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Siemens Digital Industries Webinari
FA7: SIMATIC IOT

Siemens Digital Industries Webinari, Novembar 2020.

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Datum	Tema	Predavač
03.11.2020.	DI1: Industry Mall & Online software delivery	*Mirko Milovanović*
10.11.2020.	FA5: SIMATIC Safety	*Darko Živković*
01.12.2020.	FA6: SIMATIC IPC	*Tamara Lazić*
24.11.2020.	FA7: SIMATIC IOT	*Zoran Jovanović*

Siemens Digital Industries: Webinari iz prvog ciklusa

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Materijal dostupan na web stranici:
https://new.siemens.com/rs/sr/kompanija/fairs-events/di-webinari.html

FA1: Motion Control	PI1: PI Academy world
FA2: Energy Management System	PI2: PI workshop for specialist
FA3: Redundantni kontroleri serije S7-1500R/H	PI3: #New@PI
FA4: WinCC Unified	AE1: Digitalna rešenja u procesnoj industriji
MC1: DT konfigurator	CP1: Control Panel Online Symposium
MC2: Sizer, large drives	CP2: Clever engineering in the control panel
MC3: Sizer, motion drives	CP3: New series of signaling devices 3SU
CI1: Industrial Networks	CP4: SIRIUS 3RW Soft starters
	DE1: Siemens Digital Enterprise

Današnji predavač

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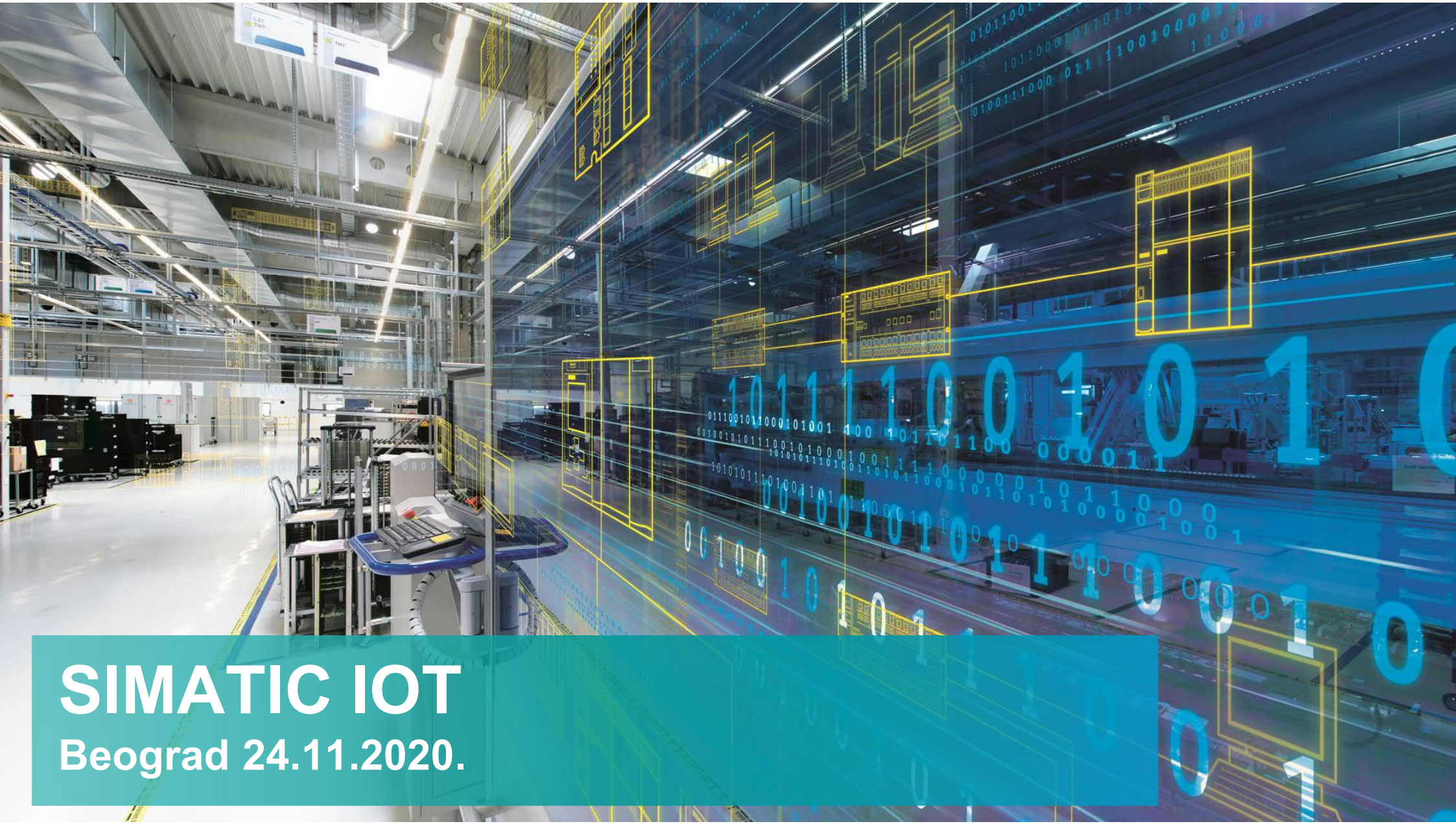

SIMATIC IOT

Beograd 24.11.2020.

Siemens Industrial IOT gateways

Collect data from production and transfer data to the higher-level IT system or the cloud

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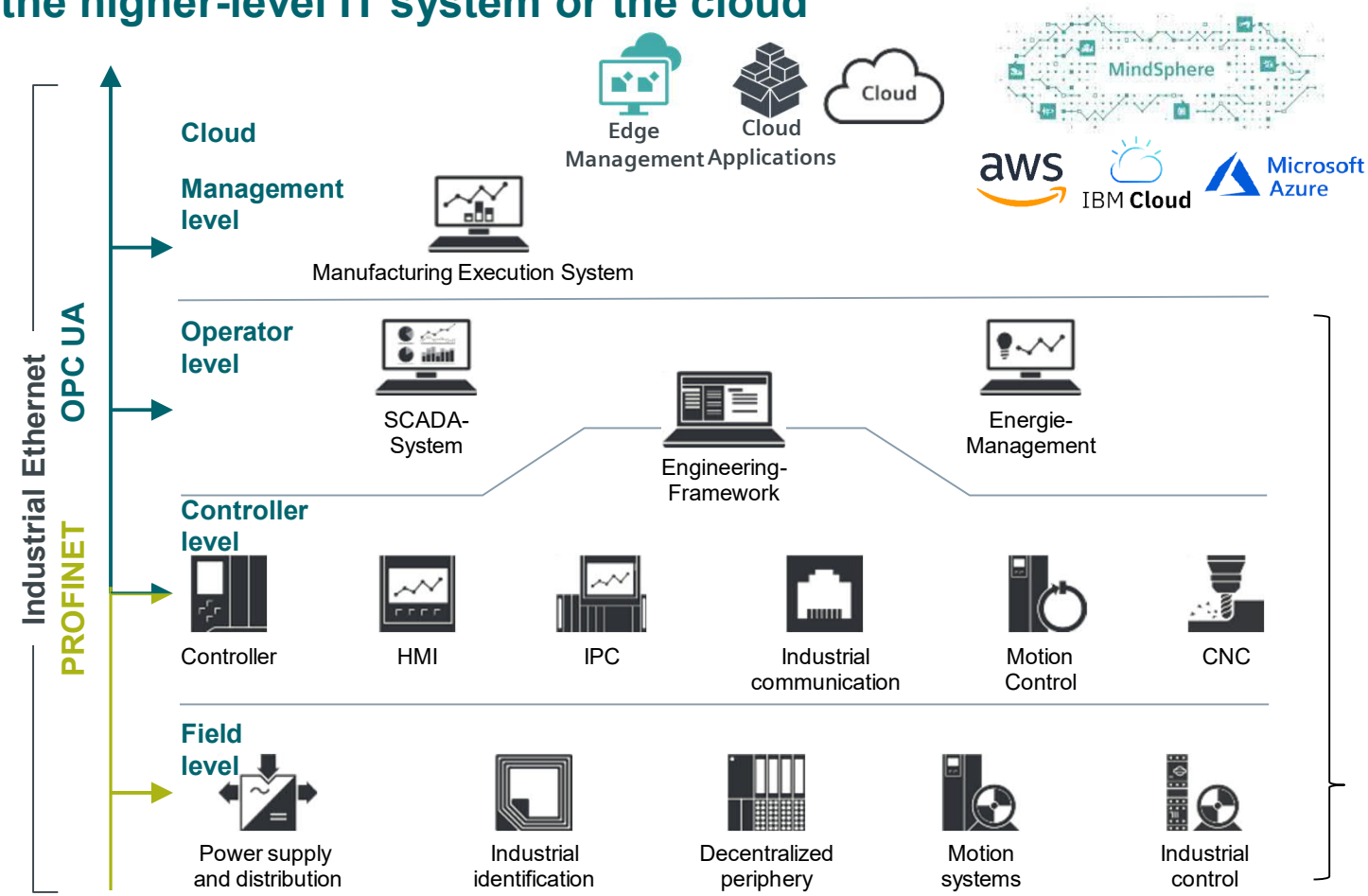

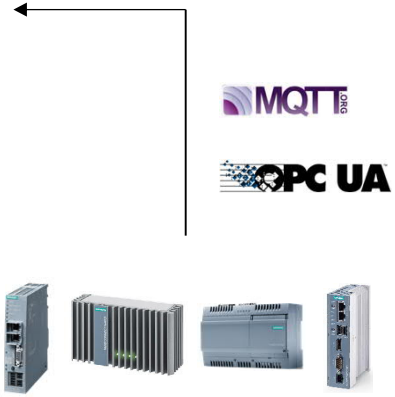

MQTT

OPC UA

Industrial IOT gateway

S7 communication

Modbus TCP/IP

Modbus RTU

OPC UA

.....

Reasons why using Cloud Computing

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1

Computing power on demand

Reduce high upfront invest for IT-hardware and its maintenance if computing power is not needed permanently. Scale your system individually by booking and releasing computing resources.

2

Cross-locational KPIs and data analytics

Integrate global external data sources to optimize your production. Compare your data and performance to detect optimization potential.

3

Centralized data management

Access data and make them useable. Provide updates to your assets for consistent coverage

4

Apps and services

Data driven business models allow customized service for machines. Applications give insights in processes, react to events and interact with machines

Cloud level

Siemens portfolio – connection to MindSphere and other cloud systems

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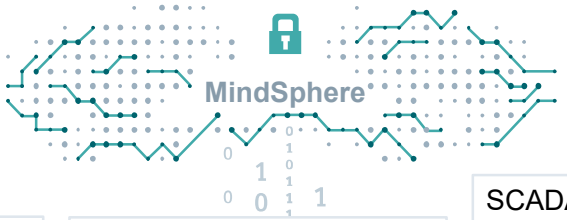
Data significance



Integrated functionality

IoT Gateways

Edge Gateway

SCADA

MES/ERP

S7, OPC UA, ModbusTCP/RTU, 3rd party

Field devices

Controller
- MindConn_MQTT [1]
- CP1545-1 [2]
- CMS1200 / SM1281
- MQTT Function blocks [1]
- SINUMERIK 840D

IoT Gateways
- MindConnect Nano, IoT2040
- Cloud Connect 7
- SIMATIC IOT2040
- IOT Gateway MQTT

Edge Gateways
- Edge Box IPC227E

SCADA connectivity
- WinCC RT Prof. V16
- WinCC V7.5
- WinCC OA V3.16

MindConnect Integration
- MES/ERP connectivity for selected systems

IT-Know-how and infrastructure of the company

Cloud level
What is MQTT?

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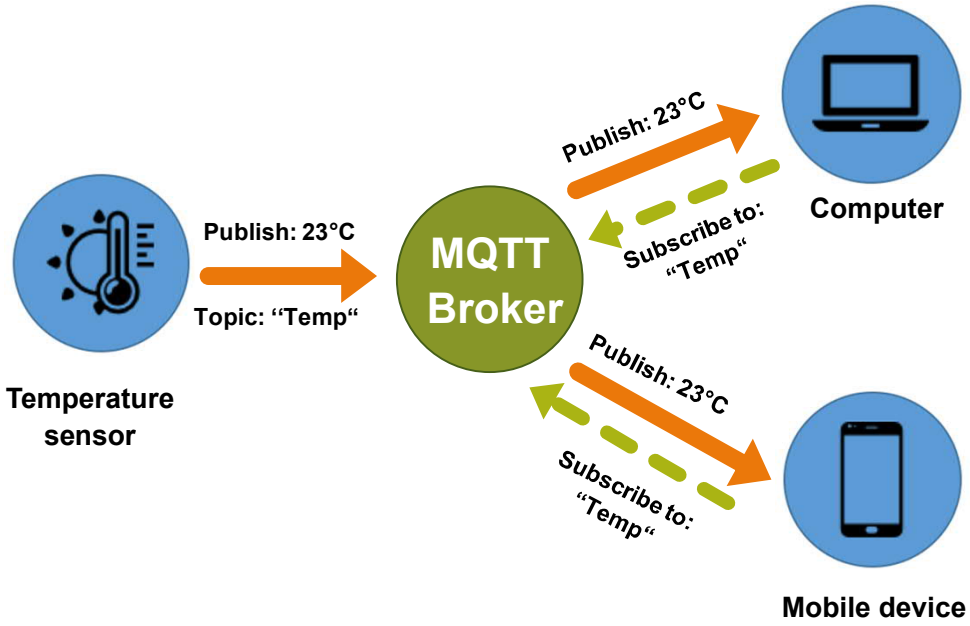
MQTT - Default Protocol of IoT
(Message Queuing Telemetry Transport)

„…is a machine-to-machine (M2M)/"Internet of Things" connectivity protocol."



- Client-server protocol
- Clients send messages with a topic to the server ("broker") after the connection has been established
  → **Publishers**
- Clients can subscribe to these topic → **Subscribers**
- Broker forwards news of the topic to subscribers
- Messages always consist of a topic and the message content (payload).
- Quality of service can be guaranteed

Cloud level
Why not AMQP? MQTT vs. AMQP

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MQTT.ORG

aws

Azure

thingworx®

IBM Watson

MindSphere

+

optimize! softing

...

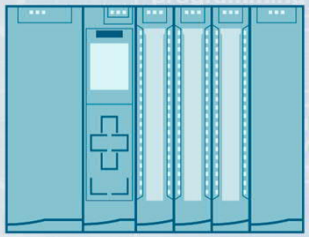
Basic IoT functionality with **small overhead**
suitable for **mobile devices** and **embedded systems**

AMQP
Advanced Message Queuing Protocol

Azure

optimize! softing

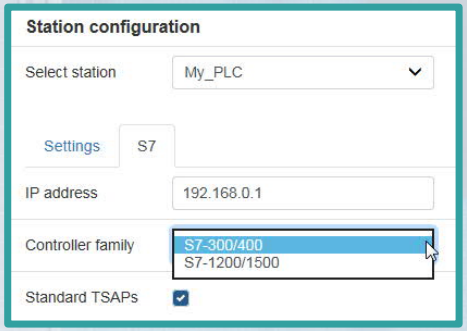
More advanced functionality with **bigger overhead**
suitable for **more complex IoT systems**

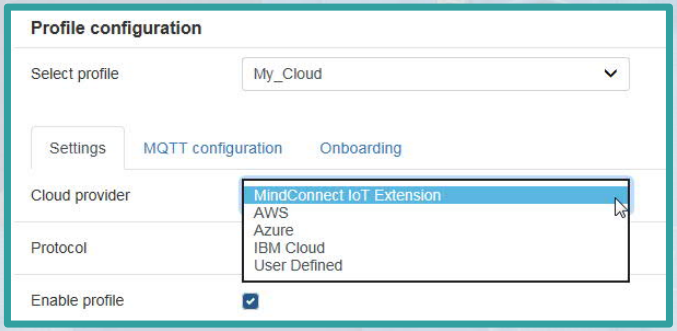


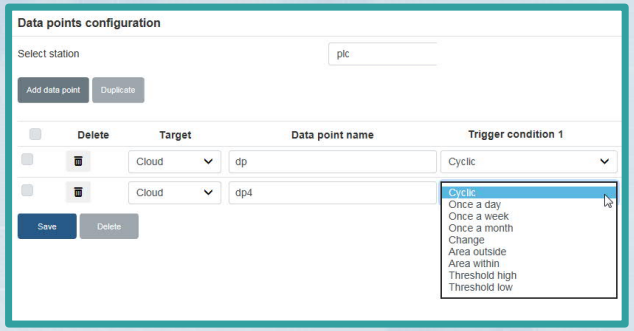
Connect the controller

Specify the cloud

Create data points







Industrial IoT Gateways
Overview

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Position

SIMATIC CloudConnect 7, CC716
SIMATIC CloudConnect 7, CC712
SIMATIC CP 1545-1

Industrial IoT Gateway for connecting brownfield installations to MindSphere and other clouds.

MindConnect Nano
MindConnect IOT2040

Industrial IoT Gateway for connecting brownfield installations to MindSphere.

SIMATIC IOT2050
SIMATIC IOT2040
SIMATIC IPC127E

Compact IoT Gateway that has the ability to collect and transfer data to MindSphere and other clouds.

LOGO!8.3
CC240-BT

Compact IoT Gateway that has the ability to collect and transfer data to MindSphere and other clouds.

Features


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SIMATIC IOT2040
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SIMATIC IOT2040 motivation for development

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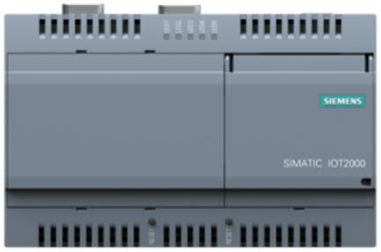
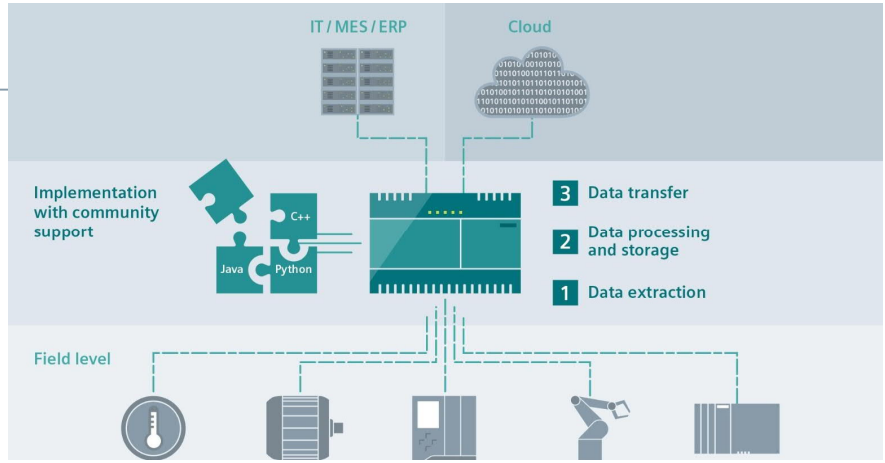
Increasing data volumes
Capturing and monitoring data from the automation level

Growing performance
Intelligence in the field required for pre-processing and data-handling

Usage of open standards
High-level languages and standard interfaces required





Connecting Automation and IT
Usage of various physics and protocols

Cloud based solutions
- Cloud based analysis requires data flow from and to the field
- Connecting brown-field applications to the cloud via retrofitting

Growing IT influence
Remote monitoring and analysis functionality required

Increasing interconnection and data communication between automation and IT require programmable gateway platforms

SIMATIC IOT2040
Product Highlights

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Usage of open standards +
Free programmable in high-level languages (e.g. Java, C++) via various IDEs (e.g. Eclipse, Node-RED) and compilers for Yocto Linux

Automation level protocols +
Communicates with PLCs, drives and motors with PROFINET, OPC UA, Modbus TCP/RTU, 3rd party protocols

Flexible connection +
to sensors/actors via serial communication, Ethernet or Arduino shields

IT systems/cloud solutions +
Data can be transmitted to IT systems/cloud solutions using OPC UA, MQTT, AMQP

Expandability and connectivity +
with mPCIe, Arduino, industrialized IO module and various standard interfaces and available protocol drivers

Performance and Deterministic +
Intel Quark® CPU and 1 GB RAM as well as x86-deterministic and battery buffered real time clock

SIMATIC quality +
Designed for 24/7 operation in industrial environment

SIMATIC IOT2040 complements automation portfolio – Making legacy automation concepts “IoT ready”

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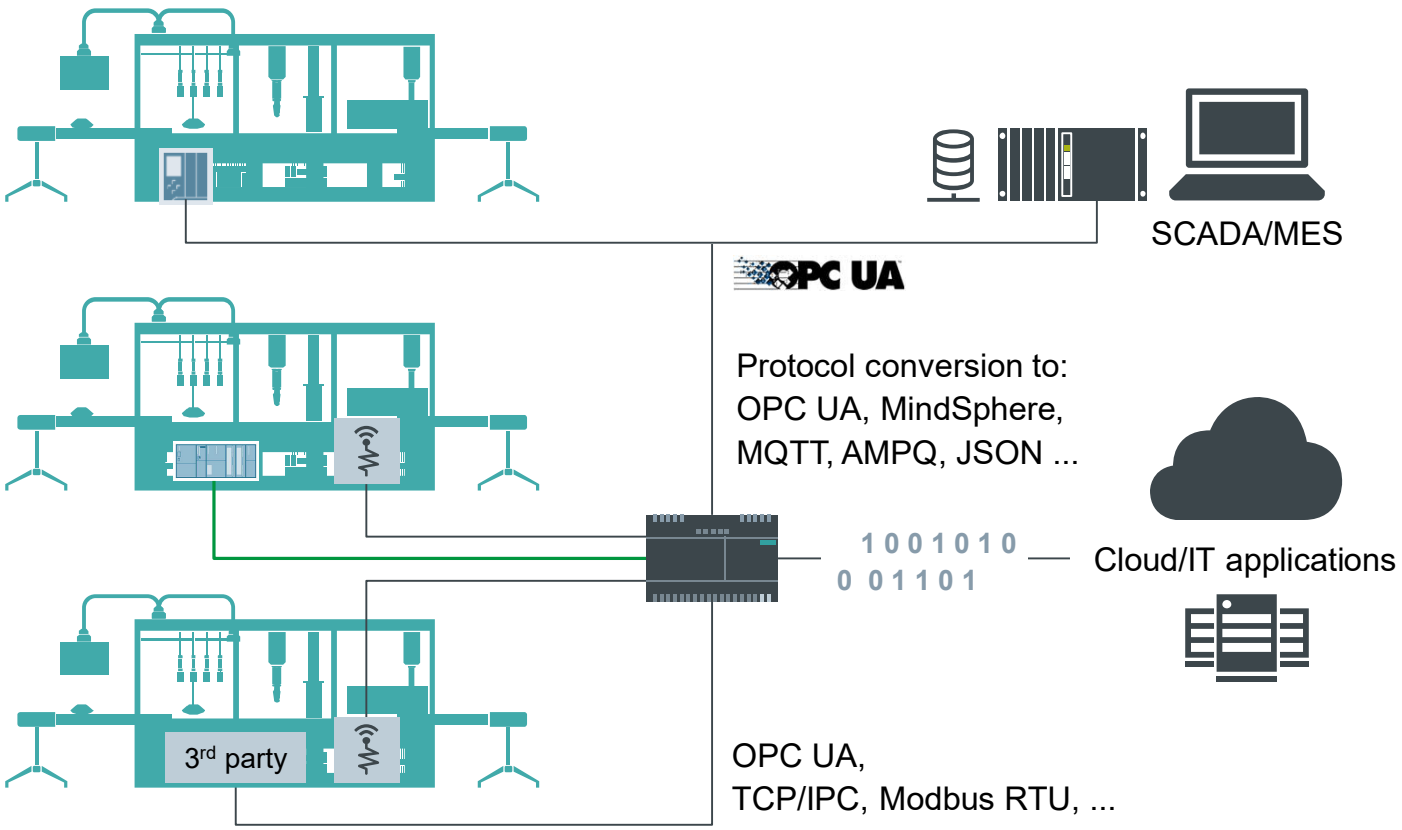

- Inter-connecting various sources and communication networks
- Pre-processing/data acquisition with SIMATIC IOT2040 and data transfer to company network or direct to cloud applications
- No need to change existing automation solution

SIMATIC IOT2040 complements automation portfolio

SIMATIC IOT2040 as cost-efficient and open data gateway for retro-fitting existing concepts and make them “IoT ready”

Application example SIMATIC IOT2040 – The intelligent gateway to connect the field level to the IT level/cloud

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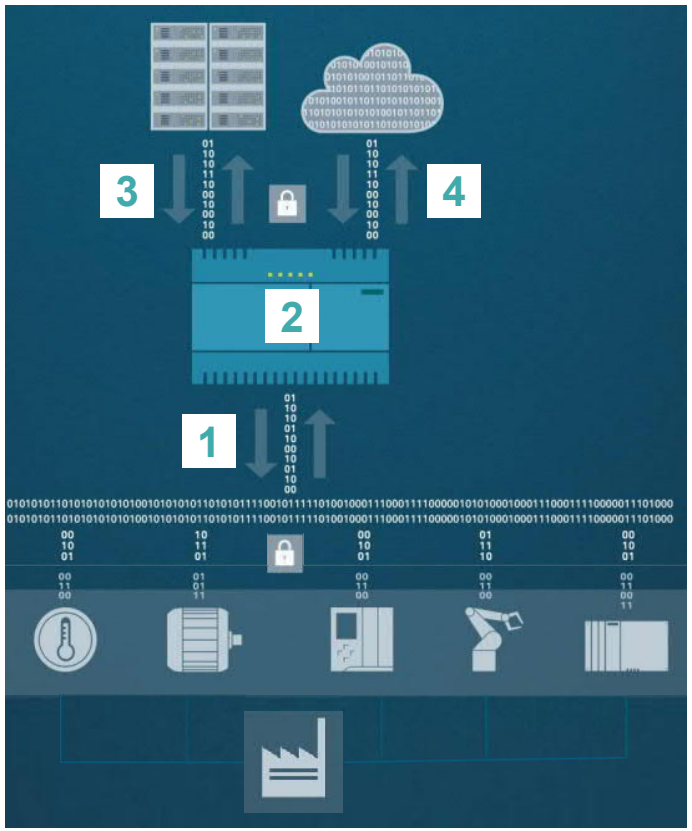

1 **Collecting and concentrating** relevant production data of several sources

Flexible connection to sensors/actors via serial communication, Ethernet or Arduino shields. Communicating with PLCs, drives and motors with e.g. PROFINET or OPC OA

2 **Protocol conversion/customer programmed control**

Data aggregation, conversion of different communication protocols and pre-processing programmed in high-level language e.g. Java, C++

3 **Secure transfer** to connected company **IT systems or cloud applications**

Converted data can be transmitted to IT systems/ cloud solutions using e.g. OPC UA, MQTT or AMQP[2]

4 **Production monitoring, analysis and optimization**

Cloud based analytics to detect optimization potential

IOT2040 for production data processing, conversion & transfer

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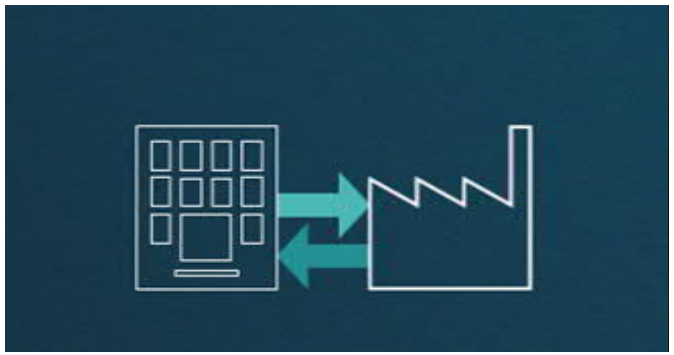

Connecting IT/cloud and automation

- Secure communication between ERP/IT systems or cloud applications and production
- Production optimization with vertical data integration from shop floor to cloud

Predictive maintenance

- Capturing and analyzing production data like e.g. speed or operation hours in order to identify the best maintenance interval
- Optimize machine downtimes

Optimized shop floor management

- Data transfer in case of undercut of minimum stock levels of consumables
- Automated alarming in shop floor management system in order to avoid production downtimes

IOT2000 as open platform to connect legacy systems, additional sensors and IT level

SIMATIC IOT2040 – Product data overview

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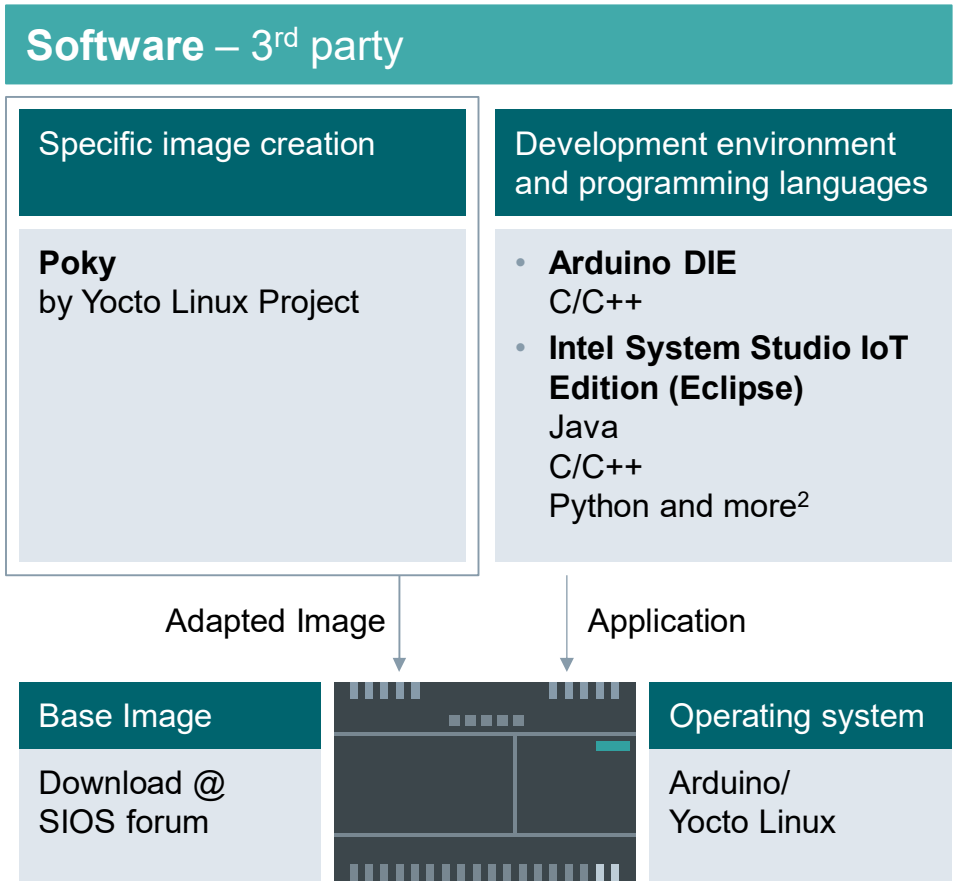
	SIMATIC IOT2040	
CPU technology	Intel Quark® x1020 (x86 400 MHz) + Security	
System memory	1 GB DDR3 RAM, 8 MB Flash, 256 KB SRAM	
Communication interfaces	2x 10/100 Ethernet RJ45	
Serial interfaces	2x RS232/485 switchable	
Media interfaces	1x USB Controller + 1x Device	
Graphic processor	–	
Extension	mPCIe + Arduino	
IO-Module	5x DI, 2x DO, 2x AI	6ES7647-0KA01-0AA2
IO-Module Sink Source	10x DI	6ES7647-0KA02-0AA2
Mass storage	Yes, with microSD card[1]	
Embedded features	5 LEDs (one user programmable), battery buffered real time clock, watchdog	
Power supply	9 … 36 V	
Operating temperature	0 – 50°C	
Certificates	Industry standards (CE, UL)	
Dimensions (w x h x d)	144 x 90 x 53 mm	
Order number	**6ES7647-0AA00-1YA2**	
	Power Supply for IOT2040	
LOGO! Power 24V/1.3A	**6EP3331-6SB00-0AY0**	

1 Not in scope of delivery; **2** Image adaption necessary



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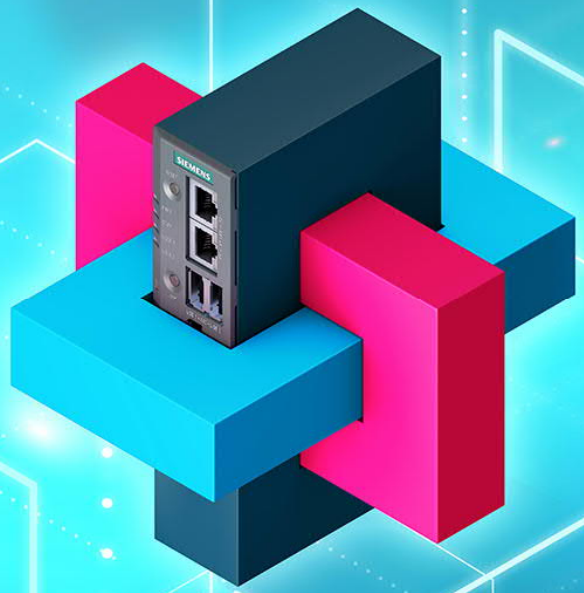

SIMATIC IOT2050

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SIMATIC IOT2050
Motivation for development

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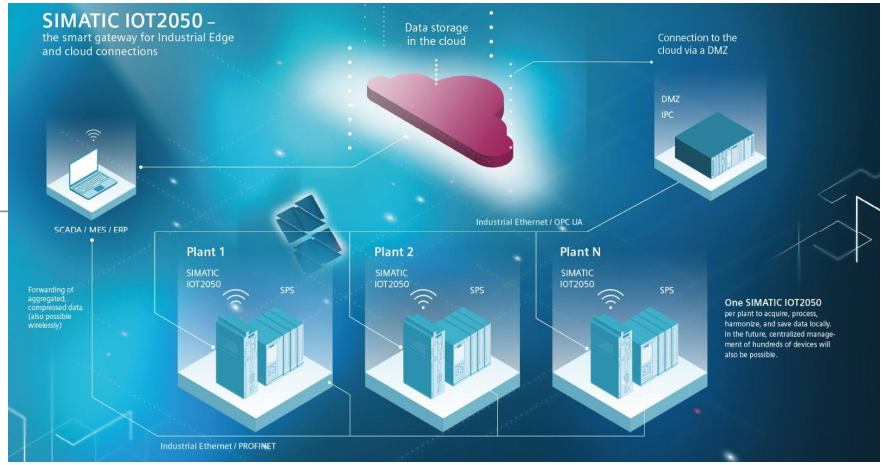
Increasing data volumes
Capturing and monitoring data from the automation level

Growing performance
Required for intelligent preprocessing and data-handling in the field

Usage of open standards
High-level languages and standard interfaces required



Connecting Automation and IT
Usage of various physics and protocols

Edge / Cloud based solutions
- Cloud based analysis requires data flow from and to the field
- Edge based analysis requires
- appropriate CPU Load
- Connecting brown-field applications to the cloud via retrofitting

Growing IT influence
Remote monitoring and analysis functionality required

Increasing interconnection and data communication between automation and IT require programmable gateway platforms

SIMATIC IOT2050

Industrial ruggedness, Openness, Connectivity, Performance

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Expandability & connectivity

- With mPCIe, Arduino Shields and various standard interfaces & available protocol drivers
- Storage: internal eMMc and Micro SD card

SIMATIC quality

Designed for 24/7 operation in industrial environment

Connectivity

- 1x serial Interface RS232/485,
- 2x USB
- Graphics Interface: Display Port

Operating System

SIMATIC Industrial OS (Linux based on Debian)

Performance & Deterministic

TI ARM SoC, 64 Bit, up to 4 cores and 2 GB RAM
Embedded features (battery buffered RTC, security chip,..)

Openness

Free programmable in high-level languages
Additional Software for IOT use case (e.g. node js, cloud protocols,..) preinstalled

SIMATIC IOT2050
External interfaces

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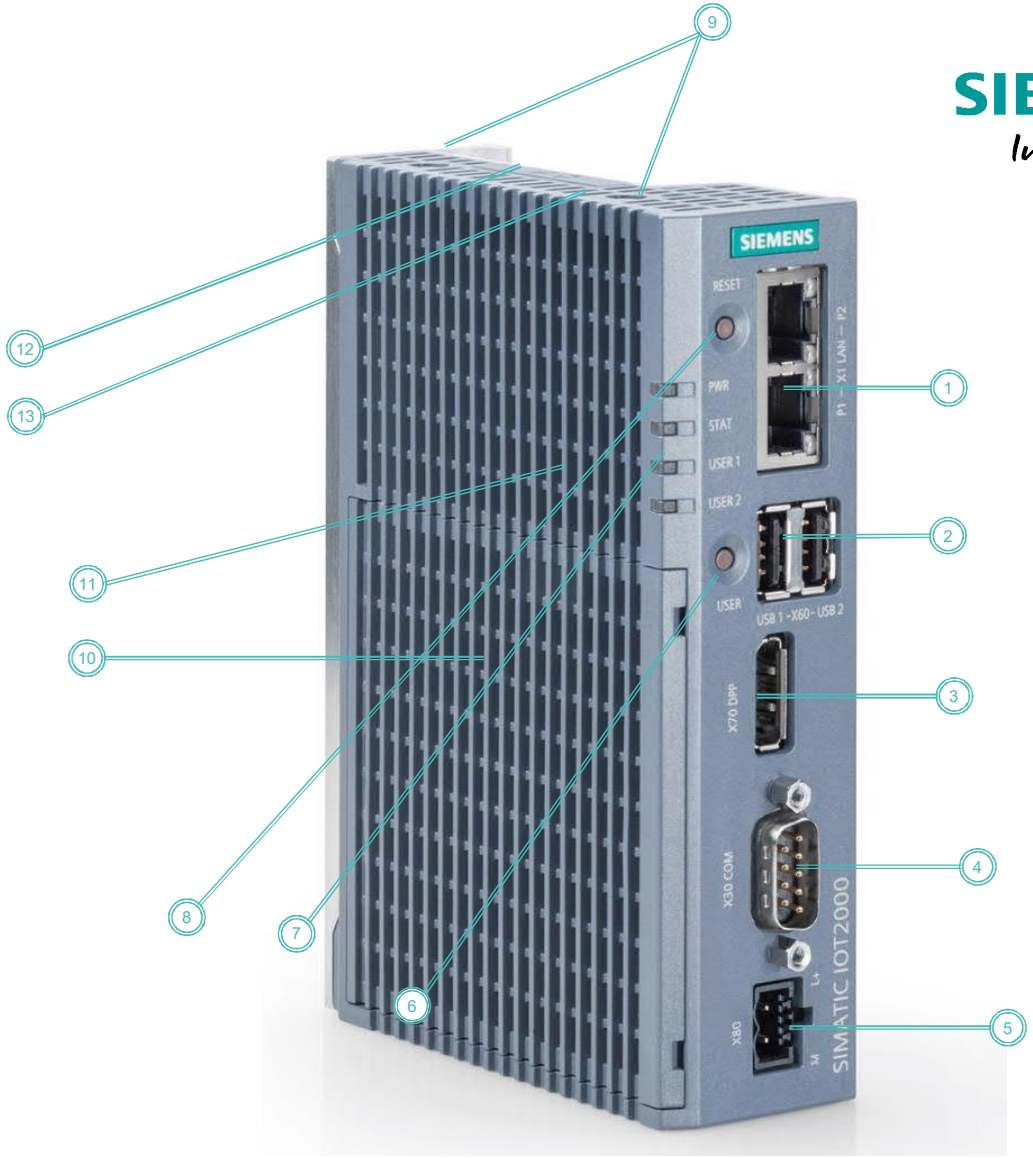
(1) 2x Ethernet Interface 100/1000 MBit
(2) 2x USB 2.0
(3) Display Port Graphics
(4) COM interfaces (RS232/422/485)
(5) Power supply connector
(6) User Button (free programmable)
(7) 4 LEDs (2x free programmable)
(8) RESET Button
(9) Markup for Antenna extension
(10) ARDUINO shield cover
(11) Top Cover
(12) µSD card slot
(13) SIM card slot



SIMATIC IOT2050 complements automation portfolio

Making legacy automation concepts “IoT ready”

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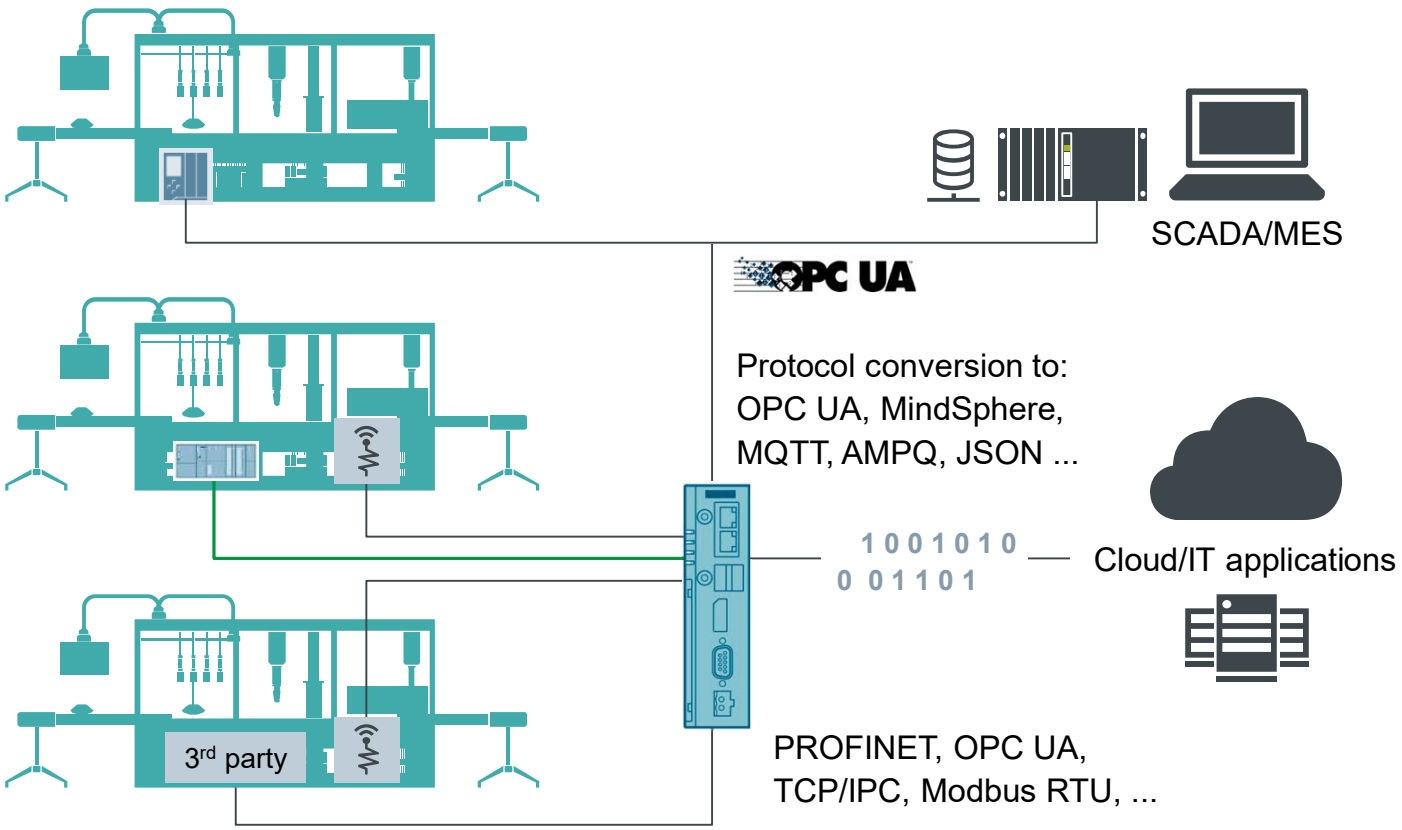

- Inter-connecting various sources and communication networks
- Pre-processing/data acquisition with SIMATIC IOT2050 and data transfer to company network or direct to cloud applications
- No need to change existing automation solution

SIMATIC IOT2050 complements automation portfolio

SIMATIC IOT2050 as cost-efficient and open data gateway for retro-fitting existing concepts and make them “IoT ready”

Application example SIMATIC IOT2050

The intelligent gateway to connect the field level to the IT level / cloud

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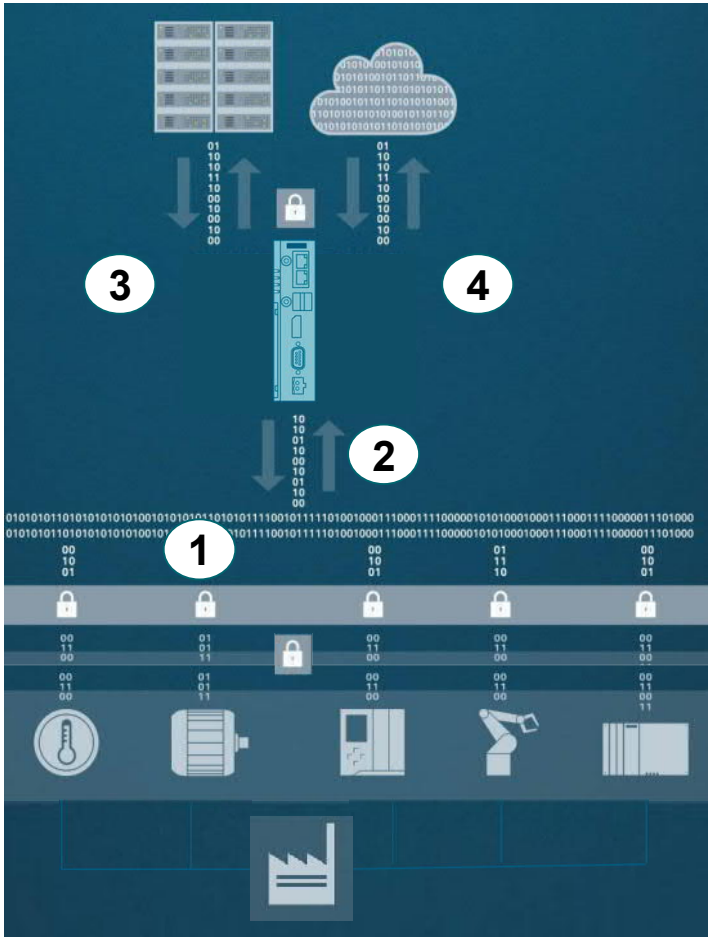

1 **Collecting and concentrating** relevant production **data** of several sources

Flexible Connection to sensors/actors via serial communication, Ethernet or Arduino shields. Communicating with PLCs, drives and motors with e.g. PROFINET or OPC UA

2 **Protocol conversion / customer programmed control**

Data aggregation, conversion of different communication protocols and pre-processing programmed in high-level language e.g. Java, C++

3 **Secure transfer to** connected company **IT-systems or cloud applications**

Converted data can be transmitted to IT systems / cloud solutions using e.g. OPC UA, MQTT

4 **Production monitoring, analysis and optimization**

Cloud based analytics to detect optimization potential

SIMATIC IOT2050
Technical data

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	SIMATIC IOT2050
CPU technology	TI ARM SoC, 64 Bit, 2 cores (approx. 5k DMIPs) TI ARM SoC, 64 Bit, 4 cores (approx. 10k DMIPs)
System technology	1 or 2 GB DDR4 RAM
Communication interfaces	2x GB Ethernet Interfaces with TSN and ProfiNet@TSN capability*
Serial interfaces	1x serial Interface RS232/485/422
Media interfaces	2x USB 2.0
Graphics interface	1x Display Port
Extension	mPCIe Slot for e. g. radio cards, ARDUINO UNO R3 shield interface
On board I/O	Arduino connector + IO Module 5x DI 2x AI 2x DI + IO Module Sink Source 10x DI
Mass storage	Micro SD card Storage internal eMMc 16GB and Micro SD card
Operating System	SIMATIC Industrial OS, via OSD + free “ISAR” Debian via download SIMATIC Industrial OS, preinstalled
Embedded features	4 LEDs, Embedded features (battery buffered RTC, security chip,..)
Nominal voltage	12..24 V
Operating temperature	0 - 50°C
Certificates	Industry standards (UL, CE,..)
Dimensions (w x h x d) [mm]	142 mm x 100 mm x 37 mm

* Profinet driver planned

SIMATIC IOT2000 Forum

Managed forum with getting started, application support and FAQs

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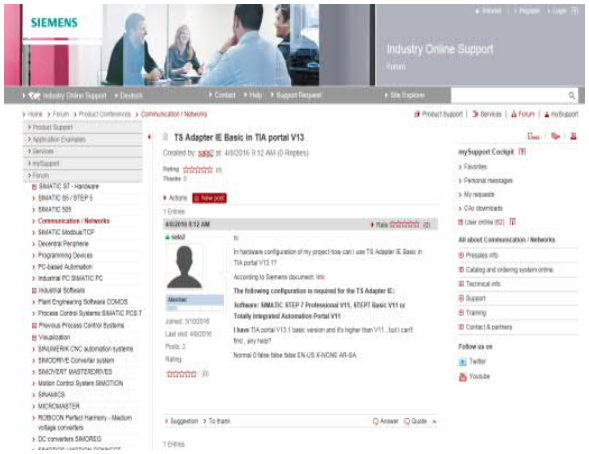
SIMATIC IOT2000 Online Forum



www.siemens.de/iot2000-forum

Getting started

- Getting started and setting up to start with IOT2000 application development.
  - Hardware setup
  - System console and driver for debugging
  - Development environment (Industrial OS / Eclipse IDE / Node-Red)

Base image as download

- µSD Card base image for download
- Usage of all onboard interfaces possible

Application examples

- cloud connect use case
- sensor connection
- ...

Q & A

- FAQs (e.g. sampling rate analog inputs using Arduino shield, max. current feed GPIOs using arduino shield)

SIMATIC CloudConnect 7

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SIMATIC CloudConnect 7
“Connection to third-party systems e.g. MES, SCADA”

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Task

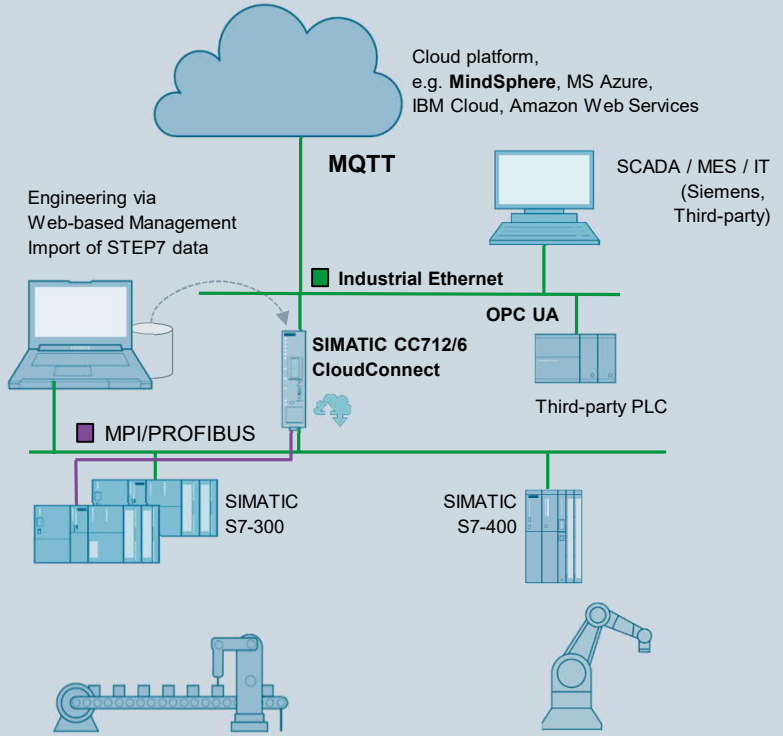
OPC UA as a common communication architecture (horizontal and vertical) for the connection to SCADA / MES / IT systems or external PLC.

Solution

CloudConnect 7 acts as an OPC UA gateway (OPC server) in which data is collected and transferred from or to the existing SIMATIC S7 systems.
The connection of the already installed base takes place without any intervention in the configuration of the control system.

Benefits

- OPC UA interface enables communication with SCADA MES/IT systems and third-party controllers
- Protection of the automation network via separate interfaces



Cloud level
Gateway solutions – CloudConnect 7

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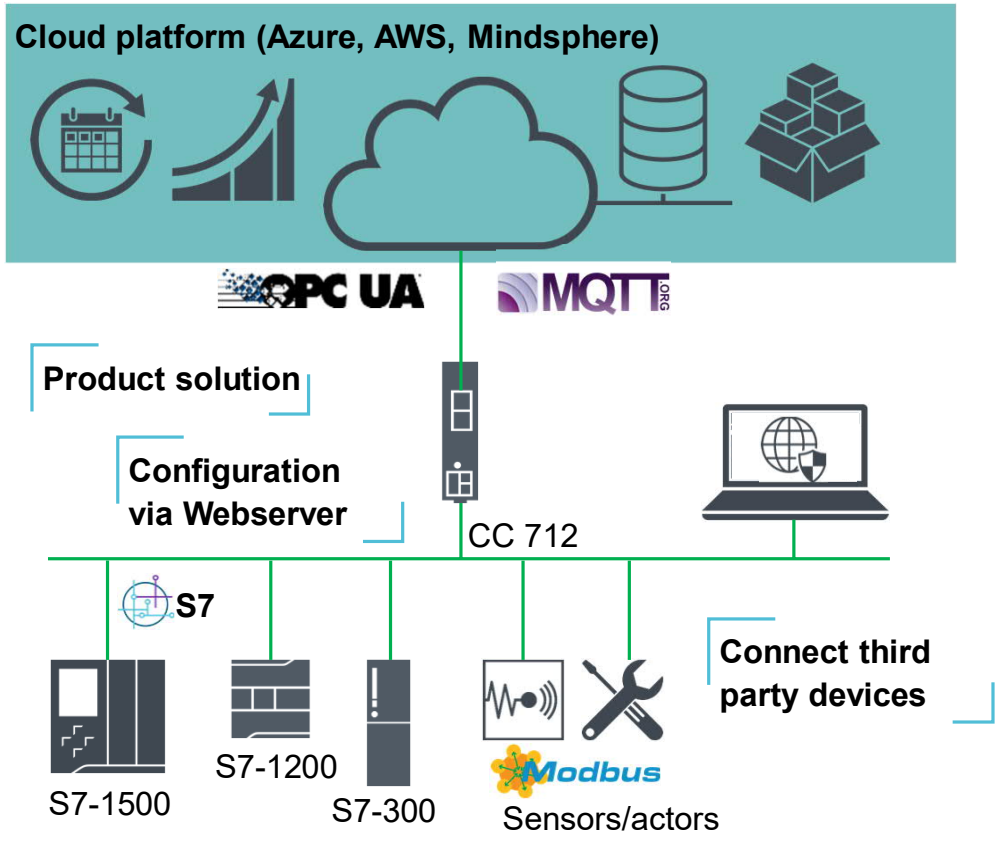

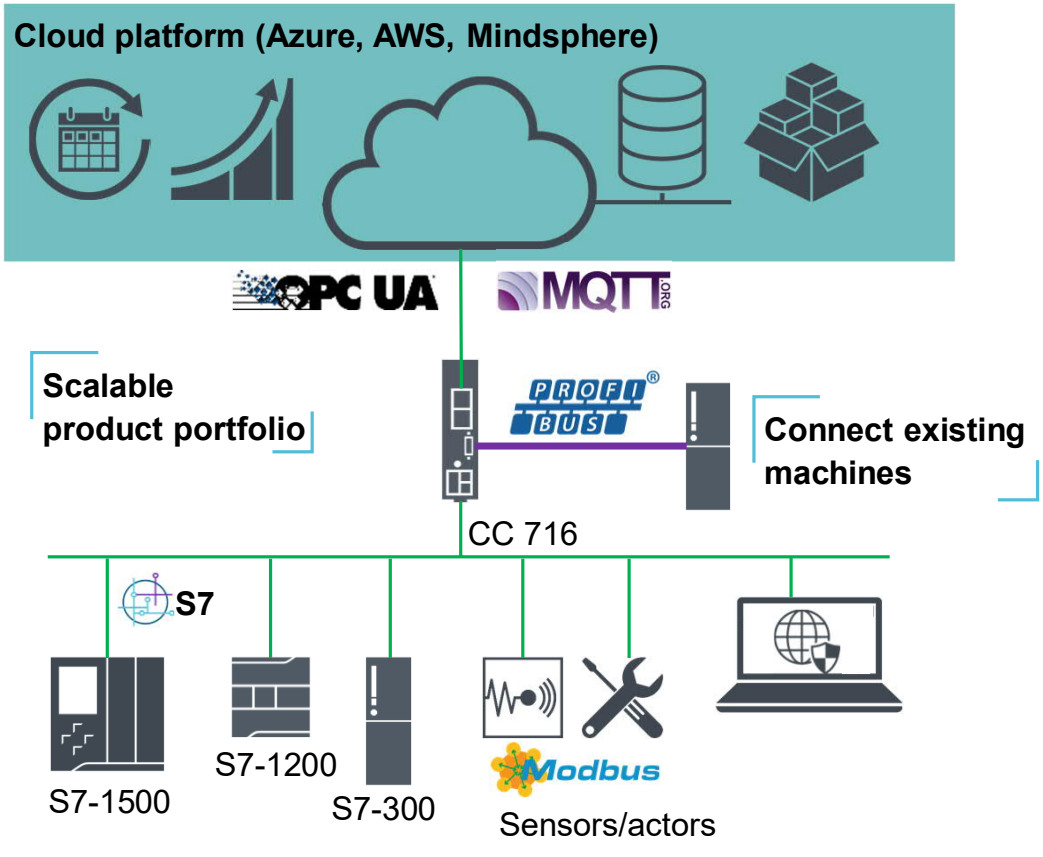

SIMATIC CloudConnect 712
Product Highlights

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Separate network interfaces for automation device and cloud platform +

Automation level protocols Connection of already installed controllers via S7 or Modbus/TCP +

Fast and error-free engineering thanks to data transfer from STEP 7 +

Easy device replacement thanks to configuration via C-plug +

Web based configuration allowing easy commissioning +

Cloud solutions Connection of automation devices to cloud platforms (e.g. MindSphere, MS Azure, IBM Cloud, Amazon Web Services) via MQTT or to MES systems via OPC UA +

Trigger management for cyclic or event-driven data transfer for each individual data point +

Mounting options for every environment – S7-300 DIN rail, standard DIN rail or wall mounting +

SIMATIC CloudConnect 716
Product Highlights

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Separate network interfaces for automation device and cloud platform +

Automation level protocols Connection of already installed controllers via S7 or Modbus/TCP +

Fast and error-free engineering thanks to data transfer from STEP 7 +

Easy device replacement thanks to configuration via C-plug +

Web based configuration allowing easy commissioning +

Cloud solutions Connection of automation devices to cloud platforms (e.g. MindSphere, MS Azure, IBM Cloud, Amazon Web Services) via MQTT or to MES systems via OPC UA +

Connection of up to 7 controllers via S7 protocol or Modbus TCP +

Trigger management for cyclic or event-driven data transfer for each individual data point +

Supports the connection of the S7 CPU via **PROFIBUS/MPI** or **PROFINET interface** (protection for your investment) +

SIMATIC CloudConnect 7 connections

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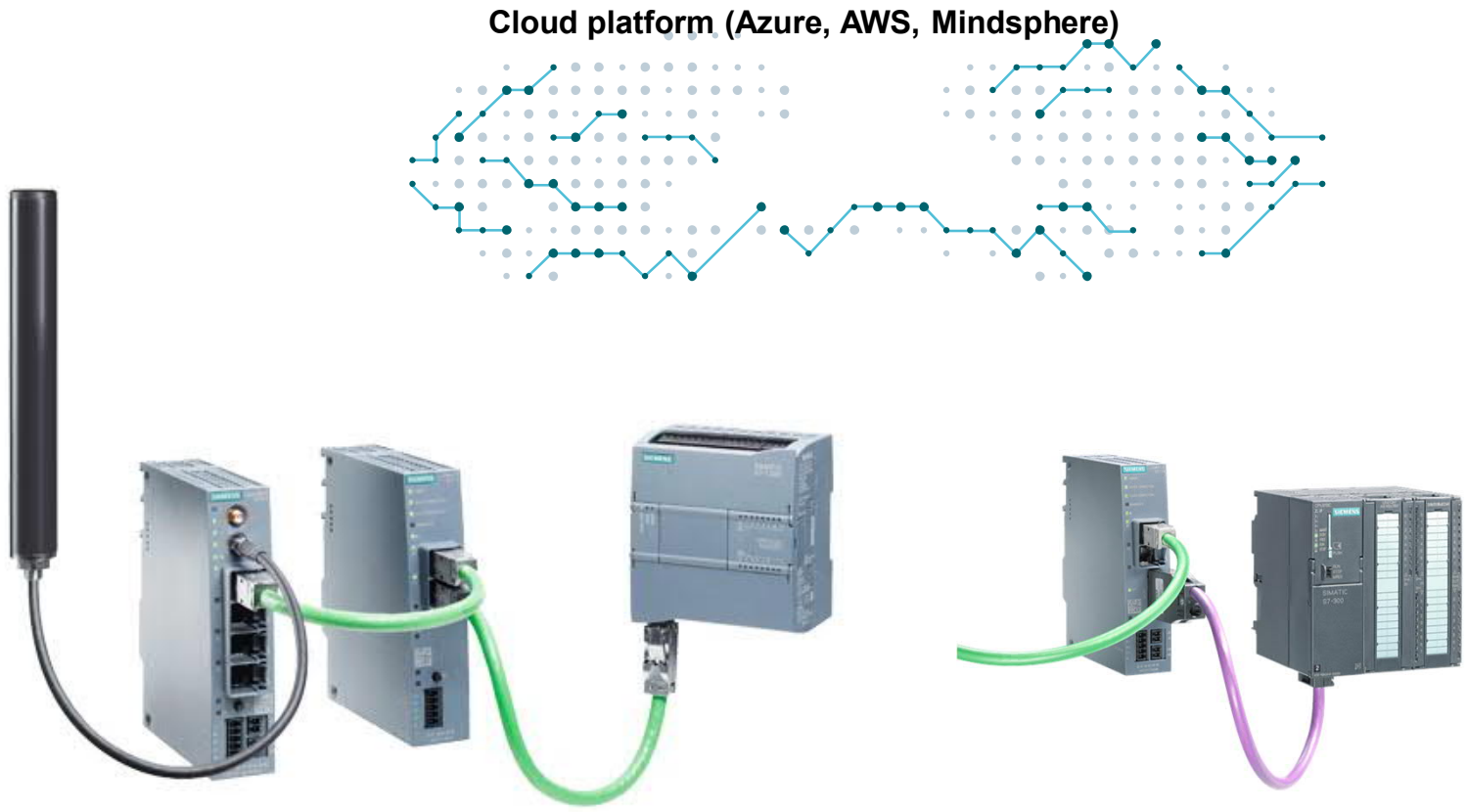

SIMATIC CC712 with SCALANCE M876 and CPU1212C

SIMATIC CP1545-1

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SIMATIC CP 1545-1
“An integral part of modern TIA installations”

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Task

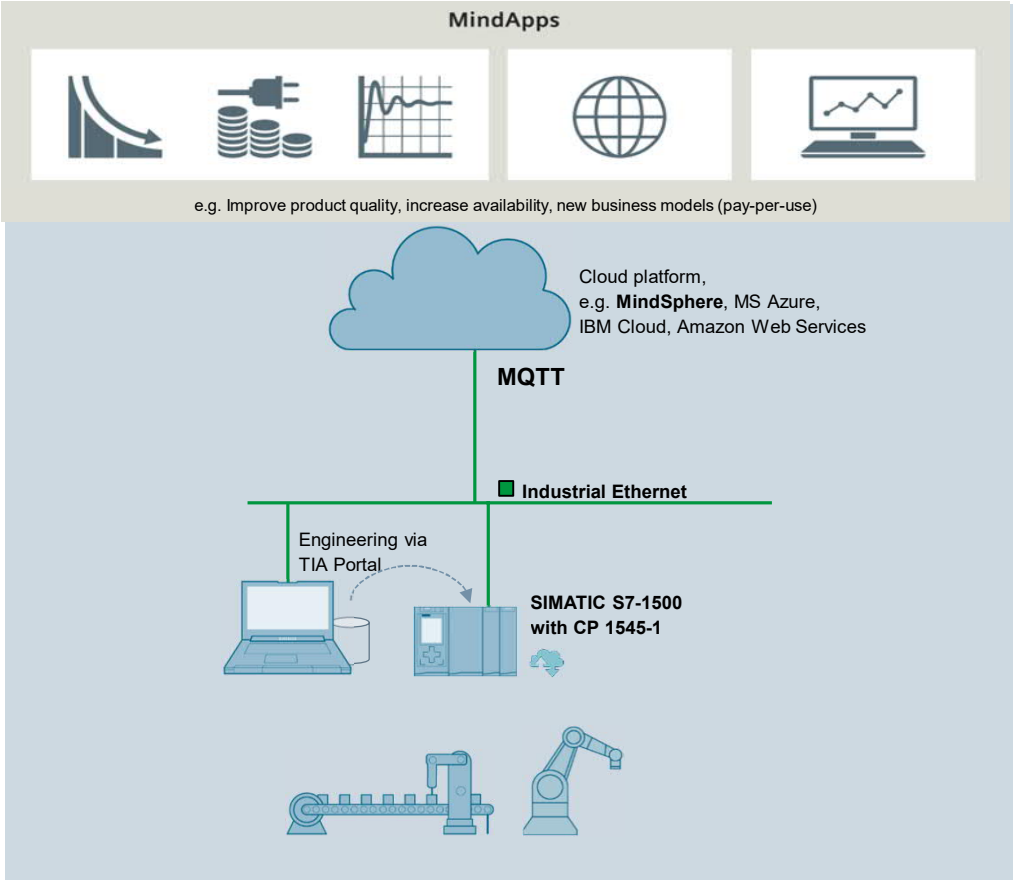
The data values of the production process, which is controlled by the S7-1500 system, are to be provided to the cloud-based application for better monitoring and further improvement of the production process.

Solution

CP1545-1 with CloudConnect to provide field data of the S7-1500 system in the cloud for further analysis and improvement of the production process. The integrated trigger management with threshold, cyclic or time-controlled transmission of the data offers an easy way of configuration.

Benefits

- Industrial IoT data transfer to cloud-based solutions
- Event-driven communication reduces network load and data exchange costs
- Simplest configuration in the TIA Portal – with just a few mouse clicks into the cloud
- Protection against unauthorized access (integrated firewall)



SIMATIC CP 1545-1
Product Highlights

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Easy IIoT data transfer to cloud-based solutions +

Trigger management for event-driven and cyclical communications +

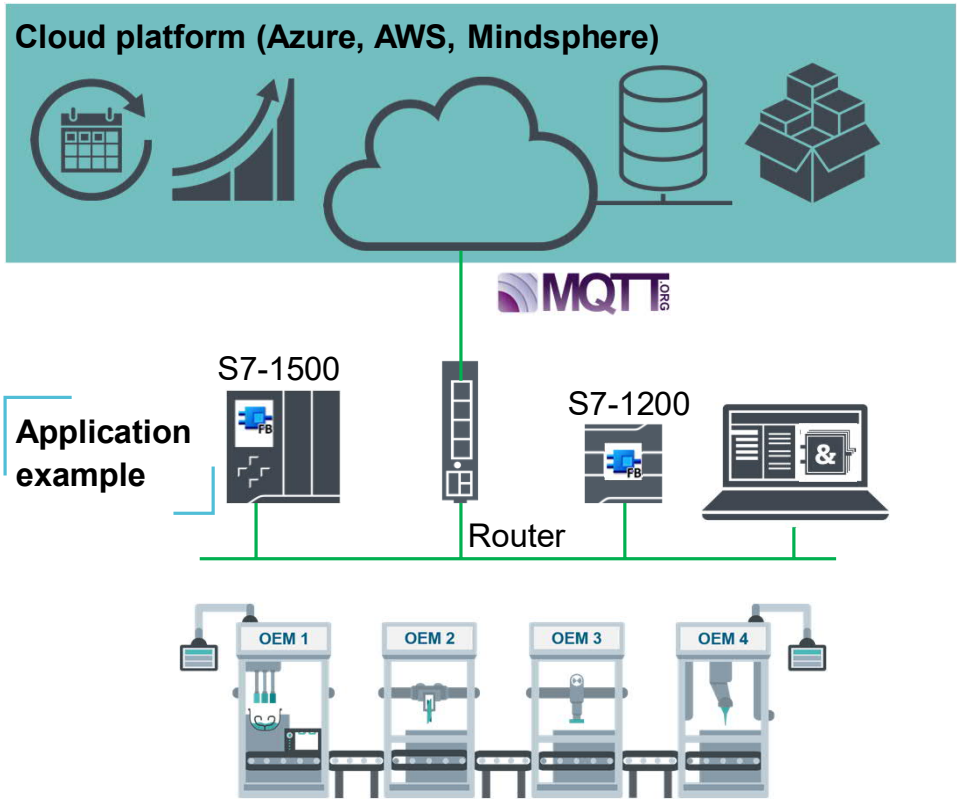
Simple engineering in the TIA Portal – the cloud is just a few mouse clicks away +

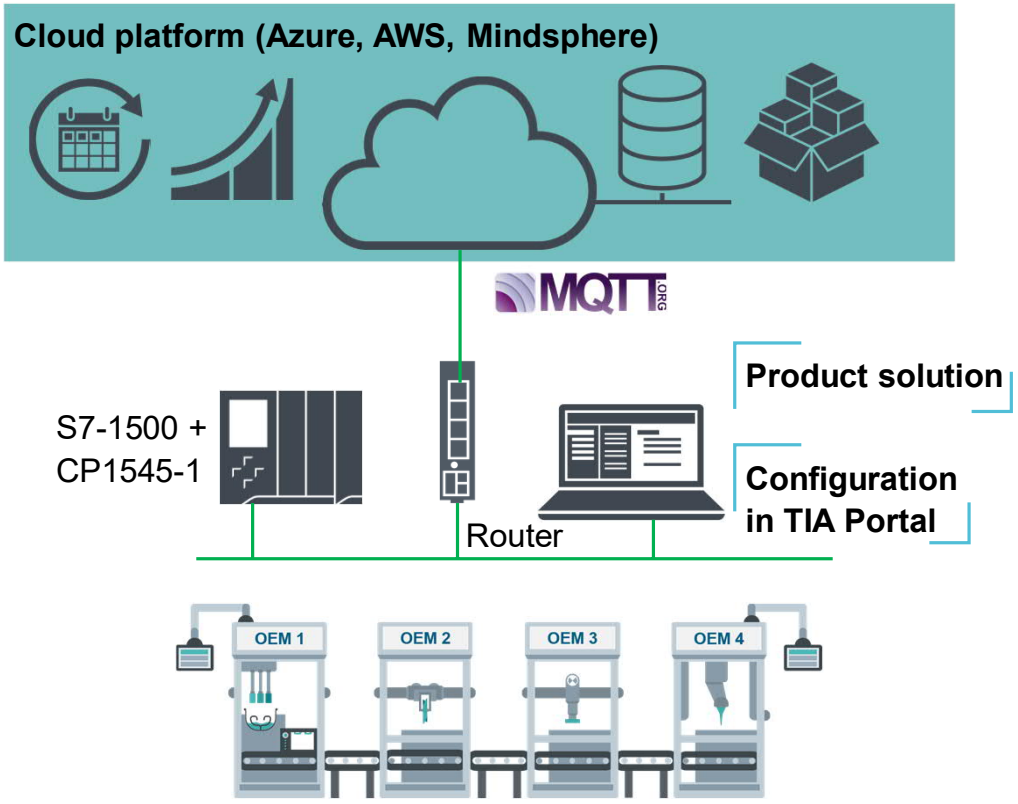
Protection against unauthorized access (via **integrated firewall**) +

Cloud solutions
Connection to cloud platforms via MQTT, e.g. MindSphere, MS Azure, IBM Cloud, Amazon Web Services +

IPv6 Support – Integration into an IPv6 infrastructure +

Cloud level
Integrated solutions – user program and CP1545-1





SIMATIC CP 1545-1
Technical specifications

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SIMATIC CP 1545-1 – Technical Data	
Cloud interface	
Type of interface	Industrial Ethernet (1 x RJ45, 1000 Mbit/s)
Protocols	MQTT
Cloud services	Siemens MindSphere + IOT Extension, IBM Cloud, AWS IOT Core, Microsoft Azure IOT Hub
Interface to PLC	
Type of interface	S7-1500 CPU via the backplane bus
Communication types	TCP/IP, UDP, S7-communication, security (firewall), SNMPv1/v3, DHCP, FTP-client/server, e-mail, IPv4/IPv6, time synchronization via NTP
Trigger Management	Event-driven, threshold, cyclic
Data point quantity	500
Hardware features	
Operating temperature	0 ... 40 °C (for a vertical installation / during operation) 0 ... 60 °C (for horizontal busbars / during operation)
IP protection class	IP20
Power Supply	15 V DC (from the backplane bus)
Dimensions (W x H x D)	S7-1500 module / 35 mm x 147 mm x 129 mm
Mounting	S7-1500 rail mounting

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LOGO! 8.3

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LOGO! 8.3 – new keys of success

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IT/Cloud-level

OT/ Automation level

Functions	Benefits
Cloud • Use of LOGO! Web Editor V1.1 project for cloud data visualization • Upload LOGO! Web Editor V1.1 into cloud • Flexible user management • Adding additional cloud services	• Easy to configure and well known by our customer • Create/modify Visu every where and any time • Flexible user management • Create more sales volume by adding new functions (cloud services)
Usability • Easy configuration in LOGO! SoftComfort 8.3 • LOGO! Web Editor „well known by users“	• LOGO! typical usability • Visio by using the existing LOGO! Web Editor knowledge
Hardware • Cloud communication and configuration part of LOGO! Soft Comfort 8.3 integrated in any LOGO! 8.3 Base Modul • Native communication via MQTT	• LOGO!, LOGO! Soft and LOGO! Web Editor goes Cloud


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MindConnect@MindSphere
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MindSphere

Siemens' cloud-based, open IoT operating system

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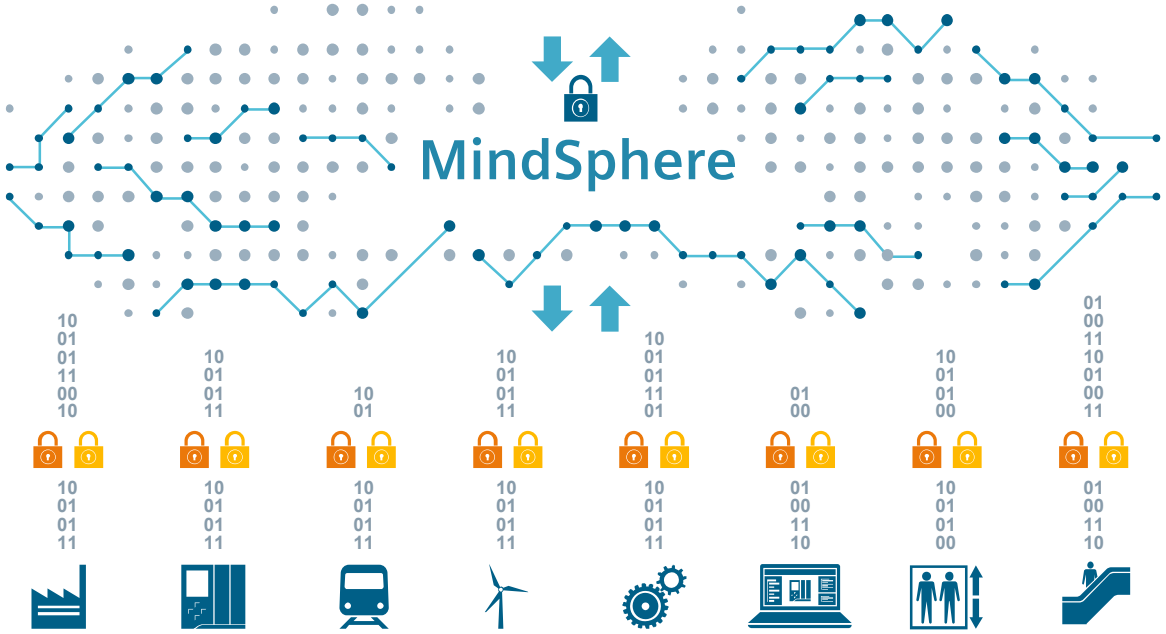
Developed by Siemens, OEMs, end customers and App developers



MindApps

- Asset transparency and analytical insights, e.g. predictive maintenance
- Subscription based pricing model
- Fleet management

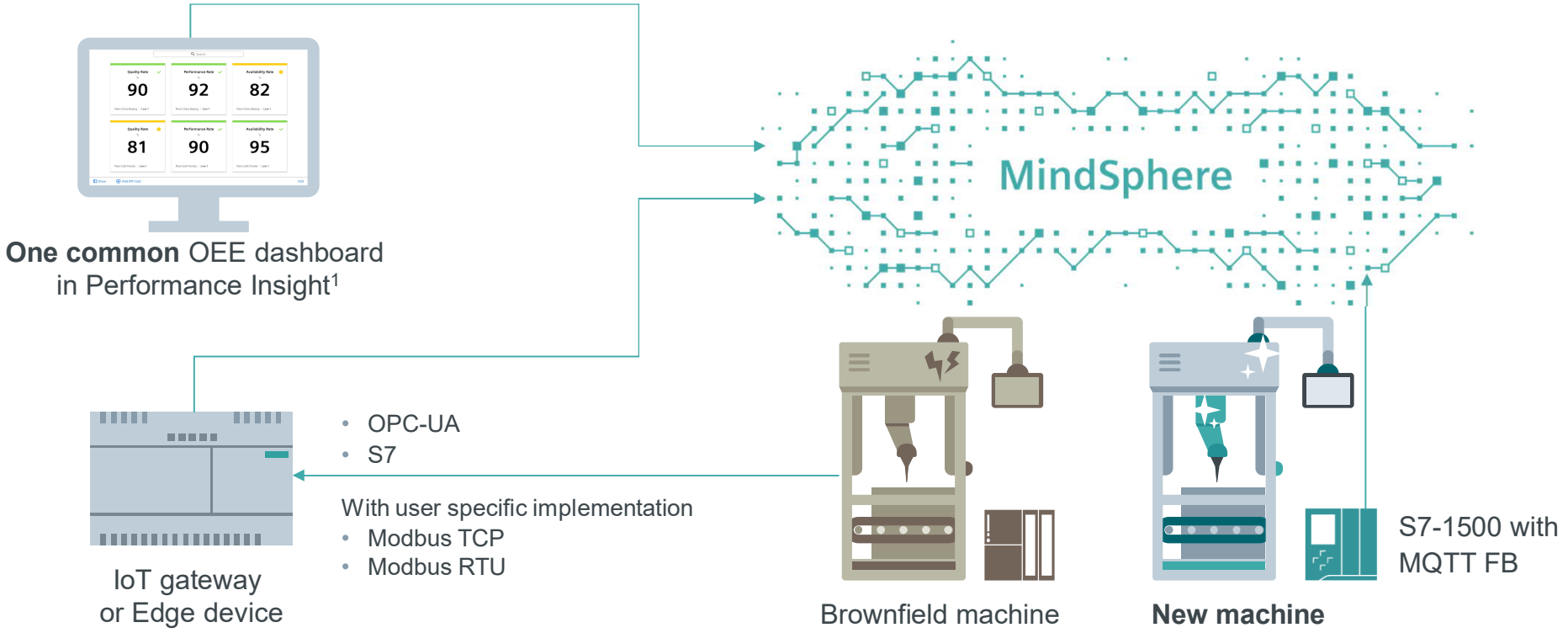
MindSphere

- Open interface for development of customer specific apps (MindApps)
- Various cloud infrastructures: Public, private or on-premise

MindConnect

- Open standards (e.g. OPC UA) for connectivity (also to 3rd party products)
- Plug and play connection of Siemens products

MindSphere



1 MindSphere IoT value plan required

MindConnect Nano

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Description

MindConnect Nano is a device for collecting data using different protocols and transferring the data to MindSphere. The device supports transmission of data through a secure internet connection, to enable cloud-based applications and services.

Benefits

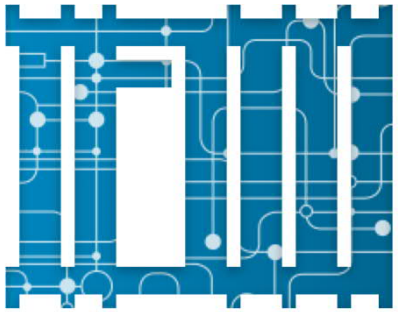
- Fast and easy connectivity of industrial machines and automation systems to MindSphere
- Data collection via standard industrial protocols
- Software update management – Always up to date
- Rugged design for maintenance-free, continuous operation
- Comprehensive security concept in accordance with applicable industry standards
- Up to 500MB local data buffer

Supporting Protocols

- Siemens S7 (for collecting data from S7-3xx / S7-4xx / ET-200s PLCs);
- OPC UA (for collecting data from all data sources which can provide data via an OPC UA server); the MindSphere Nano supports data collection with Part 8 of the OPC UA specification (Data Access)
- Modbus (TCP and RTU)

Performance

- Data reading cycle: Up to 250 data points / second
- Data transfer cycle: Every 10 seconds



MindConnect Nano
Product Highlights

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Fast and easy connectivity of industrial machines and automation systems to MindSphere

Cloud solutions
Data can be transmitted to MindSphere only using HTTPS

Automation level protocols
Siemens S7 (for collecting data from S7-3xx, S7-4xx, S7-12xx, ET-200s PLCs), OPC UA, Modbus TCP/RTU

Performance
Data reading cycle: up to 250 datapoints/second
Data transfer cycle: every 10 seconds

Comprehensive security concept in accordance with applicable industry standards (ISO 27001/IEC 62443)

MindConnect IoT2040

SIEMENS
Ingenuity for life

Description

MindConnect IoT2040 is a device for collecting data using different protocols and transferring the data to MindSphere. The device supports transmission of data through a secure internet connection, to enable cloud-based applications and services.

Benefits

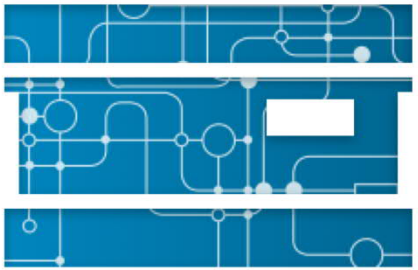
- Fast and easy connectivity of industrial machines and automation systems to MindSphere
- Data collection via standard industrial protocols
- Software update management – Always up to date
- Rugged design for maintenance-free, continuous operation
- Comprehensive security concept in accordance with applicable industry standards
- Up to 500MB local data buffer

Supporting Protocols

- Siemens S7 (for collecting data from S7-3xx / S7-4xx / ET-200s PLCs);
- OPC UA (for collecting data from all data sources which can provide data via an OPC UA server); the MindSphere Nano supports data collection with Part 8 of the OPC UA specification (Data Access)
- Modbus (TCP and RTU)

Performance

- Data reading cycle: Up to 30 data points / second
- Data transfer cycle: Every 10 seconds



MindConnect IoT2040
Product Highlights

SIEMENS
Ingenuity for life

Fast and easy connectivity of industrial machines and automation systems to MindSphere

Cloud solutions
Data can be transmitted to MindSphere only using HTTPS

Automation level protocols
Siemens S7 (for collecting data from S7-3xx, S7-4xx, S7-12xx, ET-200s PLCs), OPC UA, Modbus TCP/RTU

Performance
Data reading cycle: up to 30 datapoints/second
Data transfer cycle: every 10 seconds

Comprehensive security concept in accordance with applicable industry standards (ISO 27001/IEC 62443)

Entry level solution
for MindSphere connectivity ideal for a smaller production environment

MindConnect IoT Extension

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Description

MindConnect IoT Extension is a connectivity layer that expands the number of protocols that can communicate directly with MindSphere. Various field protocols are supported along with an increased range of hardware connectivity agents.

Benefits

- Expands connectivity across the entire production environment
- Supports various field protocols
- Supports wide range of hardware connectivity agents
- Delivers multiple level data security
- Offers a complete environment for agent development and device management

Additional Supporting Protocols & Interfaces

- Siemens S7, OPC UA, ModBus/RTU and ModBus/TCP, REST, MQTT, CANBus, GPMC(nand), MMC, SPI, I2C, CAN, McASP, MMC, 4 Timers, XDMA interrupt, GSM/GPRS/HSPA, GNSS (GPS/GLONASS/Galileo)
- Subject to change and for informational purposes only, please verify with your MindSphere sales representative.

Sitrans CC240-BT CMS

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SITRANS CC240-BT
Smart Condition Monitoring System

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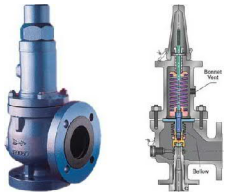
MindSphere

Pumps

On/Off Valve

Pressure Relief



Steam Trap

Heat Exchanger

Transport Syst.

Agitator Vessels

…

Pumps	Valves	Systems

In Brief: SCM IQ

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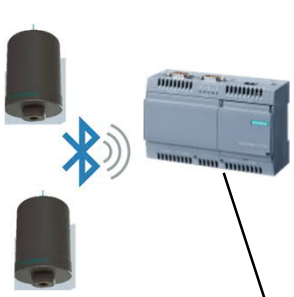
SITRANS MS



CC240-BT connects to the SITRANS MS and sends data to the cloud

Typically 1 SITRANS CC240-BT gateway for up to 10 SITRANS MS sensors, depending on local boundary conditions

Features – SITRANS MS

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- IP66 certified
- integrated antenna
- replaceable batteries (2xAA)

Bluetooth Low Energy with battery lifetime of 3 to 5 years

3-axis accelerometer:
- 2 to 6.6kHz
- nom. resolution of 0.122mg

Temperature:
- 0 to 60°C
- resolution of 0.0625°C
- accuracy +/- 5°C

IOT devices, release 2020/21

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IOT Gateway MQTT
Product Highlights

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Automation level protocols
Field devices with MQTT (unencrypted), Modubus/TCP or OPC UA interfaces as the data supplier +

Flexible connection
of „simple“ sensors via MQTT unencrypted data transfer +

Cloud solutions
Data can be transmitted cloud platforms (e.g. AWS, MS Azure, IBM Cloud, Google Cloud) via MQTT. +

Performance and Deterministic
MQTT devices: 32,
Modbus/TCP devices: 32 (up to 64 datapoints per device) +

Web based configuration allowing easy commissioning +

SIMATIC quality
Designed for 24/7 operation in industrial environment +

SIMATIC IPC127E

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Challenges and opportunities

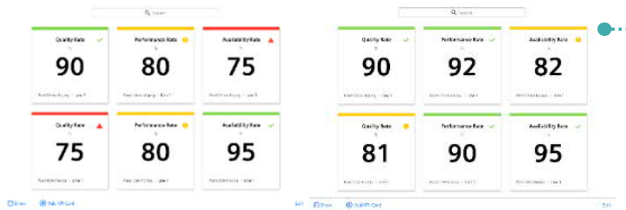
Uniform and interdisciplinary integration of the most diverse systems for performance monitoring

Solution

- Connection of machines and systems of the most variable age groups and manufacturers to the Cloud
- Use of open, flexible or closed gateways for the connection

You benefit from

A central infrastructure on which everything runs simultaneously for the comparison of machines and systems, service planning and more



OEE brownfield

OEE greenfield

MindSphere

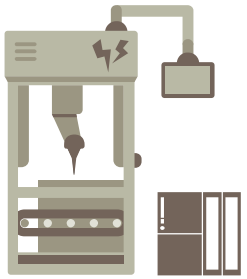
Integration of brownfield and greenfield systems

IoT gateway
(SIMATIC IPC127E)

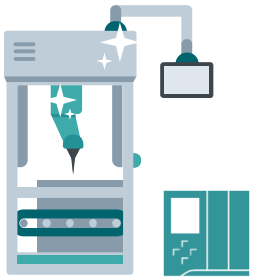
- OPC UA
- S7

With customer-specific implementation:

- Modbus TCP
- Modbus RTU



Existing machine



New machine

The big picture: We enable our customers to deploy applications everywhere based on their needs

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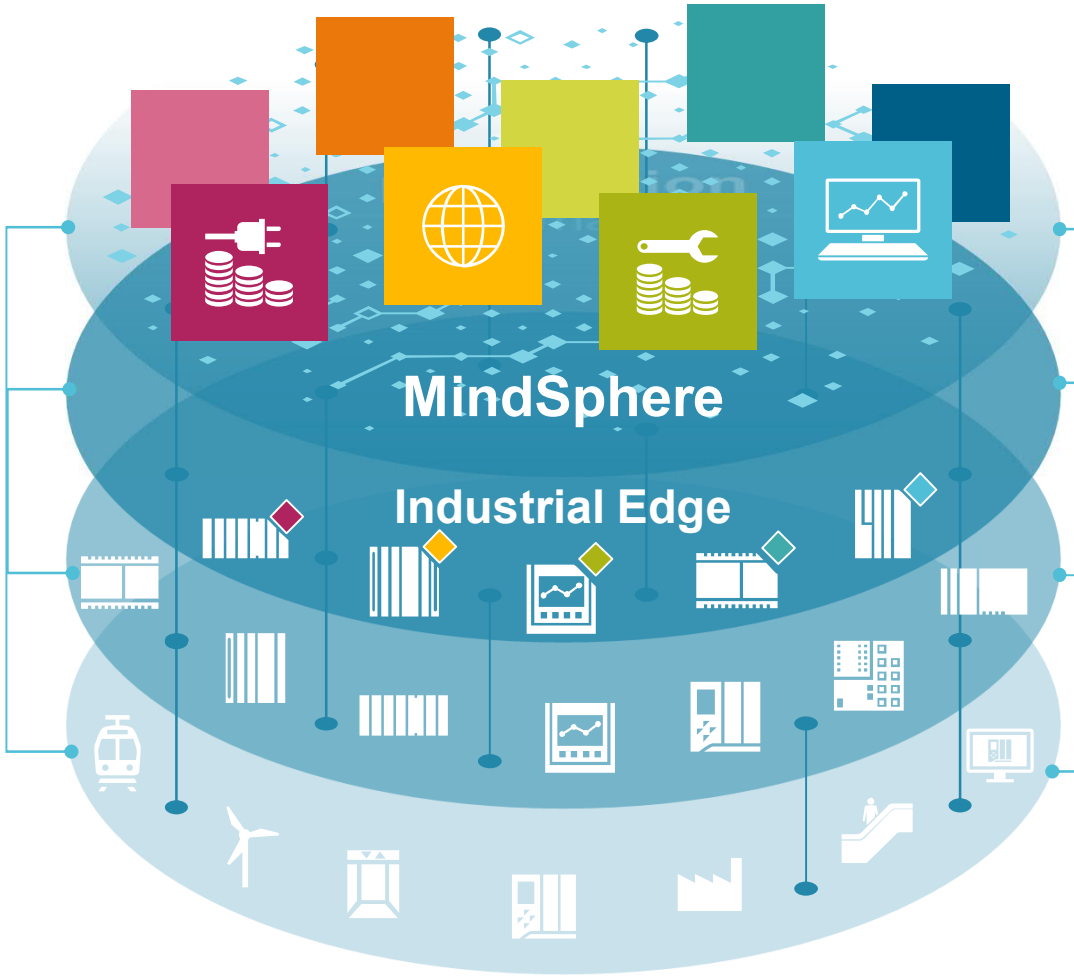
mx mendix

Low-Code platform

Build apps faster
Run apps on scalable infrastructures

- Off-Premises in Cloud
- On-Premises on Edge
- Hybrid



Cloud

Cloud apps

Edge

Management, Runtime, Edge apps

Controller

Runtime and automation engineering

Field devices

Questions and Answers

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Thank you for your attention!

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