

Welcome

Controladores

Phoenix Contact



Webinars

Agenda

- Controladores Inline
- Controladores Axioline
- Controladores RFC
- Controladores PLCnext Technology
- > Controladores de Seguridad
- Controladores tipo Software
- Tecnología PLCnext

PLCnext Technology







Controladores Inline



PLC's Inline

Advanced Training Modular Inline controllers – General data



Advanced Training

Modular Inline controller – differences

	1x1 ETH	1x1 GSM	1x1 ME AN	INC	3хх
Engineering	PC Worx or PC Worx Express	PC Worx or PC Worx Express	PC Worx of PC Worx B	or Express	PC Worx
Profinet	Device	-	Device		Controller/Device
Memory card	Optional SD-Flash	Optional SD-Flash	Optional S	D-Flash	Required CF card
Modbus TCP	Server/Client	Server/Client	Server/Cli	ent	-
HTML5	\checkmark	-	✓		-
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	



Advanced Training 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 <mark>ILC 191 ME/AN</mark> ILC 191 ME/INC	1 MByte	1 MByte	48 kByte	
ILC 350 PN	<mark>1 MByte</mark>	<mark>2 MByte</mark>	<mark>48 kByte</mark>	
ILC 370 PN ILC 390 PN	2 MByte	<mark>4 MByte</mark>	<mark>96 kByte</mark>	
			Service and Repair	
*XC temperature range: - 40°C – 60°C				

Inline I/O system - for the control cabinet



Inline – easy, flexible, reliable

Whether it's simple or complex applications, Inline provides flexibility in automation. Always cost-eff ectively adapted to your requirements.



Inline I/O system

The all-rounder in the control cabinet



Inline I/O system Controller, bus coupler or I/O terminals





ILC 100 Project+ Developing Proposals.





Advanced Training 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

lodbus

lava

M-Bus

<u>obix</u>

KNX

Supported protocols:

nia





ILC 2050 BI



Emalytics platform Building management system application

One tool for integration, engineering, visualization from reporting through to analysing



Building management

- User-oriented room automation
- Cross-utility supply concept (HVAC)
- Predictive maintenance
- · Detailed error message management
- Individual integration of SAP, room booking systems
- and production processes



Energy monitoring

Cloud service

· App-based services

Technical monitoring

· Safeguarding data integrity

· Cloud-to-cloud communication

· Protecting the confidentiality of your data

· Ensuring availability for your systems/application

- Power generation and distribution control
- · Energy management in accordance with DIN EN ISO 50001
- EnEV German Energy Conservation Regulations support for your property
- · Cost-center assignment to the respective loads
- · Preferred integration of your own energy sources,
- for example using the waste heat from your CHP



Area management

- Flexible assignment
- Support of automatic cleaning processes
- Ready for indoor navigation
- Property management
- Freely-scalable system from room automation through to energy flow control



Security

Safeguarding the building system technology
Your basis for an IT security concept in

accordance IEC 62443



PLC's



Controladores Axioline



Modular Axioline controllers – General data

Advanced Training



Advanced Training

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



Advanced Training

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





Axioline F I/O system – for the control cabinet



Axioline – fast, robust, easy

Axioline F enables the shortest response times and is characterized by its particularly robust design and easy handling.



Axioline F I/O system The specialist in the control cabinet



Axioline F I/O system Controller, bus coupler or I/O modules











AXC 3050 **Project+ Developing Proposals.**



PROJECT+ **AXC 1050 arquitecture**







Inline & Axioline F





Comparison



- 9 networks more than 250 modules
- Profisafe and SafetyBridge
- Compact PLCs
- -25°C ... 55°C and -40°C ... 65°C (XC)

Intrinsically safe modules

High flexibility

High functionality

Easy to handle (Inline Eco terminals)

Fine-modular setup





- 7 networks, more than 50 modules
- Profisafe and SafetyBridge
- Compact PLCs
- -25°C ... 60°C and -40°C ... 70°C (XC)

INSPIRING INNOVATIONS

I/Os according IEC 61850

High signal density

Highest robustness

Highest speed

Block-modular setup

Differentiation of Inline and Axioline F Simple machine building - Inline (ECO)



- Interbus, CANopen, Profibus, EtherCAT
- Small granularity of channels
- Safety Bridge
- Easy handling
- Less parametrization (ECO)



Solar energy - Inline



- Easy automation solution (PLC, I/Os & misc. devices)
- Special communication libraries & devices
- Cost-effective solutions



Water / Wastewater - Inline



- Easy automation (GSM., complete solution)
- Special communication libraries & devices
- Cost-effective solutions



Automotive - Axioline F



- Profinet
- Fiber Optic communication
- Safety
- High performance
- Enhanced robustness



Ship building - Axioline F



- Redundant Ethernet bus-coupler for 2 networks
- XC variants with coated PCBs
- Maritime approvals
- Outstanding mechanical robustness



Enhanced machine building - Axioline F



- Sercos[®], Profinet IRT and EtherCAT[®]
- Safety (SafetyBridge Technology, PROFIsafe)
- High density modules
- Mixed module
- Fast I/Os fast cycle times



Wind energy - Axioline F



- Outstanding mechanical robustness
- XC variants with coated PCBs
- Maritime approvals
- Safety



Energy distribution - Axioline F for IEC61850



- Bus-coupler for IEC 61850
- 230V DC I/Os
- I/Os with high isolation of >4kV
- Easy installation and wiring



Infrastructure - Axioline F or Inline



- Redundancy for Profinet and Ethernet (AXL)
- XC variants with coated PCBs (AXL / IL)
- Cost effective (IL)
- Flexibility (IL)



Automation on an entry level





Controladores RFC





RFC – General data



Advanced Training

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	-	\checkmark	\checkmark
Other specials:			
Redundancy	✓ AutoSync Technology Designed by PHOENIX CONTACT	-	-
Safety Controller	-	-	✓ I I I I I I I I I I I I I I I I I I I


Advanced Training

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





RFC 460R PN 3TX







PLC's **RFC PN Profisafe**







Controladores PLCnext





PLCnext Ecosystem – PLCnext Control

PLCnext Control





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PLCnext Ecosystem – PLCnext Control

PLCnext Control Portfolio Overview





PLCnext Technology

PLCnext Control for flexible automation with modular hardware platform





PLCnext Technology

PLCnext Control for centralized applications with decentralized IOs







PLCnext Control for Edge Computing





PLCnext Technology

PLCnext Control for intelligent applications with Artificial Intelligence





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PLCnext Controls Performance Benchmark

RFC 4072S	4362 Intel i5 – 6300U dual core	
	811Intel E3930 1,3GHz dual core Basic list price ~ 1599 EUR~ 2.7 times faster than AXC F 2152	
AXC F 3152		
मामा न उ	300 Cyclone 5 Cortex-A9 800 MHz dual core (Comparable with AXC 3050) Basic list price 599 EUR	
AXC F 2152		
	150 Cyclone 5 Cortex-A9 800 MHz single core (Comparable with ILC 390) Basic list price 399 EUR	
AXC F 1152		
		_



PLCnext Control **PLCnext Control AXC F 1152**



ICONTACT INSPIRING INNOVATIONS

Entry Level – PLCnext Control AXC F 1152

- 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

PLCnext Control

- 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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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)	Νο	Yes
PROFINET Features	Controller & Device with max. 16 ARs	Controller & Device with max. 64 ARs
Min. task cycle time	5 ms	1 ms





PLCnext Control PLCnext Control AXC F 2152



PLCnext Technology

Proven Standard – 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 Control **PLCnext Control AXC F 3152**



ICONTACT INSPIRING INNOVATIONS

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More Performance – 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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More Performance – 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, IEC Ex, ATEX
 - DNV/GL, LR, BV, ABS, ...





PLCnext Control **PLCnext Control RFC 4072S**





PLCnext Control **PLCnext Control RFC 4072S**

- Intel i5 6300U 2 x 2,4 GHz processor
- 4 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





PLCnext Control BPC 9102S



PLCnext Control BPC 9102S

- CPU: i7-10700TE (10th Gen 8-Core)
- RAM: 16GB
- Interfaces:
- 3 separate and independent Ethernet interfaces with 1 RJ45 port each
 - LAN1: PN Controller (I225), 1GBit
 - LAN2: PN Device (I225), 1GBit
 - LAN3: RAW user ethernet communication (I225), 1GBit
- 1 Serial Interface RS232
- 1 USB for FW/SW Update
- Reset button and power switch
- SD Card
- Internal Super-cap UPS module
- Fan (only on between 50-60°C) to expand MTBF





PLCnext Technology - New Starterkit

Start now and become a part of PLCnext Technology





What else is worth mentioning ...

New Starterkit, new sales channels



Hardware

F 2152 + Axioline

Smart Elements

3rd Party Distribution/ Channel Partner

RS Components,

RealPars

DESIGNSPARK

Getting started



Online

Extension



Additional space on DIN rail



BEST CODER EVER

Marketing Material





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Countless possibilities in hardware variance

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PLCnext Ecosystem – PLCnext Control

Left-hand side extension possibilities





PLCnext Ecosystem – PLCnext Control

Portfolio PLCnext Control Extensions





PLCnext Control PLCnext Extension AXC F XT ETH



- Additional 1Gbit MAC interface
- Temperature range: -25°C up to 60°C
- Profinet Control capability
- Security due to separated interfaces
- Modularity and Flexibility
- Approvals
- UL (Hazloc), CUL
- DNV/GL, LR, BV, ABS, ...
- IEC Ex, ATEX





PLCnext Control PLCnext Extension AXC F XT IB



- Additional INTERBUS Master
- Up to 512 Devices, up to 255 Remote Devices
- Up to 126 PCP Devices
- Up to 16 Remote Bus Level
- 4096 Bit Process data
- 500kBit und 2 Mbit
- Ideal for Retrofit applications
- Approvals
 - UL (Hazloc), CUL, IEC Ex, ATEX
 - DNV/GL, LR, BV, ABS, ...
- Temperature range: -25°C up to 60°C





PLCnext Technology

PLCnext Control for Edge Computing

Confidential

PLCnext Ecosystem – PLCnext Control Edge Computing

- Cloud computing has revolutionized how people store and use their data, but...
- Latency, bandwidth, security or a lack of offline access can be problematic
- To solve this problem, users need robust, secure and intelligent on-premise infrastructure for edge computing
- When data is physically located closer to the user who connect to it, information can be shared quickly, securely and without latency







PLCnext Ecosystem – PLCnext Control

Definition




PLCnext Ecosystem – PLCnext Control

Edge functions within PLCnext Control





PLCnext Control

PLCnext Control for Edge Computing EPC 1502





PLCnext Control

PLCnext Control for Edge Computing EPC 1522



INSPIRING INNOVATIONS

Edge Computing Artificial intelligence





Edge Computing Artificial intelligence - AXC F XT ML 1000





Join and get involved **PLCnext Community**

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PLCnext Technology

PLCnext & Axioline Smart Elements

Modular automation system





What else is worth mentioning ...

Visitors can experience PLCnext: We live and think digitalization





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Controladores de Seguridad



PLCnext Control PLCnext Extension AXC F XT SPLC 1000



- Profisafe Extension
 - Specification 2.6.1
- 54 mm width (AXC F 2152 housing)
- Supports up to 32 Profisafe devices
- Reloadable C-Functions
- Temperature range: -25°C up to 60°C
- Approvals
 - UL (Hazloc), CUL
 - DNV/GL, LR, BV, ABS, ...
 - IEC Ex, ATEX







PLCnext Control PLCnext Extension AXC F XT SPLC 3000

- **Profisafe Extension**
 - Specification 2.6.1
- 100 mm width (AXC F 3152 housing)
- Supports up to 300 Profisafe devices
- **Reloadable C-Functions**
- Temperature range: -25°C up to 60°C
- Approvals
 - UL (Hazloc), CUL
 - DNV/GL, LR, BV, ABS, ...
 - IEC Ex, ATEX





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PLCnext Ecosystem – PLCnext Control - IO Axioline Smart Elements



Axioline Smart Elements

Automate smart and economically



Axioline Smart Elements

More to come





PLCnext Technology Functional Safety Portfolio with PLCnext Technology



Limitless possibilities for functional safety applications with PLCnext Technology





PLCnext Technology Functional Safety



INSPIRING INNOVATIONS

PLCnext Technology Functional Safety

AXC F XT SAFE 1000	Core	# of Profisafe devices	Temperature	
	2 x Cortex M4	32	-25°C - 60°C	
	Width	Approvals	C Functions	
	\vdash	Q	C	
	45mm	UL, CUL, etc	Reloadable	
PLCnext Extension AXC F XT SPLC 1	.000			

INSPIRING INNOVATIONS

PLCnext Technology

PLCnext Control Extension SPLC 1000



PLCnext Technology

PLCnext Control Extension SPLC 3000



PLCnext Control

PLCnext Control RFC 4072S





PLCnext Controls PCIe SPLC 3000



PLCnext Technology

Highest performance for any automation application



PLCnext Technology - Safety

Functional Safety Integration







Standard-Applikation Safety-Applikation







PLCnext Technology Components
Safety integrated





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Scalable Safe PLCs

PLCnext Technology

AXC F XT SPLC 1000 – Low-Scale Modular Safe PLC



Decentralized Small Safe PLC

Left-hand side connectable to PLCnext Controls

Supported Safety Protocols:

- PROFIsafe V2.61 (32 instances)
- FSoE (future)

Connectable to higher-layer SPLC

- as PROFIsafe Slave
- via new OPC UA Safety Protocol



Scalable Safe PLCs

AXC F XT SPLC 1000 Categorization

Centralized Safe PLC

- e.g. SPLC 3000 @ AXC F 3152, alternatively RFC 480S / RFC 4072S
- Higher-layer plant control

Higher-layer network

- Step 1: PROFIsafe via PROFINET
- Step 2: Safety via OPC UA

Decentralized small-scale Safe PLC

- AXC F XT SPLC 1000 @ AXC F 2152 (or 3152)
- decentralized machine control incl. Safety

Machine network

- Step 1: PROFIsafe via PROFINET
- Step 2: FSoE via Ethercat

Field layer

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- Step 1: PROFIsafe IO + intelligent field devices
- Step 2. FSoE IO + intelligent field devices











PLCnext Safety / SafetyBridge Categorization

PLCnext Safety



SafetyBridge Technology





PLCnext Technology



Controladores tipo Software





Software PLC – General Data



Advanced Training

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	-	\checkmark
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







Controllers EcoSystem PLCnext Technology





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PLCnext Control

Open Control Platform

Devices in various performance classes including PLCnext Runtime System and accessories



PLCnext Engineer

Engineering Software

Engineering tool for commissioning, configuring and programming PLCnext Control



PLCnext Store

Software Store

Apps for functional extension of PLCnext Control and PLCnext Engineer



PLCnext Community

Collaboration & Resources

We offer our community Information, support and helpful resources, including FAQs, forums, tutorials, and a GitHub presence

PLCnext Technology Ecosystem

PLCnext Technology





Thank you



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