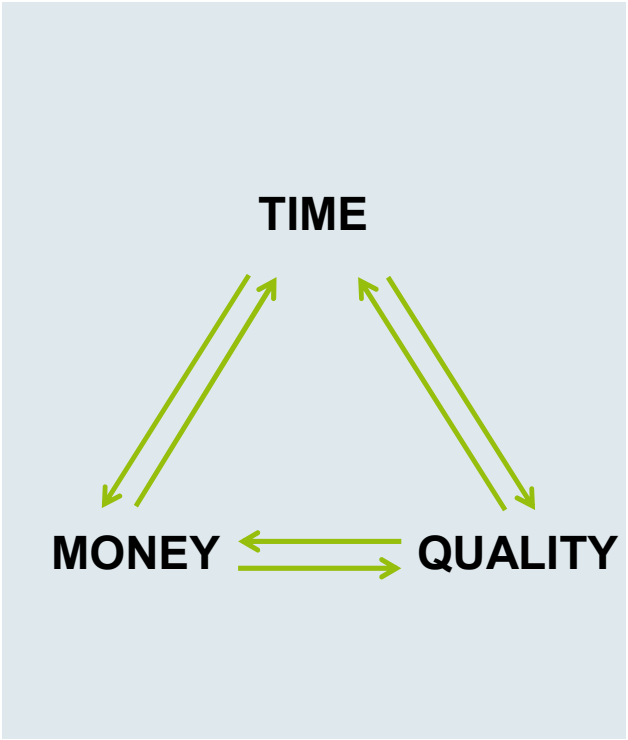
Business Area Industry Management and Automation

Our value proposition

Quality:
High-quality products and solutions by means of an extensive manufacturing capability and systematic function testing

Time:
A global network of experts for timely reactions to market demands and quick solutions

Money:
Smart products and solutions for a consistent, cost-optimized value added chain



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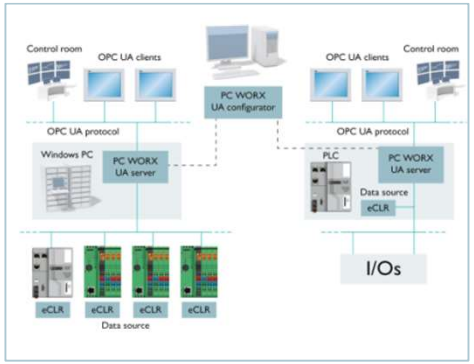
Business Area Industry Management and Automation

Comprehensive automation

Solutions



Systems

Business intelligence

Products

Components + automation concept + software + industrial know-how

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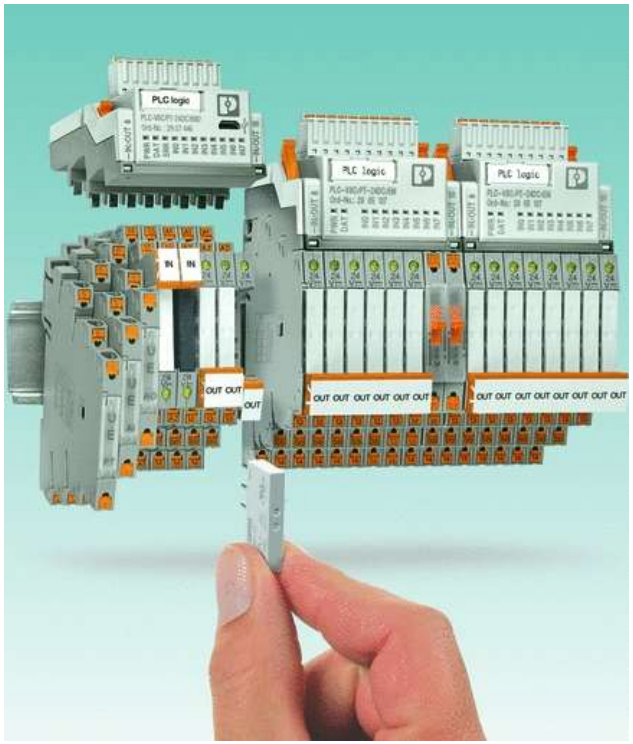

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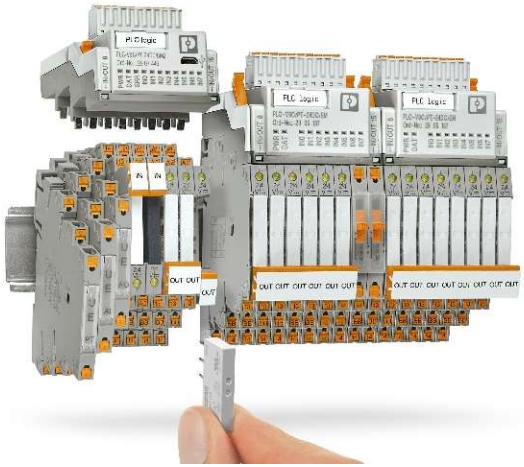
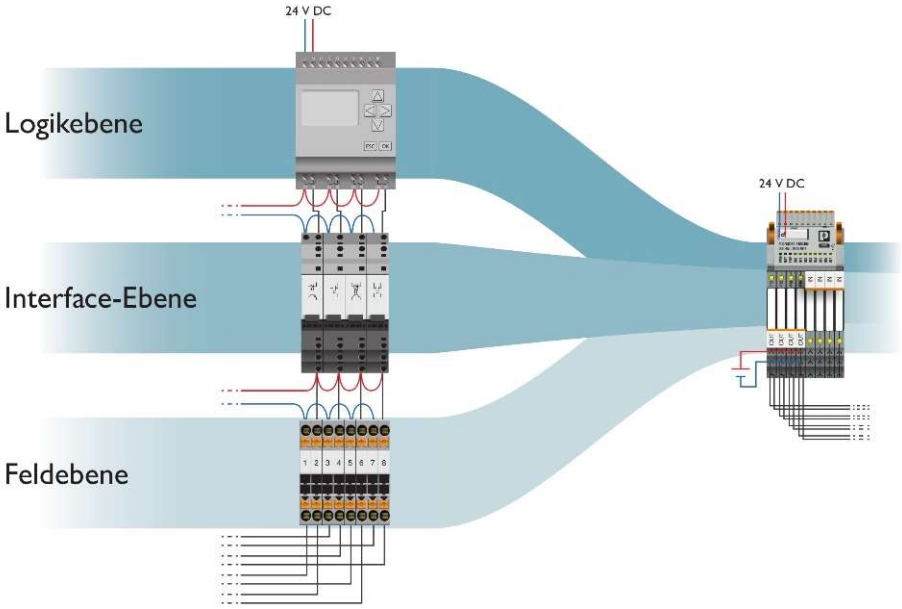
PLC logic

Programmable logic relay system





Short description

Features and benefits

Product overview

Comparison of solutions

Technology

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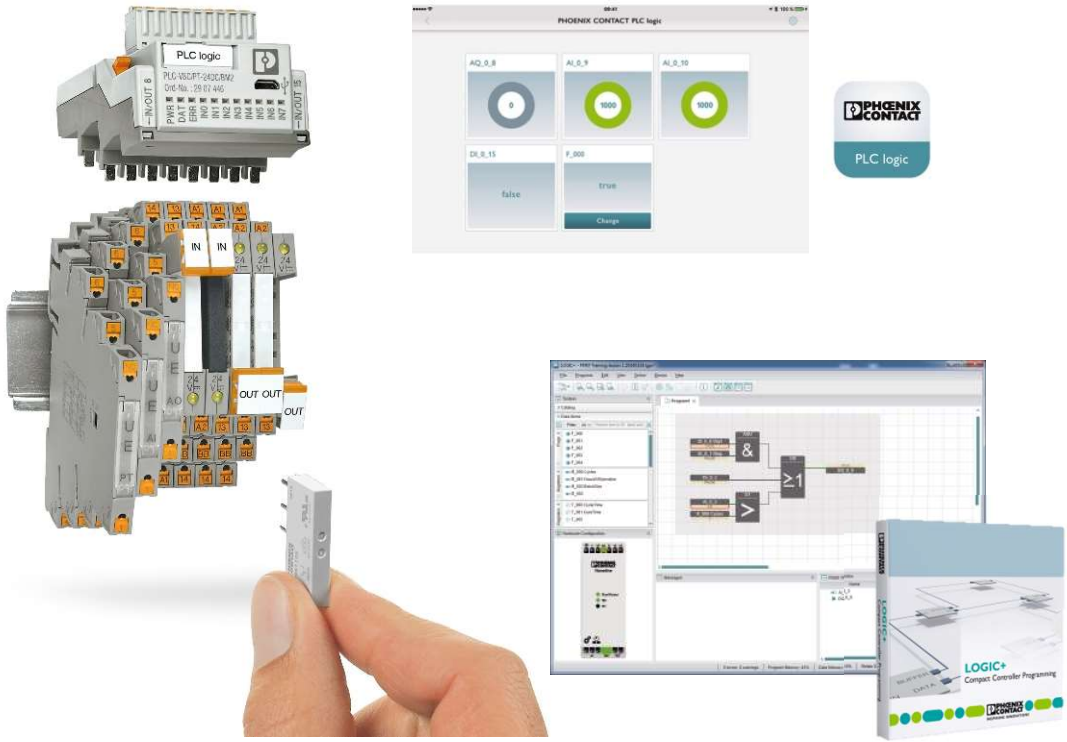
PLC logic – Short description

Programmable logic relay system

On the logic module market, the PLC logic relay system is the first to combine logic, interface, and field connection levels in a single solution. This means that you can switch and control I/O signals using a single compact system.

You can combine the new PLC logic module with the corresponding relay and analog modules as required.



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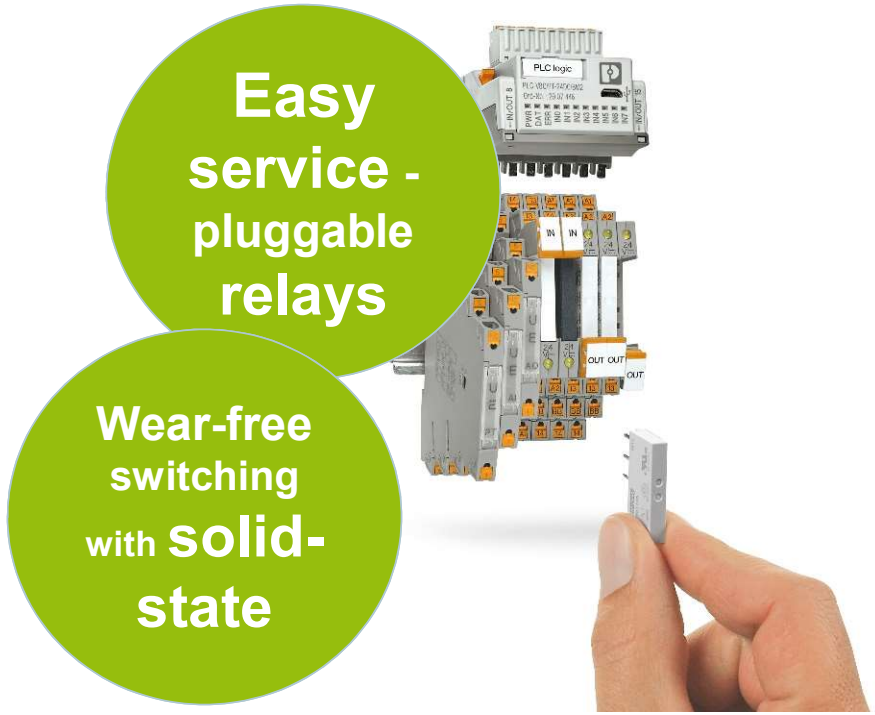
PLC logic – Features and benefits

Programmable logic relay system

- Benefit from high availability thanks to plug-in relays and special function modules.The relays can be replaced quickly during maintenance work. This helps to ensure high machine and system availability.
- Wear-free switching with solid state relays to reach a high system availability.
- Filter series protect for net or signal interferrence.



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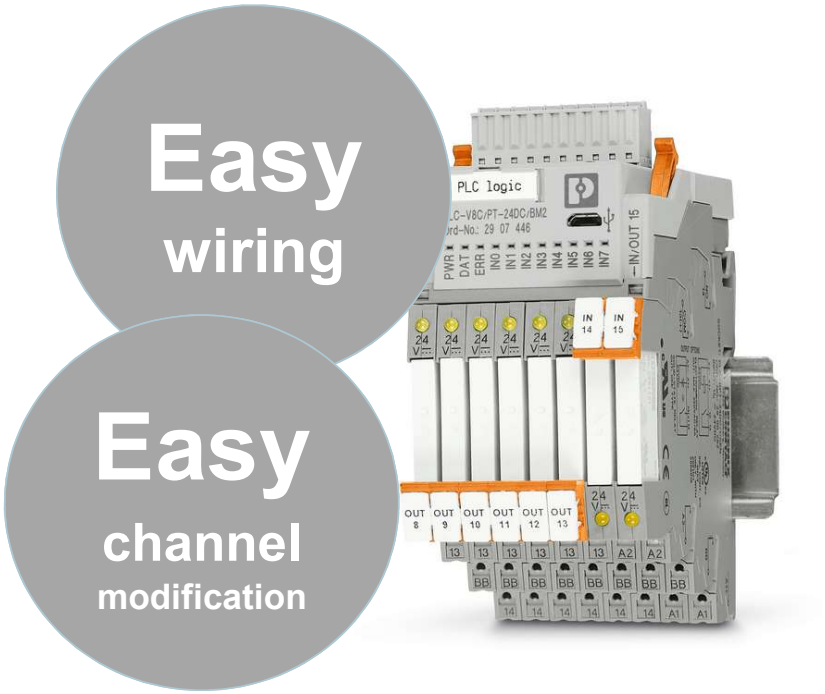
PLC logic – Features and benefits

Programmable logic relay system

- **Easy wiring**
  Thanks to push-in connection technology. This enables quick, tool-free wiring.
- **Easy modification** per IO channel.
- **Easy project implementation**
  LOGIC+ is intuitive software that allows you to implement your projects quickly.



Push-in Technology
Designed by PHOENIX CONTACT

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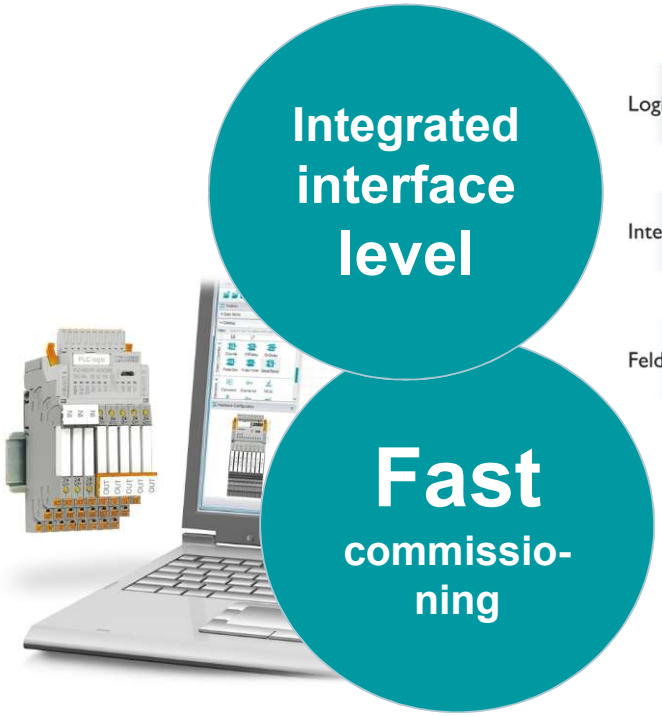
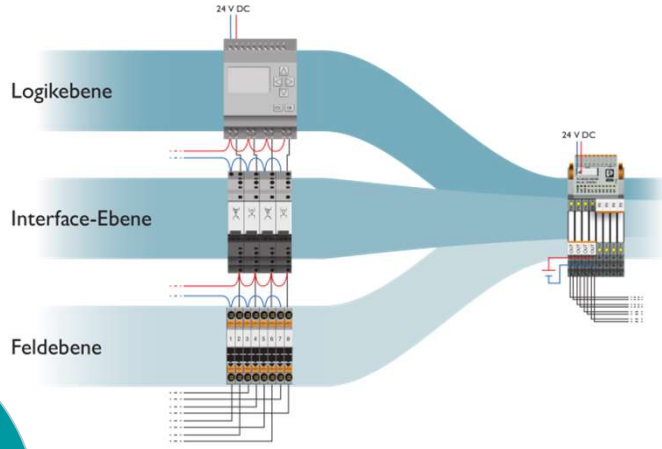
PLC logic – Features and benefits

Programmable logic relay system

- **Integrated interface level**
  The PLC logic relay system is the first to combine logic, interface, and field connection levels in a single solution.
- **Fast commissioning**
  The easy handling helps when it comes to configuration and startup of the products. The programs created can be simulated offline on the PC and tested online during operation.





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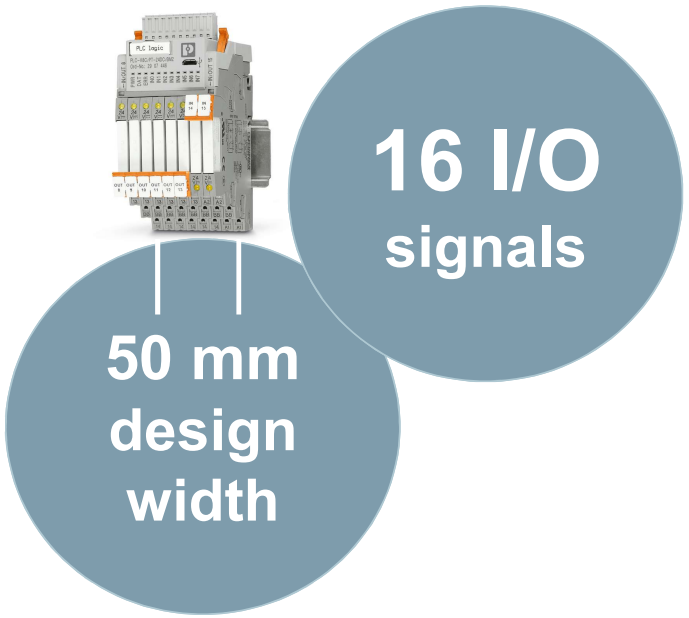
PLC logic – Features and benefits

Programmable logic relay system

- **50mm design width**
  PLC logic processes 16 I/O signals with just one basic module, with an overall width of just 50 mm.



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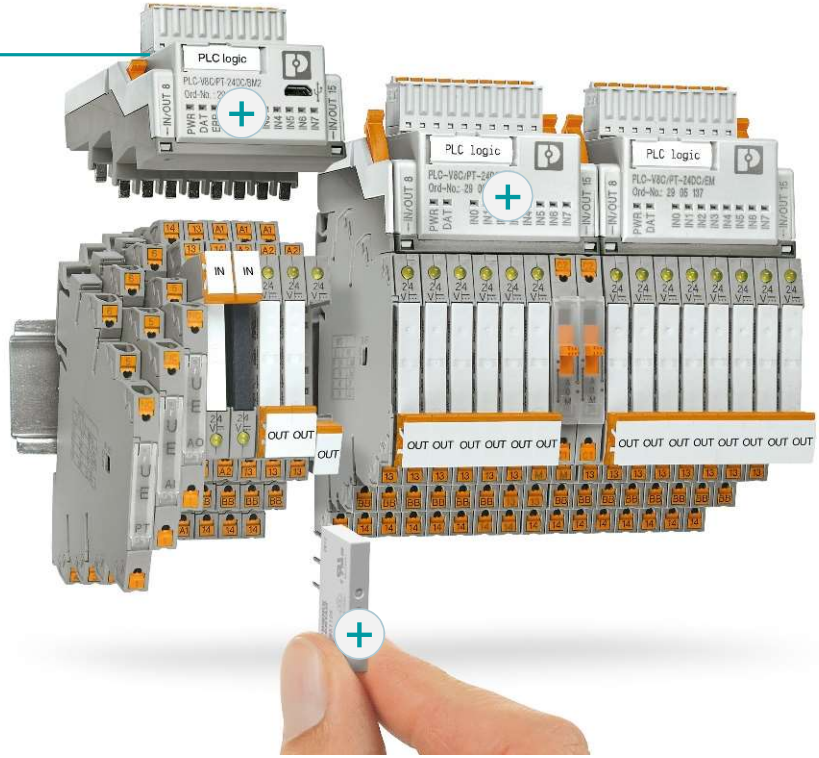
PLC logic – Product overview

Programmable logic relay system



Touch panel

PLC logic App

LOGIC+

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PLC logic – Product overview

Programmable logic relay system

System Availability
Easy handling
Time saving
Space saving

Memory module
Save programs or easily copy them to other devices with the memory module.

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PLC logic – Product overview

Programmable logic relay system

System Availability
Easy handling
Time saving
Space saving

Basic module

PLC logic processes 16 I/O signals with just one basic module, with an overall width of just 50 mm.

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PLC logic – Product overview

Programmable logic relay system

System Availability
Easy handling
Time saving
Space saving

Intuitive LOGIC+ software

LOGIC+ is the intuitive software which allows you to rapidly impleme

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PLC logic – Product overview

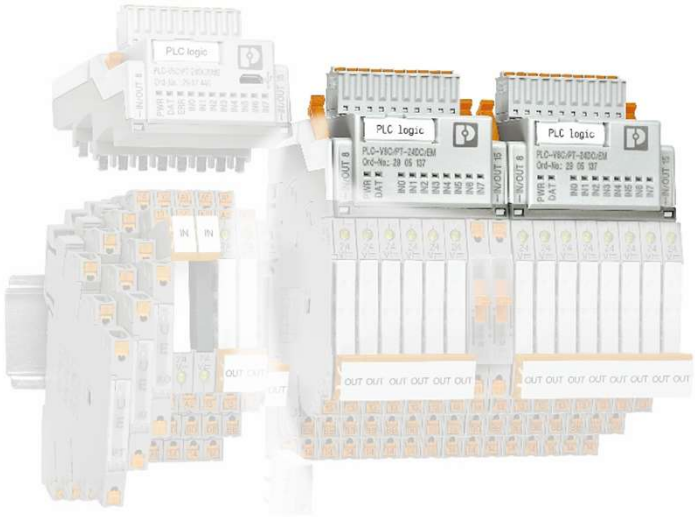
Programmable logic relay system

PLC logic app
Easy and quick parameter adjustments and monitoring via app for iOS.

Thanks to the app and the corresponding Bluetooth adapter, you can access the process data quickly and wirelessly.

PLC logic – Product overview

Programmable logic relay system



Extension modules

The basic module and the extension module are connected via integrated connectors - no tools required.

Up to 48 I/O signals can be acquired and switched with one basic module and two extension modules.

PLC logic – Product overview

Programmable logic relay system

System Availability
Easy handling
Time saving
Space saving

Relay and analog modules
The modular design with the widest variety of relay and analog modules enables channel-specific assembly.

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PLC logic – Product overview

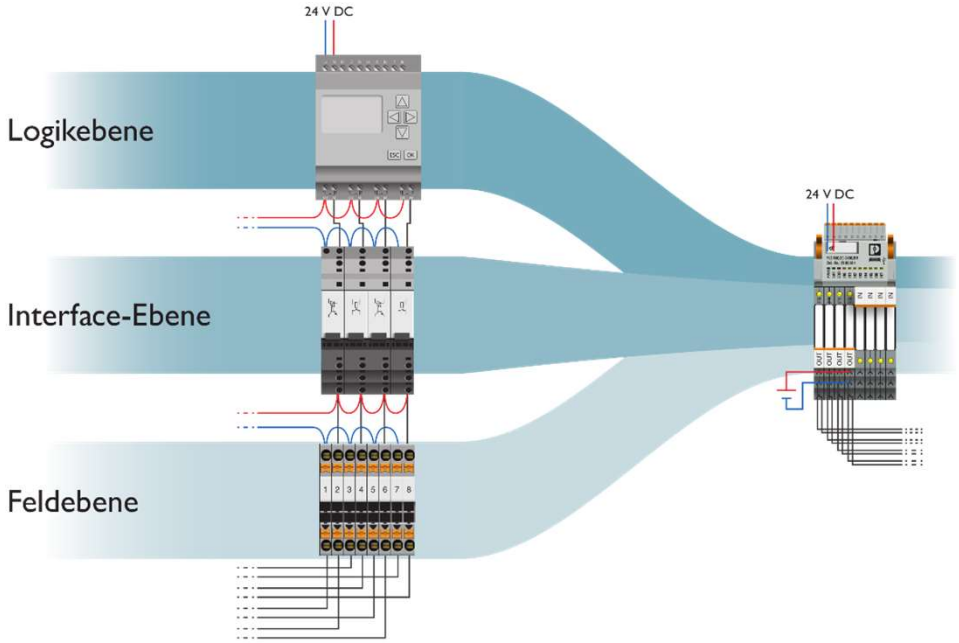
Programmable logic relay system

Touch panel

For jobs requiring control, operation, and monitoring, the BTP 2000 series HMIs go perfectly with PLC logic. Basic touch panels can be used to visualize all the logic module process data.
Three different display sizes enable clear representation, from simple alphanumeric images to graphics-intensive images with object animation.

PLC logic – Comparison of solutions

Programmable logic relay system



conventional wiring

wiring with PLC logic

On conventional logic modules, module wiring is complex and time consuming.

To avoid the disadvantages of permanently soldered relays, additional relay modules are often used in front of the inputs and outputs.

PLC logic replaces conventional switching and control devices and reduces the wiring required.

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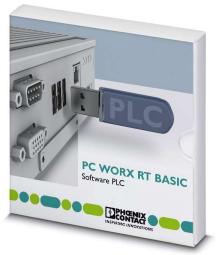
General overview controls

Inline
- The modular PLC for small and medium-sized applications

Axioline
- The fast and robust modular PLC for any application

RFC
- The compact PLC for complex applications and the highest requirements

Software PLC
- Transform your industrial PC into a PLC



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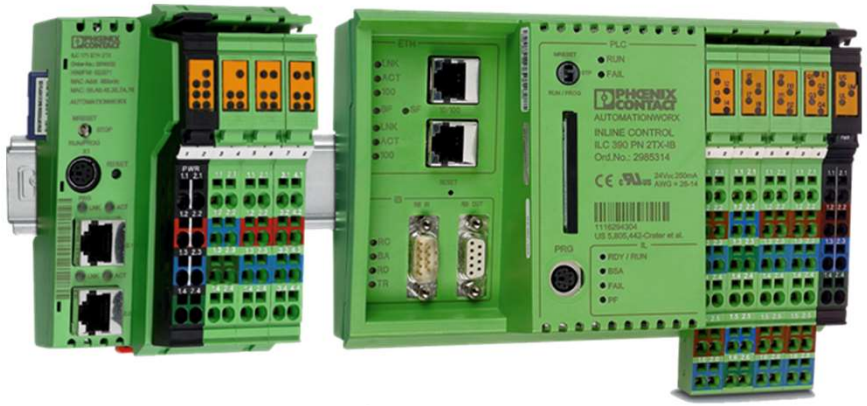
Modular Inline controllers – General data

IEC 61131-3

FTP-Server

Web Server



Parameterization memory up to 2GB

Real-time clock (buffered)

Modular Inline controller – differences

	1x1 ETH	1x1 GSM	1x1 ME AN | INC	3xx
Engineering	PC Worx or PC Worx Express	PC Worx or PC Worx Express	PC Worx or PC Worx Express	PC Worx
Profinet	Device	-	Device	Controller/Device
Memory card	Optional SD-Flash	Optional SD-Flash	Optional SD-Flash	Required CF card
Modbus TCP	Server/Client	Server/Client	Server/Client	-
HTML5	✓	-	✓	-
Onboard DI/Os	8/4	16/4	8/4	12/4
Other specials		GPRS/GSM Modem	RS 485/422/ PWM	
			2/2 AIO 2 counter	

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Modular Inline controller – differences

	Program memory	Mass storage	Retentive mass storage
ILC 131 ETH (XC*)	192 kByte	192 kByte	8 kByte
ILC 151 ETH (XC*)	256 kByte	256 kByte	8 kByte
ILC 151 GSM/GPRS ILC 171 ETH	512 kByte	512 kByte	48 kByte
ILC 191 ETH ILC 191 ME/AN ILC 191 ME/INC	1 MByte	1 MByte	48 kByte
ILC 350 PN	1 MByte	2 MByte	48 kByte
ILC 370 PN ILC 390 PN	2 MByte	4 MByte	96 kByte

*XC temperature range: - 40°C – 60°C

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Special Controller: ILC 2050 BI

- New application fields: Infrastructure, energy & building
- Integrated: 4x LAN, 2x USB & 2x RS-485 interfaces
- Programming with Niagara 4 Framework
  - Expandable by self-programmed functions
- Supported protocols:

niagara framework

BACnet, HTML 5, CSS 3, Java, KNX, oBIX Open Building Information Xchange, LonWorks, batik SVG Toolkit, Modbus, M-Bus, OPC Foundation

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Modular Axioline controllers – General data

JAVA

IEC 61131-3

PROFINET

Web Server

FTP-Server

OPC FOUNDATION

HTML

Parameterization memory up to 2GB

Modbus

Real-time clock (buffered)

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Modular Axioline controller – differences

	1050 (XC*)	3050	Cloud
Engineering	PC Worx or PC Worx Express	PC Worx	PC Worx PC Worx Express
Profinet	Controller/Device	Controller/Device	Controller and Proficloud-Device
Memory card	Optional SD-Flash	Optional SD-Flash	Optional SD-Flash
Modbus TCP	Server/Client	Server/Client	
Ethernet	2x (switched internally)	3x	2x (switched internally)
Other specials			▪ Cloud controller for decentralized use of I/Os ▪ Global availability ▪ Cloud Credits - runtime licenses

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Modular Axioline controller – differences

	1050 (XC*)	3050	Cloud
Program memory	1 MByte	4 MByte	1 MByte
Mass storage	2 MByte	8 MByte	1 MByte
Retentive mass storage	48 kByte	128 kByte	48 kByte

*XC temperature range: - 40°C – 70°C

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RFC – General data

IEC 61131-3

FTP-Server

Controller & Device

Diagnostic display

Web Server

Ethernet 3x

Parameterization memory up to 2GB

Real-time clock (buffered)

INSPIRING INNOVATIONS

RFCs - differences

	RFC 460R PN 3TX	RFC 470 PN 3TX	RFC 470S PN 3TX
Engineering	PC Worx	PC Worx	PC Worx
Onboard DI/Os	-	5/3	5/3
Interbus	-	✓	✓
Other specials:			
Redundancy	✓ AutoSync Technology Designed by PHOENIX CONTACT	-	-
Safety Controller	-	-	✓ PROFIsafe

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RFCs - differences

	RFC 460R PN 3TX	RFC 470 PN 3TX	RFC 470S PN 3TX
Program memory	8 MByte	8 MByte	8 MByte
Mass storage	16 MByte	16 MByte	16 MByte
Retentive mass storage	120 kByte	240 kByte	240 kByte

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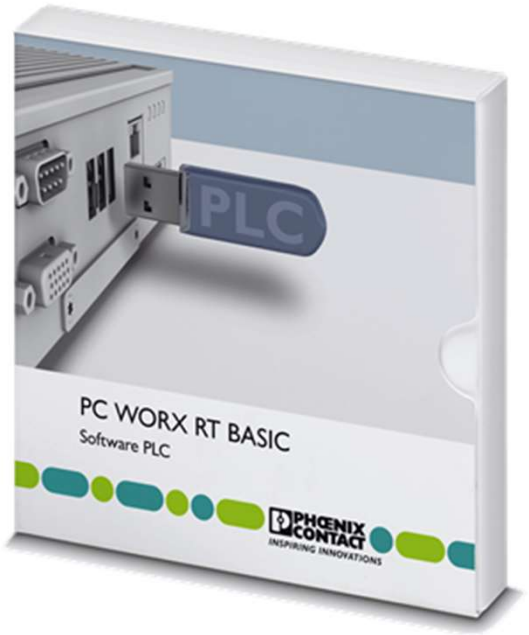
- Software
- New products
- Competitors
- Application areas
- Phoenix Contact World



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Software PLC – General Data

IEC 61131-3

FTP-Server

Controller & Device

Web Server

SW for IPC or Windows

Real-time clock

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Software PLC - differences

	PC Worx RT Basic	PC Worx SRT
Engineering	PC Worx	PC Worx
Installation on	IPC	Windows or IPC
Performance class	High control performance and large-sized memory	Compact controller
Real-time capability	Yes	No
Interbus	✓ only in conjunction with an INTERBUS master controller board	-
Program memory	8 MByte	1 MByte
Mass storage	16 MByte	1 MByte
Retentive mass storage	240 kByte	48 kByte

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Software - PC WORX 6.xx

IEC 61131-3 Engineering tool

FBD, LD, ST, IL, SFC

Worldwide usable

Powerful debugging

Free graphical programming editors

Express

Basic license

Basic update

Pro license

Pro update

Demo

Pro license 180days

Pro lic copy

Basic →Pro upgrade lic

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PLCnext Technology
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PLCnext Engineer

PLCnext Technology Configuration and Engineering

Fast and flexible configuration

- C-Code, Simulink models, function components, IEC61131-3, Safety, HMI

Extendable

- By licensed add-ins like the Viewer for Simulink

Easy handling

- Intuitive user interface
- Clear structures

The software for configuration and engineering

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Complete Integrated System

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PLCnext Technology
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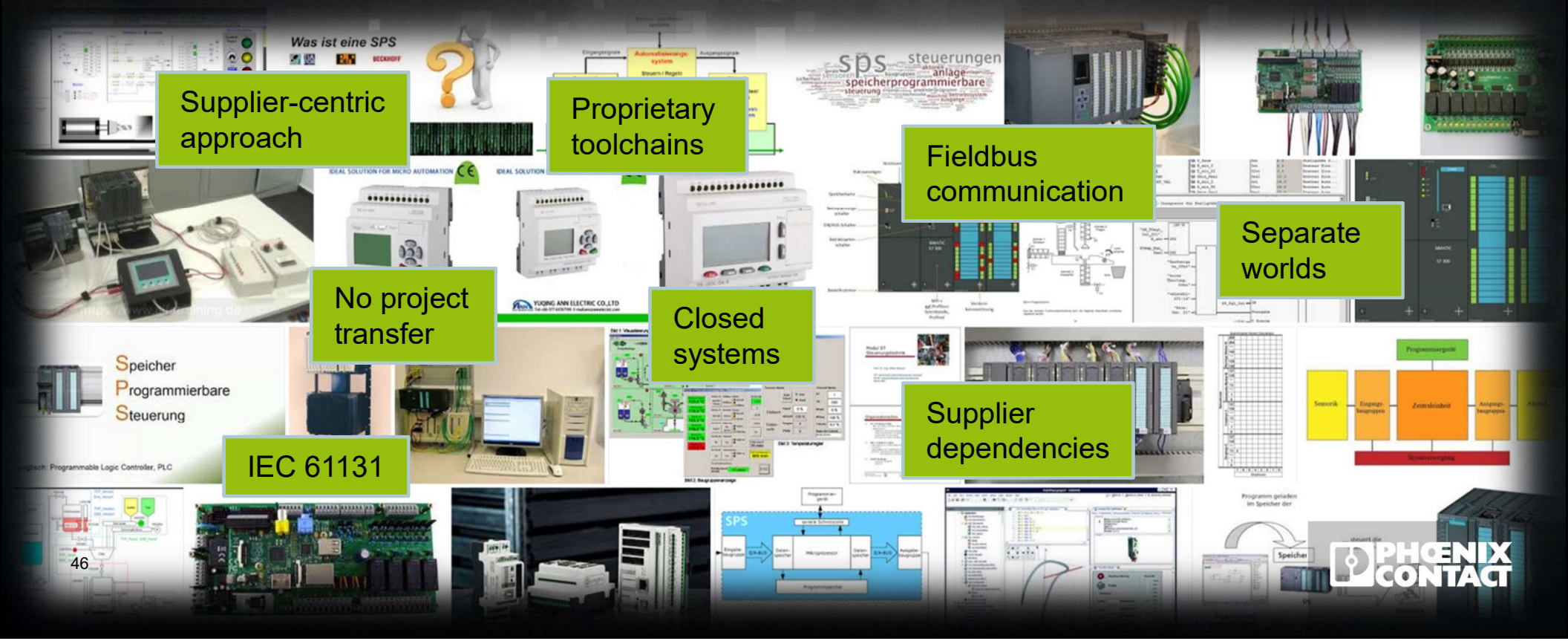
Where we come from – Control Technology yesterday



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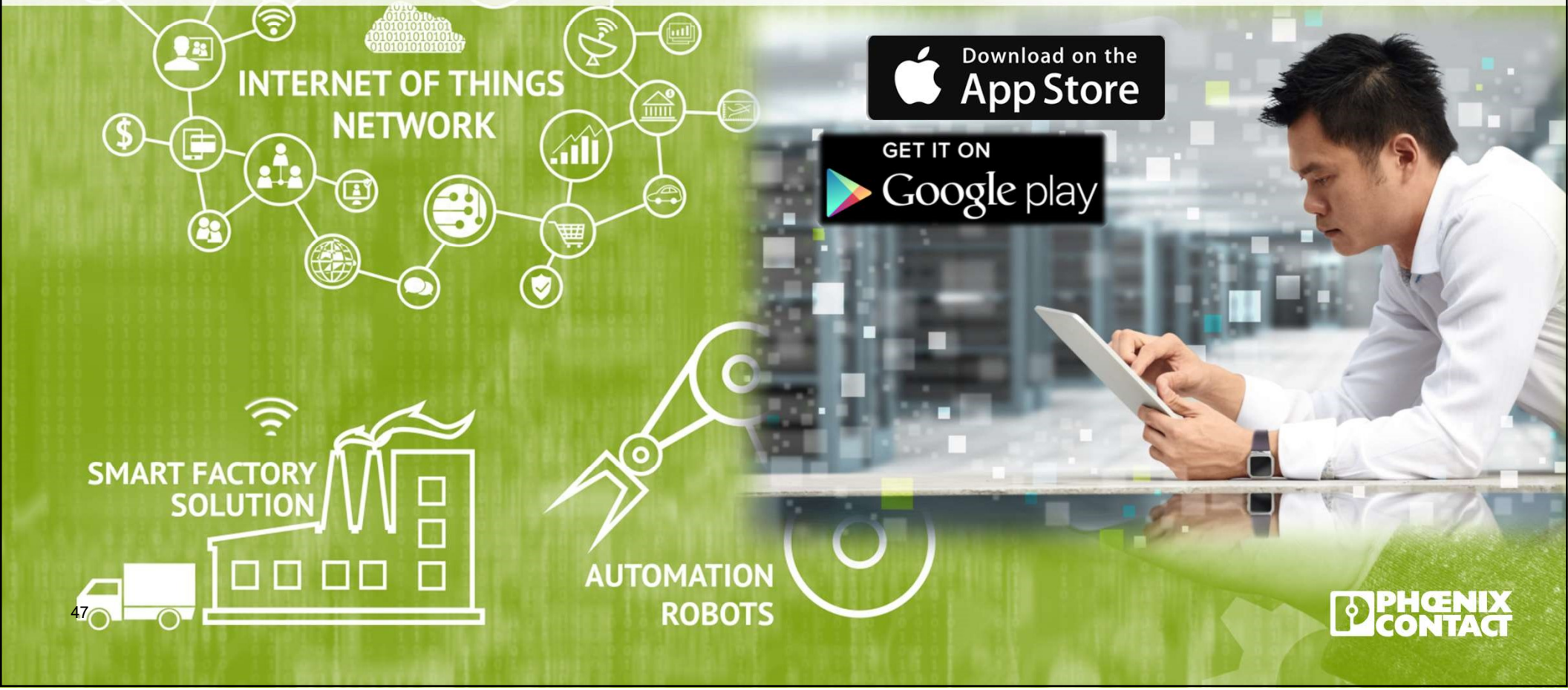
Digitalization – Changing Market & Customer Requirements



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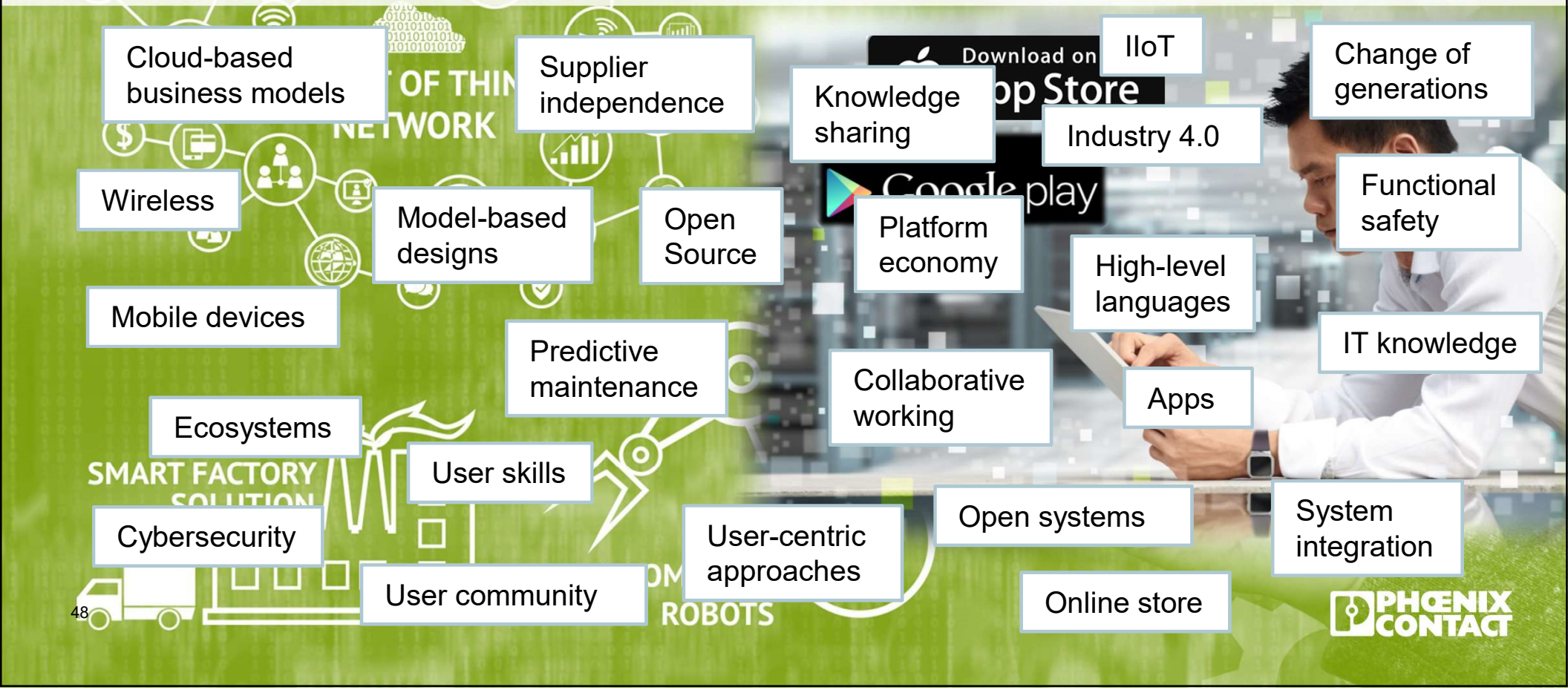
Digitalization – Changing Market & Customer Requirements



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Our Answer: An Open Ecosystem for Limitless Automation

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PLCnext Technology in a nutshell

The Open Ecosystem for Limitless Automation

PLCnext Technology
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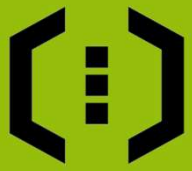
PLCnext Technology
enhance your automation thinking

PLCnext Control



Open Control Platform

PLCs in various performance classes including PLCnext Runtime System and accessories for PLCnext Technology

PLCnext Engineer

Engineering Software

Engineering tool for commissioning, configuring, and programming PLCnext Controls

PLCnext Store

Software Store for Automation

Apps for functional extension of PLCnext Control and PLCnext Engineer

PLCnext Community

User Collaboration & Resources

Information, support, and helpful resources about PLCnext Technology including FAQs, forums, tutorials and a GitHub presence

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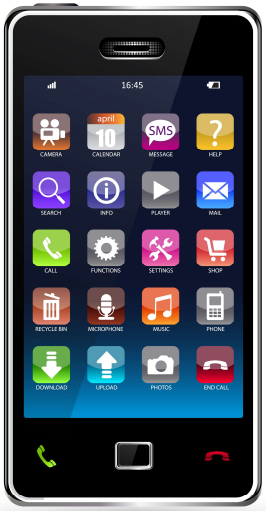
PLCnext Technology

The reliability and robustness
of the classical PLC world

enhances

with the openness and flexibility
of Smart Devices.



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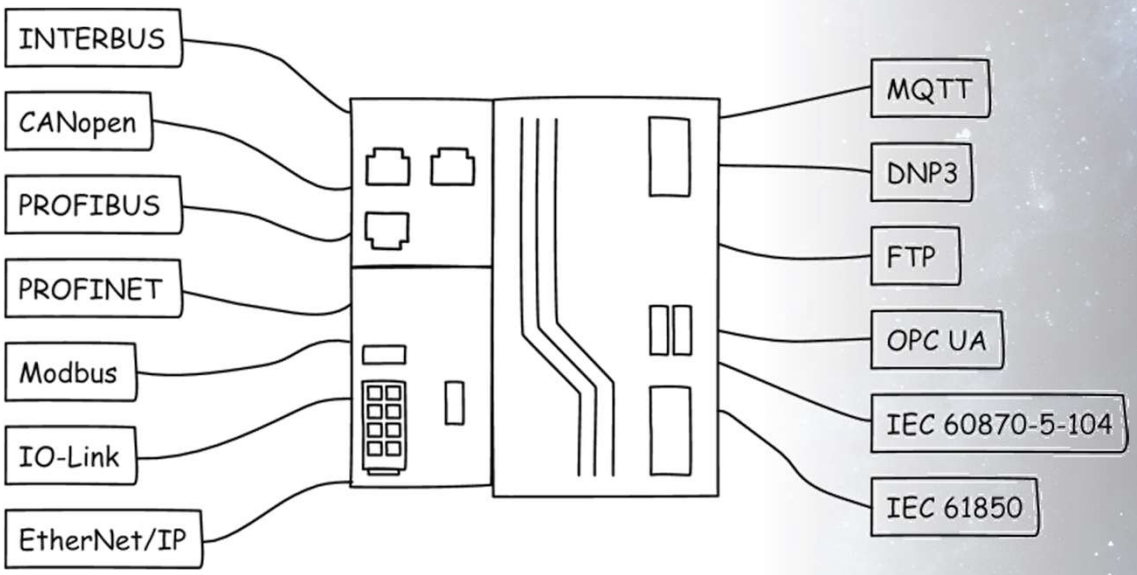
enhanced connectivity – Intelligent Networking

Future-proof Connectivity



PLCnext Technology enables the integration of current and future interfaces and protocols for open communication in highly networked automation systems.

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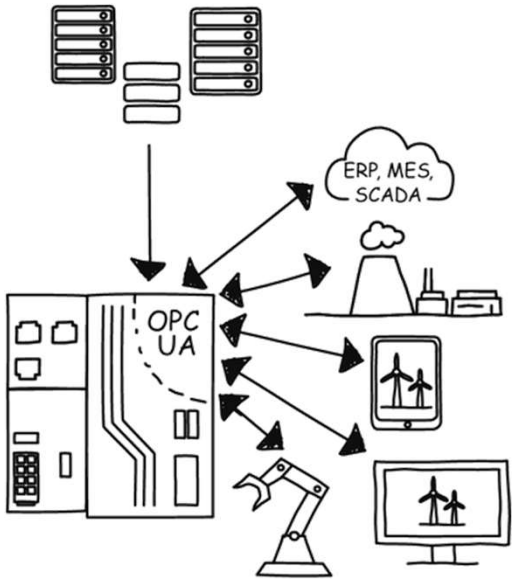
enhanced connectivity – Intelligent Networking

Integrated OPC UA Server



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OPC UA

Data Access, Alarms and Conditions, Programs, Historical Access, Global Discovery Server

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enhanced connectivity – Intelligent Networking

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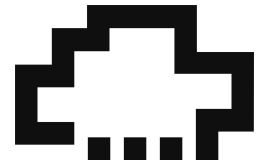
PROFICLOUD, Public Cloud, Private Cloud – any Cloud!



Implement new IoT-based business models through direct connection to cloud-based services and databases.
Benefit from the seamless integration of Phoenix Contact´s PROFICLOUD and a cloud-agnostic strategy where the PLCnext Store delivers cloud connectors for every cloud. PLCnext Technology supports any customer cloud implementation – public, private, hybrid - including AWS, IBM, Azure, Alibaba, and MindSphere.

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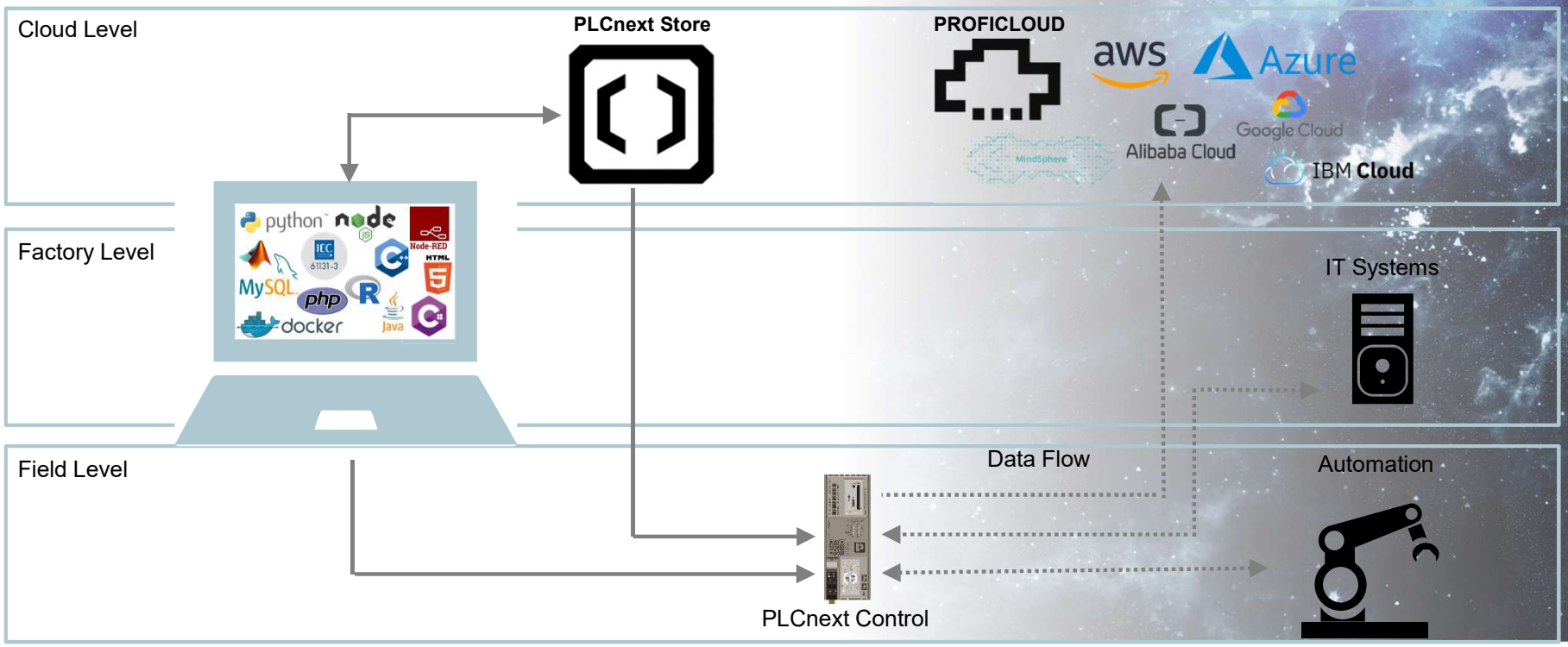
INSPIRING INNOVATIONS

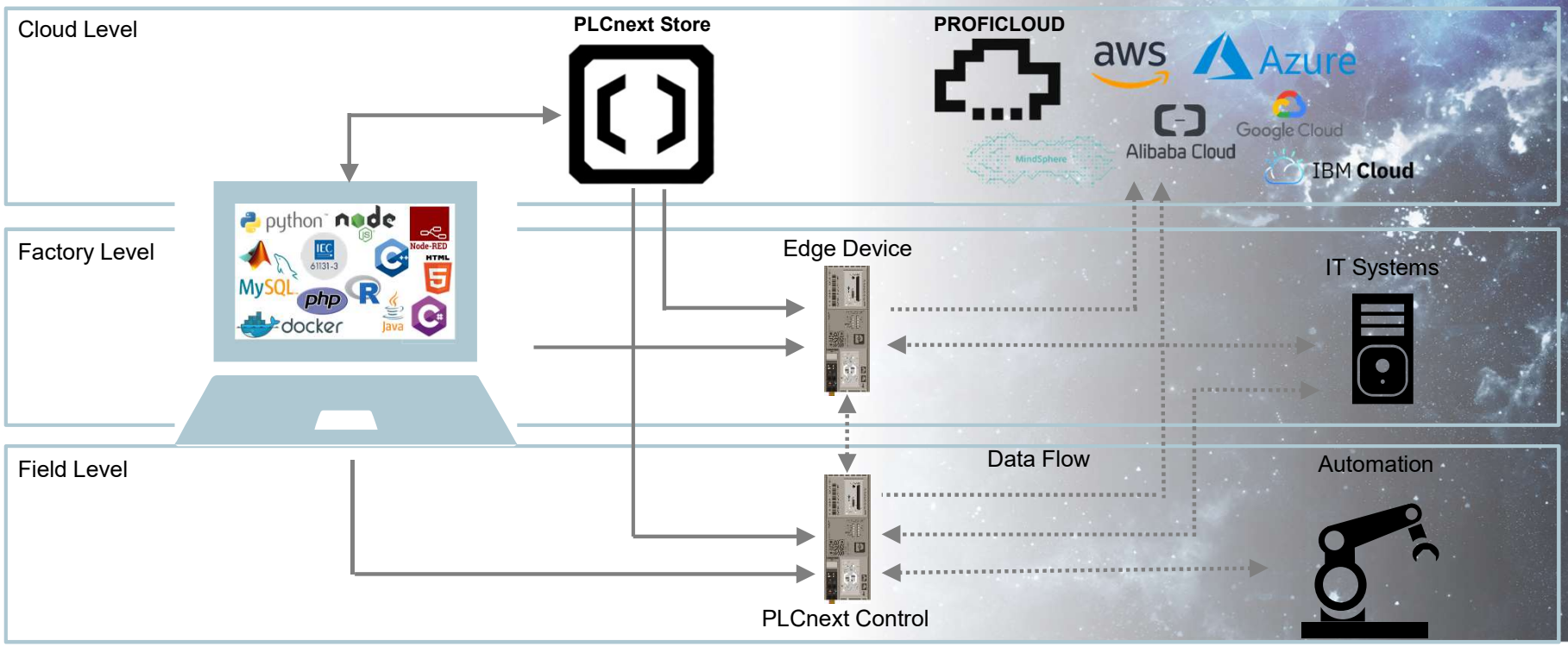
enhanced connectivity – Edge Device or PLC connecting all Levels

PLCnext Control as PLC



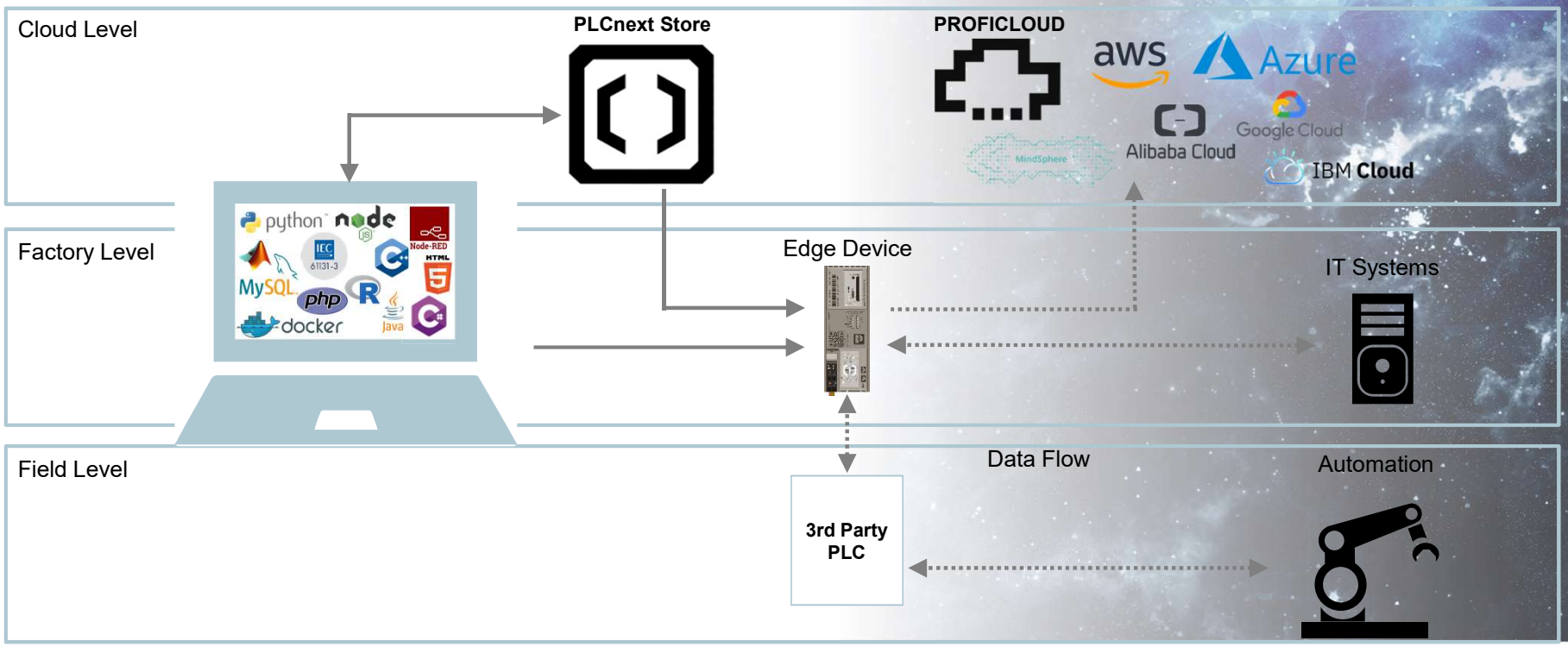
enhanced connectivity – Edge Device or PLC connecting all Levels

PLCnext Control as PLC and Edge Device



enhanced connectivity – Edge Device or PLC connecting all Levels

PLCnext Control as Edge Device



enhanced
freedom
Flexible integration of
open source software and apps
PLCnext Technology
Designed by PHOENIX CONTACT
PLCnext Technology enables any desired combination of independently created program parts and complete applications. The use of open-source software and apps, e.g. from our PLCnext Store, improves the efficiency of your development processes. They sky is the limit when it comes to future expansions.

enhanced freedom

Limitless Adaption Capability

PLCnext Technology enables any desired combination of independently created program parts and complete applications. The use of open-source software and apps improves the efficiency of your development processes.

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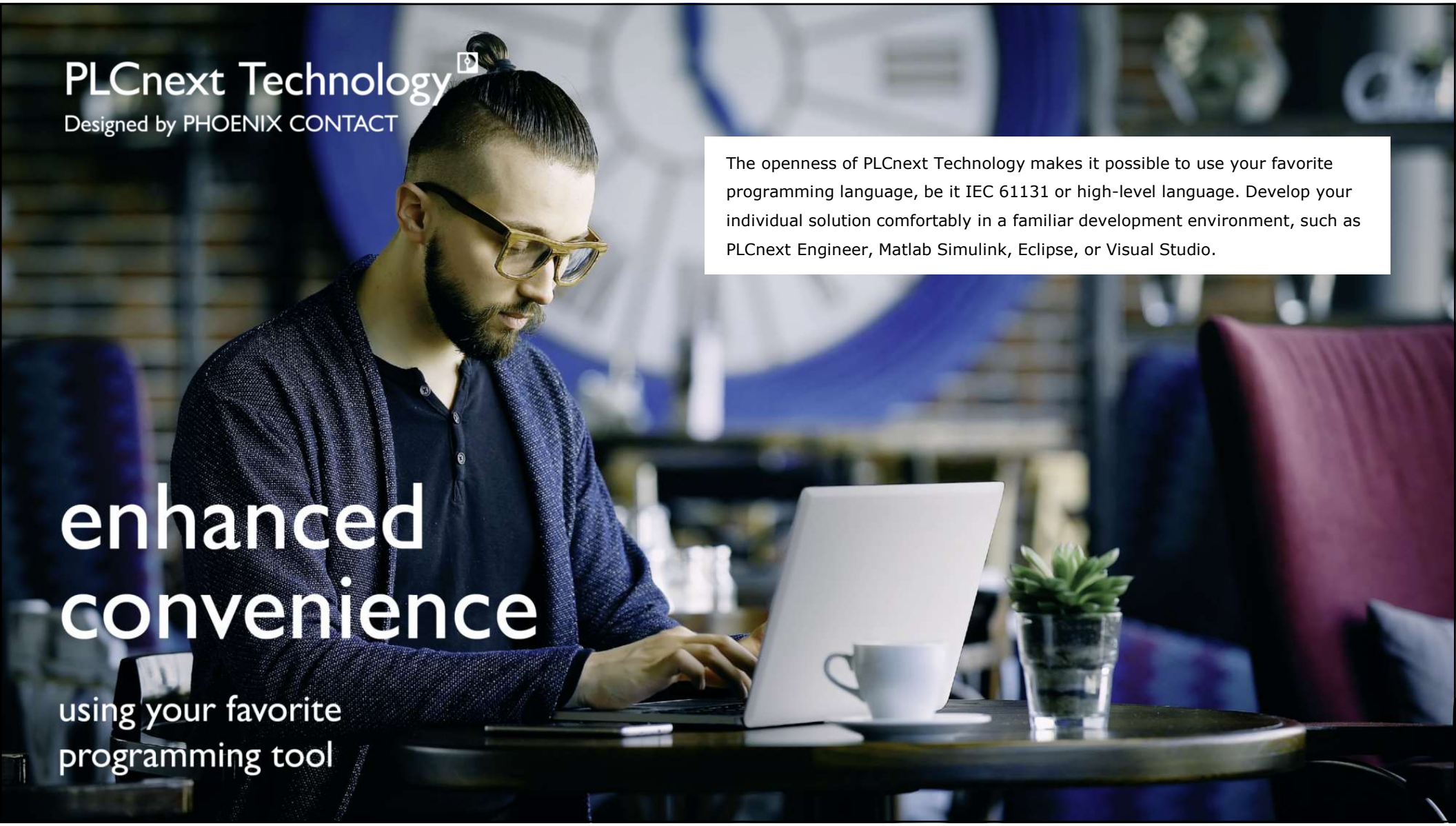
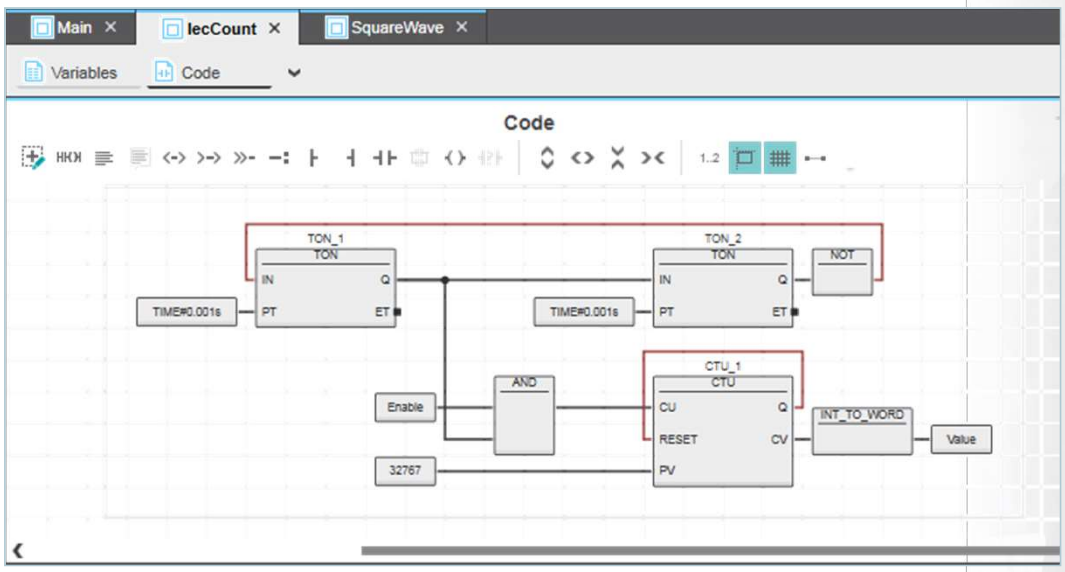
INSPIRING INNOVATIONS



The openness of PLCnext Technology makes it possible to use your favorite programming language, be it IEC 61131 or high-level language. Develop your individual solution comfortably in a familiar development environment, such as PLCnext Engineer, Matlab Simulink, Eclipse, or Visual Studio.

enhanced convenience

IEC 61131-3 Programming with PLCnext Engineer



Use the innovative and easy to use features of PLCnext Engineer.

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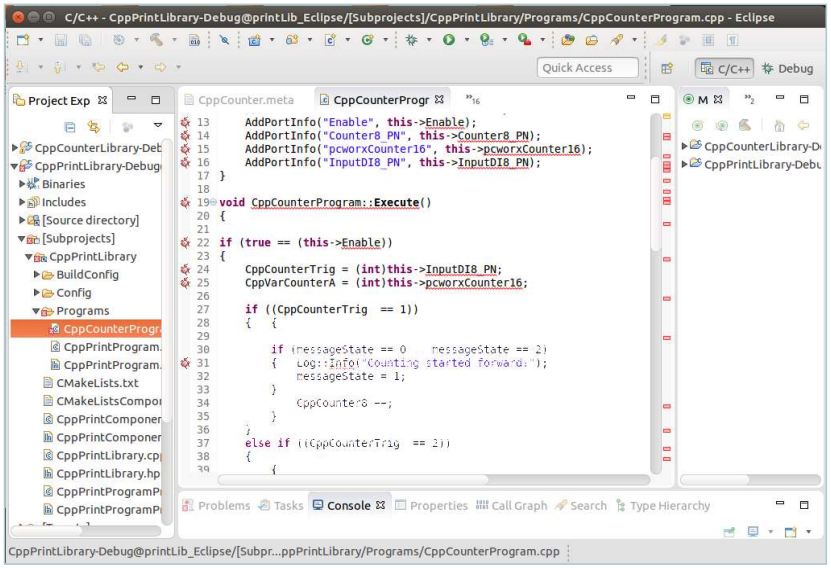
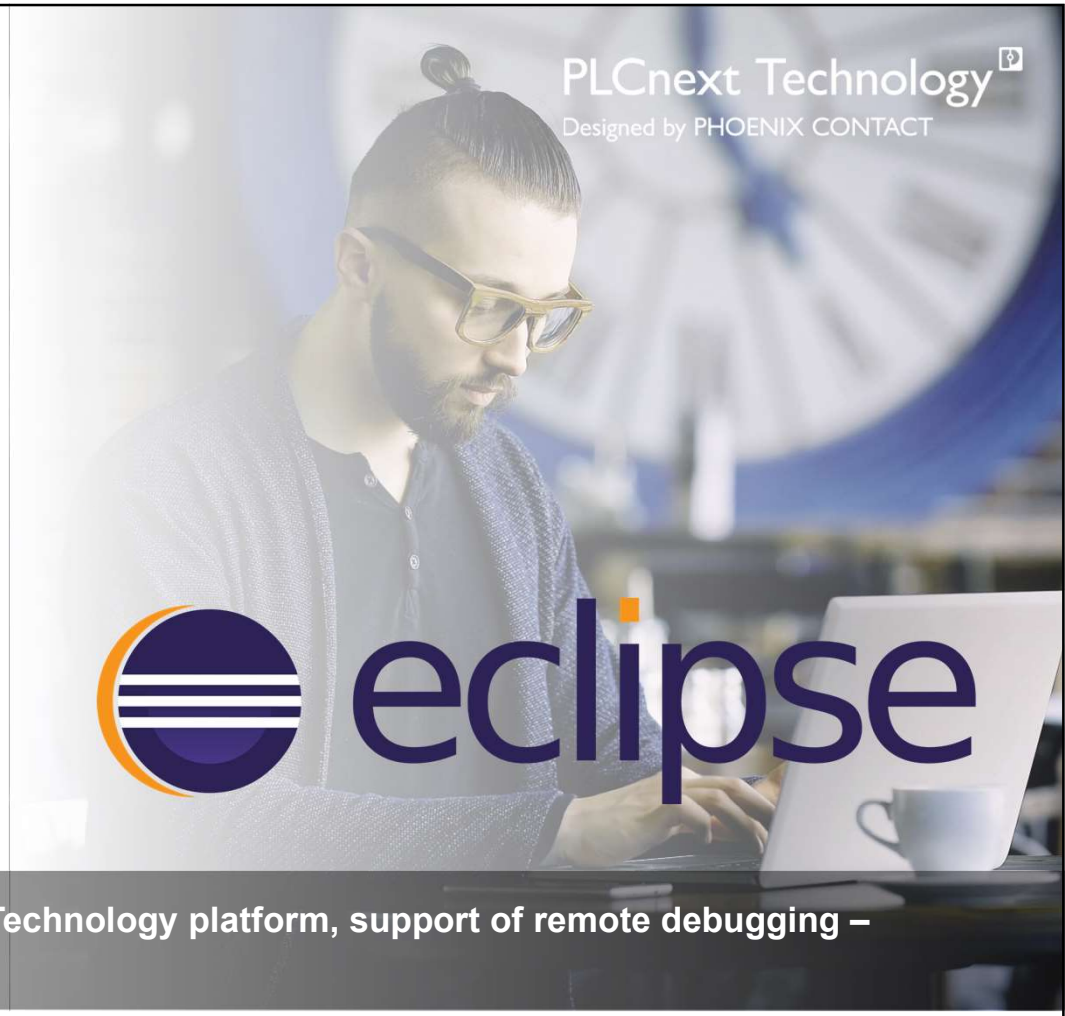
enhanced convenience

Programming – C/C++





C/C++ acc. to standard, easy interface to the PLCnext Technology platform, support of remote debugging – use the tool you are familiar with.

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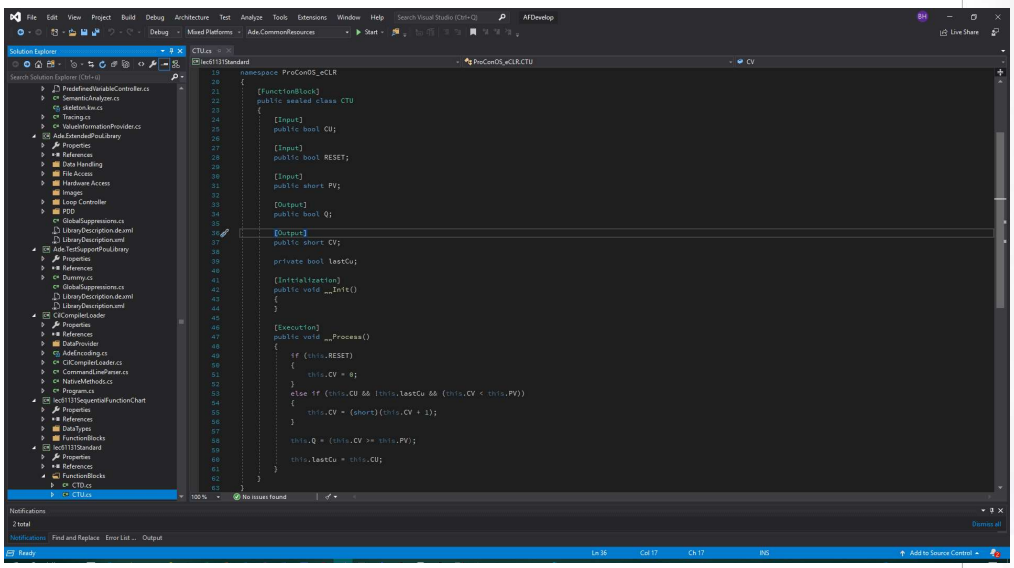
enhanced convenience

C# Function Blocks



Development and integration of function blocks with C# with a dedicated plug-in for Visual Studio.
Create IEC 61131 function blocks with C# and execute them in real-time with the eCLR runtime system.

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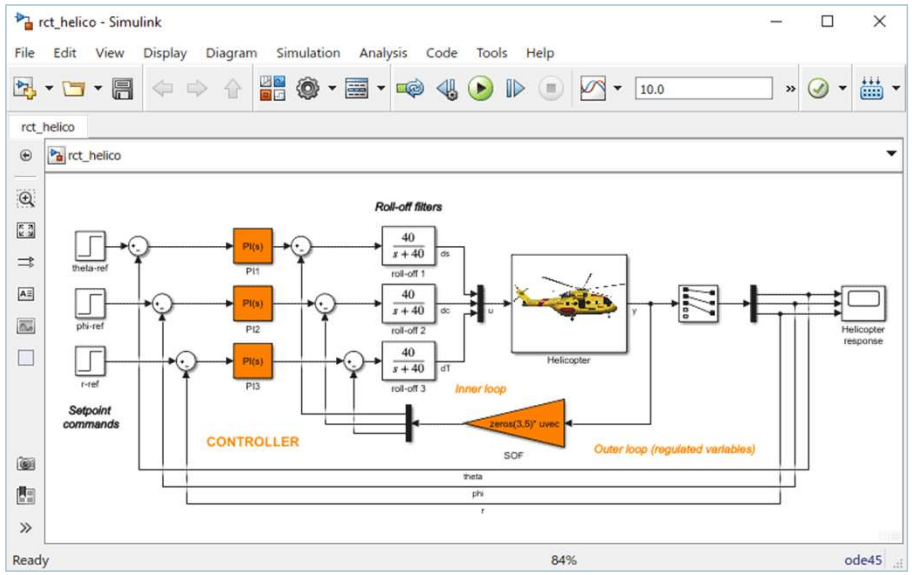
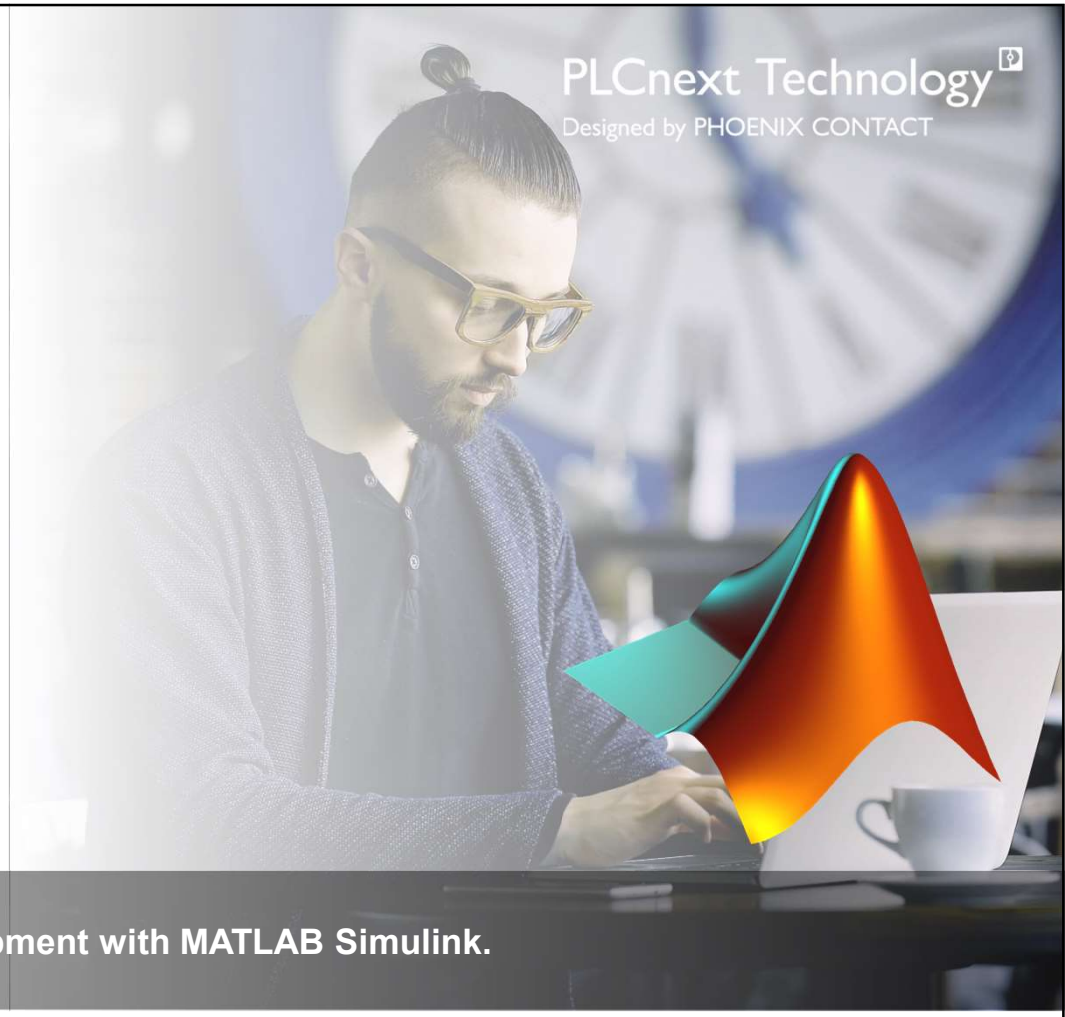
MATLAB Simulink





Seamless integration of model-based design & development with MATLAB Simulink.

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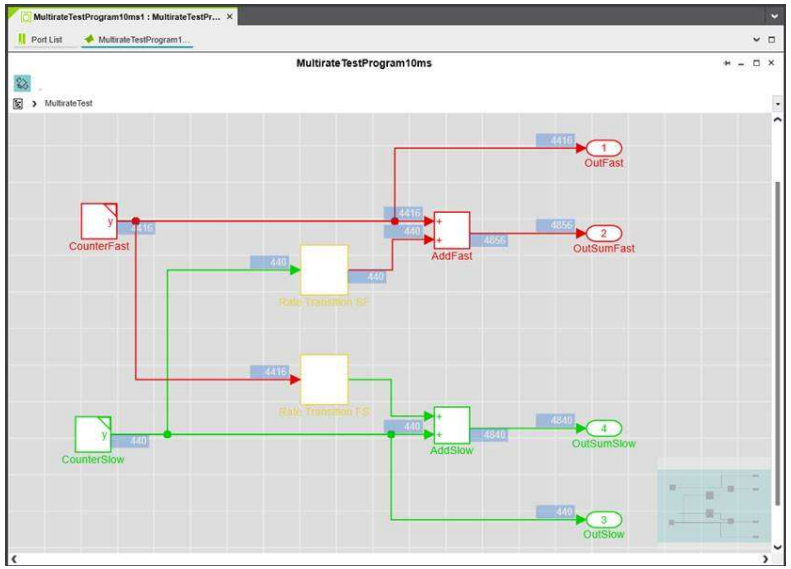
enhanced convenience

MATLAB Simulink & PLCnext Engineer



Seamless integration of model based design & development with MATLAB Simulink and PLCnext Engineer.

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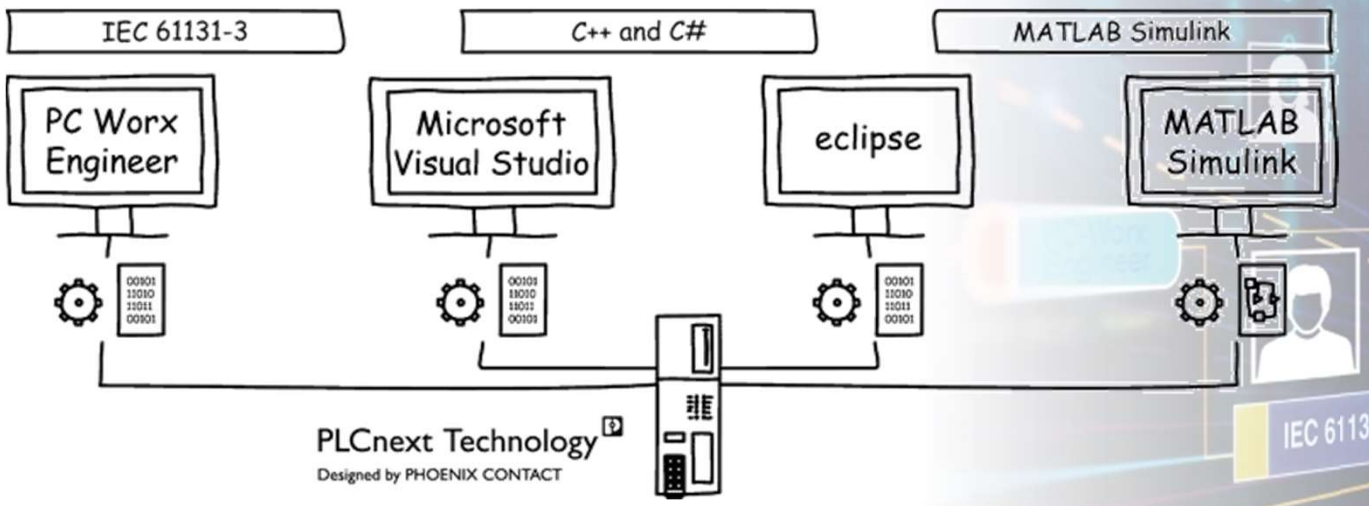
enhanced development

Convenient Engineering & Application Development



With PLCnext Technology, several developers from different generations, with different skill sets and expertise can work on one controller program, in parallel and yet independently, using different programming languages.

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PLCnext Technology
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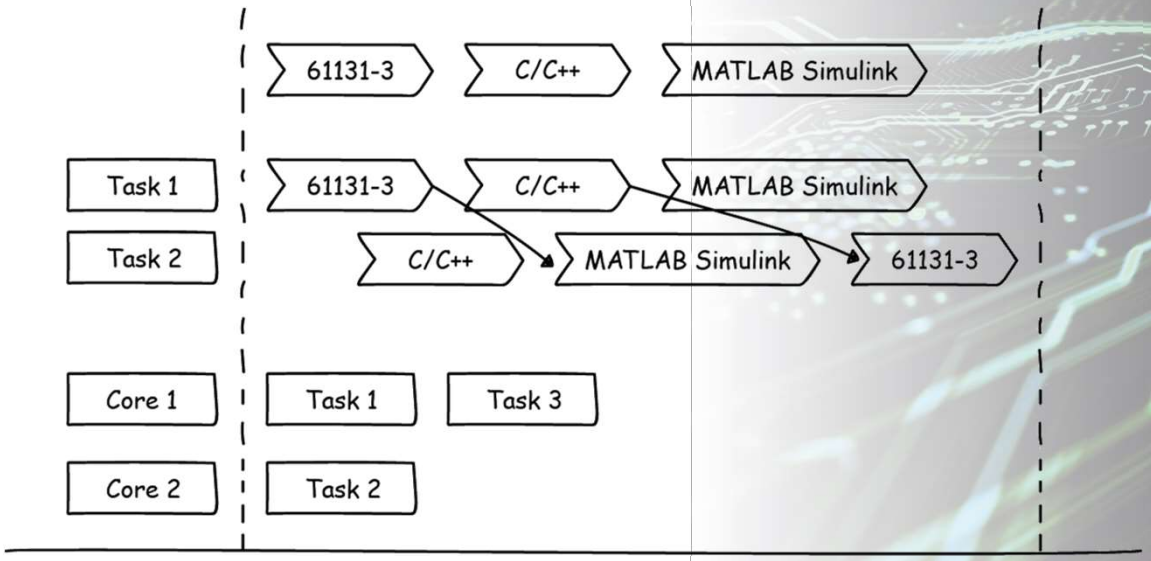
enhanced performance – PLC-typical Real-time Performance

Execution & Synchronization Manager



The patent-applied-for task handling of PLCnext Technology lets program routines of different origin run like classical IEC 61131 PLC code. Your high-level language programs become automatically deterministic.

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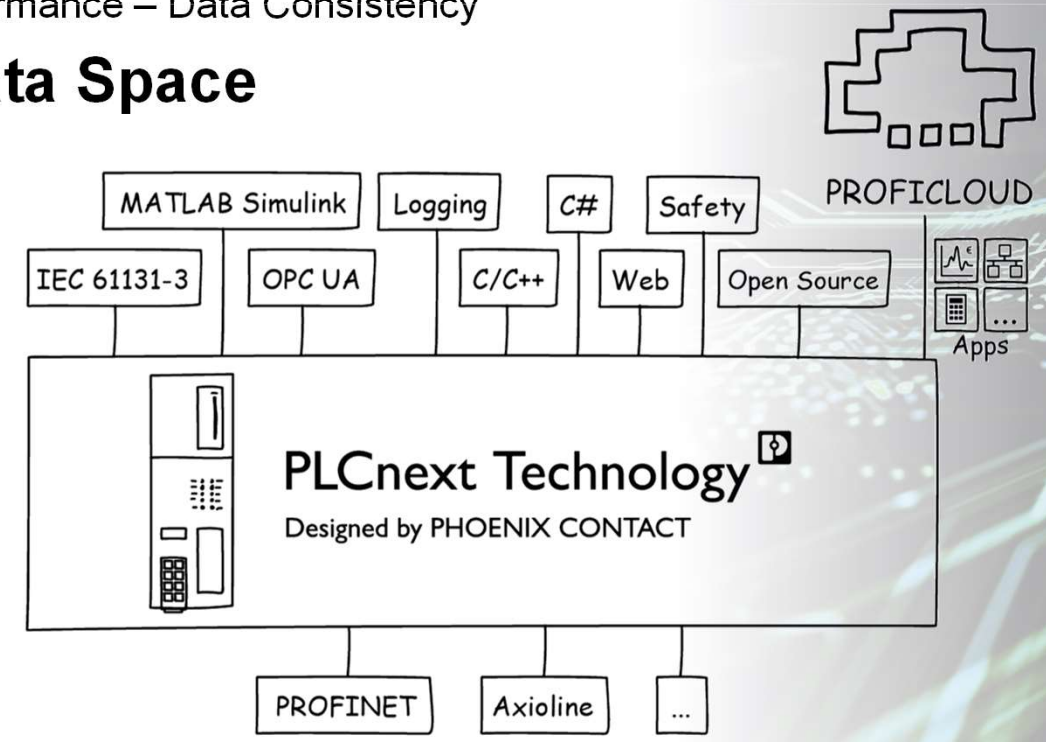
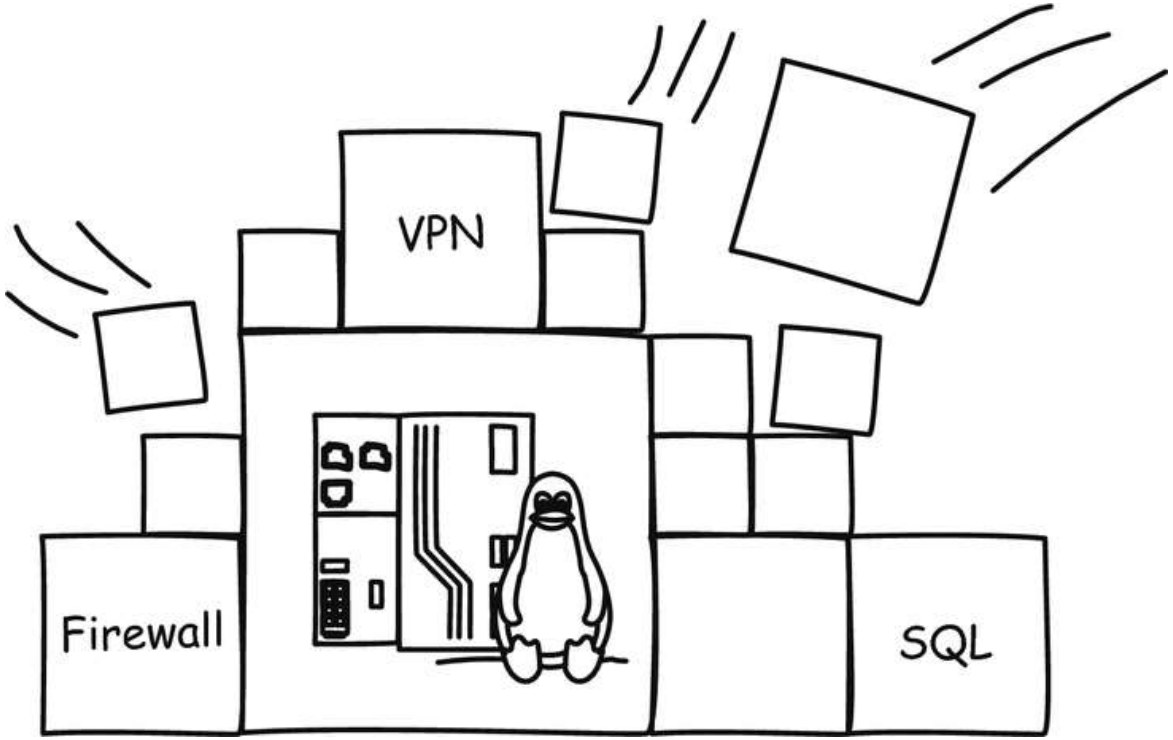
enhanced performance – Data Consistency

Global Data Space



Fast and consistent data exchange between user programs, fieldbuses, and system programs. Access via Data Logger, HMI, and OPC UA. Security aspects for user management.

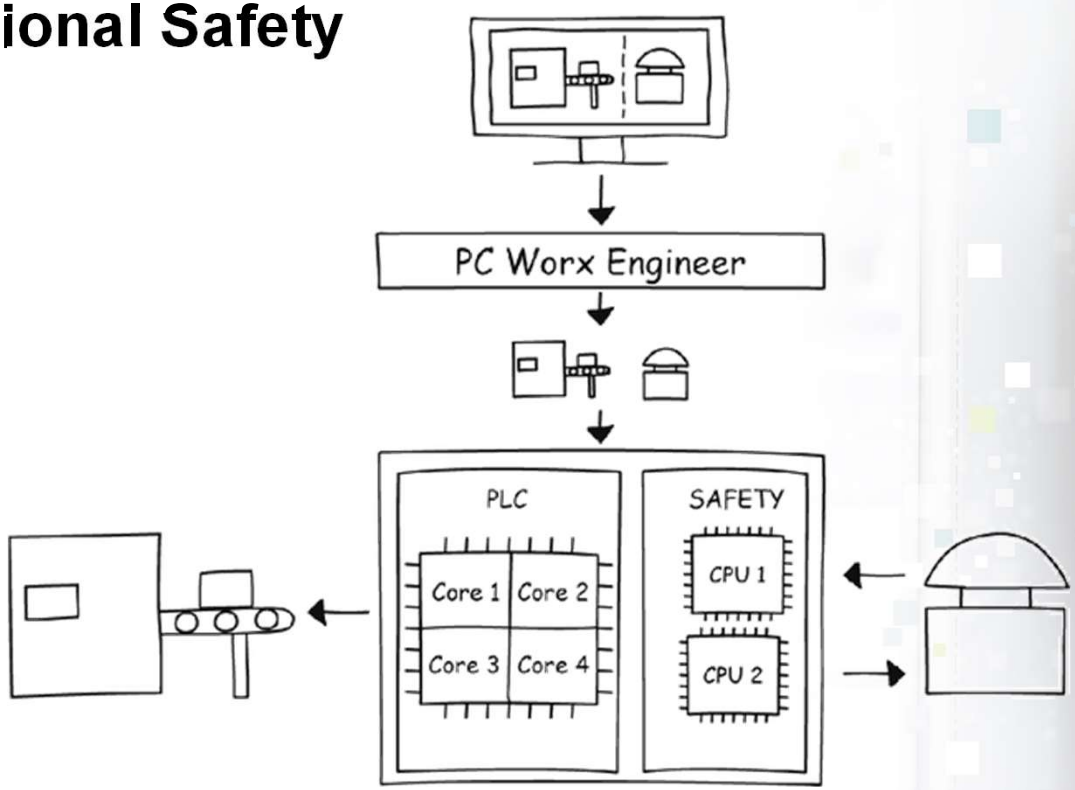
Flexibility of Linux plus the Reliability of a PLC

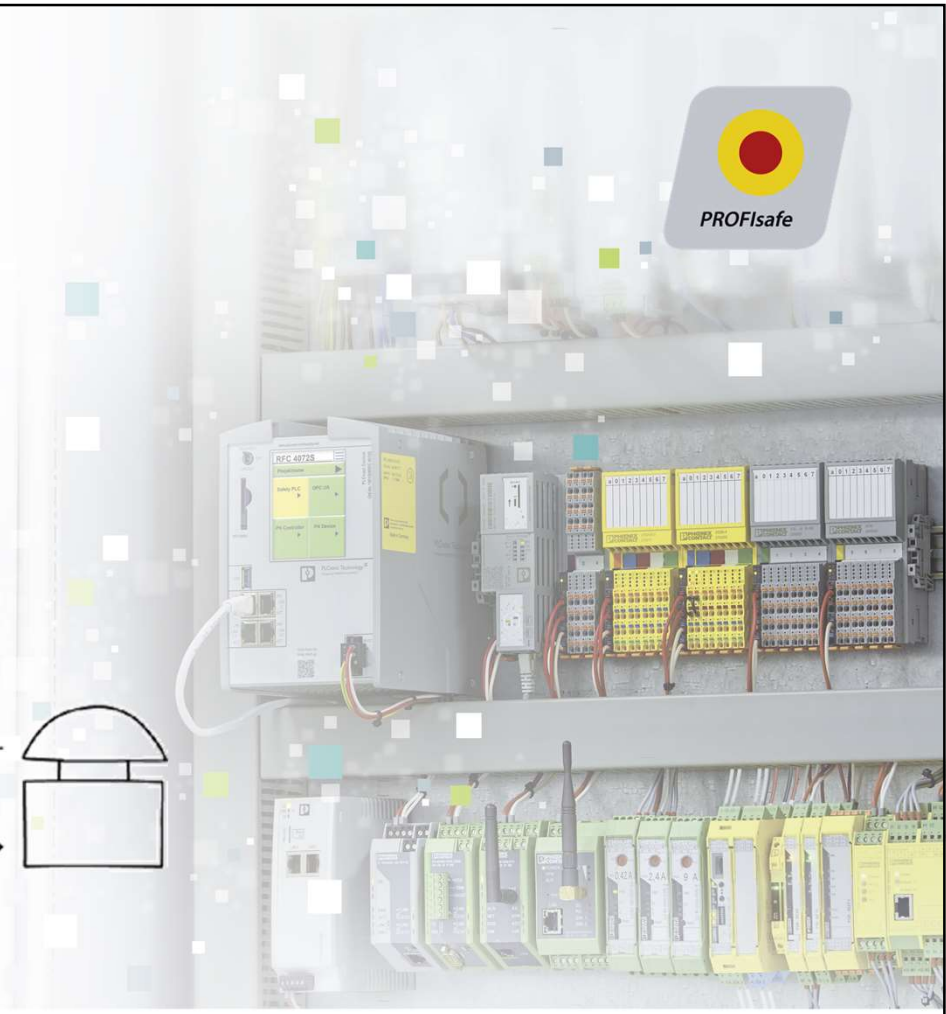


- **PLCnext Technology is based on Linux…**
  - Open source Linux Packages
- **… but as performant as a “classic” PLC!**
  - Easy task management
  - Precise synchronization
  - Cycle-consistent data exchange
  - No Linux knowledge needed

PLCnext Technology – Safety

Functional Safety





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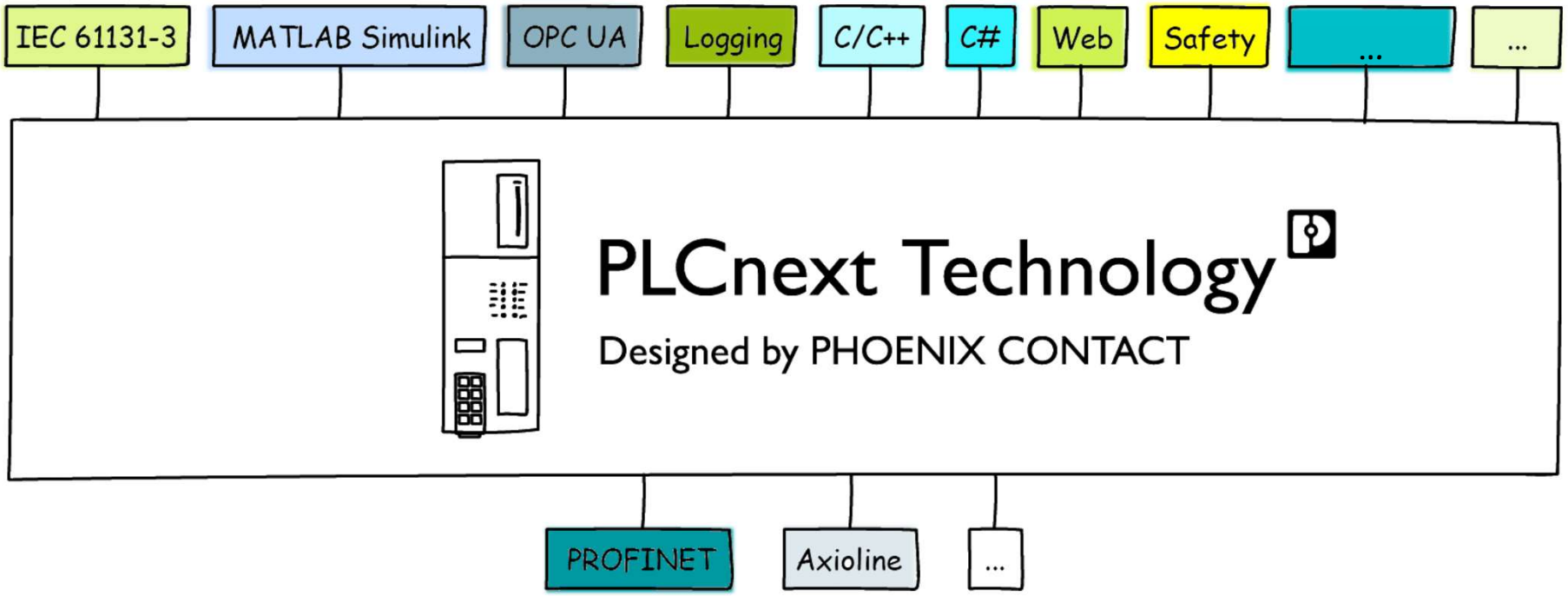
New technology – PLCnext Technology



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PLCnext Technology
enhance your automation thinking
PLCnext Controls

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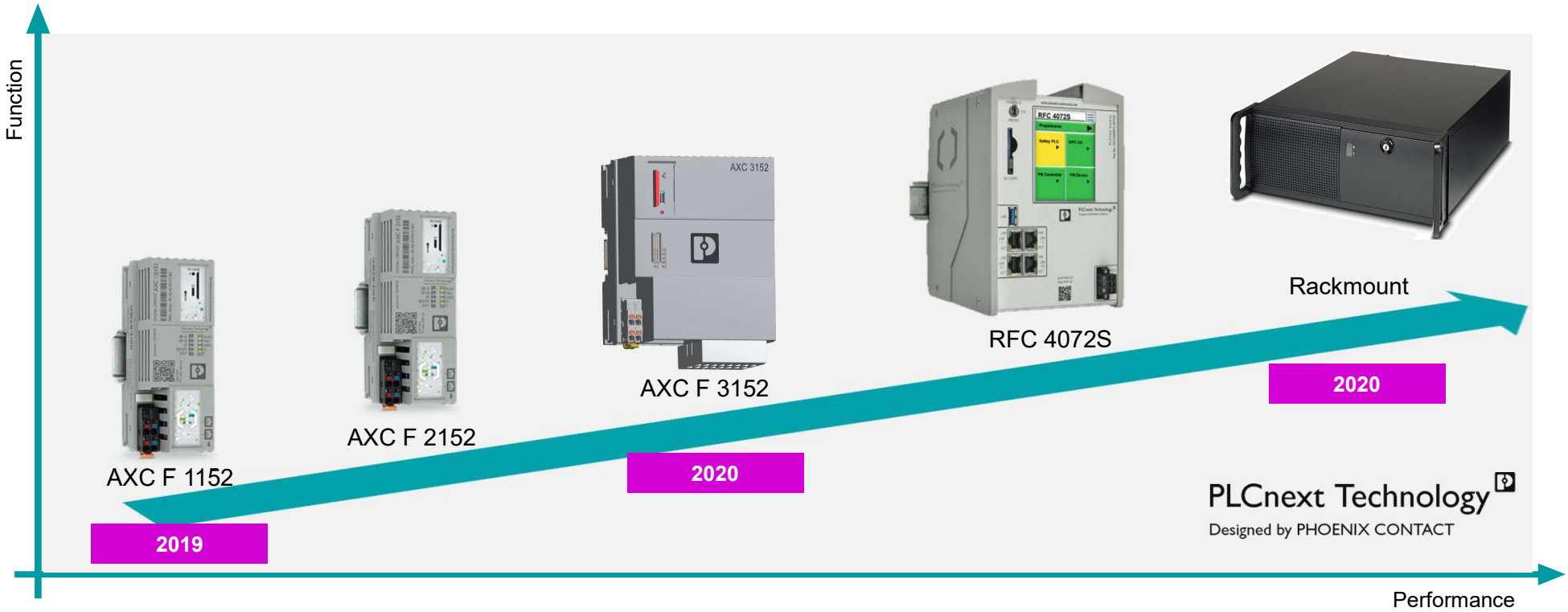
PLCnext Controls Portfolio



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PLCnext Controls

PLCnext Control AXC F 1152

PLCnext Technology
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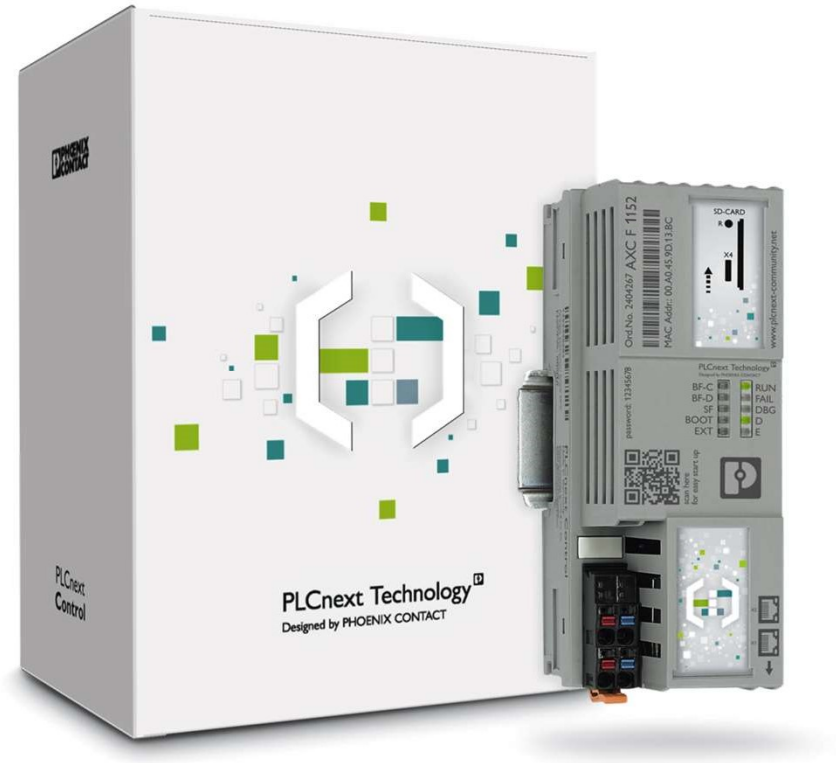

- Cyclone 5 with ARM Cortex-A9 CPU 1 x 800 MHz
- Number Control-Tasks (IEC 61131): 8
- Min. cycle time (IEC 61131): 5 ms
- Profinet Controller & Device with 16 ARs
- 512 Mbytes RAM
- SD Flash card slot
- 1 x ETH-MAC interface (2 x 10/100 Mbit) switched
- Real-time clock
- Supports INLINE and AXIOLINE I/O modules
- Trusted platform module (TPM) for security
- Temperature range: -25°C up to +60°C

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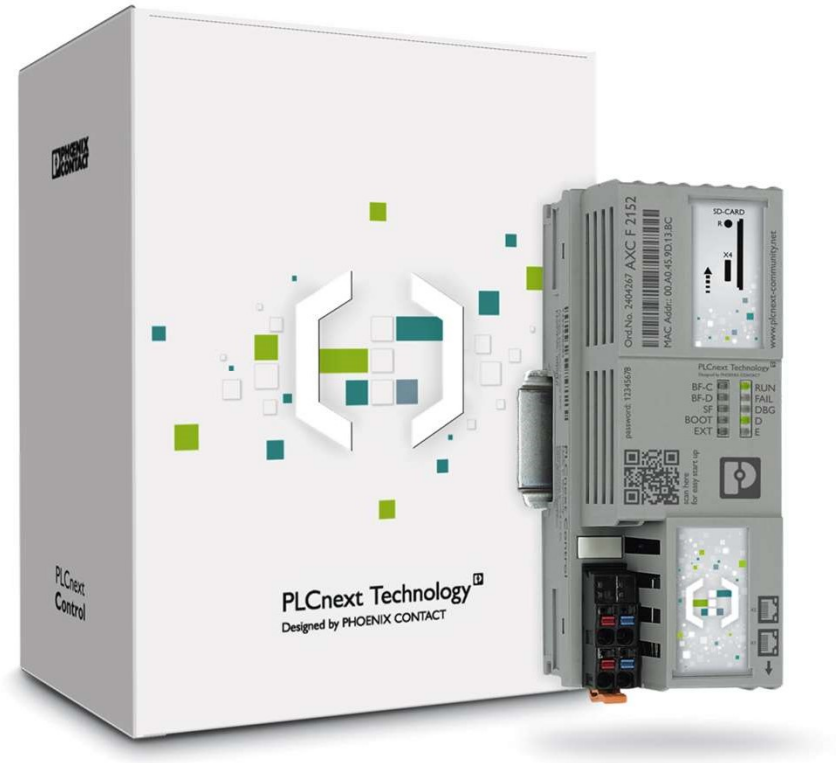
PLCnext Controls

PLCnext Control AXC F 2152



- Cyclone 5 with ARM Cortex-A9 CPU 2 x 800 MHz
- 512 Mbytes RAM
- SD Flash card slot
- 1 x ETH-MAC interface (2 x 10/100 Mbit) switched
- Micro-USB type C
- Real-time clock
- Supports INLINE and AXIOLINE I/O modules
- Left side extension capability
- Trusted platform module (TPM) for security
- Temperature range: -25°C up to +60°C

PLCnext Technology
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Feature Set Differences – AXC F 1152 vs. AXC F 2152

Feature	AXC F 1152	AXC F 2152
CPU	Cyclone 5 with ARM Cortex-A9 1 x 800 MHz	Cyclone 5 with ARM Cortex-A9 2 x 800 MHz
Approvals	UL, CE	UL, CE, Marine, ATEX
Max. number of control tasks	8 (1 x 8)	32 (2 x 16)
PLCnext extension support (left-hand side)	No	Yes
PROFINET Features	Controller & Device with max. 16 ARs	Controller & Device with max. 64 ARs
Min. task cycle time	5 ms	1 ms

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PLCnext Control AXC F 3152

- Intel ATOM x5-E3930 dual-core CPU (2 x 1,3 GHz)
- 2 GB DDR4 dual-channel RAM
- 3 independent ETH-MAC interfaces (3 x 1 Gbit)
- Supports 2 PLCnext Control extensions (internal PCIe bridge)
- Supports INLINE and AXIOLINE I/O modules
- Integrated uninterruptible power supply (UPS) for targeted application shutdown
- SD card slot
- Diagnostic LEDs
- Real-time clock
- Temperature range: -25°C up to 60°C
  - Optional fan to increase service life

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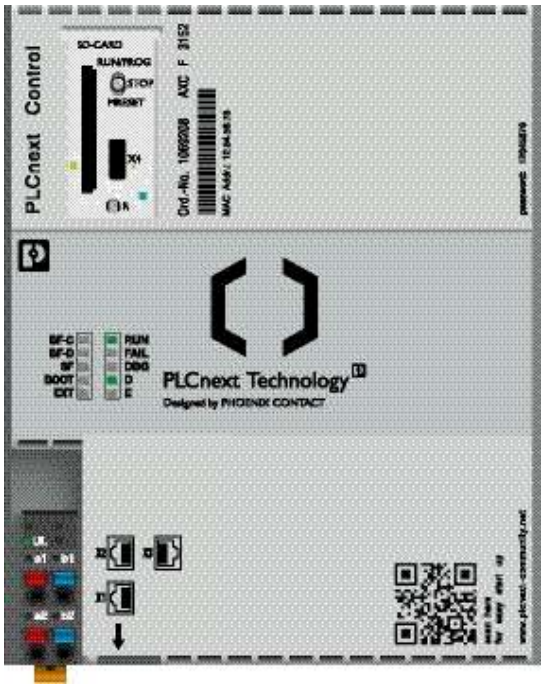
PLCnext Control AXC F 3152



- Based on PLCnext Technology
  - Linux operating system
  - Supports high-level programming languages
  - PROFICLOUD Connection
- PROFINET Controller (up to 128 devices) + Device
- OPC UA
  - Easy integration of other fieldbus protocols (Linux OS)
- Prepared for TSN
- Trusted platform module (TPM) for security
- Approvals
  - UL (Hazloc), CUL
  - DNV/GL, LR, BV, ABS, …
  - IEC Ex, ATEX

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PLCnext Control Extensions Portfolio

AXC F XT ETH 1TX
Art. No: 2403115

Released

AXC F XT IB
Art. No: 2403018

Released

AXC F XT PB
Art. No: 1091657

NEW

AXC F XT EXP
Art. No: 1139999

NEW

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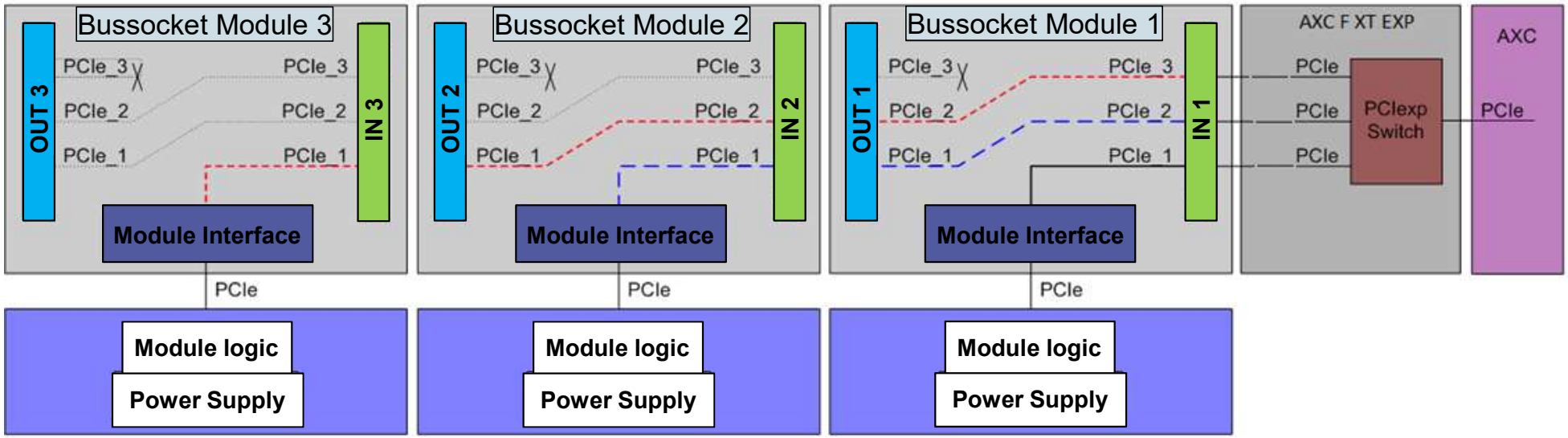
Bussocket function AXC F XT EXP



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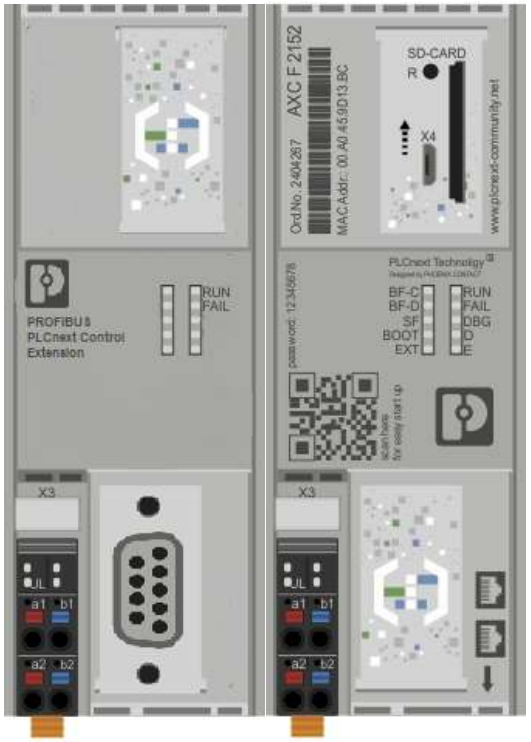
Expansions with AXC F 2152

AXC F 2152 have one PCIe Lane Gen 1. Usable is one Extension:

- AXC F XT ETH 1TX **or**
- AXC F XT IB **or**
- AXC F XT PB



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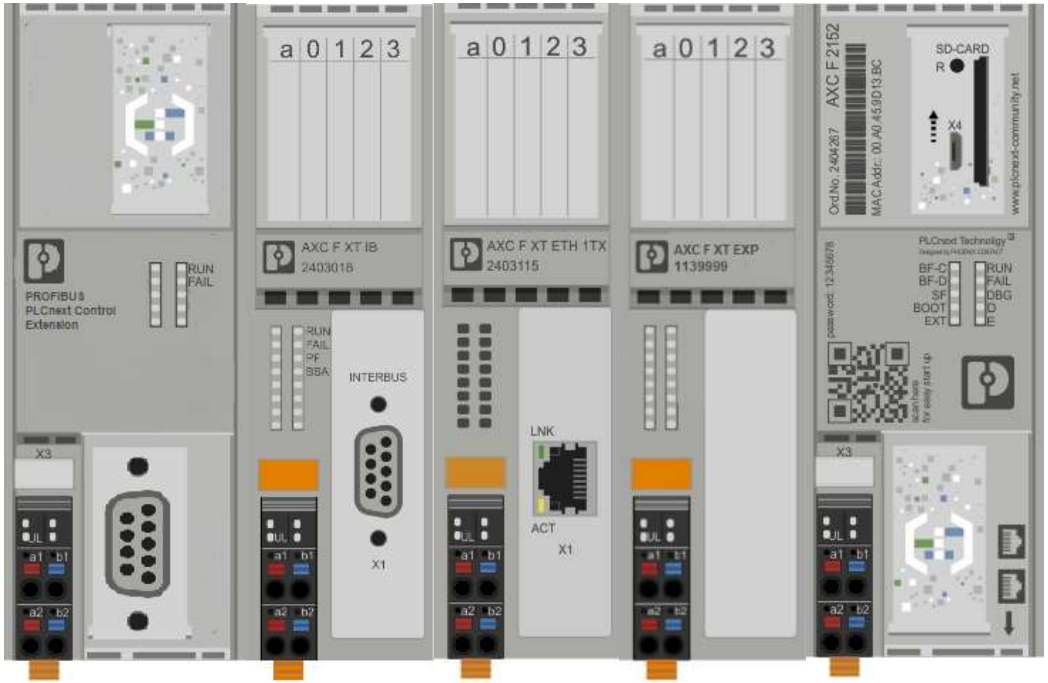
Extensions with AXC F 2152

AXC F 2152 with AXC F XT EXP - Three Extensions are usable simultaneously:

- AXC F XT EXP **and**
- AXC F XT ETH 1TX **and**
- AXC F XT IB **and**
- AXC F XT PB



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PLCnext Control RFC 4072S

- Intel i5 6300U 2 x 2,4 GHz processor
- 8 GB DDR 4 dual channel RAM
- Profisafe integrated (up to 300 F-Devices)
- Operation Mode Switch
- Touch display
- SD Flash card slot
- 3 ETH-MAC interfaces
  (2 x 1 Gbit, 1 x 100 Mbit switched)
- Real-time clock
- Trusted platform module (TPM) for security
- Temperature range: 0°C up to 55°C with fan

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enhance your automation thinking
Security by design
acc. to IEC 62443

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IEC 62443: IT-Security for Industrial Automation Control Systems

Industrial Automation
Basis Standard

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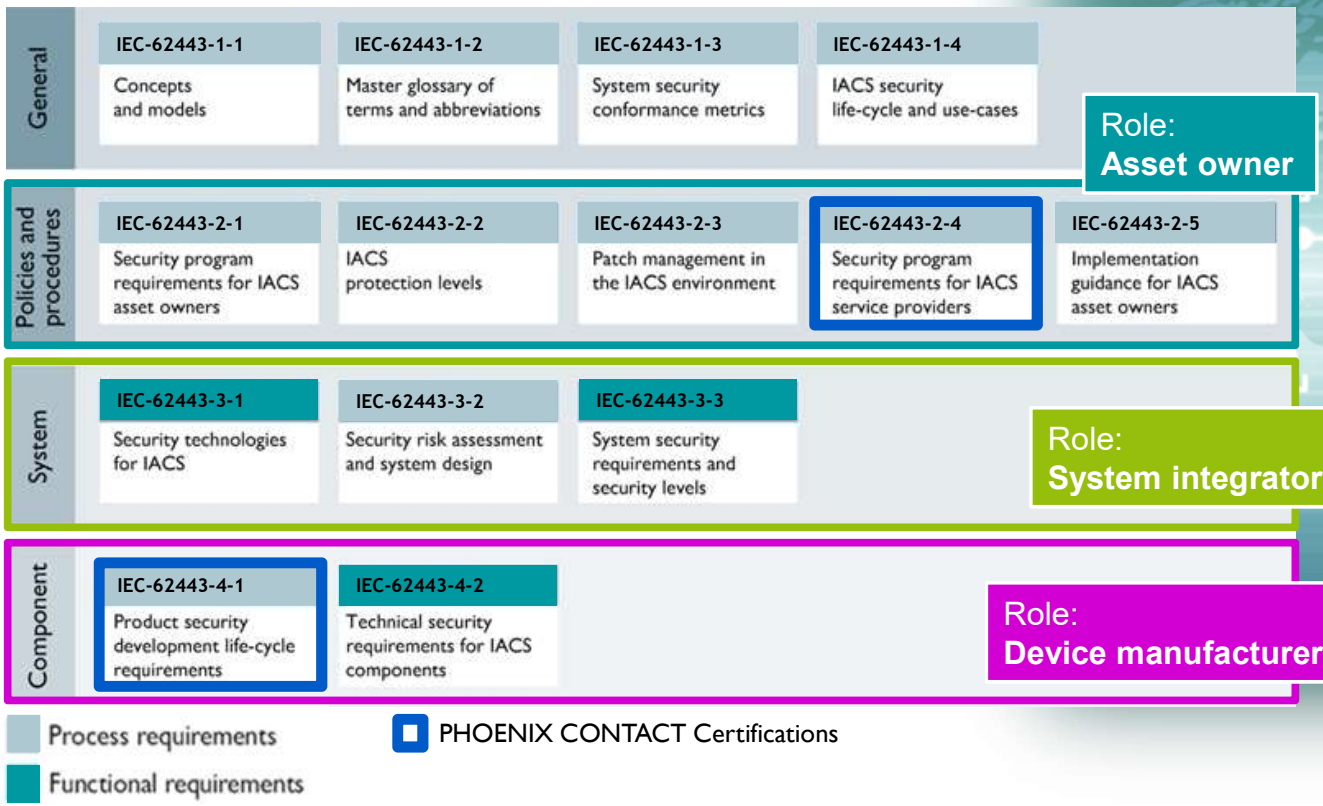
IEC 62443 Structure and Systematics



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IEC 62443-4-1 Secure Product Development Lifecycle Certificate

CERTIFICATE

No. Q4B 029429 0007 Rev. 00

Holder of Certificate: PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg
GERMANY

Factory(ies):
PHOENIX CONTACT Electronics GmbH
Industry Management and Automation
Business Unit Control Systems
Dringenauer Strasse 30, 31812 Bad Pyrmont, GERMANY

PHOENIX CONTACT Software GmbH
Langenbruch 6, 32657 Lemgo, GERMANY

Certification Mark:

Scope of Certificate: Secure Product Development Lifecycle

Applied Standard(s): IEC 62443-4-1:2018
PPP 15002A:2018 *(IEC 62443-4-1 Full Process Profile)*

The Certification Body of TÜV SÜD Product Service GmbH certifies that the company mentioned above has established and is maintaining a management system which meets the requirements of the listed standards. The results are documented in a report. See also notes overleaf.

Report No.: 18CR01S007

Valid until: 2021-07-29

Date, 2018-08-01 (Andreas Barwald)

Page 1 of 1
TÜV SÜD Product Service GmbH • Certification Body • Ridlerstraße 65 • 80339 Munich • Germany

Industrial IT Security — TÜV SÜD — Secure Product Development Lifecycle

Secure Product Development Lifecycle assessed & monitored according to IEC 62443-4-1

ID	Requirement	Maturity Level
Practice 1 – Security Management		
SM-1	Development Process	3
SM-2	Identification of Responsibilities	2
SM-3	Identification of Applicability	2
SM-4	Security Expertise	2
SM-5	Process Scoping	2
SM-6	File Integrity	2
Practice 2 – Specification of Security Requirements		
SR-1	Product Security Context	2
SR-2	Threat Model	2
SR-3	Product Security Requirements	2
SR-4	Product Security Requirements Content	2
SR-5	Security Requirements Review	2
Practice 3 – Secure by Design		
SD-1	Secure Design Principles	2
SD-2	Defense In Depth Design	2
SD-3	Security Design Review	2

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PLCnext Technology
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IEC 62443-2-4 - ICS-Security Service Provider Certificate

CERTIFICATE
No. Q4B 029429 0008 Rev. 00

Holder of Certificate: PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg
GERMANY

Certification Mark:

Scope of Certificate: ICS Security Service Provider

The Certification Body of TÜV SÜD Product Service GmbH certifies that the company mentioned above has established and is maintaining a management system which meets the requirements of the listed standards. The results are documented in a report. See also notes overleaf.

Report No.: 19CR11S007

Valid until: 2022-03-17

Date, 2019-03-18 (Andreas Barwald)

As an ICS service provider we are offering

- Security services
- Design and commissioning of an automation system for acceptance as system integrator

CERTIFICATE
No. Q4B 029429

Factory(ies): PHOENIX CONTACT Electronics GmbH
Vertical Market Management
Dringenauer Str. 30, 31812 Bad Pyrmont, GERMANY

PHOENIX CONTACT Deutschland GmbH
Vertical Market Management
Flachsmarktstrasse 8, 32825 Blomberg, GERMANY

Applied Standard(s): IEC 62443-2-4:2015
IEC 62443-2-4:2015/AMD1:2017
PPP 15010A:2018 (IEC 62443-2-4: Profile for a Generic Integration Service Provider)

ICS = Industrial Control System

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Secure Product Development according to IEC 62443-4-1

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Functional Product Requirements for IACS acc. to IEC 62443-4-2

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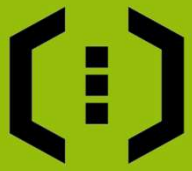
Ecosystem & PLCnext Store

The Open Ecosystem for Limitless Automation

PLCnext Technology
enhance your automation thinking

PLCnext Control	PLCnext Engineer	PLCnext Store	PLCnext Community
			
Open Control Platform PLCs in various performance classes including PLCnext Runtime System and accessories for PLCnext Technology	**Engineering Software** Engineering tool for commissioning, configuring, and programming PLCnext Controls	**Software Store for Automation** Apps for functional extension of PLCnext Control and PLCnext Engineer	**User Collaboration & Resources** Information, support, and helpful resources about PLCnext Technology including FAQs, forums, tutorials and a GitHub presence

PHOENIX CONTACT

Phoenix Contact

www.phoenixcontact.com/global

www.proficloud.net

www.plcnext-community.net

www.phoenixcontact.com.mx

Actividades 2020 Folletos Presentaciones Webinar

INSPIRING INNOVATIONS

Antonio Gordillo / Product Manager ICE IMA

Thank you

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