Marc Reitmaier

PLCnext Technology – Die Plattform für grenzenlose Automatisierung
Agenda

- PLCnext Architektur
- PLCnext Store
- Applikationsbeispiele
PLCnext Technology & enhances

IEC 61131

C / C++
C#
MATLAB Simulink
Microsoft Visual Studio
Eclipse
With PLCnext Technology, several developers from different generations can work on one controller program independently of each other using different programming languages. Thus, you can develop complex applications quickly using the advantages of the classic PLC world and the openness and flexibility of PLCnext Technology.
Combine program sequences in different languages into tasks as desired. The task-handling of the PLCnext Technology (patent applied for) lets program routines of different origin run like a classical IEC-61131-PLC-code – Your high-level language programs become automatically deterministic. The platform ensures consistent data exchange and synchronous execution of the program code.

enhanced performance

Real-time execution across different programming languages
Reasons for a New Automation Solution

Industrial Controls in a Value Added Chain

Phoenix Contact
Controller with initial function / feature set

Vertical Market Specialists, System Integrators, end users, ...
Application knowledge, algorithms, processes, analysis, recipes, ...

End Users
Most diverse applications in various industries
PLCnext Technology Architecture – Competitive Advantages

D: PLCnext Technology Architecture Advantages – ESM

ESM
Execution & Synchronization Manager
- Real-time scheduler for all Linux tasks
  - Separated from IEC 61131 runtime
    - no mutual dependencies
- Tasks can run inside or outside the real-time context
- Open source and HLL programs are based on Linux
  - Unlimited access to Linux API – directly or via Common Classes
- HLL or Simulink applications possible, also combined with IEC 61131 programs
- No need for in-depth Linux knowledge to implement PLC-like real-time
- Easy configuration via PC Worx Engineer or XML files
Enhanced performance – PLC-typical Real-time Performance & Data Consistency

**Execution & Synchronization Manager**

- Combine program sequences in different languages into tasks as desired
- The task-handling of the PLCnext Technology (patent applied for) lets program routines of different origin run like a classical IEC-61131-PLC-code
  - Your high-level language programs become automatically deterministic
- The PLCnext Technology platform ensures consistent data exchange and synchronous execution of the program code
PLCnext Technology Architecture – Competitive Advantages

D: PLCnext Technology Architecture Advantages – GDS

GDS
Global Data Space
- Intelligent shared memory
- Port-based process data exchange among tasks via intelligent automatic buffer generation
- No programming effort for consistent and task-synchronous process data exchange (e.g. semaphores, resource blocking, …)
- No need for in-depth Linux knowledge
- Easy configuration via PC Worx Engineer or XML files
### D: PLCnext Technology Architecture Advantages – Summary

- No vendor dependency
- Combined use IEC61131, HLL, and model-based programs
- Built-in real-time and data consistency for IEC 61131, HLL, and Matlab
- Unlimited OS API access

#### EVALUATION

- Open programming tools
- Open application & network interfaces
- Open source & apps integration
- Real-time HLL programs can use OS API
- Future-proof through modular extensibility
- Integrated real-time capability
- Cloud connectivity integrated
- Security integrated
Agenda

- PLCnext Architektur
- PLCnext Store
- Applikationsbeispiele
Extends the PLC with the openness and flexibility of smart devices

App variety from different vendors

Apps suitable for your needs

Open ecosystem for the distribution of Apps for PLCnext Controls

Flexible integration of Open Source software and Apps

Extends the PLC with the openness and flexibility of smart devices

App variety from different vendors

Apps suitable for your needs

Open ecosystem for the distribution of Apps for PLCnext Controls

Flexible integration of Open Source software and Apps

Apps as ready-to-use solutions

No programming, only parameterization

Plug & Work: customize your PLCnext Controller in minutes

PLCnext Technology

World of Applications

Faster solution building
What is the Goal of an App?

An App as an application package for industrial automation solutions
# App Types available with the first Release (SPS IPC Drives 2018)

<table>
<thead>
<tr>
<th>Description</th>
<th>Solution App</th>
<th>PLCnext Engineer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation solution consisting of different components with Web pages for parametrization</td>
<td></td>
<td>Function as a part of a PLC Program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Users Skill Level</th>
<th>Example</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fill level monitoring, pump automation, protocol conversion</td>
<td>Data logger, Protocol (Resy, -101/-104) PID-Modulator</td>
<td></td>
</tr>
</tbody>
</table>
New Possibilities – Faster to the finished Application

- Trading platform for industrial automation - limitless possibilities
- Central, cataloged software store for the PLCnext Control family
- Wide range of apps: from software that transforms a standard PLC into a special controller (without programming skills) to small features that can accelerate application creation or post-installable runtime environments for more convenience
- Accelerated development ➔ Faster to the finished application
- Convenient access to new possibilities and innovative software functions
- Evaluation and commenting system makes customer experiences transparent
- Easy access also to special software
- Customization possibilities
New sales channel – new revenue model

- Programmers, software developers and e.g. even system integrators can provide once conceived solutions to a broad customer group and sell their know-how as an app
- New distribution channel for software providers
- Easy access to a global audience from different industries
This is just the beginning of the AppStore and a new world of open automation ...
Ecosystem & PLCnext Store

PLCnext Store – Sign-Up Screen

App Store

Please sign up for our App Store

Username

Email

Password

or: use your Phoenix Contact client number →
Welcome to the App Store

Filter

Compatibility
Industries
Rating
Price
PoC Certification

This is a promoted app

App number one
Version of the app

App number two
Version of the app

App number three
Version of the app

App number four
Version of the app

Ecosystem & PLCnext Store
PLCnext Store – Landing Page
Ecosystem & PLCnext Store

PLCnext Store – User Profile

Your name
Company
Lorem ipsum dolor sit amet
Lorem ipsum dolor sit
Lorem ipsum dolor

Messages & Requests

Installed Apps and Devices

Planned Apps and Devices

Offered Apps

Pipeline

Released

App number five
Installed

App number four
Installed

App number three
Installed, update 2.3 available

App number two
Installed, update 4.5 available

App number one
Installed

New App in draft mode
Submit for review

App ready for release
Needs for use

App in approval process
Waiting for approval

Released

App number five
Installed

App number four
Installed

App number three
Installed, update 2.3 available

App number two
Installed, update 4.5 available

App number one
Installed

#1
135 Downloads
Released App
Responsive PLCnext Network
Promote this app

#2
96 Downloads
Released App
Responsive PLCnext Ecosystem
Promote this app

#3
36 Downloads
Released App
Responsive PLCnext Ecosystem
Promote this app

Device 1

Device 2

Device 3

Device 4

Device 5
Overview: PLCnext Store + PLCnext Apps Business Model
PLCnext Store Components

PLCnext Store Highlights SPS IPC Drives 2018

1. User / Developer Profile
2. App Filter
3. Customize App Button
4. App Rating
5. Messaging
6. App Management
7. Payment
8. App Search
9. Device Selection
10. App Description
Agenda

- PLCnext Architektur
- PLCnext Store
- Applikationsbeispiele
Aufgabenstellung

Sensorik

Klassische Anlagenautomation

Aktorik

Einfache und flexible Anbindung der Azure Cloud
Lösung

Sensorik

Klassische Anlagenautomation

Aktorik

node-red-contrib-azure-iot-hub
- Open source

Azure

- Open source
- Linux based
Kamerabasierte Objekterkennung

Applikationsbeispiele

Sensorik

Klassische Anlagenautomation

Aktorik
Kamerabasierte Objekterkennung

Sensorik

Klassische Anlagenautomation

Aktorik

Beispiel PLCnext Community
Applikationsbeispiele Solution Apps: Water and Wastewater Treatment

**Pump Station, Water Supply Well, and High-level Tank**

**Wastewater pump station App**
- Complete **Solution App** including visualization
- Turns a PLCnext Device into a ready-to-use pump station

**Water supply well & high-level tank App**
- For use with a high-level tank or well
- 2 PLCnext Controls are needed for operation
- Both communicate with each other
Thank you