

Welcome to PHOENIX CONTACT

Automation Systems Overview

PLCnext / Edge Controls / HMIs

Created by Peter Mannon
Automation Sales Engineer Phoenix Contact

Delivered today by *Mark Dean PSE*
With *Dave Eifert, Senior BDM, IIoT*



Limited Lifetime warranty



**LIMITED LIFETIME
WARRANTY**

BUILD WITH CONFIDENCE

1. Sign up. <http://www.PhoenixContact.com/LLW>.
2. Use Phoenix Contact Surge Suppression and Power Supply (where required).
3. Limited Lifetime Warranty on all Phoenix Contact Parts in the Cabinet.

There are a few exceptions, PCs, HMI, Mechanical relays. See web for details.

Phoenix Contact – Automation

Why ?

I have heard of the PLCnext,

What is it ?

Is it Different ?

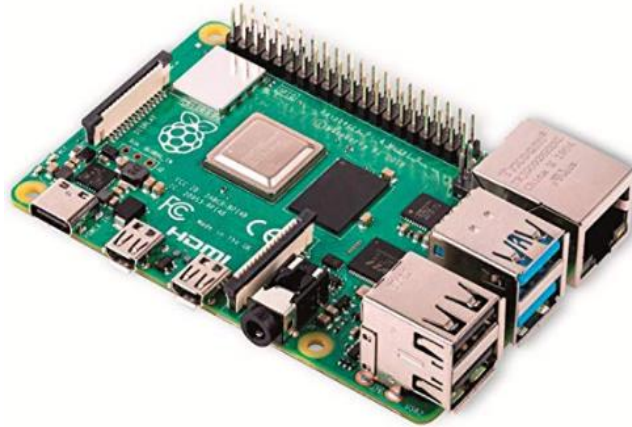
What Makes it Different ?

Is it just another 'ME TOO' PLC ?

What is so Revolutionary ?

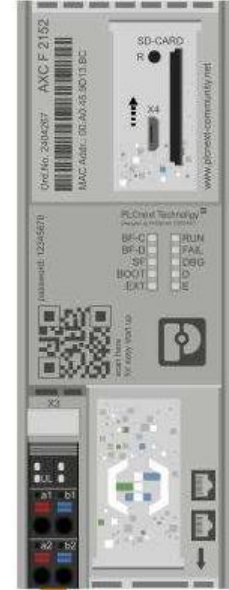


PLC



Linux PC

=



PLCNext

What is so Revolutionary ?



PLCNext

Advantages for PLC Users:

- No Cost Software (Licensing)
- Deterministic PLC Performance
- Ability to Synchronize C++/C#/Python with Ladder !!
- HTML 5 (Incredible Graphics)
- Open Coms (OPC-UA)
- Web Connectivity
- Designed from Ground Up as a IIOT Device

Advantages for LINUX Users:

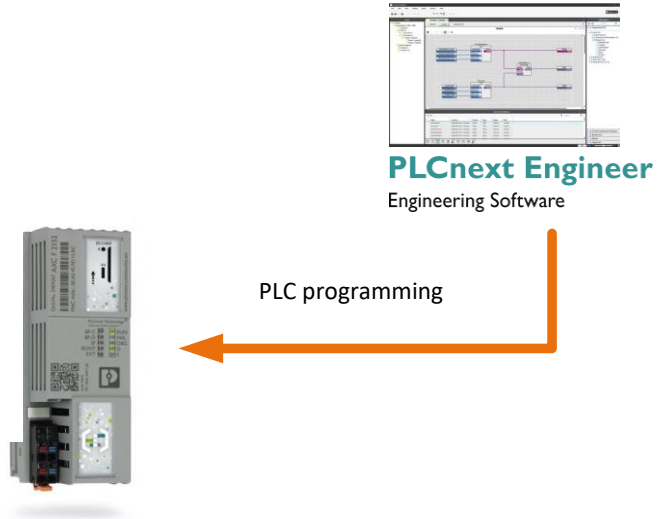
- Familiar Programming
- Can Use Open Source Code
- Program in C++/C#/Python/etc..
- Support of Docker/Balena
- REST Implemented
- Familiar Linux Interface
- Industrial Grade PLC
- Industrial Grade I/O

**No Software Licensing Fees.
No Restrictions.**

**Our Open Systems allow you to use Open Markets to get
for free or for a fee – You Decide !!!**

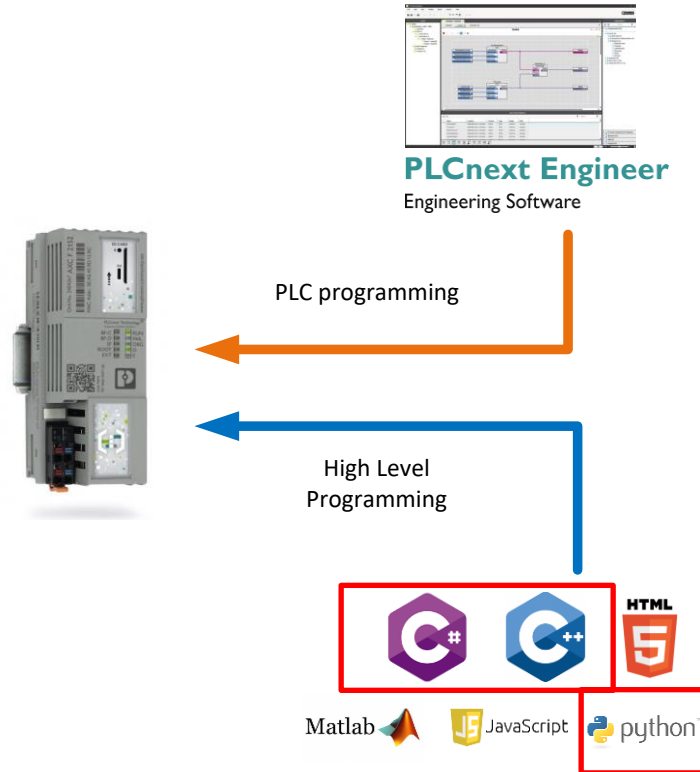
PLCnext Technology

Control – PLCnext approach



PLCnext Technology

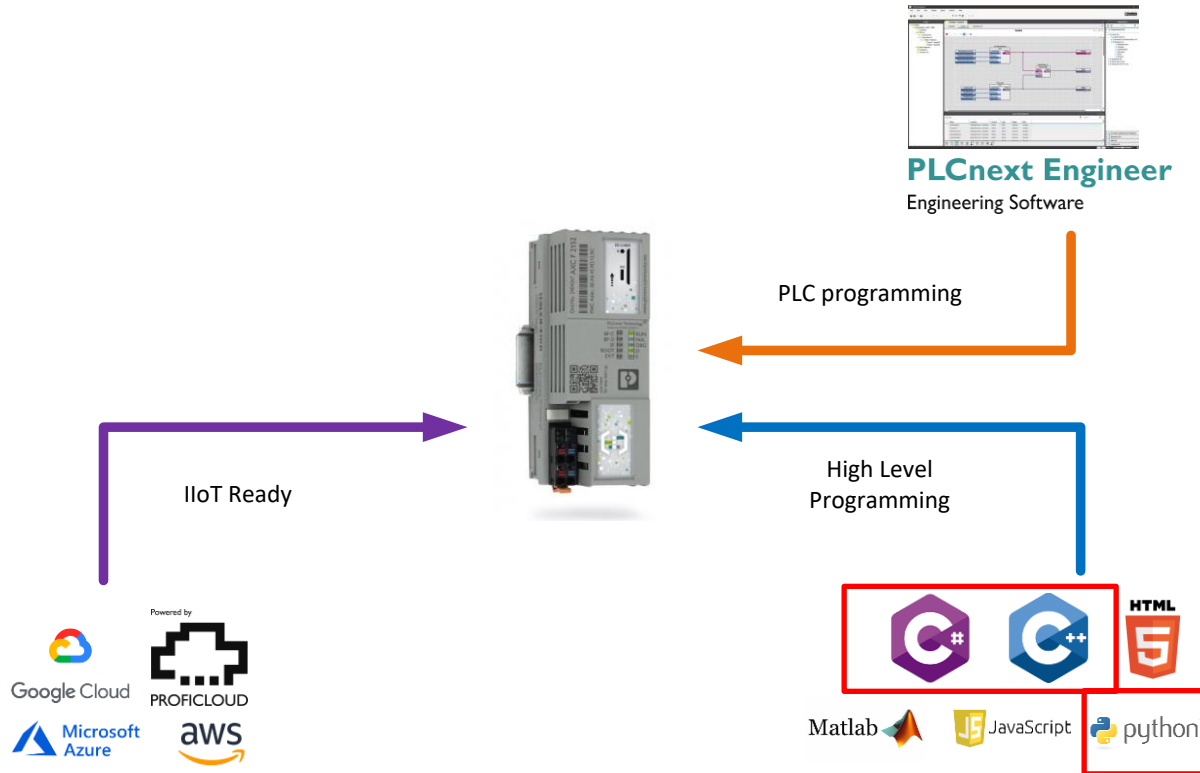
Control – PLCnext approach



Open

PLCnext Technology

Control – PLCnext approach

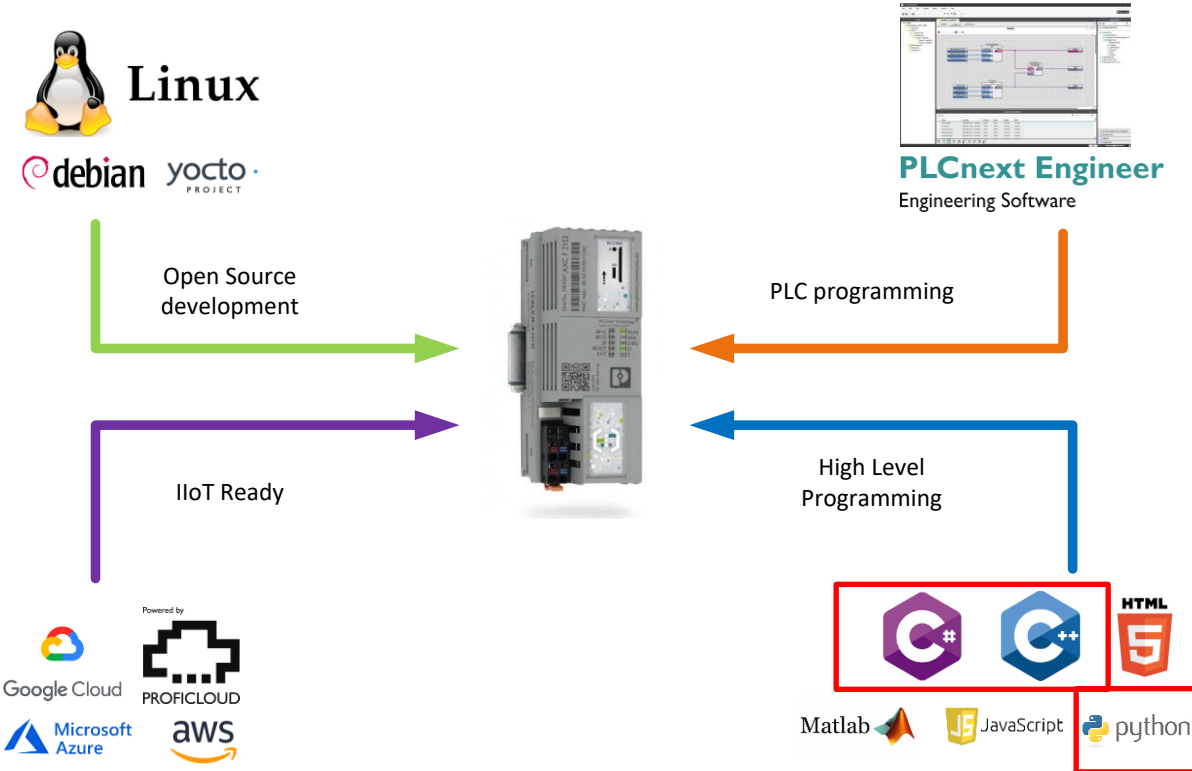


Open

IIoT Ready

PLCnext Technology

Control – PLCnext approach



Open

IIoT Ready

Reimagined

PLCnext Technology

5 Things Your PLC Can't Do - But Should

5 Things Your PLC Can't Do - But Should

1. Understand High-level Scripted Languages



HLL Languages – CAN your System Evolve with them ??



5 Things Your PLC Can't Do - But Should

1. Understand High-level Scripted Languages

2. Establish a Cloud Connection



PROFICLOUD



Google Cloud



PLC



Advanced Analytics,
Data Storage,
etc...



Alibaba Cloud



IBM Cloud



5 Things Your PLC Can't Do - But Should

1. Understand High-level Scripted Languages
2. Establish a Cloud Connection
3. Interface with Databases



PLC



SQL



5 Things Your PLC Can't Do - But Should

1. Understand High-level Scripted Languages
2. Establish a Cloud Connection
3. Interface with Databases
4. Leverage Open Source Support



5 Things Your PLC Can't Do - But Should

1. Understand High-level Scripted Languages
2. Establish a Cloud Connection
3. Interface with Databases
4. Leverage Open Source Support
5. Easily Incorporate New Technology

Means Independence for Industrial Users.

No longer Waiting for Control Manufacturers to develop 'Hooks' or a new Dedicated System



PLCnext Technology

PLCnext: Swiss Army of Control



Complete Ecosystem – From Control to Cloud Integration



PLCnext Control



PLCnext Engineer



PLCnext Store

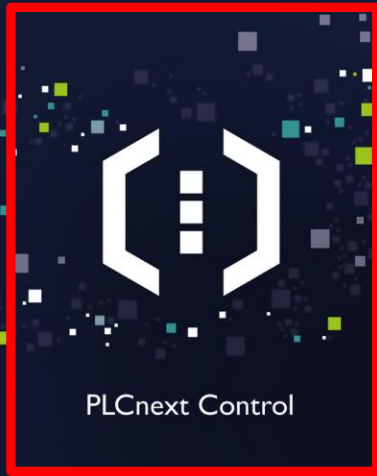


PLCnext Community



PROFICLOUD

Complete Ecosystem – From Control to Cloud Integration



PLCnext Control



PLCnext Engineer



PLCnext Store

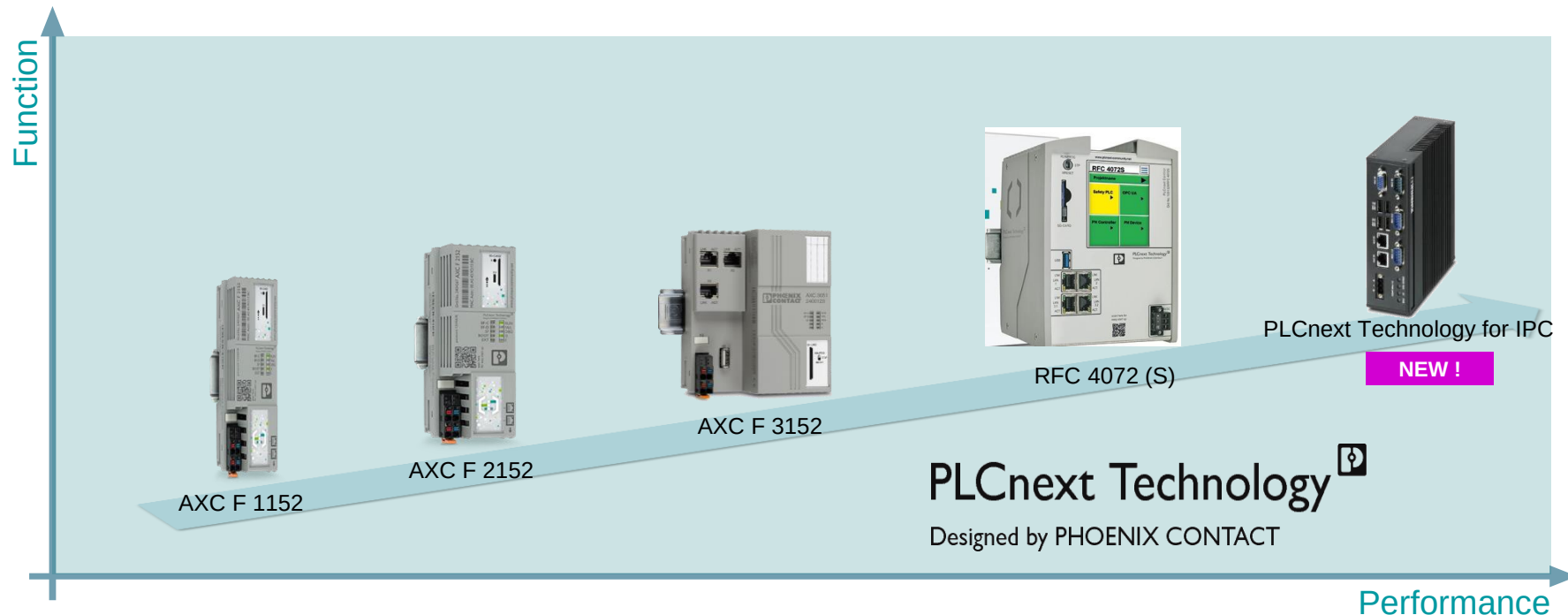


PLCnext Community



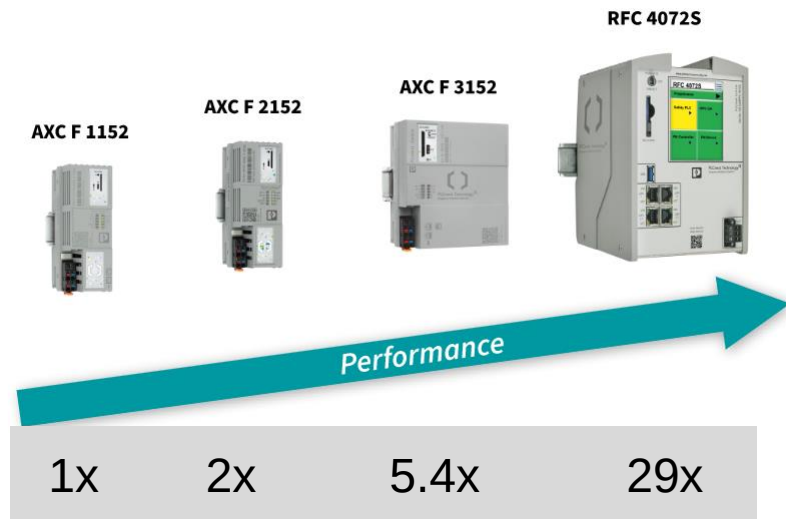
PROFICLOUD

PLCnext Controls Roadmap



Common Functions / Features for entire Family

PLCnext Control product family



- ✓ Linux RT – Kernel (Debian / Yocto)
- ✓ SD Flash card slot
- ✓ Firewall / VPN (VPN OPEN / IPSEC)
- ✓ OPC-UA Server Integrated
- ✓ Integrated HTML 5 For Visualization
- ✓ ProfiNet / Modbus / Ethernet I/P (Slave-Adapter)
- ✓ ProfiCloud Gateway
- ✓ IEC61131-3, C++, C#, Simulink
- ✓ MRP / PROFINET® Redundancy
- ✓ NTP Timer Server Configuration
- ✓ Logic Analyzer / Breakpoints / Advanced Debugging



PLCnext Control AXC F 1152



- ✓ ARM® Cortex® -A9 (32bit) - 800 MHz Single Core
- ✓ 512 MB RAM / 512 MB Flash - 48k NVRAM
- ✓ 2 x Ethernet (10/100 Mbit) switched
- ✓ 8 Tasks – 5ms Fastest ScanTime
- ✓ ProfiNet: 4 Devices@2ms – 16 Devices@4ms
- ✓ Temperature range: -25°C to +60°C



PLCnext Control AXC F 2152



- ✓ ARM® Cortex® -A9 (32bit) - 800 MHz Dual Core
- ✓ 512 MB RAM / 512 MB Flash - 48k NVRAM
- ✓ 2 x Ethernet (10/100 Mbit) switched
- ✓ Optional 1 x Added NIC Card (10/100/1000 Mbit)
- ✓ 16 Tasks per Core (32 Total)– 1ms Fastest ScanTime
- ✓ ProfiNet: 4 Devices@2ms – 64 Devices@16ms
- ✓ C1/D2 and Maritime Approvals
- ✓ Temperature range: -25°C to +60°C



PLCnext Control AXC F 3152



- ✓ Intel® Atom™ X5-E3930 - 1.3 GHz Dual Core
- ✓ 2048 MB RAM / 512 MB Flash – 1MB NVRAM
- ✓ 3 x NICs Ethernet (10/100/1000 Mbit) switched
- ✓ 16 Tasks per Core (32 Total)– 0.5ms Fastest ScanTime
- ✓ ProfiNet: 32 Devices@1ms – 128 Devices@4ms
- ✓ C1/D2
- ✓ Temperature range: -25°C to +60°C



PLCnext Control RFC 4072S



RFC 4072S: Integrated Safety PLC

- ✓ Intel® i5 6300U 64bit - 2.4 GHz Dual Core
- ✓ 2048MB RAM / 8GB Flash – 2MB NVRAM
- ✓ Dual Processors (A8/A6) – Functional Safety Rated.
- ✓ 16 Tasks per Core (32 Total) – 0.5ms Fastest ScanTime
- ✓ Touch display
- ✓ ProfiNet: 64 Devices@1ms – 256 Devices@8ms
- ✓ 3 NICs Ethernet
 - NIC1/NIC2 = 2 x 10/100/1000 Mbit
 - NIC3 = 2 x 10/100 Mbit switched
- ✓ USB A
- ✓ Temperature range: 0°C to +60°C



PLCnext I/O Solutions

PLCNext

AxioLine I/O - Advantage – fast, robust, easy

Easy

Easy start-up by means of rotary encoding switches and Startup+



Fast

Decrease installation time with **Push-in technology**



Robust

Backplane design and location reduced radiation

Easy

Individual and fast labeling thanks to the MARKING system

Robust

EMC protection with adjustable filter times

Fast

Fast module exchange with pluggable I/O connections

Fast

Increase in the system output due to fast and signal acquisition



Easy

Wiring with Colored Terminals



Robust

Wide Temperature options with XC variants -40°C ... 70°C



PLCNext

Smart Elements – Modular I/O



Modular

Scalable

Compact

Cost-Effective

Push In Connection

Tool Free
Upto 16 AWG Wire

Built-In Locking Mechanism

Quick and Easy Install and Removal



Compact

15mm x 62mm

Common Carrier

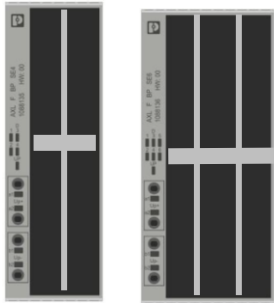
Enables Large Variety in same
form factor

PLCNext

Smart Element I/O - Advantage – Flexible, Compact, Inexpensive

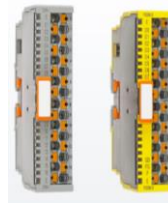
1. Choose Module Carrier

BP SE4 – 4 Slots
ONLY 40mm wide !
BP SE6 – 6 Slots
ONLY 55mm wide !



2. Choose Modules

14 Different Functions



3. Insert Modules into Carrier

Upto 96 Digital or 24 Analog Signals in 55 mm Wide !!!

- No Module Settings
- No Dials
- No Jumpers
- Freely Mix/Match Modules within a Carrier

Digital AXL SE DI16/1
AXL SE DO16/1

Analog AXL SE AI4 I 4-20
AXL SE AI4 U 0-10
AXL SE AO4 I 4-20
AXL SE AO4 U 0-10

Temperature AXL SE RTD4 PT100

Special Function AXL SE RS 485
AXL SE INC1 SYM
AXL SE CNT1
AXL SE IOL4

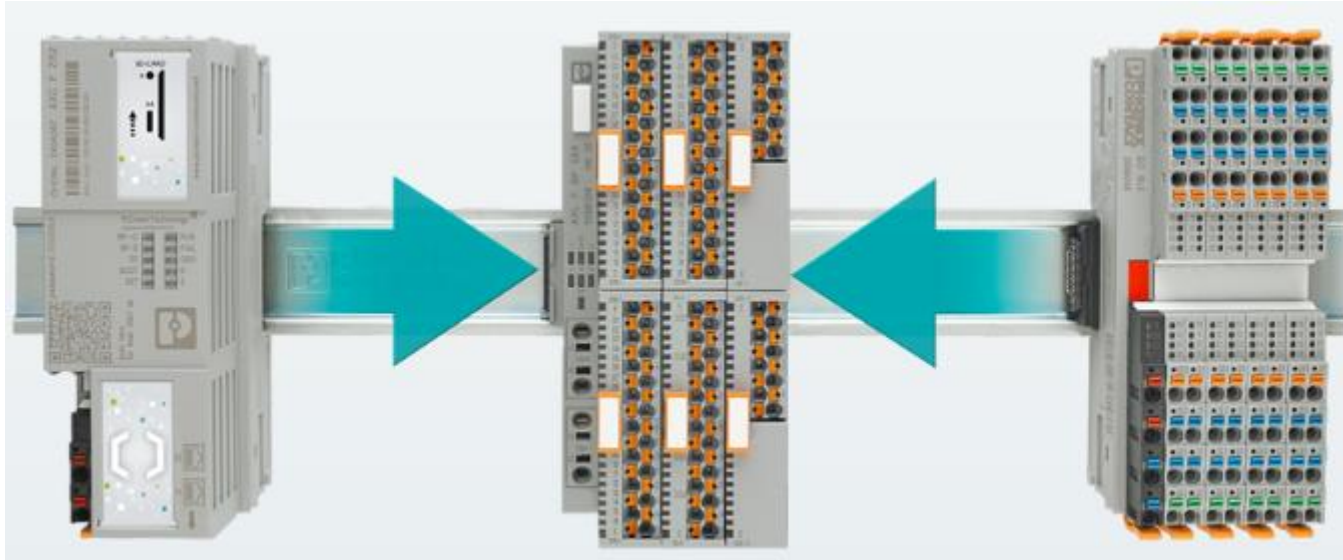


PLCNext

PLCnext

Smart Elements

AxioLine I/O



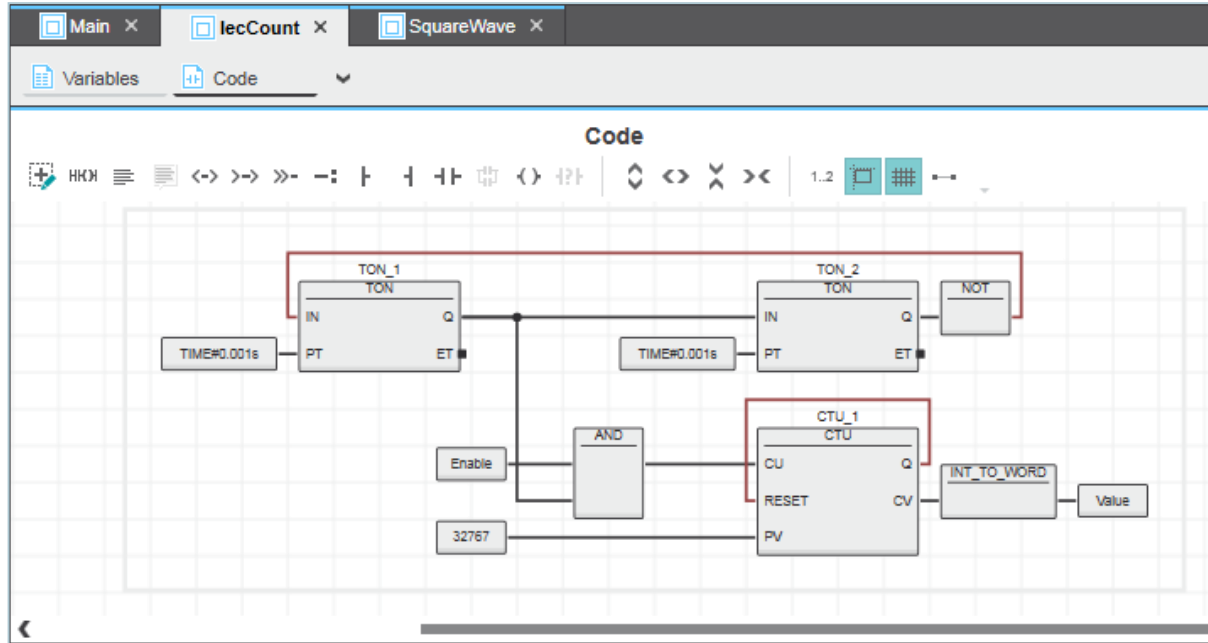
- You can Freely Integrate anywhere with Standard AxioLine Modules !!!!

Complete Ecosystem – From Control to Cloud Integration



PLCNext

PLCnext Engineering



Standard IEC61131:

ST

FBD

LADDER

SFC

SAFETY PLC

Integration with:

C#, C++, Python

MatLab Simulink

Synchronous Execution of
High Level Languages

PLCNext

Web Based Management



Project Name: DataLogger_byPM2

HW: 02 FW: 2021.0.0 LTS
MAC: 00:AD:45:A5:CB:76

AXC F 2152
2404267



Information

General Data

Network Configuration

Diagnostics

Profinet

Local Bus

Notifications

Configuration

PLCnext Store

Profcloud Services

Web Services

Security

User Authentication

Certificate Authentication

LDAP Configuration

Firewall



Tip of the day

PLEASE check regularly:

- Product download area for FIRMWARE UPDATES!
 - PSIRT webpage for known SECURITY vulnerabilities!
- For more information see menu item "Help" (PLCnext Engineer and WBM)



Advanced Access:

Passwords

Firewall / VPN

I/O Diagnostics

Web Services

Firmware Updates, etc..



PLCnext Technology

Complete Ecosystem – From Control to Cloud

Integration



PLCnext Control



PLCnext Engineer



PLCnext Store



PLCnext Community



PROFICLOUD

PLCNext Store

Code Repository, Apps, Free and For Fee



Basic Light Control



CODESYS Control for
PLCnext SL



Tank and Well Control



AWS IOT Client



DBFL_SQL



MQTT Client



FourZero Runtime



Complete Ecosystem – From Control to Cloud

Integration



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MAKERS BLOG

KNOWLEDGE BASE ▾

FORUM

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Become part of the PLCnext Community



PLCNext

Landing Page

- <http://www.phoenixcontact.com/OPEN>
 - PLCNext Community (Developer, other customers)
 - Developers and Other Customers
 - How-Tos.
 - Vidoes
 - Etc...
 - Direct Links
 - Hardware Spec
 - Software Specs and Downloads
 - PLCNext Store (Free and for Fee) Functions/Function Blocks.
 - Github Links..
 - Much More...



Phoenix Contact – Automation

Visual Display Options

- PLCnext
 - Ethernet/Serial Coms
 - Communications ProfiNet, Modbus,
 - Ethernet I/P (Slave Only)

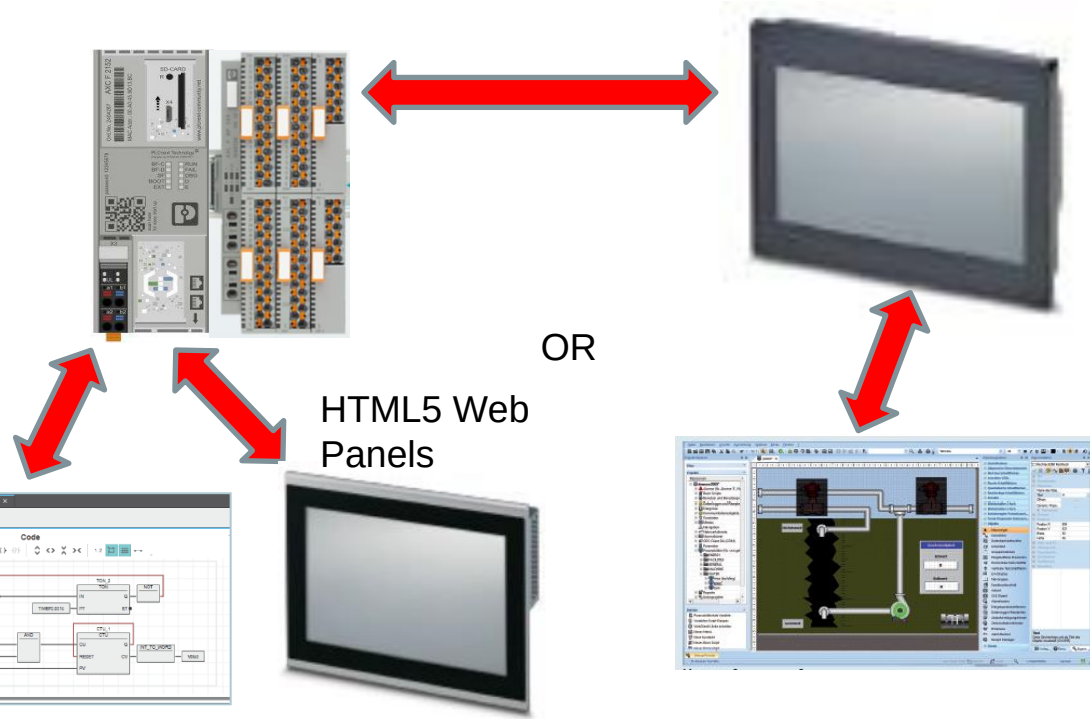
- Applications:
 - Medium to Large machines
 - Web-Connected Machines
 - HLL Needed/Wanted

- Programming Software:
 - PLCnext Engineer (Free) –
 - SFC / MatLab Add Ons

- Visualization:
 - Pair with Traditional HMI with External Software
 - *Visu+ Express (free)
 - * Visu+ (Paid License) ILC

OR

- Use HTML5 Thin Client



Phoenix Contact – Automation

Use Cases



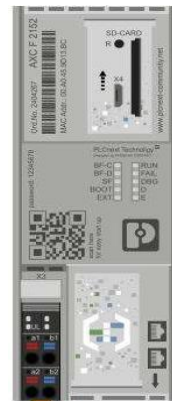
PLCnext Technology 
Designed by PHOENIX CONTACT



Linux Operating System



Axioline Industrial I/O Hardware



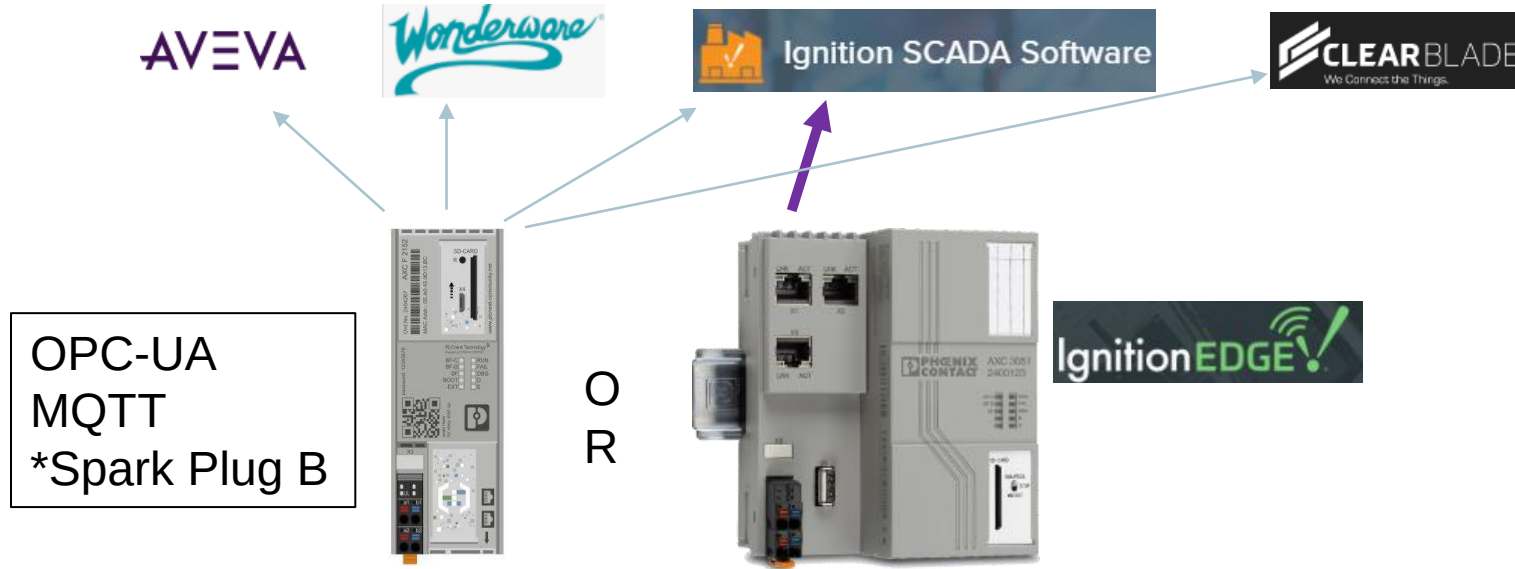
Use Cases ?

- ~60% Use Only PLC
- ~10% Use Only Linux
- ~30% Use PLC/Linux

The PLC/Linux Space
Is Quickly growing and will
most likely be our Largest
Segment in 2-3 Years.

Phoenix Contact – Automation –

Integration- Ignition/SCADA/Other



Whether the Scada is Local or 'In the Cloud', We can get you there !!!

*Spark Plug B to be released Q1 2022

Phoenix Contact – Automation –

Connect to
Wireless
Network

Connect to
HTML
Screens



1

2

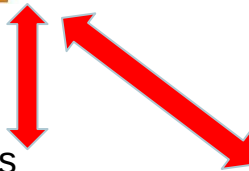


1. Open Camera on Device.
2. Scan Barcodes
3. View Same HTML 5 Screens

Wifi Access
Point



Thin Client to
View / Control
HTML 5 Screens



C1D2 Available

Network Interfaces

Add Wifi for Mobile Device Control/View

PLC with I/O
- NO SOFTWARE FEES
HTML 5 Screens Served inside
DI/DO - AI/AO
RS-485 Coms (ie. Modbus)

System Network
Connection if Desired



Phoenix Contact – Automation –

Connect to
Wireless
Network

Connect to
HTML
Screens



1
2



1. Open Camera on Device.
2. Scan Barcodes
3. View Same HTML 5 Screens



Wifi Access
Point



Thin Client to
View / Control
HTML 5 Screens



C1D2 Available

MQTT to Cloud

Network Interfaces

Add Wifi for Mobile Device Control/View
With Internet Connection, MQTT to any
Cloud Service (AWS/Google Cloud,
Azure, etc..)

PLC with I/O
- NO SOFTWARE FEES
HTML 5 Screens Served inside
DI/DO - AI/AO
RS-485 Coms (ie. Modbus)

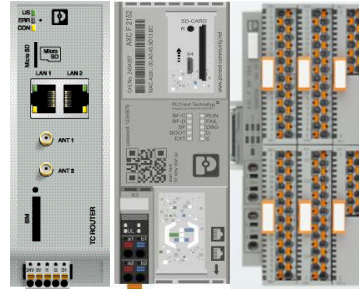
System Network
Connection if Desired

Phoenix Contact – Automation –

Network Interfaces

Router for Text Messaging

4G Router



**PLC Clears Fault
Engages Motor to
Restart**



Motor Running

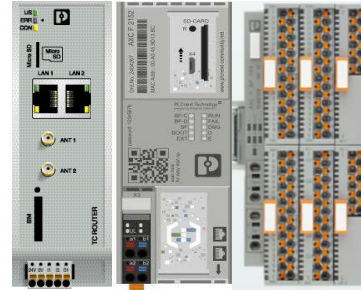


Phoenix Contact – Automation –

Network Interfaces

Remote Connectivity

4G Router or
mGuard



PLC with I/O
- NO SOFTWARE FEES
HTML 5 Screens Served inside
DI/DO - AI/AO
RS-485 Coms (ie. Modbus)



View / Control
Same Screens –
Locally AND Remotely



Local
Thin Client to
View / Control
HTML 5 Screens

THANK YOU !!