



Antonio Gordillo / 19 Mayo 2021 / IMA Marketing

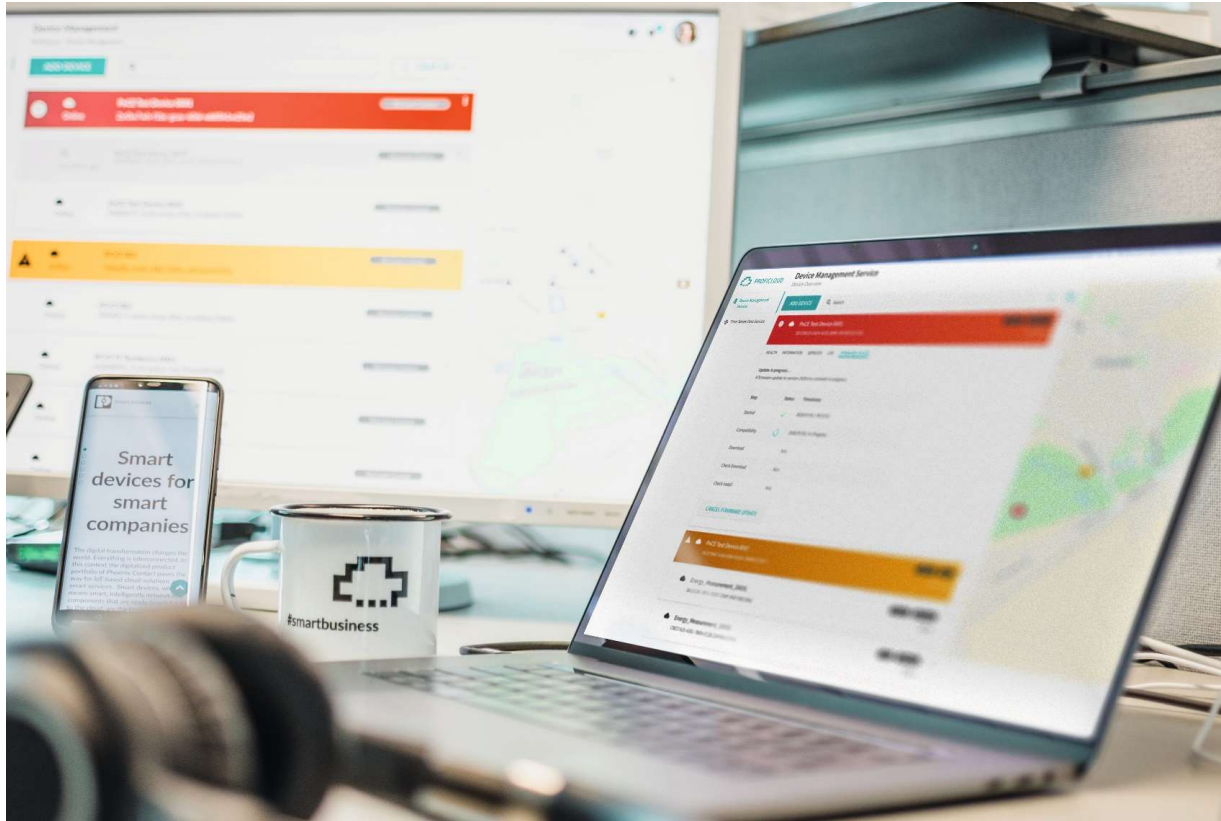
Welcome

Presentación

Novedades 2021

Software y Tecnologías





Software y Tecnologías

News 2021

Agenda

➤ Software y Tecnologías

- PLCnext Engineer
- PLCnext Store
- PLCnext Community
- Applications C++, MQTT
- proficloud.io
- OPC UA
- CLOUD/EDGE

Confidential – For internal use only

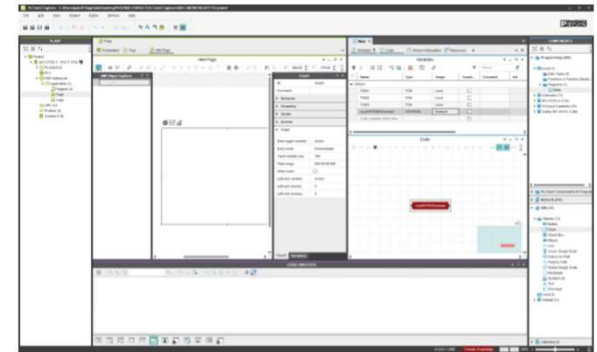
PLCnext 2021.3

- Improvements
- Ethernet Topology
- PLCnext Target for Simulink
- License SD Flash

Novedades 2021

PLCnext Engineer Application and Programming 2021.3

- The Logic Analyzer supports continuous recording in context to a user task.
- Copy & paste of a function block instance results now in a new instance.
- TCP_* are replaced by TLS_* und UDP_* function blocks. The new TLS_* function blocks support multicast.
- The IEC61131-3 datatype WSTRING is now supported.
- The function EN/ENO is deactivated.



PLCnext Engineer 2021.3

Hardware Configuration

- IO-Link integration: ■ Import IODD files ■ Connect process data based on the IODD
- The Ethernet Topology viewer supports now the graphical presentation of VLAN information. Additionally, the user can choose the root device for the tree presentation of the network.
- The GSDML converter supports now the GSDML specification version 2.2 - 2.41

PLCnext Engineer 2021.3

HMI

- New page template editor.
- The Chart object supports new properties: ▪ Downsample mode ▪ Left axis variable ▪ Left axis Min/max value
- The object explorer supports now the exclusion from the build process
- New "Bring to Top" dynamic for click actions available

PLCnext Engineer 2021.3

Safety Programming

- The safety parametrization supports now the update of device descriptions by keeping the parameter
- For the Safe C Libraries functionality, a time server is automatically chosen for the creation of a signature.

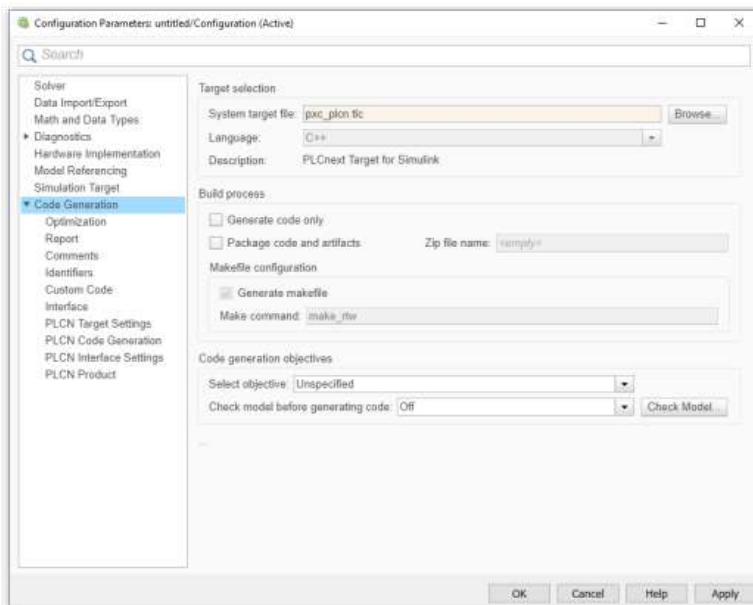
PLCnext Engineer

PLCnext target for Simulink

- Product Description



- @ V.2.0 PLCnext Target for Simulink !



PLCnext Target for Simulink

MATLAB/Simulink with PLCnext

Product Overview

Brief introduction of the UI changes

01

New Features

Brief overview of the highlights

02

Roadmap

Release Date and Outlook

03

Multi-Instantiation

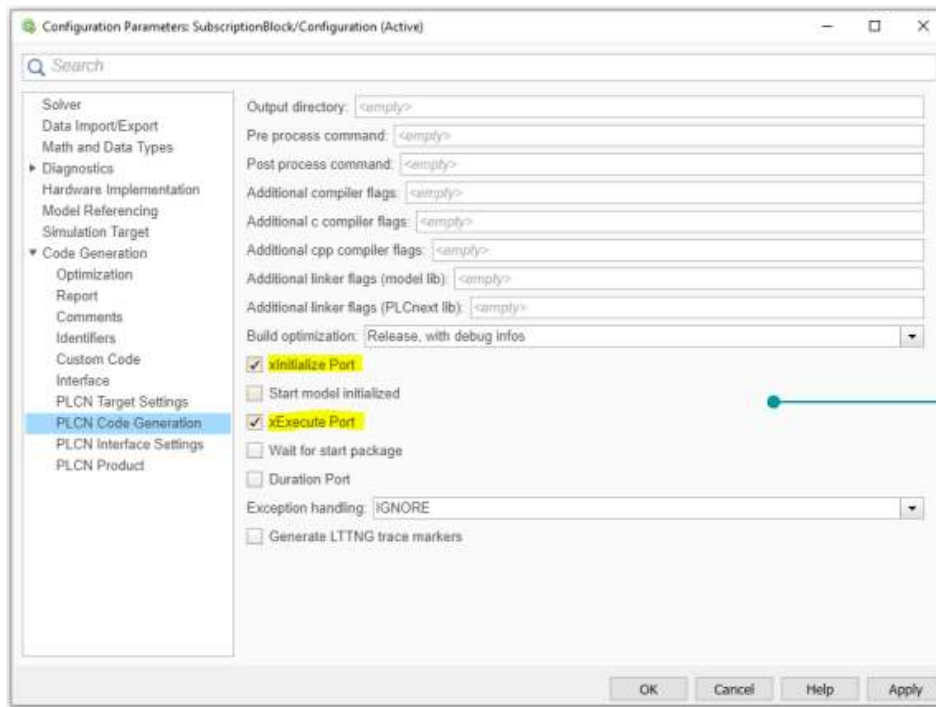
ESM1				
Task1		Zyklischer Task		
Test3Program1	Test3Component1			Test3Program
Test3Program3	Test3Component1			Test3Program
Programmistanzname hier eingeben				Programmtyp hier auswählen
Task2		Zyklischer Task		
Test3Program2	Test3Component1			Test3Program
Test3Program4	Test3Component1			Test3Program
Programmistanzname hier eingeben				Programmtyp hier auswählen
Taskname hier eingeben				
ESM2				
SafetyProxyTask		Zyklischer Task		
sproxy_1	Arp.Services.SpnsProxy			SpnsProxyProgram
Task3		Zyklischer Task		
Test3Program5	Test3Component1			Test3Program
Test3Program6	Test3Component1			Test3Program
Programmistanzname hier eingeben				Programmtyp hier auswählen
Taskname hier eingeben				

1: <model>.so (**Modell Library**)
2: <model>_plcn.so (**PLCnext Programm-Interface Library**)

Multiple instantiation of one program into different tasks or ESMs

PLCnext Target for Simulink

Download changes



- Two new model settings ***PLCN_GenInitializePort*** & ***PLCN_StartInitialized*** generate an ***xInitialize*** port

PLCnext Target for Simulink

Download changes

The screenshot displays the PLCnext Target for Simulink interface. The top window, titled 'Portliste', shows a table of ports. The bottom window, titled 'WATCH-FENSTER', shows a table of variables. A callout box points to the 'WATCH-FENSTER' window with the text 'Add Ports to the Watch-Window to enable Download Changes'.

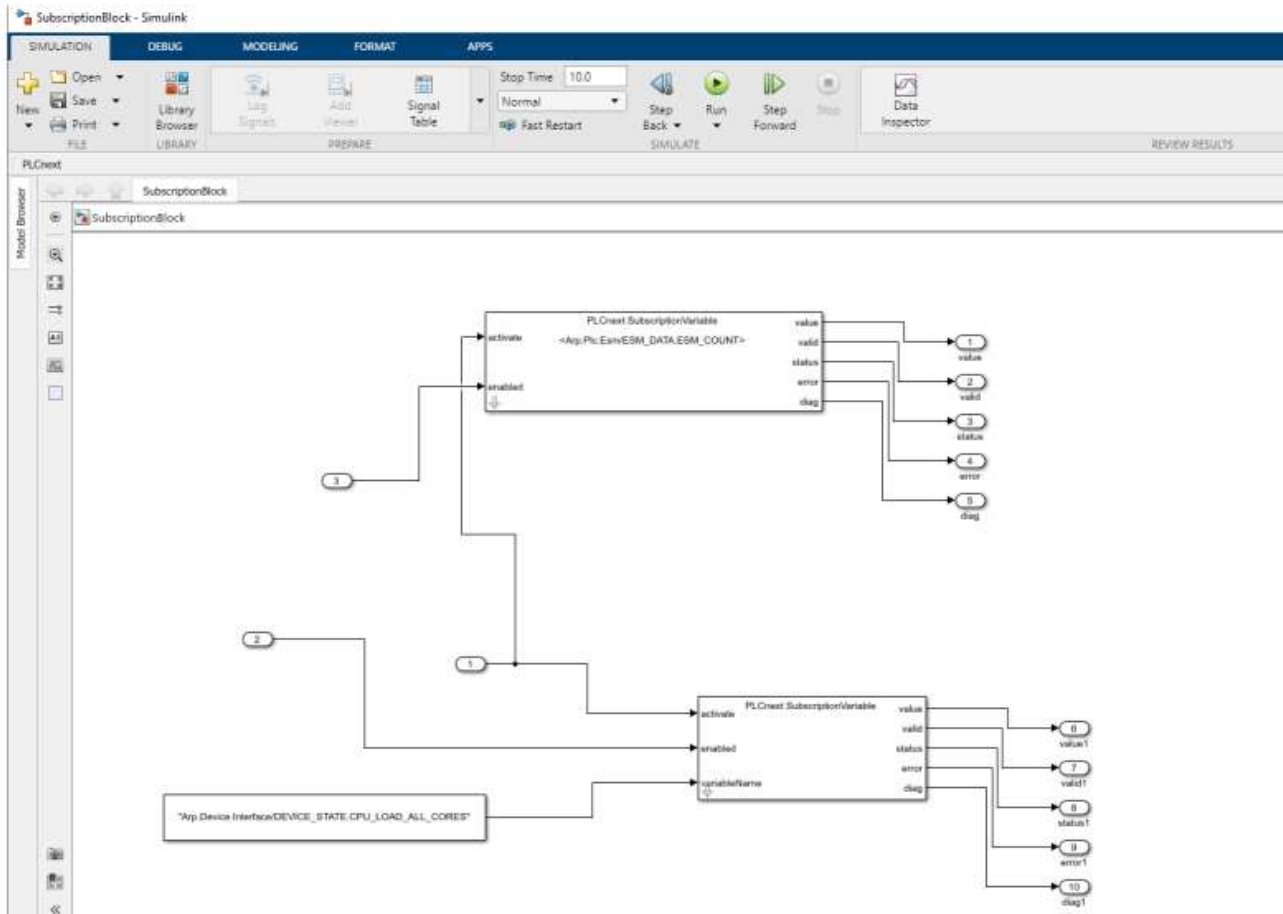
OUT Port	Wert	Typ	IN Port	Wert	Typ
OUT Port auswählen			Test6Component1 / Test6Program2 : in1	0.0	float64
Test6Component1 / Test6Program2 : Out1	1.0	float64	IN Port auswählen		
Test6Component1 / Test6Program2 : s_Diag Diag		Test6_c_...	IN Port auswählen		
OUT Port auswählen			Test6Component1 / Test6Program2 : s_Ctrl Ctrl		Test6_c_...

Name	Wert	Datentyp	Instanz
s_Ctrl Ctrl		Test6_c_Ctrl_Test...	Test6Component1/Test6Program1 s_Ctrl Ctrl
xExecute	TRUE	boolean	Test6Component1/Test6Program1 s_Ctrl Ctrl.xExecute
xInitialize	FALSE	boolean	Test6Component1/Test6Program1 s_Ctrl Ctrl.xInitialize
s_Ctrl Ctrl		Test6_c_Ctrl_Test...	Test6Component1/Test6Program2 s_Ctrl Ctrl
xExecute	TRUE	boolean	Test6Component1/Test6Program2 s_Ctrl Ctrl.xExecute
xInitialize	TRUE	boolean	Test6Component1/Test6Program2 s_Ctrl Ctrl.xInitialize
s_Ctrl Ctrl		Test6_c_Ctrl_Test...	Test6Component1/Test6Program3 s_Ctrl Ctrl
xExecute	FALSE	boolean	Test6Component1/Test6Program3 s_Ctrl Ctrl.xExecute
xInitialize	FALSE	boolean	Test6Component1/Test6Program3 s_Ctrl Ctrl.xInitialize
s_Diag Diag		Test6_c_Diag_Tes...	Test6Component1/Test6Program1 s_Diag Diag
wDiagCode	0	uint16	Test6Component1/Test6Program1 s_Diag Diag.wDiag...
dwAddDiagCode	0	uint32	Test6Component1/Test6Program1 s_Diag Diag.dwAdd...
dwAddDiagCode2	917570912	uint32	Test6Component1/Test6Program1 s_Diag Diag.dwAdd...

Add Ports to the Watch-Window to enable Download Changes

PLCnext Target for Simulink

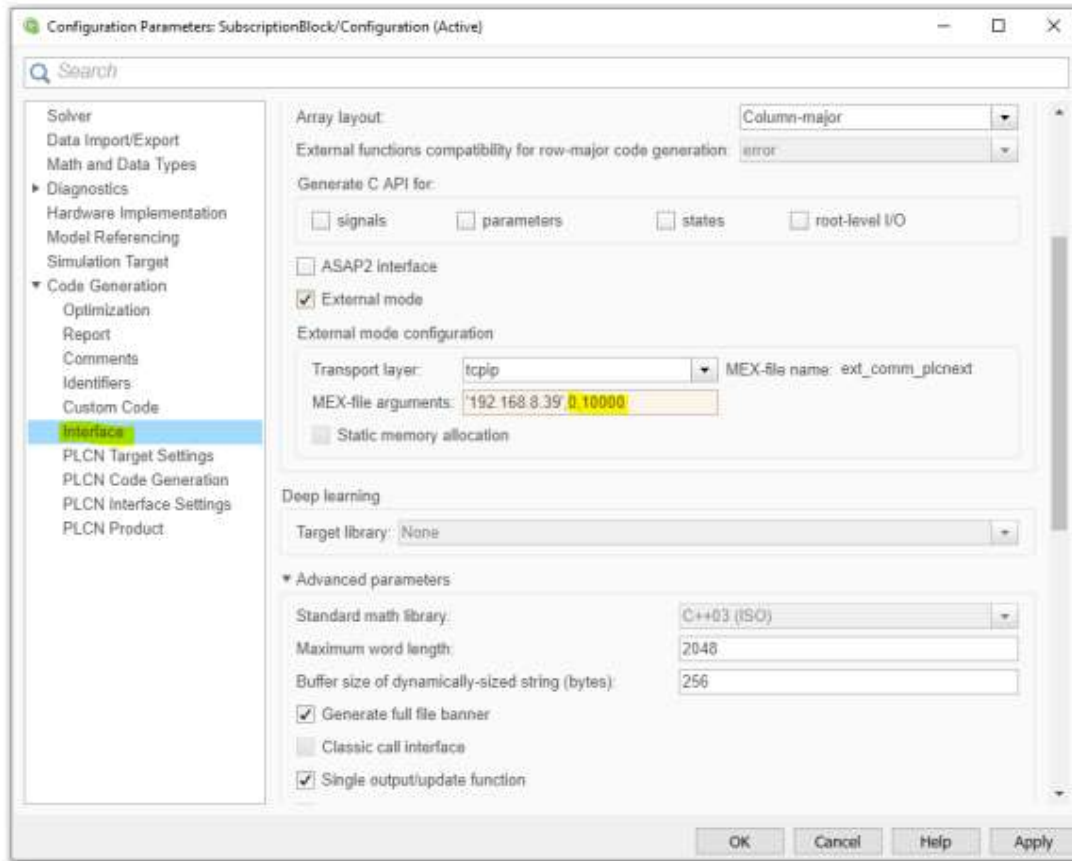
Simulink Block: Variable Subscription



- New Simulink Block via which a subscription can be made to a variable
- After the connection is established, the subscription provides real-time values at the same update rate as if ports were connected via the *.gds.config. Overwrite of GDS ports

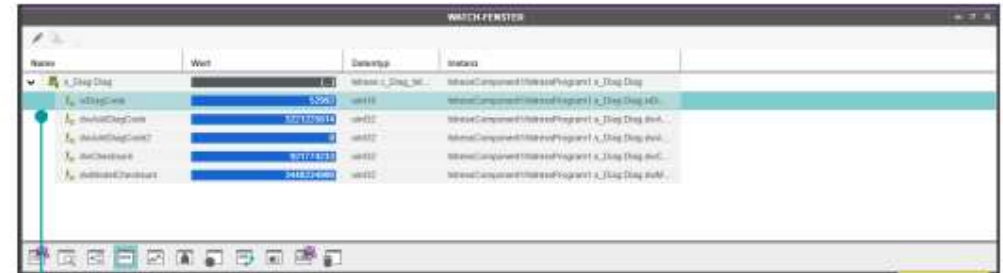
PLCnext Target for Simulink

External Mode: Port Configurability



- The TCP port of the External Mode is now configurable in the model configuration. With this change, uniquely instantiated models are accessible from Simulink via different ports.
- Ports are allowed from 1000 to 65535

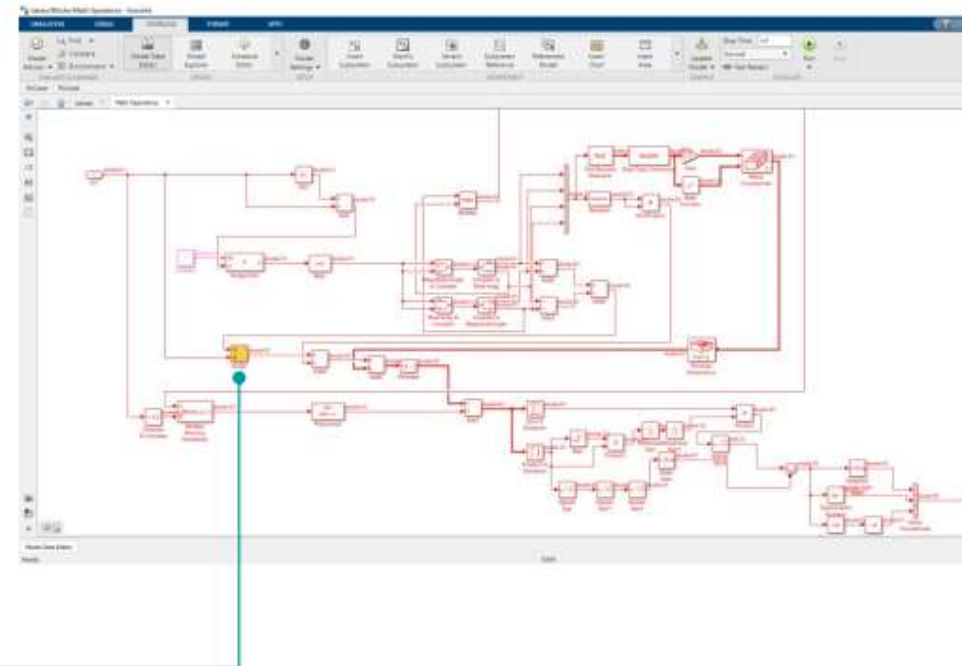
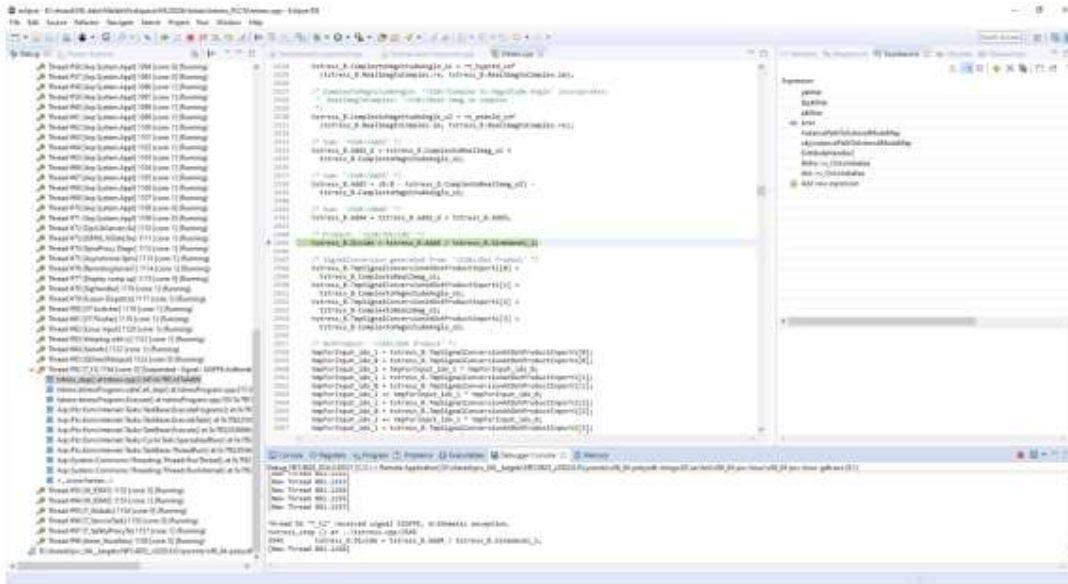
C++ Debugging/Breakpoints - Model <=> Code



- 15

PLCnext Target for Simulink

C++ Debugging/Breakpoints - Model <-> Code



```
Command Window
>> PLCN.CodeConnection.jumpToModelLocationForCodeLine('tstress',2545)
>> |
```


Motivation

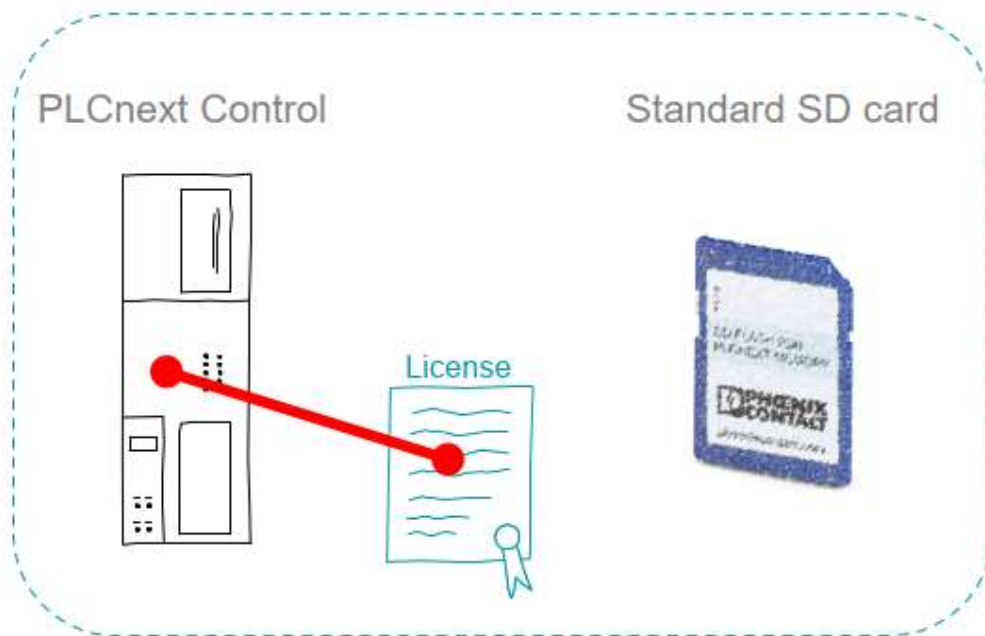
License SD FLASH

- Security
 - Basic mitigation of threats related to license fraud
- Distribute licenses
 - License binding to the SD card
- Series production of machines
 - Option of storing the application program and the needed licenses on the SD card
- Device replacement
 - Easy device replacement by taking over the application program and the licenses on the SD card



License

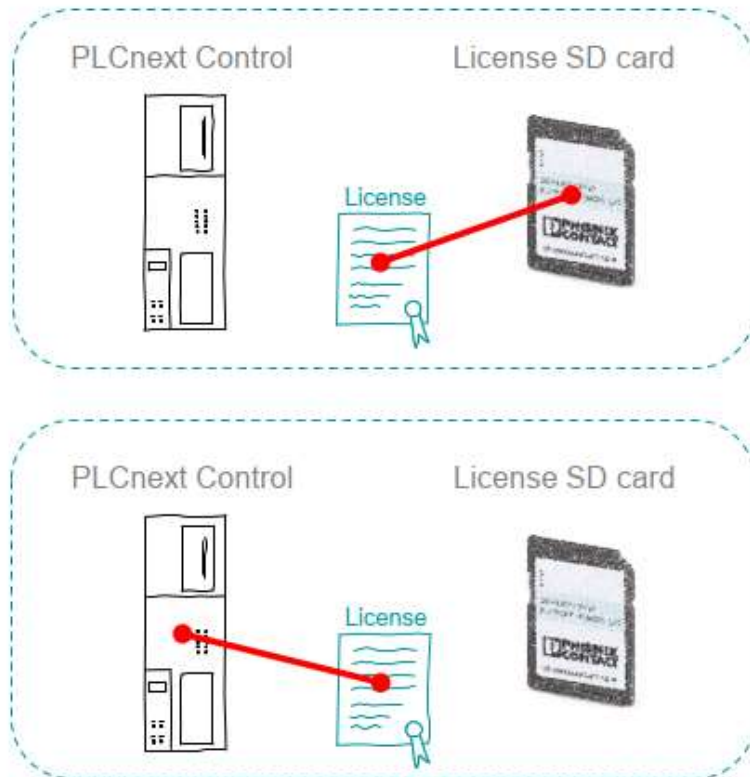
License Binding Today



- Licenses are bound to the TPM module of the PLCnext Control
- In case of a defect, the licenses need to be transferred to the replacement device
- No license distribution via SD card possible
- In serial machine manufacturing each controller must be licensed individually

License

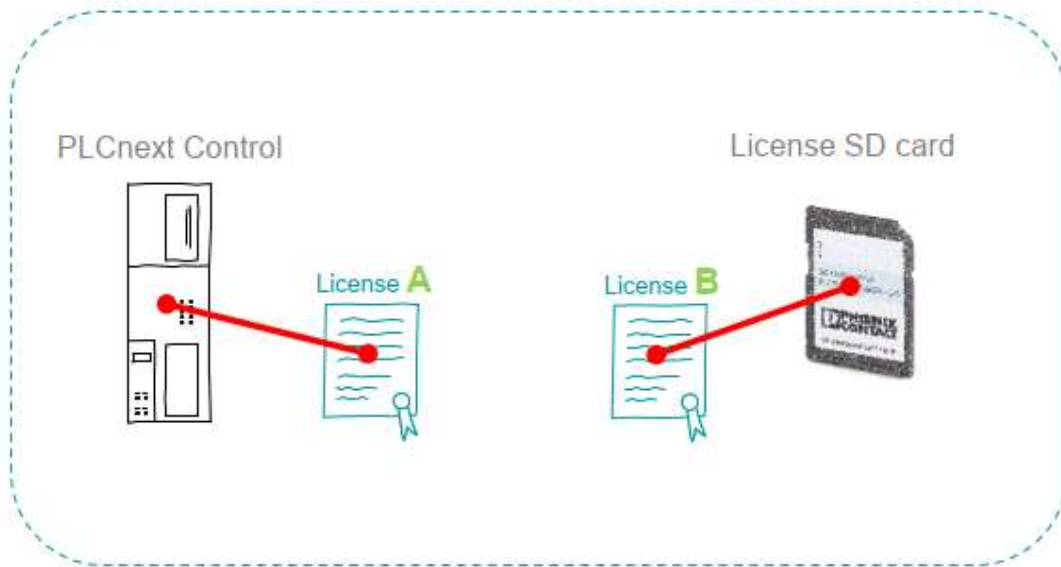
License Binding Tomorrow



- Licenses are bound to the SD card
- In case of a defect, the license can be taken over with the SD card
- Distribution of licenses via SD card possible
- The SD card can be prepared with the application program and licenses without PLCnext Control
- It will still be possible to bind licenses to the PLCnext Control

Options for customer

License Binding Outlook



- License A is bound to the PLCnext Control TPM
- License B is bound to the SD card
- The Customer is able to decide which license is bound to which hardware

Types

License on SD Card

	Standard	License <i>Coming soon</i>	Configurable License <i>Coming soon</i>
	 2GB / 8GB	 8GB / 32GB	 8GB / 32GB
storing application programms / other files	●	●	●
storing licenses		●	●
data protection ready		●	●
preactivated licenses			●

Technical Data of License SD flash

- The License SD flash will be...
 - ...available with 8GB and 32GB
 - ...equipped with an pre-installed empty license container
 - ...able to store licenses
 - ...unique with a non-manipulative hardware fingerprint
 - ...prepared to activate the data protection functionality if a data protection license is available on the sd card



Licenses

What means „Configurable“?



Configuration of the sd-card will be supported by a configurator in the e-shop

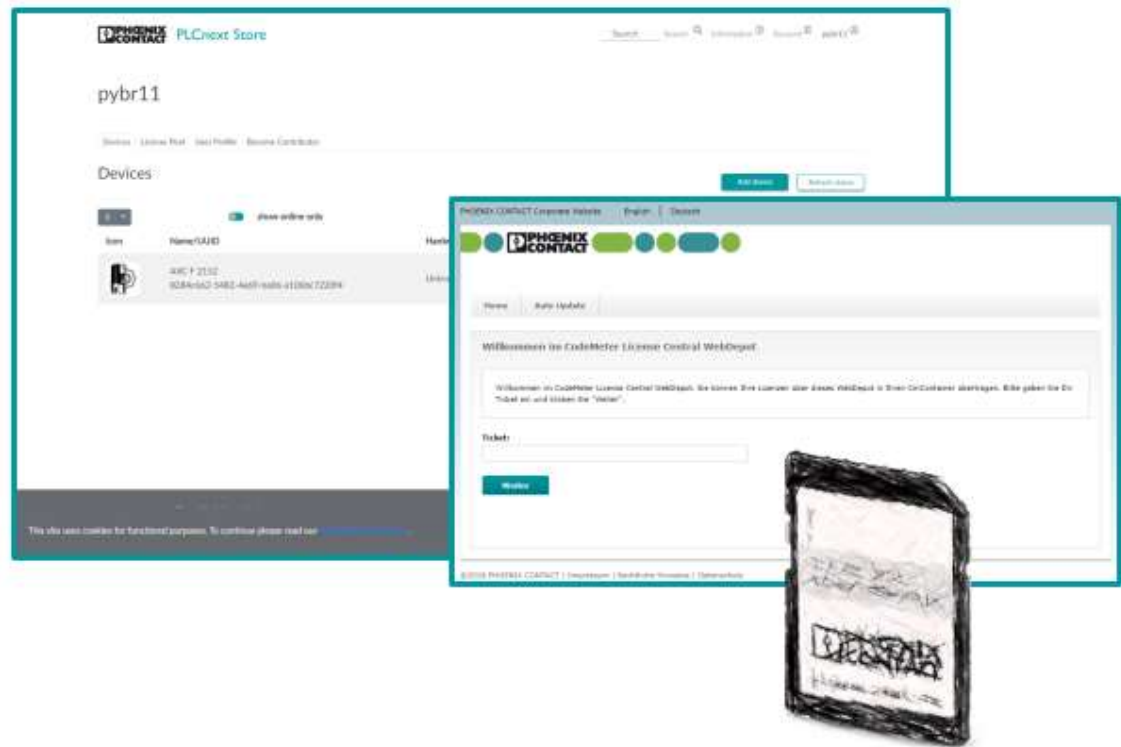
The Data Protection function

- Data protection are used to securely store applications, sensitive user data as well as valuable Know-how
- Partition protection
 - Overlay filesystem
 - User storage area
- User PIN and administrator login
 - User PIN is stored in the TPM of the controller, no need to type in
 - The SD card can only be read by the PLCnext Control with the correct User PIN in the TPM
 - In case of a defect of the PLCnext Control the SD card must be unlocked with the administrator password

DP
Data Protection

How to activate a license on a SD card?

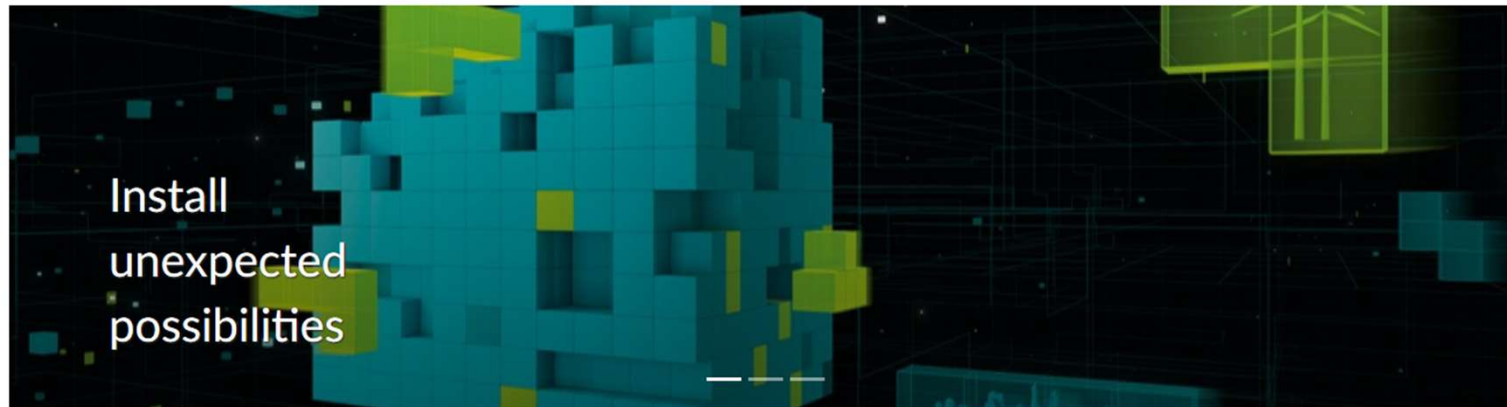
- License Central WebDepot
 - using the Offline Activation and the WBM
- PLCnext Store
 - Online Activation
 - Implementation in progress



Technical Data of License SD flash

- The designations of the new SD cards are:
 - SD FLASH 8GB PLCNEXT MEMORY LIC (1151112)
 - SD FLASH 32GB PLCNEXT MEMORY LIC (1151111)
 - SD FLASH PLCNEXT MEMORY LIC CFG (1308064)





Filter

Reset all

Promoted Best Rated Top Downloads Most Recent All

Hardware

- AXC F 2152
- AXC F 1152
- AXC F 3152
- RFC 40725



easymon AXC F 2152

in-tech GmbH

Remote Monitoring of PLCnext controllers - It's that easy! With easymon you can easily view any data values from your controller live & remotely and monitor thresholds. Temperature too high, quantiti...

Get it

NEW | Function Extension

Support

Free

PLCnext Store

New Apps

PLCnext Store

0€

Type

All

Function Extension

Runtime

Library

Solution App

Rating



balenaEngine-Docker ForIOT-ARM

Phoenix Contact Deutschland GmbH

NEW | Function Extension

BalenaEngine is an OCI (including Docker) compatible container runtime for embedded systems and is based on the Moby project. Known issues: Will be found in our GitHub Project. Support: You can get ...

Free

Get it



straton Runtime for AXC F 2152

Straton Automation

NEW | Runtime

The straton Runtime is a softPLC engine allowing to develop IEC61131-3 applications for the PLCnext Controller AXC F 2152. It supports many protocols: IEC61850, IEC60870, OPC UA, Modbus... The install...

Free

Get it



DataMux

Phoenix Contact SAS

NEW | Library

This library handles communication between 2 PLCs. It permits to exchange a complete data structure, no matter the size, by the use of a multiplexed communication using the PN I/Os.

Free

Get it



Reisenbauer Solutions Runtime

Reisenbauer Solutions GmbH

NEW | Runtime

Reisenbauer Solutions stands for easy and rapid automation. The Runtime process the Logic which is programmed with our Engineering-Software Assemble. Additionally you can monitor, receive alarms and r...

Free

Get it

Library

PLCnext Store



Alarms Lib

Phoenix Contact SAS

Get it

Downloads: 26 | Library

This library handles alarms. It can use 100 different alarms, and archive them in an historic array of 1000 items. The text of each alarm has to be set by programming. The function bloc archives the a...

Free



AnalogTechnology

Phoenix Contact GmbH & Co. KG

Get it

Downloads: 665 | Library

The AnalogTechnology library offers function blocks for acquisition and evaluation of analog signals.

Free



AsynCom

Phoenix Contact GmbH & Co. KG

Get it

Downloads: 145 | Library

The function blocks of the AsynCom library are working as an interface between function blocks which are intended to communicate acyclically and bus system dependent firmware function blocks (PCP_CONN...

Free



AXL_Analog

Phoenix Contact GmbH & Co. KG

Get it

NEW | Library

Function blocks for acquisition and evaluation of analog signals for the Axioline system.

Free



AXL_ComSerial

Phoenix Contact GmbH & Co. KG

Get it

Downloads: 166 | Library

The AXL_RSUNI_PD block provides the user with a convenient option for configuring a serial connection when using the AXL F RS UNI 1H module.

Free



AXL_PDI

Phoenix Contact GmbH & Co. KG

Get it

Downloads: 85 | Library

Function blocks for asynchronous communication with Axioline modules.

Free

Solution App

PLCnext Store



Proficloud Writer

Phoenix Contact GmbH & Co. KG

Get it

NEW | Solution App

Easily automate and optimize your processes by analyzing your operational data out of the cloud. Start to log your data in the Proficloud and make it accessible no matter where you are. PHOENIX CONT...

Free



Pump Station Control

Phoenix Contact GmbH & Co. KG

Get it

NEW | Solution App

Save time and money by continuous monitoring and controlling of your pumping stations. Easily transform your controller into a pumping station without any engineering or programming effort! Pump Sta...

Free



SBT_Gateway

Phoenix Contact SAS

Get it

NEW | Solution App

This application is designed to control up to 16 InLine or AxioLine Safety Bridge devices. Both can be mixed, using the appropriate bus coupler. ----- In the technical details, y...

Free



seepex MTP

Phoenix Contact GmbH & Co. KG

Get it

NEW | Solution App

MTP interface for Seepex pump A Seepex pump can be driven using two MTP compatible services: - "Portioning": You can pump a specified amount of fluid for batch operations. - "Dosing": You can dose ...

Free



Starter Kit Demo

Phoenix Contact GmbH & Co. KG

Get it

NEW | Solution App

Use this solution app to test the AXC F 2152 Starter Kit. It is possible to test the digital inputs and outputs and to display and scale the analog input. A visualization is included. The app was deve...

Free



Tank and Well Control

Phoenix Contact GmbH & Co. KG

Get it

NEW | Solution App

Simplify and ensure your reliable drinking-water supply. Easily control your tank and wells without any engineering or programming effort! The Tank and Well Control from PHOENIX CONTACT takes on all...

Free

Function extensions

PLCnext Store



Alibaba Cloud Connector

Phoenix Contact GmbH & Co. KG

NEW | Function Extension

The Alibaba Cloud Connector can connect a PLCnext controller to the Alibaba Cloud via internet directly. By using this app, data can be transmitted bidirectionally between a PLCnext controller and the...

Free

Get it



balenaEngine-DockerForIoT-ARM

Phoenix Contact Deutschland GmbH

NEW | Function Extension

BalenaEngine is an OCI (including Docker) compatible container runtime for embedded systems and is based on the Moby project. Known issues: Will be found in our GitHub Project. Support: You can get ...

Free

Get it



balenaEngine-DockerForIoT-x86

Phoenix Contact Deutschland GmbH

NEW | Function Extension

BalenaEngine is an OCI (including Docker) compatible container runtime for embedded systems and is based on the Moby project. Known issues: Will be found in our GitHub Project. Support: You can get ...

Free

Get it



CDPIO for PLCnext

CDP Technologies AS

NEW | Function Extension

CDP Studio is a comprehensive software development tool to build industrial control, automation and edge systems. The CDPIO app enables CDP Studio applications to use the analog and digital I/O modu...

Free

Get it



connect-Gateway HTTP Trial

verlinked GmbH

NEW | Function Extension

An HTTP client and server for your PLCnext. Collect data from variables of your PLCnext project and send them via HTTP to any Web server. Or provide a RESTful Web interface to the realtime data of you...

Free

Get it



connect-Gateway MQTT Trial

verlinked GmbH

NEW | Function Extension

An MQTT client and Broker for your PLCnext. Collect data from variables of your PLCnext project and send them via MQTT to any MQTT Broker. Or provide a MQTT Broker with realtime data of your PLCnext p...

Free

Get it

PLCnext community

NEWS ON PLCNEXT TECHNOLOGY 15 FEBRUARY 2021 HITS: 332

PLCnext Technology Starterkit Video Series - Plug and play with RealPars



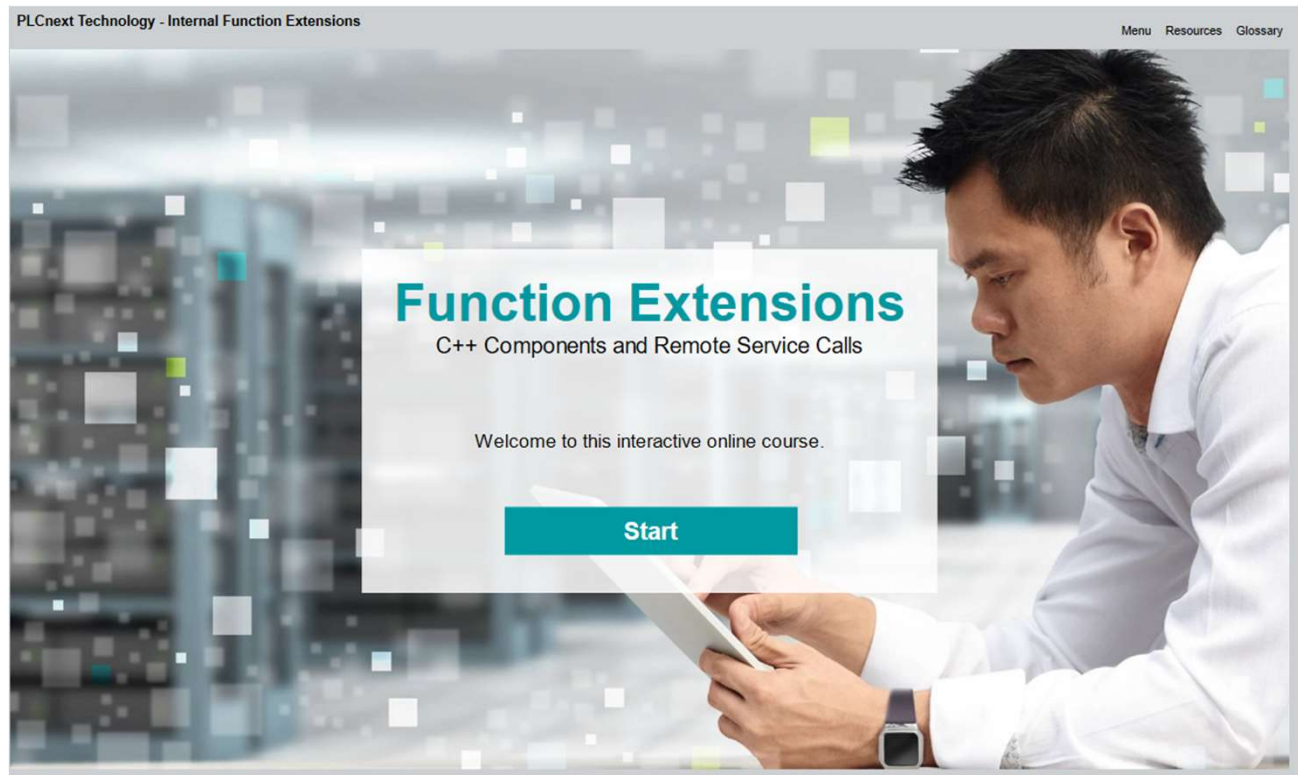
Watch the unboxing of the new PLCnext Technology starterkit. The first video of a whole series is online right now. The Youtube video is created by RealPars, an online platform for industry learning. In this video, they are going to identify all the PLCnext Technology starterkit bits and pieces in the box that arrived at their door. They are also going to familiarize you with everything in the box and discuss the purpose and function of each item. More videos are coming soon on how to configure and program our innovative PLC soon. Stay tuned for new easy-to-follow videos and articles from RealPars.

[Watch the video here](#)

[Read the full blog entry](#)

About RealPars - RealPars offers its users the opportunity to create progress through industrial technology and develop the skills of tomorrow. With hands-on industrial courses authored by industry experts, the platform helps businesses and individuals' close skills gaps in critical areas, innovate faster and deliver on key objectives www.realpars.com.

PLCnext Community



C++ Component

E-Learning PLCnext Community

PLCnext Technology - Internal Function Extensions

Menu Resources Glossary

Agenda

Chapter 1
Preparation

Chapter 2
Theoretical
Basics

Chapter 3
Project



Click on the chapter fields to learn more about the topic.

In this e-learning you will learn how to create an Internal Function Extension in the form of a C++ Component.

For this purpose, you will be guided step-by-step through the implementation of an example.

You'll also learn to know different component types and the benefits of available C++ functions.

← PREV

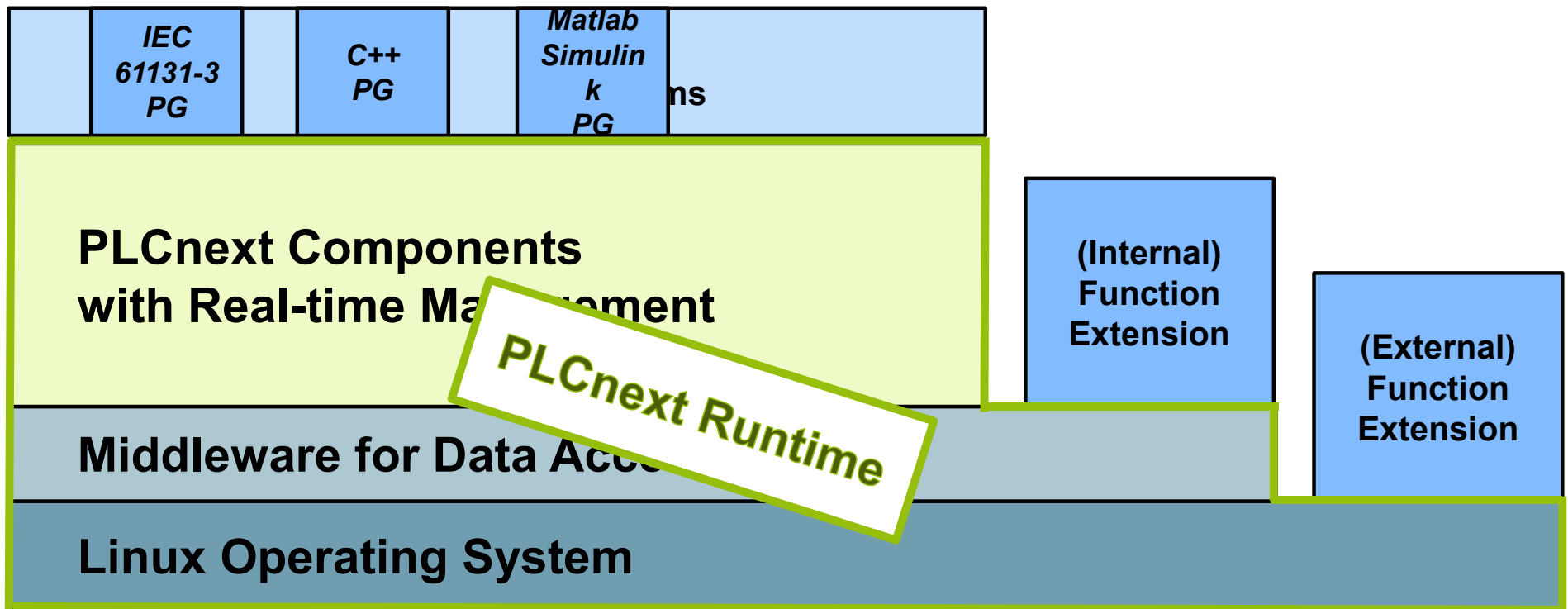
C++ Components

Agenda

- General introduction
- Required software for C++ Programming
- C++ project structure
- C++ Component functions
- C++ Worker thread
- C++ Component interfaces (GDS ports)
- C++ Component instantiation
- C++ Remote Service Calls (Overview)

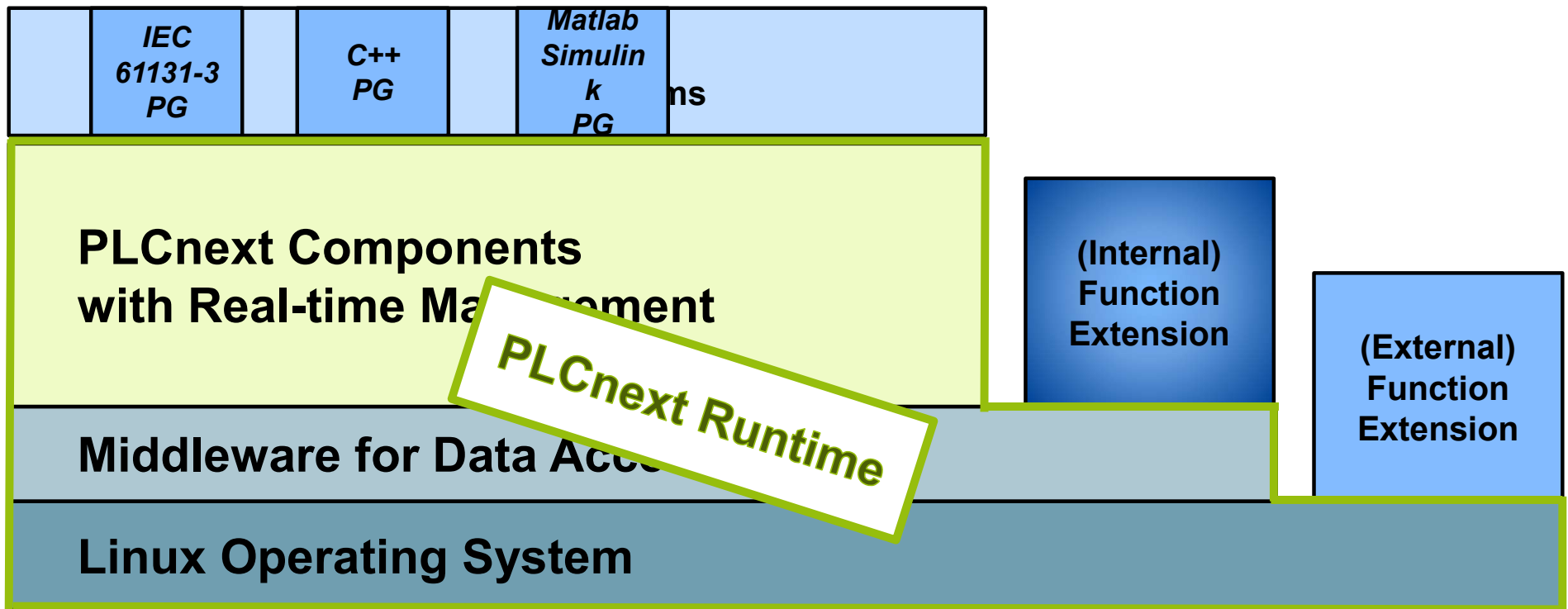
C++ Components

PLCnext Control - System architecture



C++ Components

PLCnext Control - System architecture



C++ Components

Required software

C++ with Eclipse

- Eclipse ≥ Neon
- Command-Line Interface (PLCnCLI)
- Software Development Kit (SDK)
- PLCnext Plugin for Eclipse

C++ with Visual Studio

- Visual Studio 2019
- Command-Line Interface (PLCnCLI)
- Software Development Kit (SDK)
- PLCnext Plugin for Visual Studio

C++ with any further editor

- Preferred C++/text editor
- Command-Line Interface (PLCnCLI)
- Software Development Kit (SDK)

 Available as one bundle on the Phoenix Contact homepage



More information:

https://www.plcnext.help/de/Programming/Cpp/Cpp_programming/Required_Installations.htm

Webinars

MQTT

Webinar: Basics of PLCnext Technology

Date: 19 May 2021

Time: 09:00 AM (CET), Netherlands 09:00 AM (LT)

Language: Dutch

Speaker: Harm Geurink

During this webinar the participant gets acquainted with the unique characteristics of PLCnext Technology. In addition, the architecture of the classic PLC, the PLCnext Technology and other control solutions will be discussed.

[CHECK IN FOR WEBINAR](#)

[Read more ...](#)

[Linux](#) [Profilcloud](#) [IEC 61131-3](#) [cloud](#) [Global Data Space](#)

Webinar: REST examples

Date: 25 May 2021

Time: 04:30 PM (CET), Germany 04:30 PM (LT)

Language: English

Speaker: Christiane Kownatzki

During this webinar you will learn how to configure the embedded webserver of PLCnext Controls to provide data via REST. In addition several examples for using PLCnext Control as REST client will be presented. These examples will be programmed in different programming languages and environments to show various ways of accessing data via REST.

[CHECK IN FOR WEBINAR](#)

[Read more ...](#)

[HMI](#) [Python](#) [curl](#) [eHMI](#) [Rest](#) [Rest API](#) [NodeRED](#) [javascript](#)

Webinar: REST examples

Date: 31 May 2021

Time: 09:00 AM (CET), Germany 09:00 AM (LT)

Language: English

Speaker: Christiane Kownatzki

During this webinar you will learn how to configure the embedded webserver of PLCnext Controls to provide data via REST. In addition several examples for using PLCnext Control as REST client will be presented. These examples will be programmed in different programming languages and environments to show various ways of accessing data via REST.

[CHECK IN FOR WEBINAR](#)

[Read more ...](#)

[HMI](#) [Python](#) [curl](#) [eHMI](#) [Rest](#) [Rest API](#) [NodeRED](#) [javascript](#)

Webinar: MQTT examples

Date: 07 June 2021

Time: 09:00 AM (CET), Germany 09:00 AM (LT)

Language: English

Speaker: Christiane Kownatzki

The webinar will give you an overview of communication via MQTT. Additionally, you will learn by means of different examples how you can use PLCnext Control as MQTT Client and MQTT Broker.

[CHECK IN FOR WEBINAR](#)

[Read more ...](#)

[MQTT](#) [mosquitto](#) [Node-RED](#) [Python](#) [Paho](#)

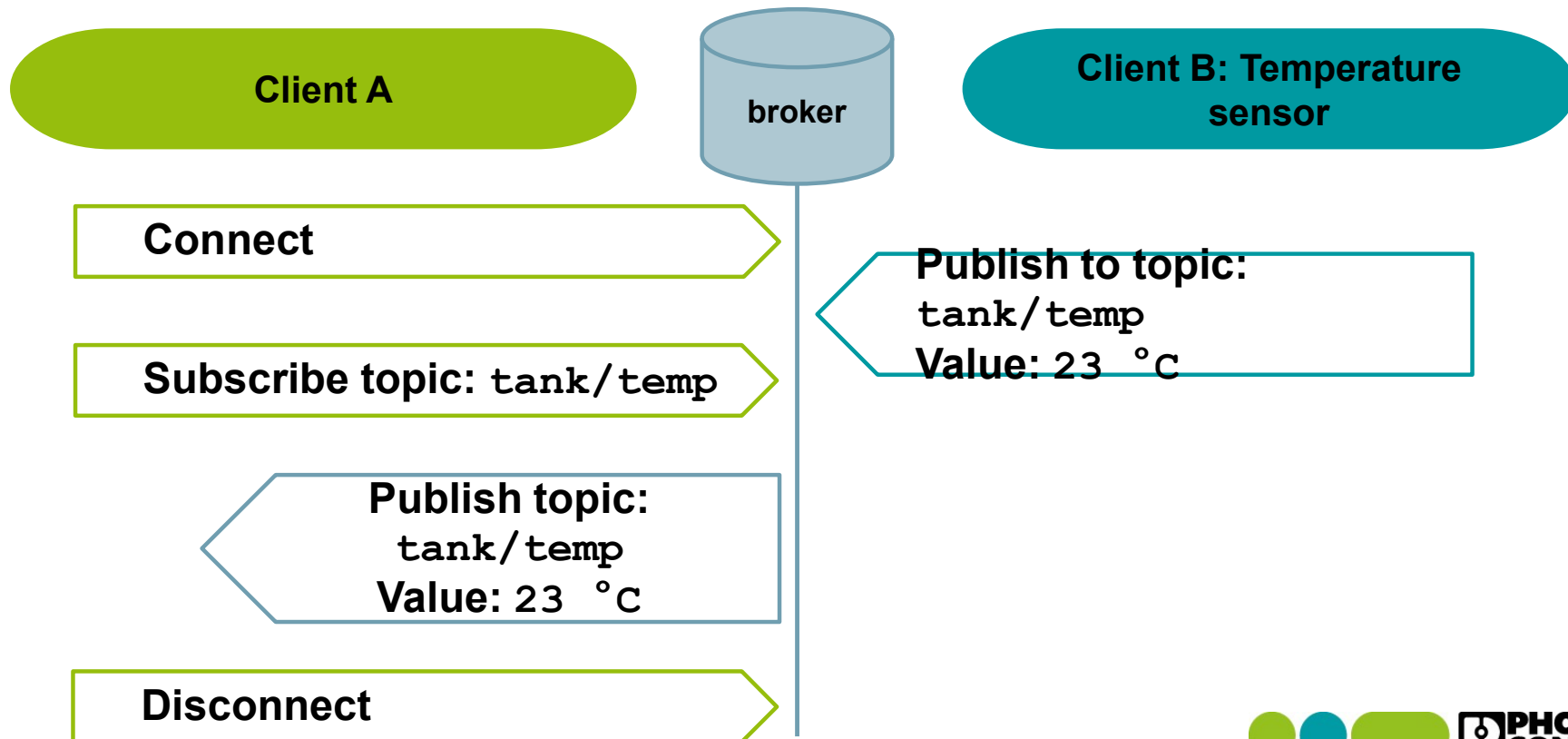
MQTT

Agenda

- General introduction to MQTT
- MQTT with Node-RED
 - Subscribe data from a public broker
 - Publish data to a public broker
- MQTT with Python
 - Installation of the paho-mqtt library
 - Subscribe data from a public broker
 - Publish data to a public broker
- MQTT in IEC61131
- PLCnext Control as MQTT broker
- Q&A

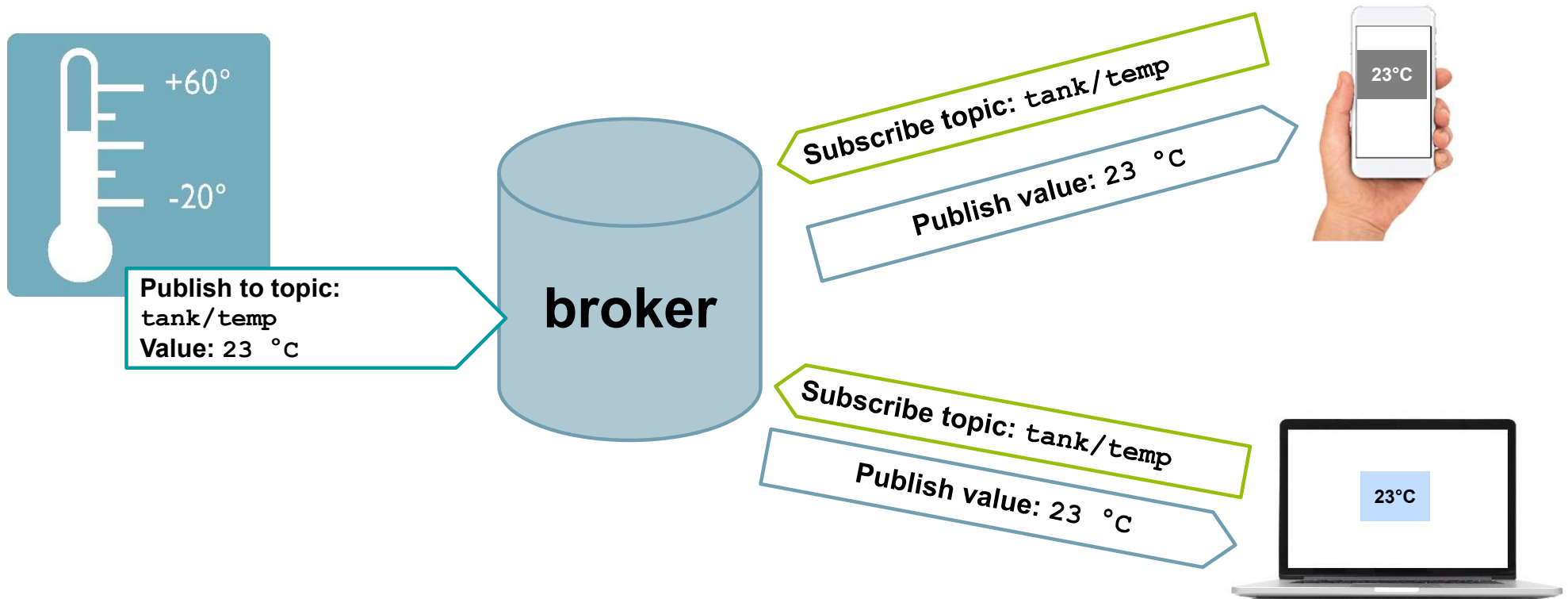
MQTT examples

Example of an MQTT connection



MQTT examples

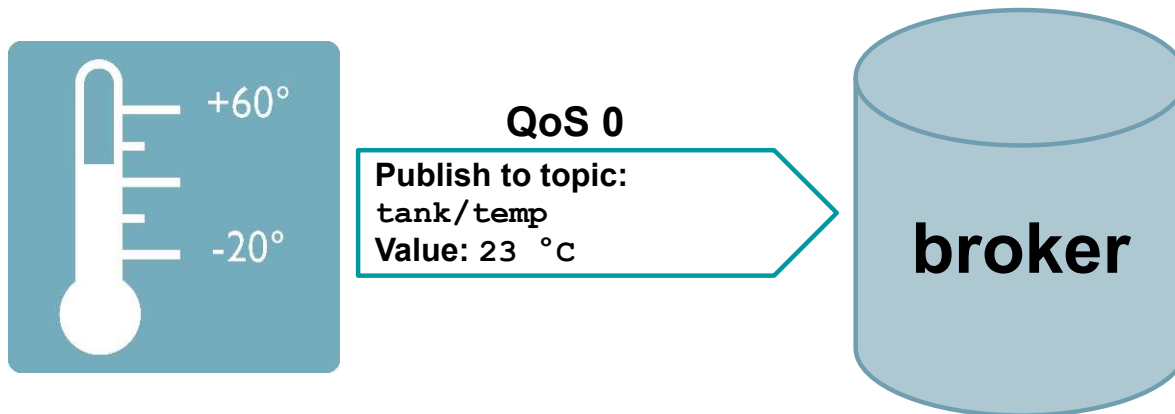
Multiple subscriptions



MQTT examples

Quality of Service (QoS)

- Determines how the message is sent
 - 0: „at most once“ → message is sent without any acknowledgement of the receiver



MQTT examples

Agenda

- General introduction to MQTT
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 - Installation of the paho-mqtt library
 - Subscribe data from a public broker
 - Publish data to a public broker
- MQTT in IEC61131
- PLCnext Control as MQTT broker
- Q&A

MQTT examples

PLCnext Store > IIoT Library



IIoT_Library

Phoenix Contact GmbH & Co. KG



Download

NEW | Library

This software library contains libraries and function blocks for "IIoT communication". With this library, PLCnext controllers can establish direct communication with cloud service providers. (Azure, A...

Free

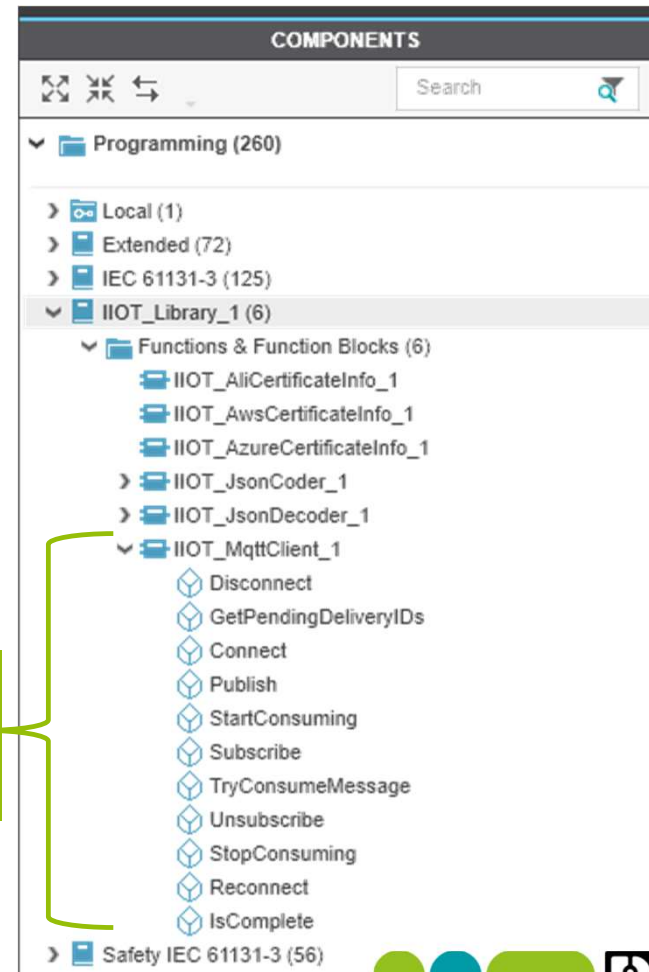


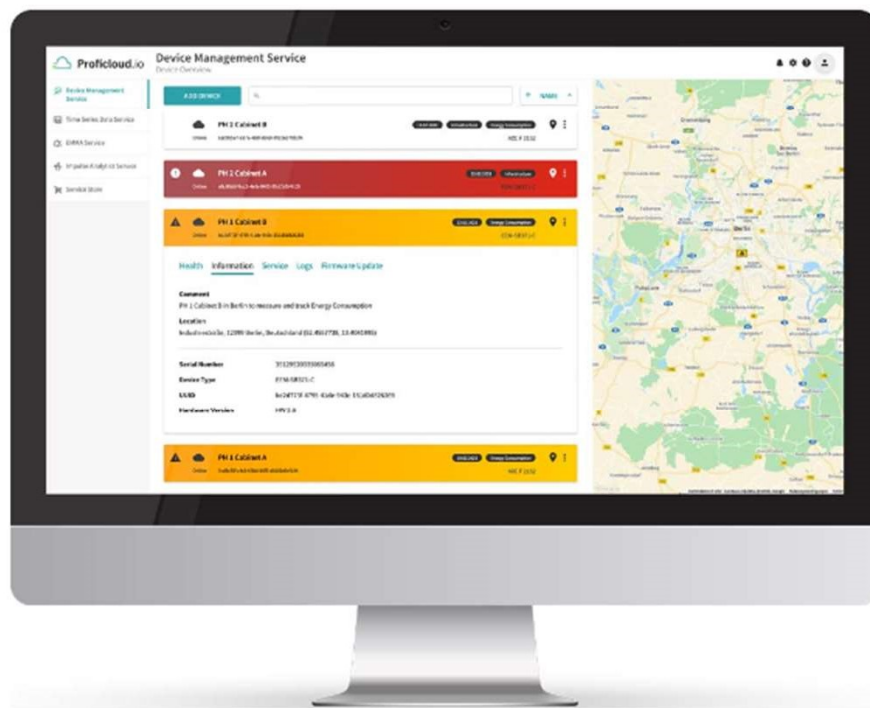
<https://www.plcnextstore.com/#/878>

MQTT examples

IEC61131 MQTT library

**MQTT function block
with different methods**





Maximum simplicity, maximum transparency: the industrial cloud for companies with no or limited IT resources

Proficloud.io is a Plug and Play IIoT platform that empowers small and mid-sized companies having no own or only limited IT resources to easily connect their devices to a cloud infrastructure. The goal? Use the full scope of advantages of Smart Services to unleash the full potential of your business!

[LEARN MORE ABOUT PROFICLOUD.IO](#)

PROFICLOUD.IO

Agenda

- **Welcome and Introduction**
- What should I know? WrapUp - Smart Services on Proficloud.io
- Use cases for our Smart Services
- How to book a Smart Service
- Closing

Every Smart Service starts with a Smart Device



Smart Networking

- Smart Devices are ready for sending data to Proficloud.io – safely and easily.
- Smart Services from Phoenix Contact are simple and standardized Software-as-a-Service solutions.



Smart Management

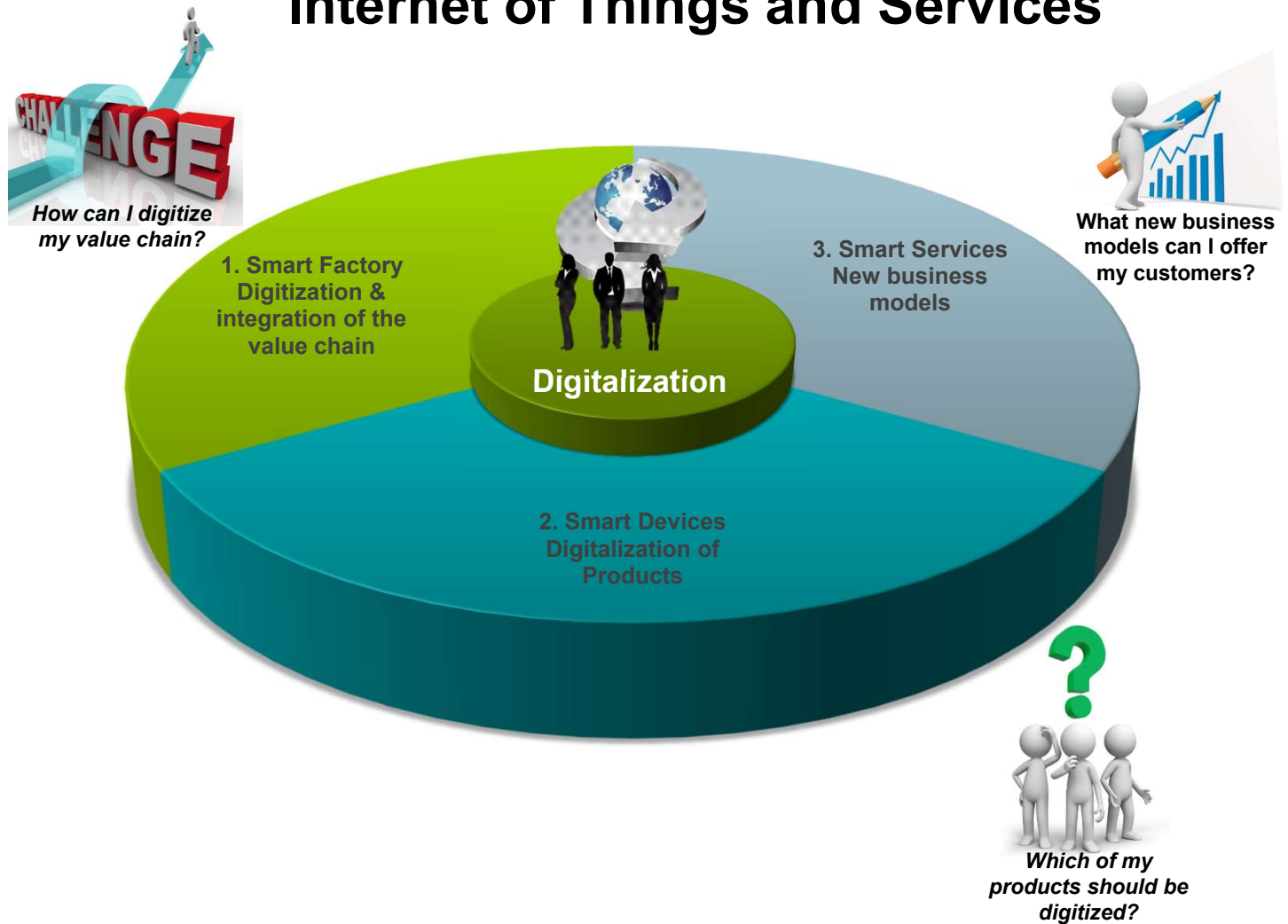
The Smart Service portfolio on Proficloud.io comprises for example

- | | |
|----------------------------|--------------------------|
| ▪ Secure device management | ▪ State of health |
| ▪ Real-time measurement | ▪ Predictive maintenance |
| ▪ Cloud-based analysis | ▪ Energy management |

**Digitalization
affects the entire
economy:**

**Every company
should ask itself
3 questions**

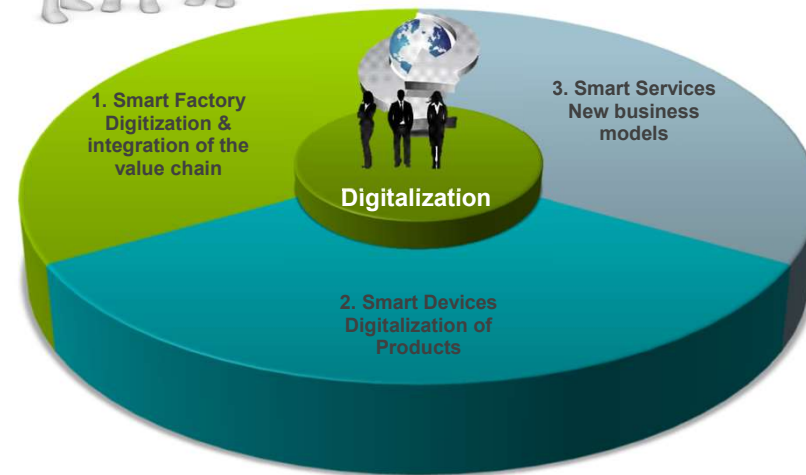
Internet of Things and Services



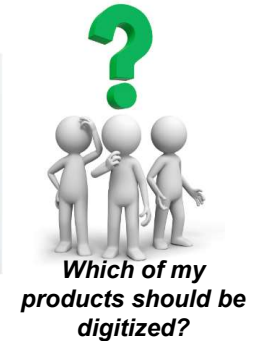
**Digitalization
affects the entire
economy:**

**Every company
should ask itself
3 questions**

Internet of Things and Services



Device Management Service	Time Series Data Service	Insights/Analytics Service
Free of Charge	Starts at € 100	Starts at € 250
✓ Monitoring of systems and devices	✓ 24/7 Monitoring	✓ Assistance system for maintenance and repair
✓ Location of devices through the network	✓ Data processing and analysis	✓ Comprehensive analysis of the plant
✓ State of health of every device from anywhere	✓ Highly configurable and scalable	✓ Time series detection of anomalies and trends
		✓ Real-time dashboards



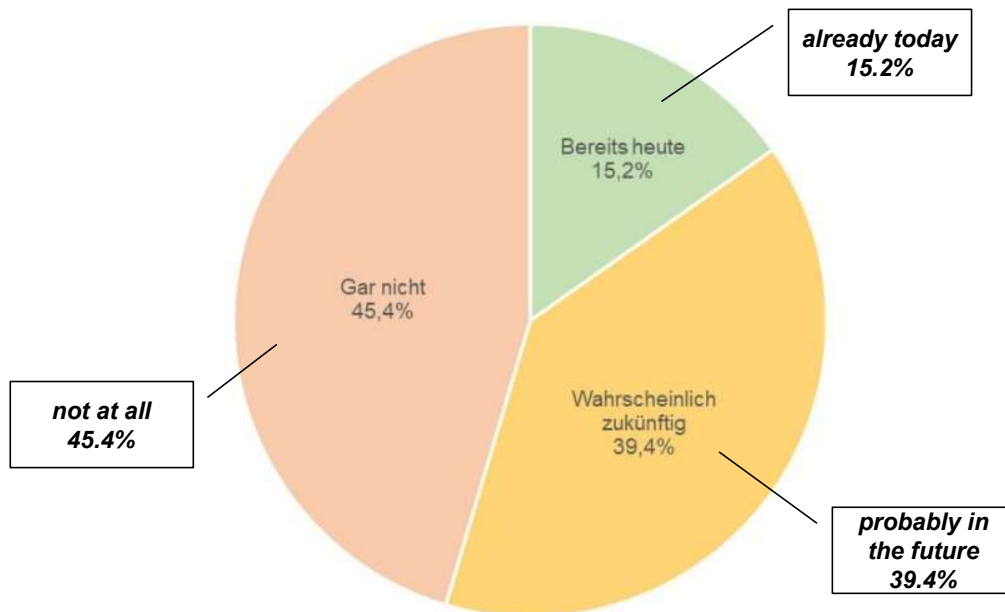
**Digitalization
affects the entire
economy:**

**Machine Builders
in Germany**

Internet of Things and Services

MICHAELA
ROTHHOFT
Marktstudie
Industrielle
Kommunikation

Inwieweit sind Ihre Maschinen/Anlagen an eine Cloud
angebunden?



To what extent are your machines / systems connected to a cloud?

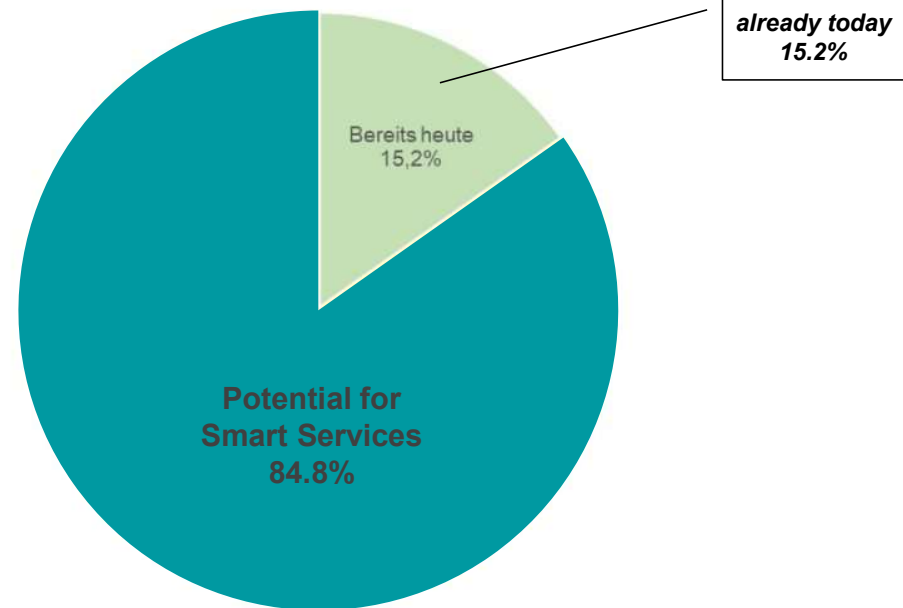
**Digitalization
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Internet of Things and Services

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To what extent are your machines / systems connected to a cloud?

**Digitalization
affects the entire
economy:**

Think about

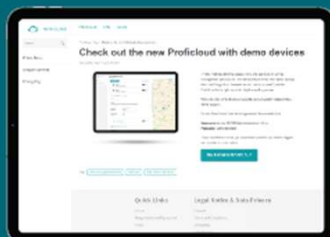
Internet of Things and Services

- **Cloud Technology:** Hardware and software resources and services are made available over the Internet.
- **Digitization is more than the application of technologies:** ... business models, cultures, people, ...
- **Internet of Things:** Products that are made smarter through sensors and network technology. They lead to the Internet of Things.
- **Automation of IT:** Intelligent systems that can perform tasks - also based on artificial intelligence (AI).
- **Robotics:** More powerful robots that drive automation thanks to AI and improved dexterity.
- **Mobile Internet:** Expansion of structures in order to increase networking and reduce prices.

Agenda

- Welcome and Introduction
- **What should I know? WrapUp - Smart Services on Proficloud.io**
- Use cases for our Smart Services
- How to book a Smart Service
- Closing

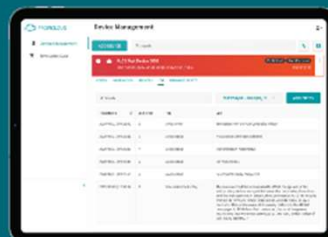
The introduction to Proficloud.io



Proficloud.io stands for a simple, usable possibility to realise industrial applications in the cloud. For us and our customers, data security and high usability are in the focus.

[ACCESS FREE COURSES](#)

Core functionality within Proficloud.io



The Device Management Service is one of the linchpins of Proficloud.io – so of course you will find some lessons for this service as well.

[ACCESS FREE COURSES](#)

The Time Series Data Service



Visualising incoming data points, setting up customised dashboards and setting up alerts – you will learn all this in the Time Series Data Service lessons.

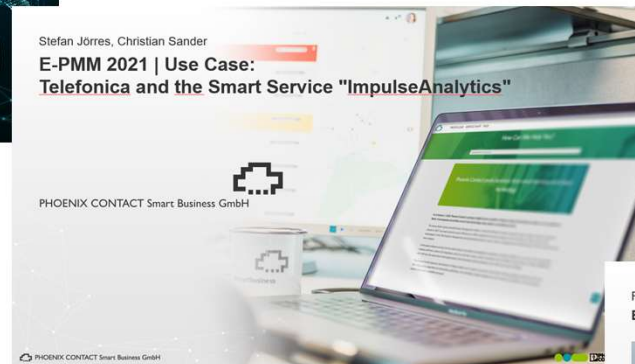
[ACCESS FREE COURSES](#)

Agenda

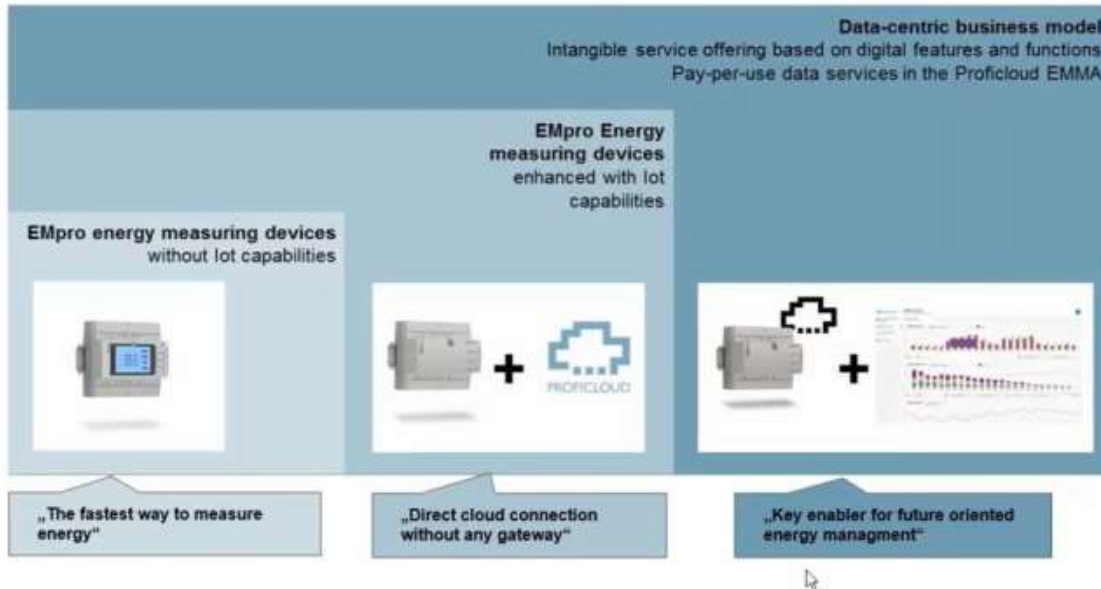
- Welcome and Introduction
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E-PMM 2021 | Get to know Proficloud.io

Use cases for our Smart Services



The EMpro Evolution



EMMA Energy Monitoring Management Analytics



PROFICLOUD

Proficloud

Service Store

FAQ

News



The cloud solution for industrial purposes: Proficloud.io

Use the many advantages of the Proficloud, whether for your automation solutions or to monitor your machinery. Get an individual notification or simply check the health status of your Phoenix Contact hardware.

SIGN UP

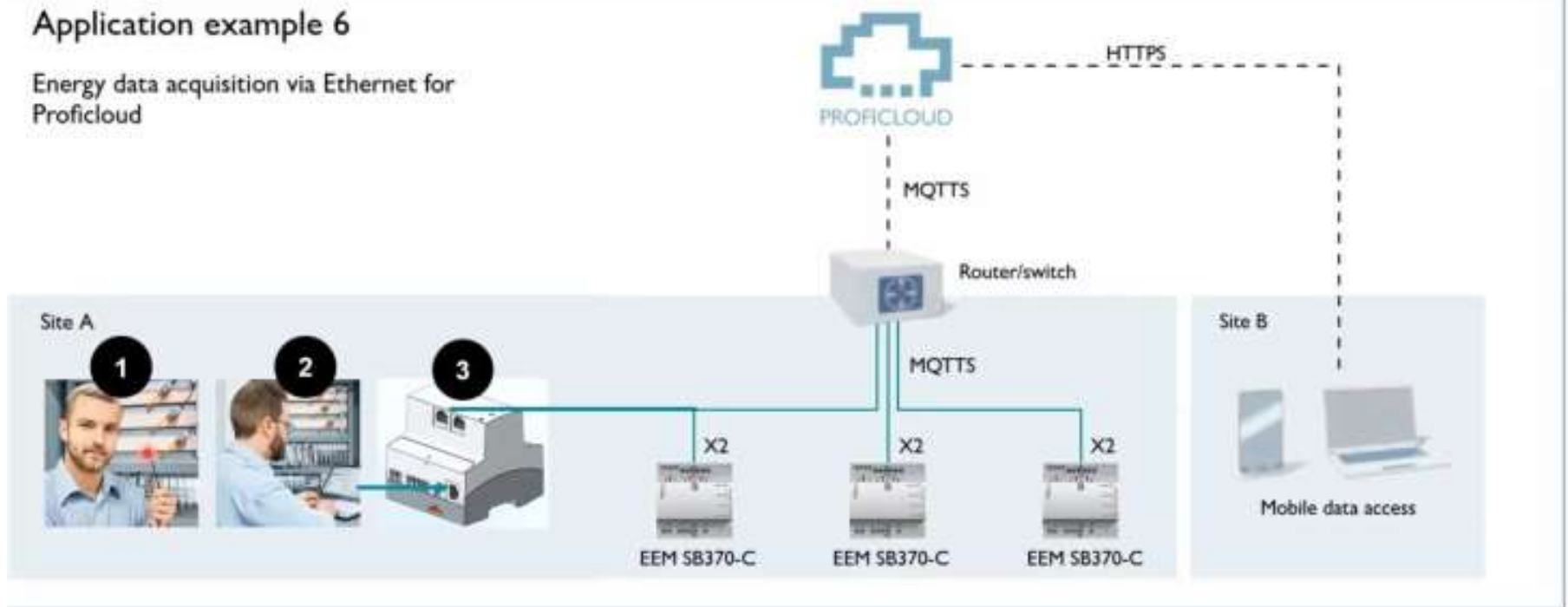
Welcome back!

LOGIN

Empo in PROFICLOUD

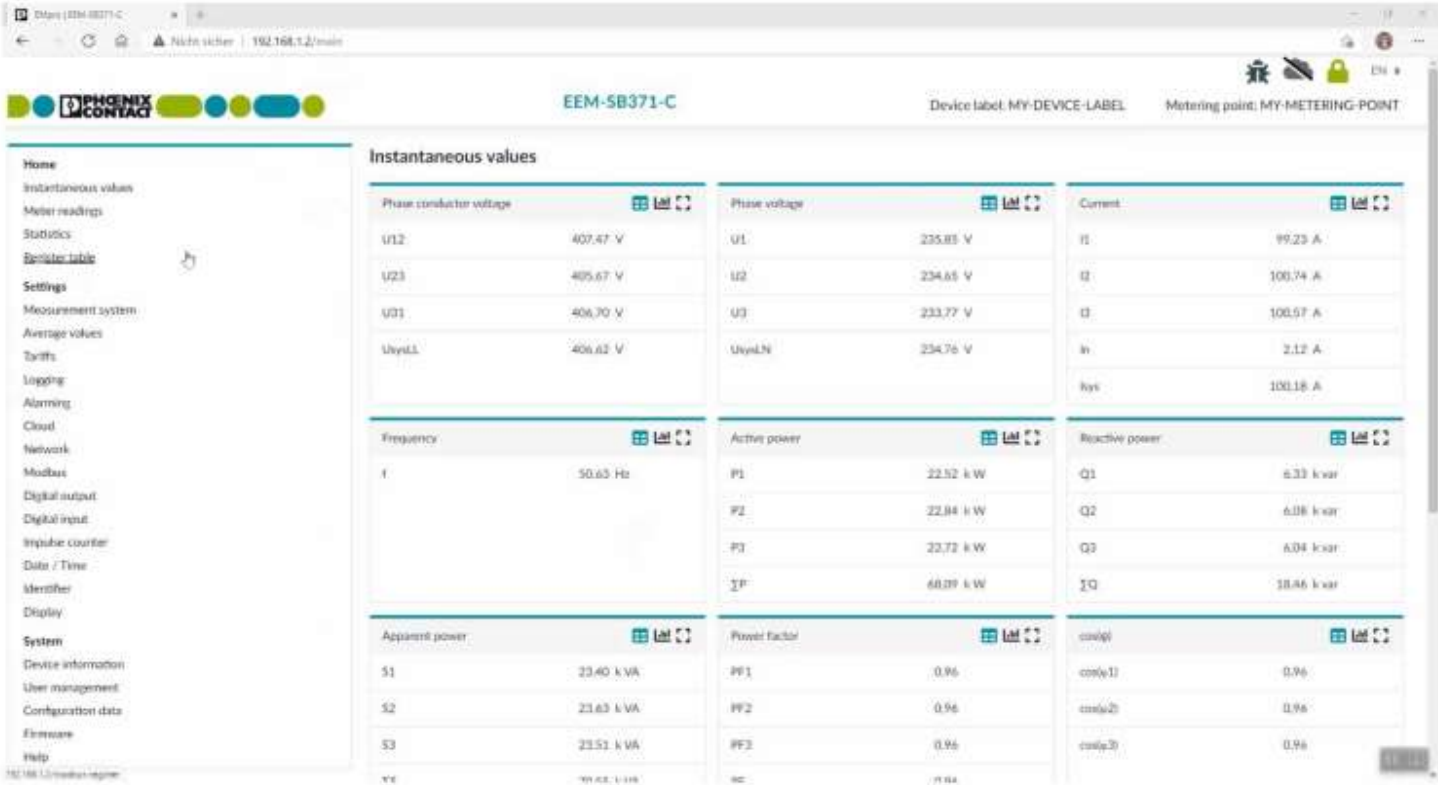
Application example 6

Energy data acquisition via Ethernet for Proficloud



Proficloud

Empro EEM SB371-C





Device Management Service

EMMA Service

Time Series Data Service

Impulse Analytics

Service Store

Device Management Service

Device Overview

ADD DEVICE

STATUS

**PH 1 Machine Park 1**

Online77c8f486-eded-4581-b928-9f76730b6526EEM-SB370-C

**Device 3**

Online2ae5e0d6-8bc7-4398-80be-f97bf1be0a27EEM-SB370-C

**PH 1 Machine Park 2**

Online690a6911-30f9-4def-98a0-d7b1a0e96f3bEEM-SB370-C

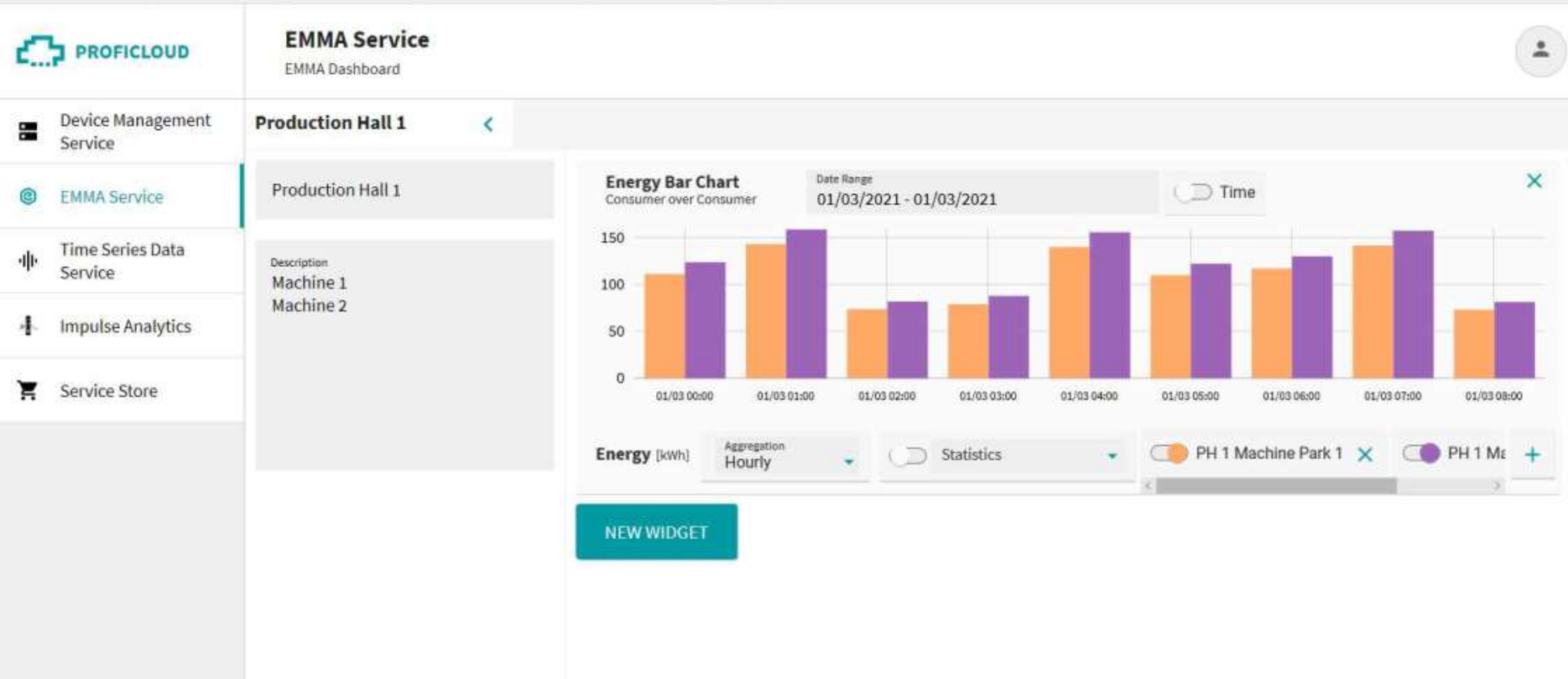


64

**PHOENIX
CONTACT**

INSPIRING INNOVATIONS

EMMA Service



EMMA Service



EMMA Service

EMMA Dashboard

Production Hall 1



Active power (kW)

Statistics

PH 1 Machine Park 1

PH 1 Machine Park 2

Consumer

PH 1 Machine Pa... PH 1 Machine Pa...

min (kW)

0,00349 0,00316

all time max (kW)

0,22 0,22

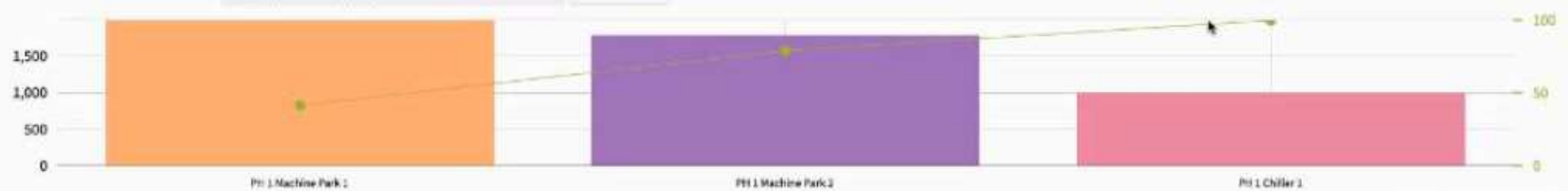
Energy Pareto Chart

Ranked by Consumer

Date Range

01/03/2021 - 01/03/2021

Time



Energy Daily (kWh)

PH 1 Machine Park 1

PH 1 Machine Park 2

PH 1 Chiller 1

Cumulative Percentage [%]
100% = 4.762 kWh

NEW WIDGET

Agenda

- Welcome and Introduction
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- **How to book a Smart Service**
- Closing

E-PMM 2021 | Get to know Proficloud.io

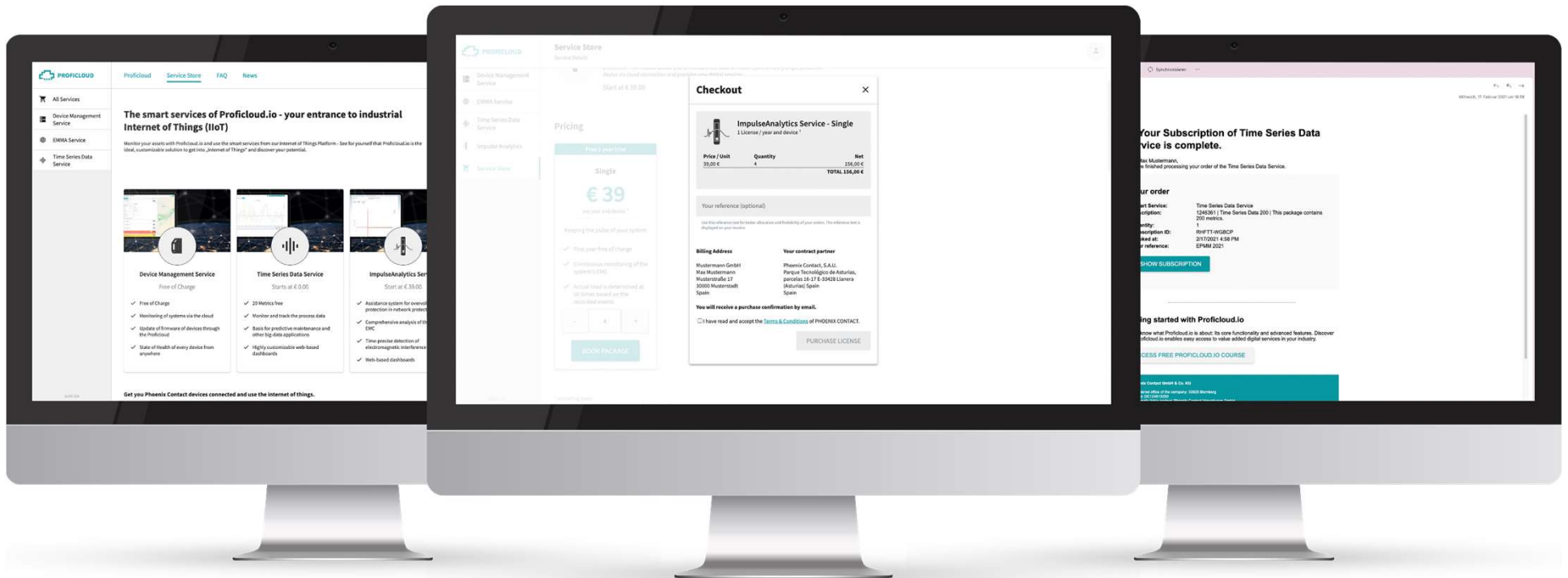
How to book a Smart Services?

Smart Services for Proficloud.io are booked directly on Proficloud.io

Proficloud.io

E-PM 2021 | Get to know Proficloud.io

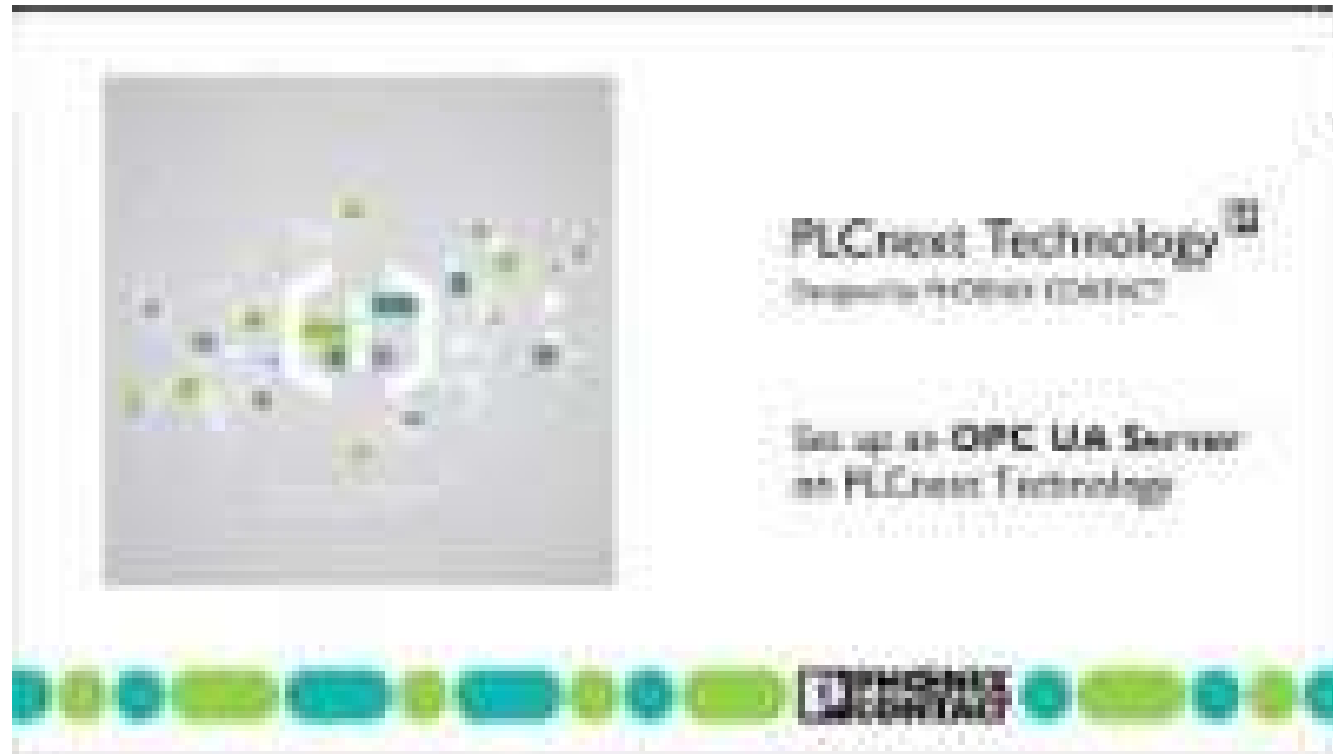
View into the Smart Service Store at Proficloud.io



Agenda

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- **Closing**

OPC UA on PLCnext Technology



OPC UA

VISU+ OPC UA

OPC UA

OPC UA Write and Read
Script XML Solution

VISU+ Write and Read

Use Case regarding the information from our official OPC UA document.

OPC UA Manual

Art.-Nr. 109303: AH EN VISU+ OPC UA IMPORT

If you are using the VISU+ push button with Impulsive command type and a OPC UA variable then it could be necessary to setup the Write and Read It

In large OPC UA projects the Ethernet latency could be the reason that we need to adjust this settings.

In our manual and in the VISU+ help you can find some helpful information regarding this topic!

This power point describe how you could change all Read Items automatically over an internal VBA Script very fast and easy!

Please use the provided Zip File (ScriptManagImpulsiveTags.zip).

VISU+ OPC UA IMPORT

5.3 Pulse-controlled variables



NOTE: Delayed change messages of the OPC UA Server when receiving the value!

If you are using pulse-controlled variables, please observe the following notes.

- In order to make the pulse-controlled variables insensitive to delayed change messages from the OPC UA Server when receiving the value, disable the "Read Item from Server" property.

This prevents negative influences when setting the value caused by latency times in the network.

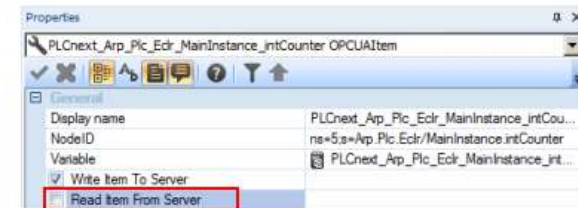


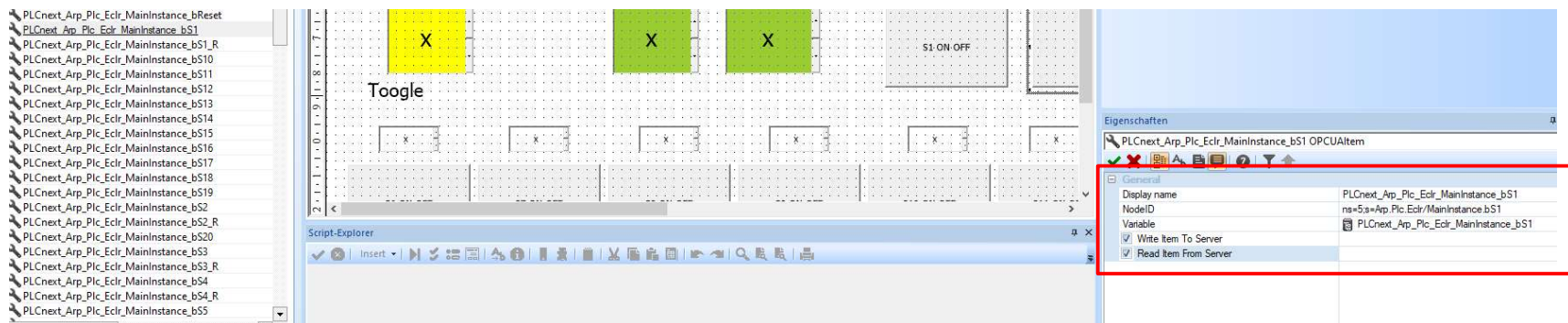
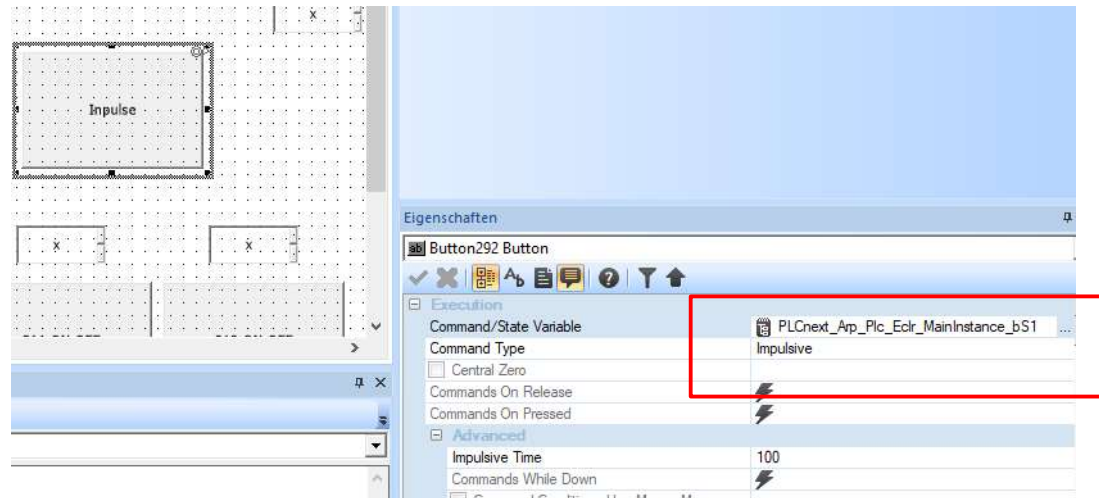
Fig. 14 Disable "Read Item from Server"



Please also refer to the Visu+ help.

VISU+ Write and Read

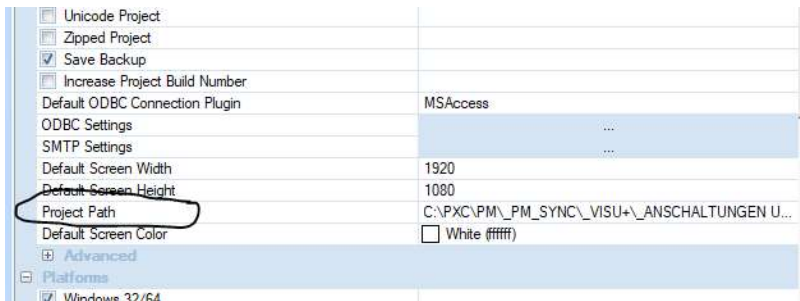
Here we can see, that
Push button
with Impulsive is in use.



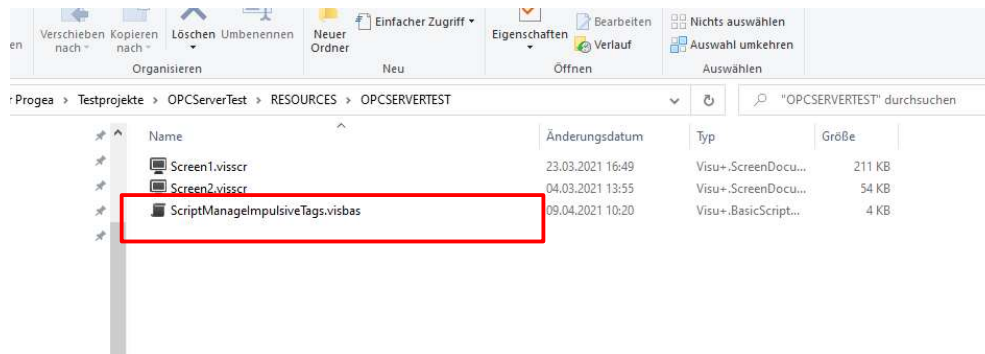
And you can see that the Read Item is enabled for this variable!

VISU+ Write and Read

First open your project in windows explorer. Open Project Tree view an double click on Project Path.



**Then navigate to the folder Resource and your project folder
In this case /RESOURCE/OPCSERVERTEST**



**Copy here the VBA Script File from
the enclosed Zip File.**

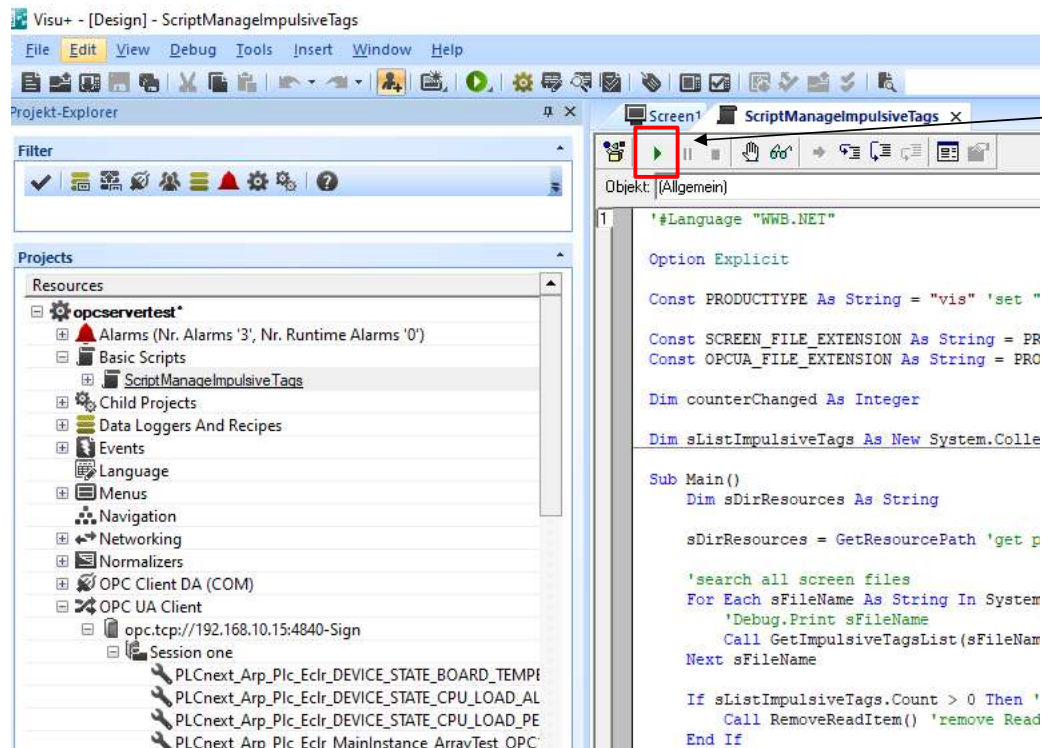
VISU+ reloading the files.

VISU+ Write and Read

Open the Script in VISU+ and Start the script.

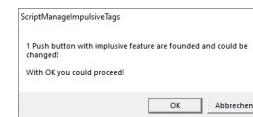
The script is scanning all screens and searching all push buttons.

After that the script will manipulate the XML File opcservtest.visopcuacient



The following procedure is important.

1. Start the Script



2. With OK you could start to manipulate the XML.

3. Reload the Project



4. Attention:

Avoid to save the poject over this dialog! Press No



5. Save the VISU+ project (VISU+ Menue bar)

VISU+ Write and Read

You can check the property in the XML file or directly in VISU+

The image shows the VISU+ configuration interface. The top part displays an XML snippet for a session configuration. The bottom part shows the OPC UA Client tree view with a red box highlighting the 'PLCnext_Arp_Plc_Eclr_MainInstance_bs1' item.

```
351 <Name ConnTO="2000" WatchTO="3000" AutoReconn="1" SamplInt="150" PubInt="150" SamplIntNotInUse="150" WatchTime="1500" SessTO="600" DefNS="">Session
352 <ItemList>CRLE
353 <Item>CRLE
354 <ItemName NodeId="ns=5;s=Arp.Plc.Eclr/MainInstance.b_ALL" Variable="PLCnext_Arp_Plc_Eclr_MainInstance_b_ALL" EnableWrite="1" EnableRead="1">
    PLCnext_Arp_Plc_Eclr_MainInstance_b_ALL</ItemName>CRLE
355 </Item>CRLE
356 <Item>CRLE
357 <ItemName NodeId="ns=5;s=Arp.Plc.Eclr/MainInstance.bReset" Variable="PLCnext_Arp_Plc_Eclr_MainInstance_bReset" EnableWrite="1" EnableRead="1">
    PLCnext_Arp_Plc_Eclr_MainInstance_bReset</ItemName>CRLE
358 </Item>CRLE
359 <Item>CRLE
360 <ItemName NodeId="ns=5;s=Arp.Plc.Eclr/MainInstance.bs1" Variable="PLCnext_Arp_Plc_Eclr_MainInstance_bs1" EnableWrite="1" EnableRead="0">
    PLCnext_Arp_Plc_Eclr_MainInstance_bs1</ItemName>CRLE
361 </Item>CRLE
```

OPC UA Client tree view:

- opc.tcp://192.168.10.15:4840-Sign
 - Session one
 - PLCnext_Arp_Plc_Eclr_DEVICE_STATE_BOARD_TEMPERATURE
 - PLCnext_Arp_Plc_Eclr_DEVICE_STATE_CPU_LOAD_ALL_CORES
 - PLCnext_Arp_Plc_Eclr_DEVICE_STATE_CPU_LOAD_PER_CORE
 - PLCnext_Arp_Plc_Eclr_MainInstance_ArrayTest_OPC1
 - PLCnext_Arp_Plc_Eclr_MainInstance_ArrayTest_OPC2
 - PLCnext_Arp_Plc_Eclr_MainInstance_ArrayTest1_OPCArray
 - PLCnext_Arp_Plc_Eclr_MainInstance_ArrayTest1_OPC1
 - PLCnext_Arp_Plc_Eclr_MainInstance_ArrayTest1_OPC2
 - PLCnext_Arp_Plc_Eclr_MainInstance_ArrayTest1_OPCArray
 - PLCnext_Arp_Plc_Eclr_MainInstance_b_ALL
 - PLCnext_Arp_Plc_Eclr_MainInstance_bReset
 - PLCnext_Arp_Plc_Eclr_MainInstance_bs1
 - PLCnext_Arp_Plc_Eclr_MainInstance_bs1_R

The 'Eigenschaften' (Properties) dialog for the selected OPC UA item 'PLCnext_Arp_Plc_Eclr_MainInstance_bs1 OPCUAItem'. The 'General' tab is active, showing the 'Variable' section with 'Write Item To Server' checked and 'Read Item From Server' unchecked.

Eigenschaften	
PLCnext_Arp_Plc_Eclr_MainInstance_bs1 OPCUAItem	
General	
Display name	PLCnext_Arp_Plc_Eclr_MainInstance_bs1
NodeID	ns=5;s=Arp.Plc.Eclr/MainInstance.bs1
Variable	PLCnext_Arp_Plc_Eclr_MainInstance_bs1
☒ Write Item To Server	
☐ Read Item From Server	

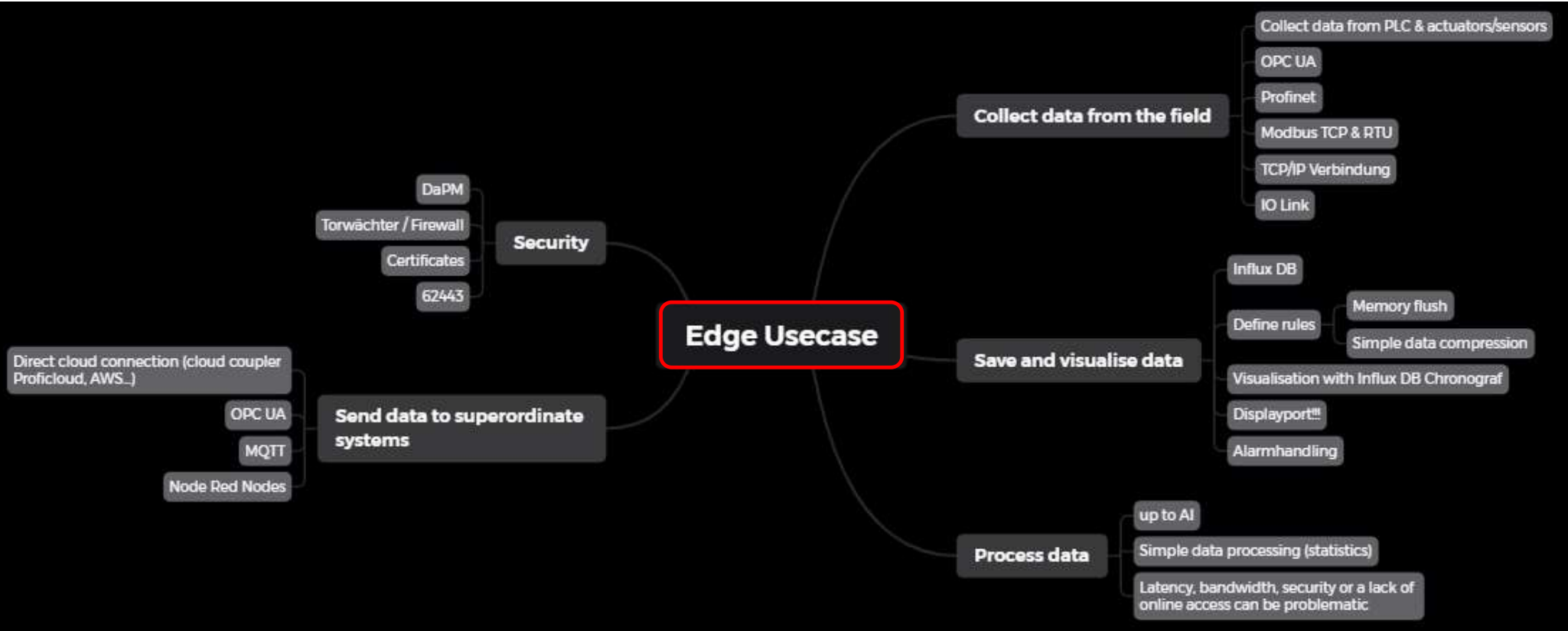


CLOUD / EDGE



What is Edge computing ?

Edge Usecase

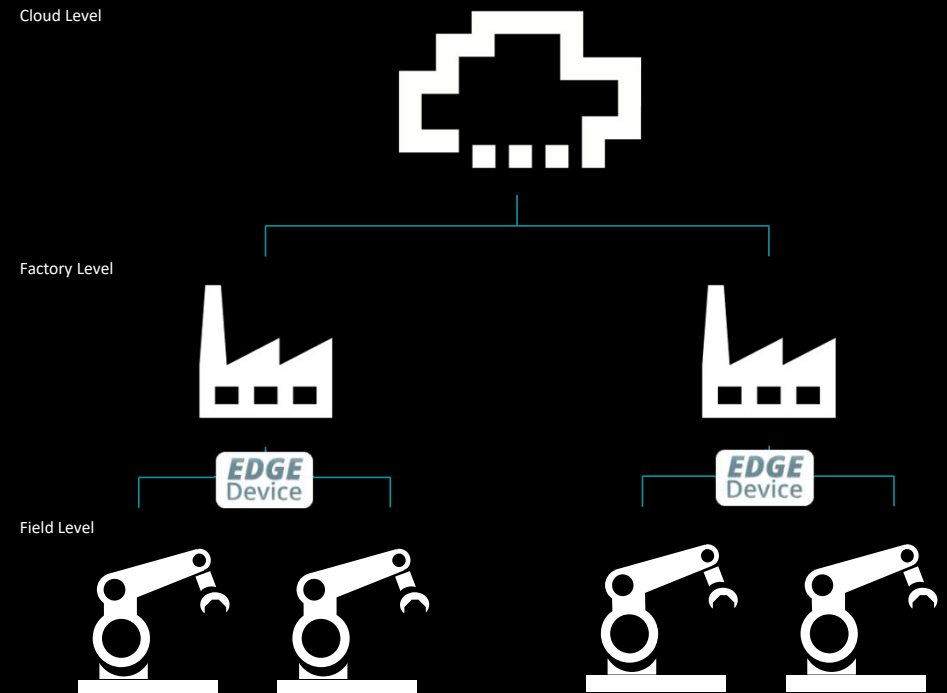


Edge-PC 15x2

What is Edge Computing?

- Cloud computing has revolutionised 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

>>Edge Computing is the practice of capturing, storing, processing and analyzing data near the client, where the data is generated.

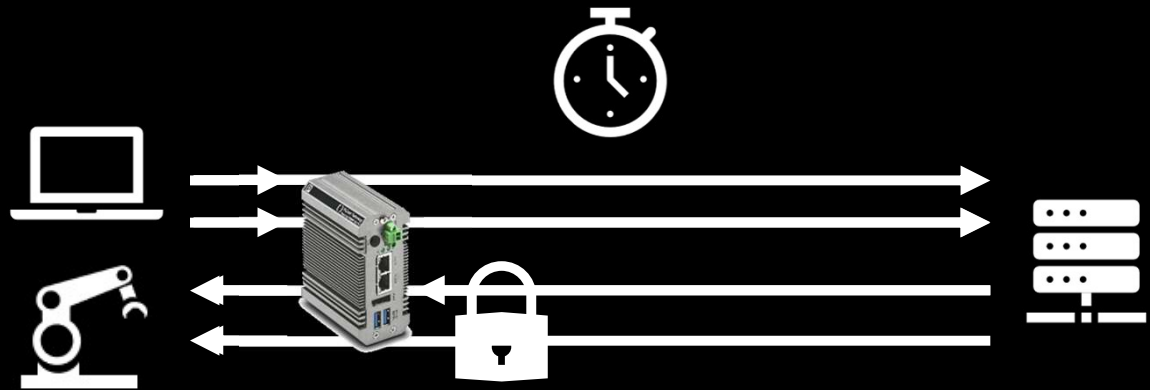


Edge-PC 15x2

Benefits of Edge Computing

For IoT use cases, connecting thousands of devices and datapoints directly to the cloud is often not feasible due to costs, privacy, and network issues.

- Network latency
- Data privacy and security
- Network load reduction
- Computational efficiency
- Reduced cloud costs
- Autonomy



Target Group

>>Collecting and (pre-)processing data locally to reduce the bandwidth load on the network while at the same time ensuring faster processing and thus lower delay times



- Factory automation (focus)
- Mechanical engineering
- Infrastructure

Edge-PC 15x2

Product Features – EPC 1502



Core



Intel Celeron
N3350 (Dual Core)

RAM



2 GB RAM

Temperature



0°C-50°C

Storage



32 GB eMMC

Approvals



UL, CE

Features



PLCnext RT
Edge Functions

Release: Hannover fair 2021

Edge-PC 15x2

Product Features – EPC 1522



Core



Intel Celeron
N3350 (Dual Core)

RAM



4 GB RAM

Temperature



0°C-50°C

Storage



32 GB eMMC +
128 GB m.2 SSD

Approvals



UL, CE

Features



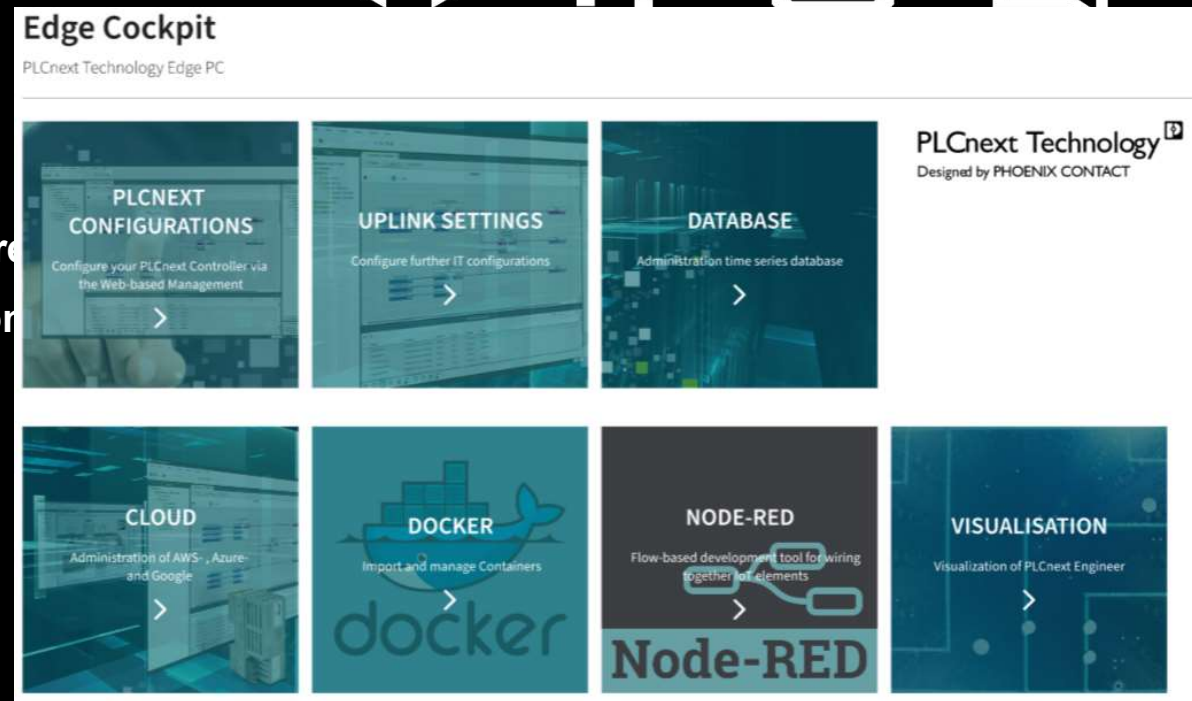
PLCnext RT
Edge Functions
+Serial Interface

Release: Hannover fair 2021

Edge-PC 15x2

EPC Feature Set

- PLCnext fully integrated
- Node-RED preinstalled
- Time-Series database preinstalled
- Docker and Portainer via PLCnext Store
- Easy cloud connection and certification
 - PROFICLOUD
 - Amazon Web Services
 - Microsoft Azure
 - Google Cloud
- ✓ Easily accessible via User-Interfaces
 - ✓ No Expertise needed
 - ✓ No command prompts needed
 - ✓ Consistent graphical programming



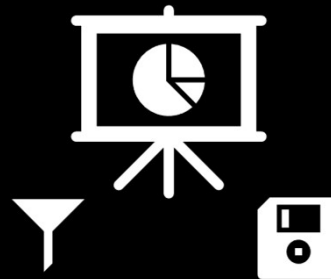
Edge-PC 15x2

Edge-PC 15x2 Usecase

The EPC combines OT- and IT-Layer



Data collection from sensors, actuators and PLCs.
Usage of typical protocols like OPC UA, Profinet, Modbus TCP & RTU and much more.



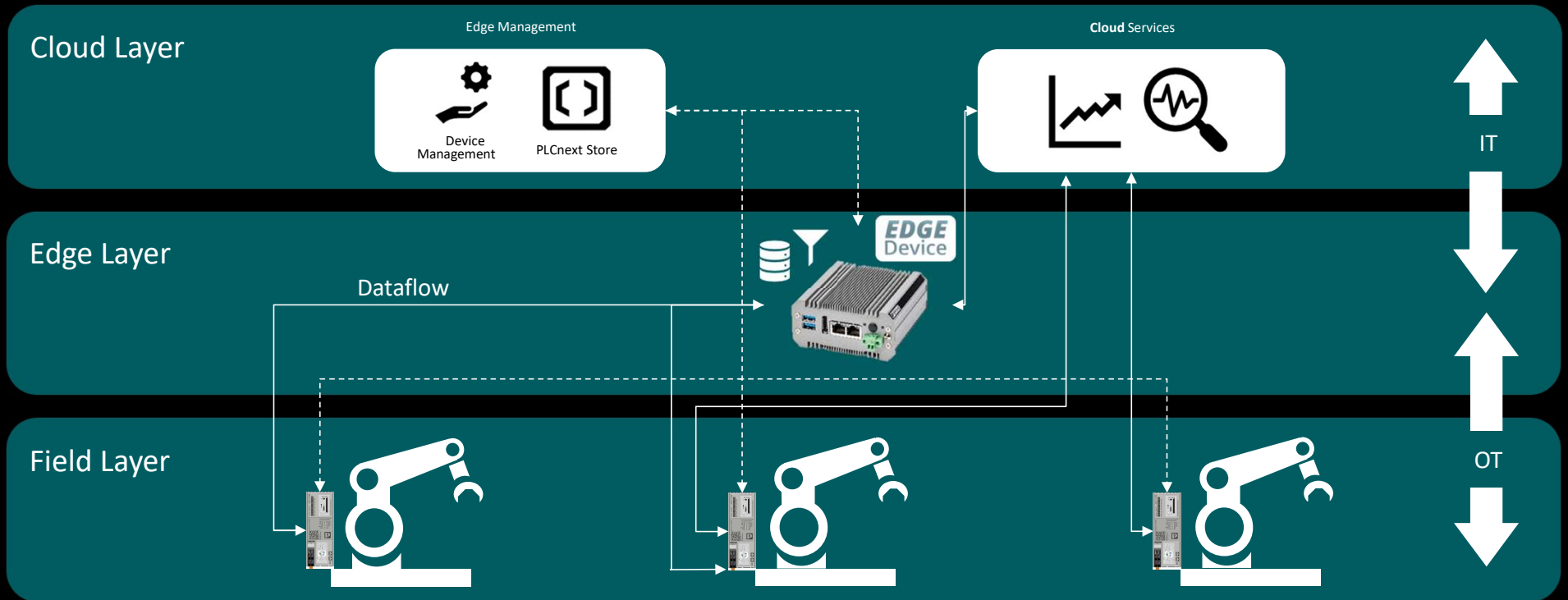
Data storage, processing and dashboards.
A wide range of rules and statistics can be used with Influx DB. Visualization is supported with Influx DB Chronograf.



Sending data to superordinated- and Cloudsystems.
Integrated cloud connection and support of a wide range of communication e.g. via Node Red

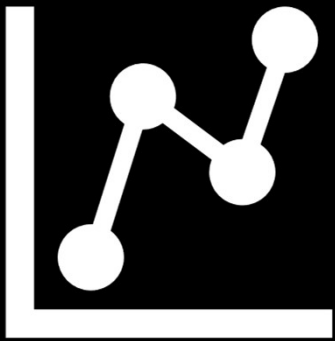
PLCnext Control

PLCnext Control for Edge Computing

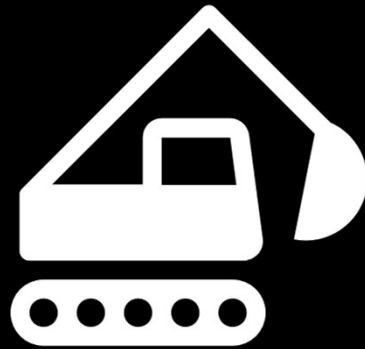


Application Example

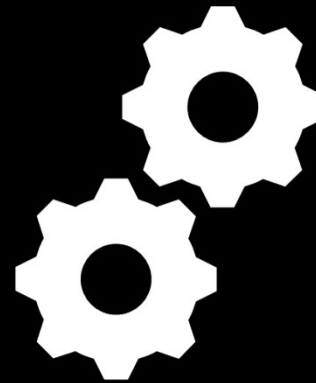
USE CASES



Downsampling data to
reduce network traffic.
Local processing of data
(mathematical functions)



Autonomous driving
or autonomous
transport systems



Predictive
maintenance of
machines



Quality assurance in
production

Edge-PC 15x2

Hands On – Live

- >> Edge Cockpit
- >> Node-RED
- >> Influx Database + Chronograf
- >> Portainer



Software and Technology

Digitalization in Production



Danke