

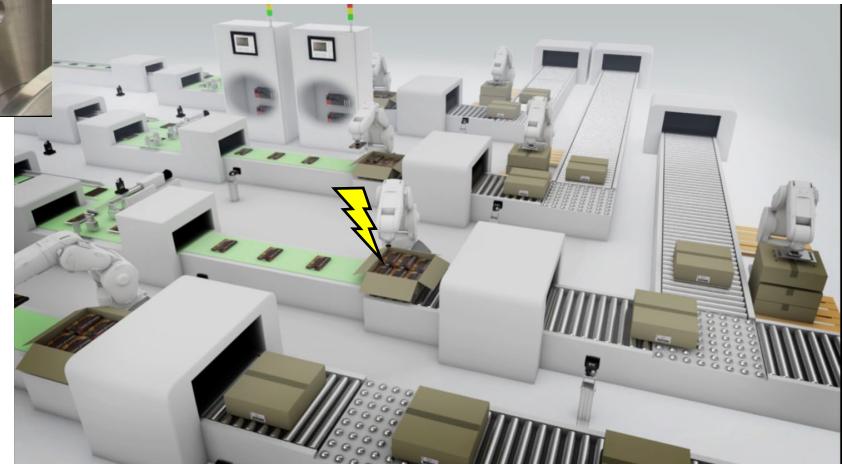
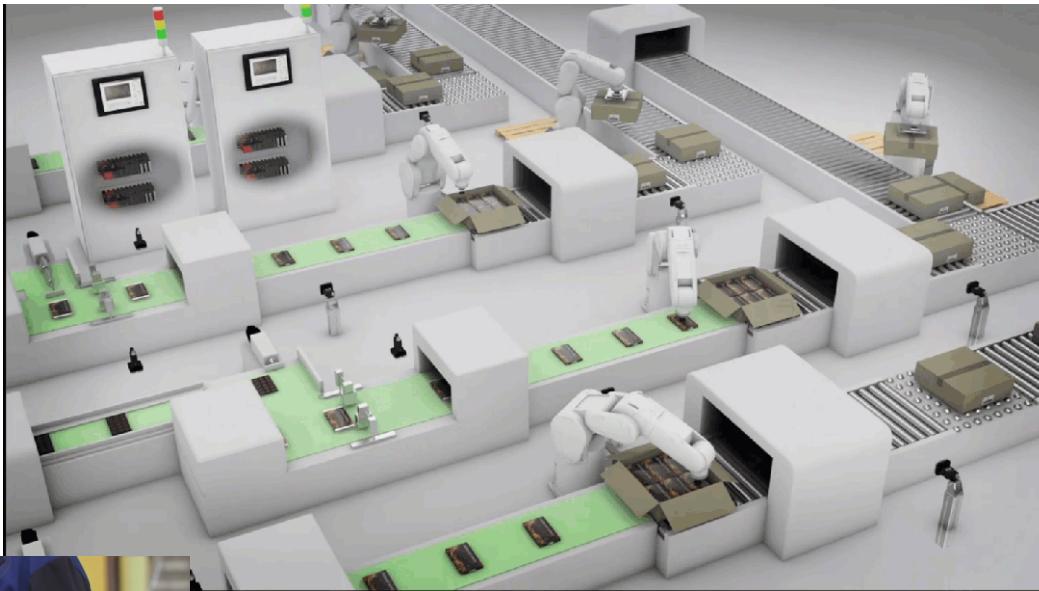


We ❤️ Robots

Robotics Predictive Maintenance with AI and Data transfer into cloud systems

FUTURE OF THE AI MACHINERY MARKET

- Predictive & Preventive Maintenance
 - €45.000.000.000
 - Estimated annual cost of unplanned machine downtime in Europe
 - 42%
 - Proportion of machine downtimes due to faults in automation products
 - USD 5.261 million → USD 81.582 million
 - Expected Market of AI-based Predictive and Preventive Maintenance (2021 → 2031)



Source: <https://www.researchnester.com/>
Global Predictive Maintenance Market Size, Forecast, and Trend Highlights Over 2021 – 2031 /



PREDICTIVE AND PREVENTIVE MAINTENANCE

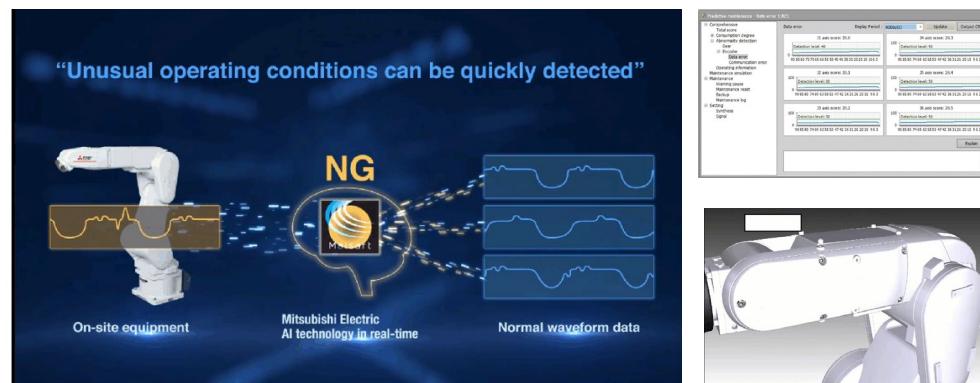


Predictive Maintenance

PREDICTIVE MAINTENANCE



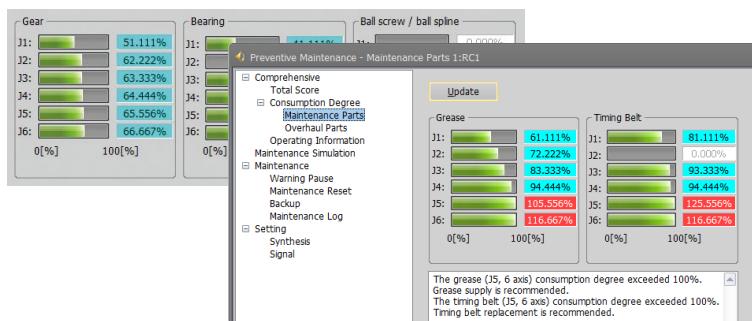
- Mitsubishi Electric's AI creates the State-of-the-ART in technology
- AI - Artificial Intelligence
- Information and warnings in text form
- Preventive maintenance planning





PREVENTIVE MAINTENANCE

- Simulation and preparation
- Intelligent, computer-aided functionality
- Basis: Robot programme
- Estimation of the lifetime of the components

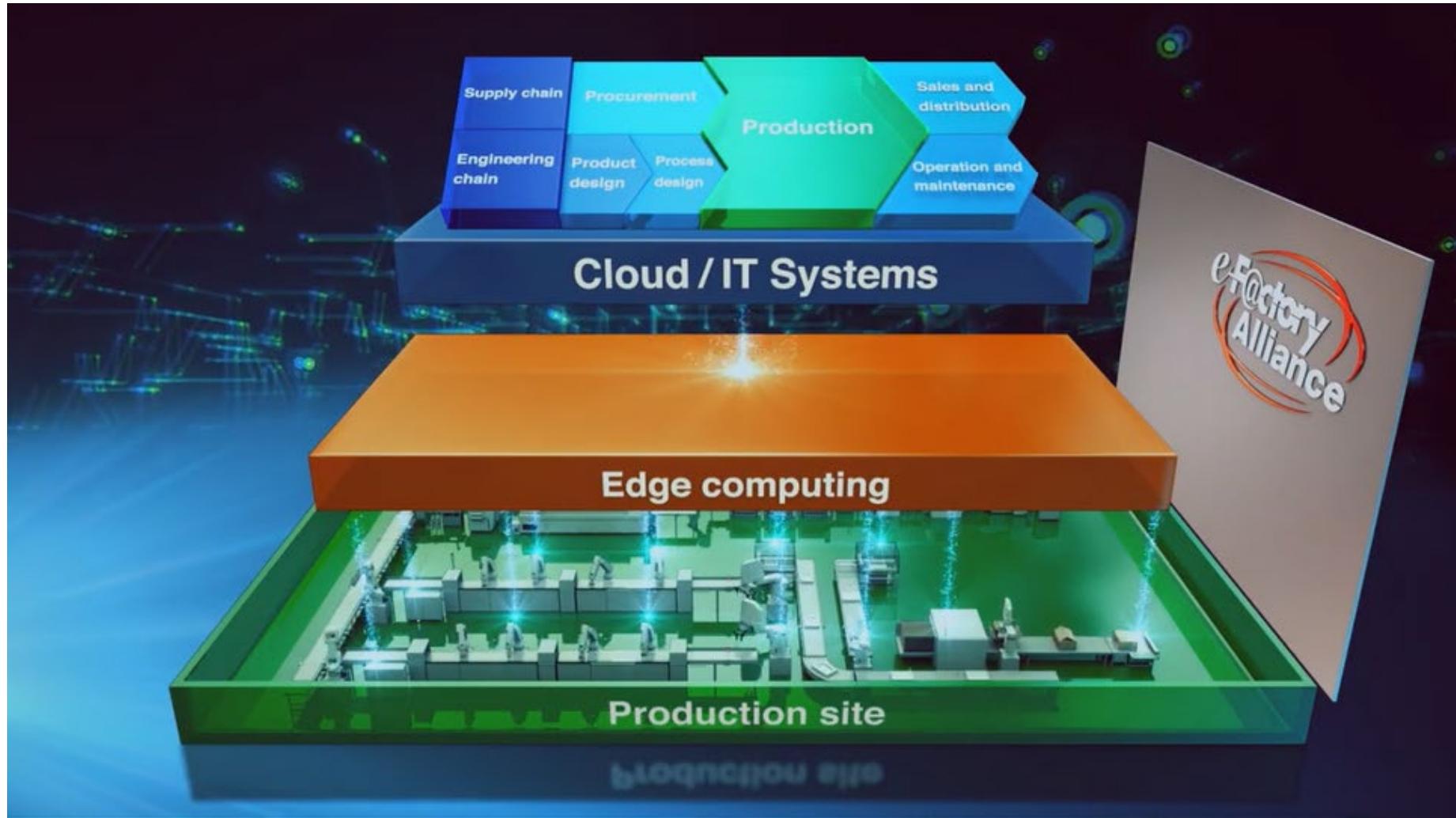


PREDICTIVE MAINTENANCE

- Live evaluation
- Symptoms recorded in the field and evaluated in real time
- Detection of damage or wear of grease, gears or bearings



Mitsubishi Electric's AI creates the State-of-the-ART in technology



“
DIGITALISATION
IS THE PROCESS
ADDING VALUE
FROM
DATA
”

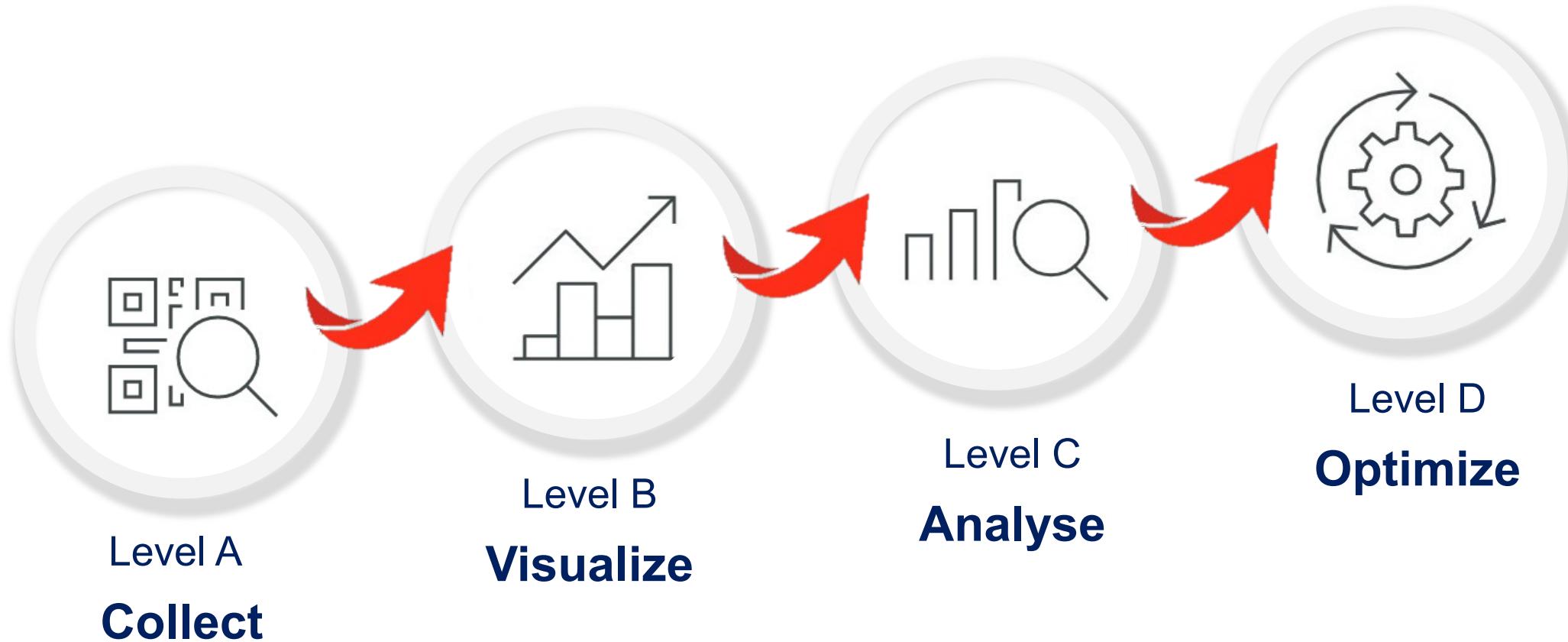
Digitalization Yes, BUT: Every company is different!

Approach SMKL:

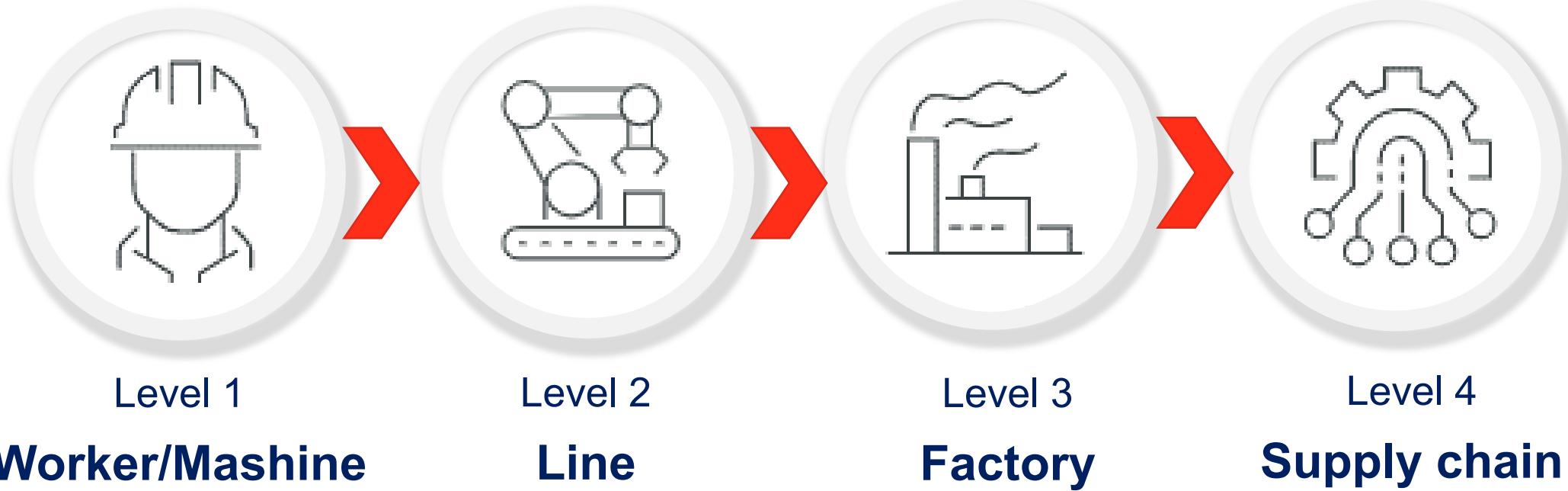
Smart
Manufacturing
Kaizen
Level



- The degree of data transparency is represented by the maturity level, which is mapped on the vertical axis of the SMKL model.



- The horizontal axis represents the resolution or the level of detail of the elements to be managed.



MatURITY LEVEL

Level D
Optimize

Level C
Analyse

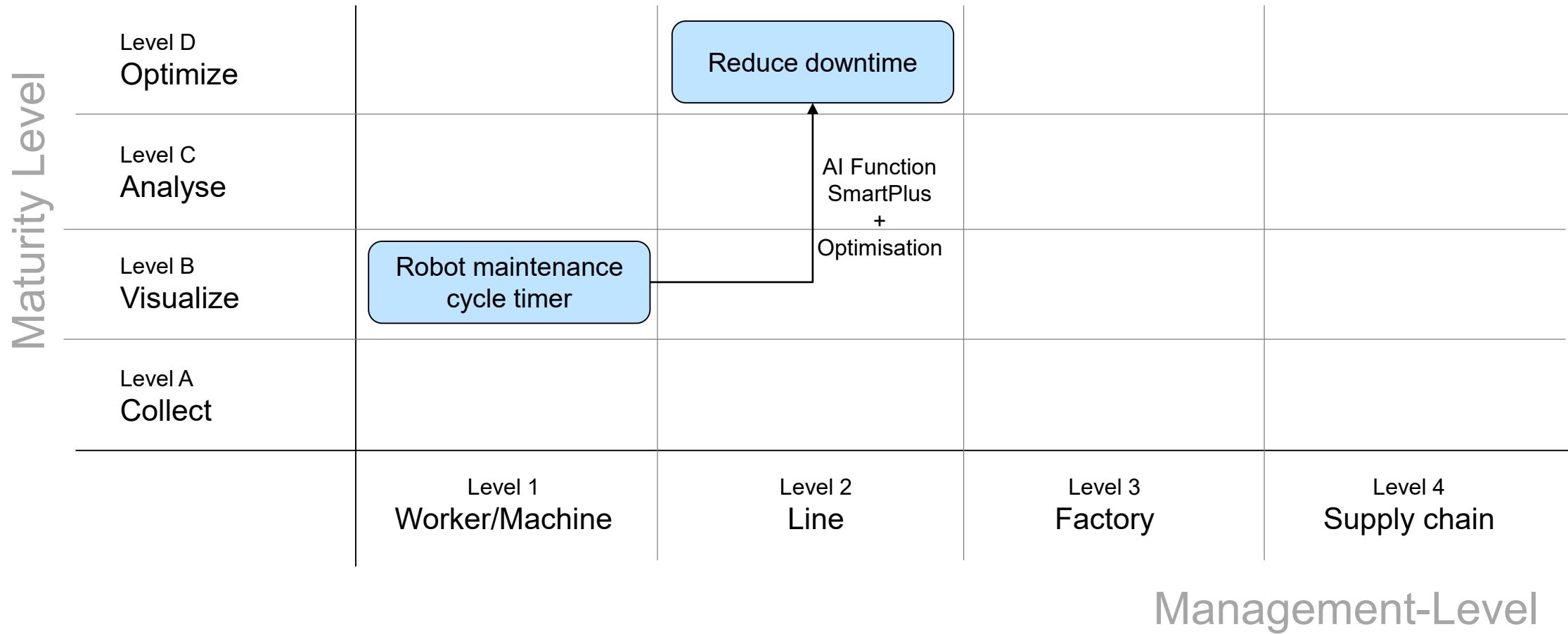
Level B
Visualize

Level A
Collect



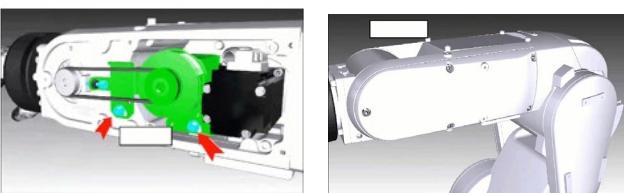
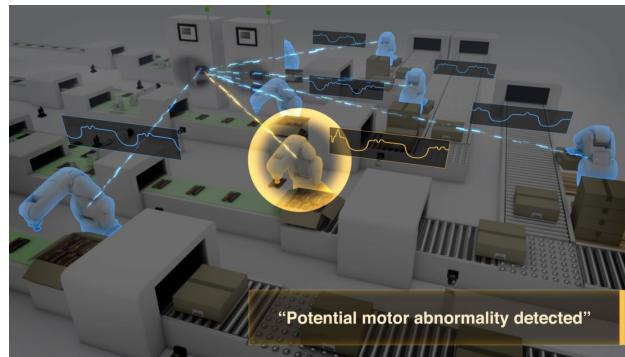
Management-Level

Your structured approach to digitalisation

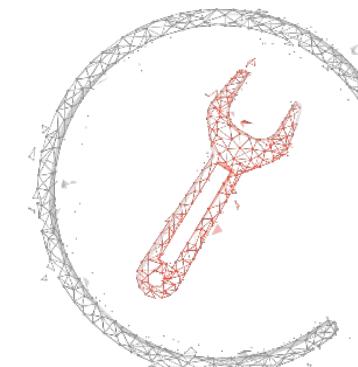




No way into the future without DATA

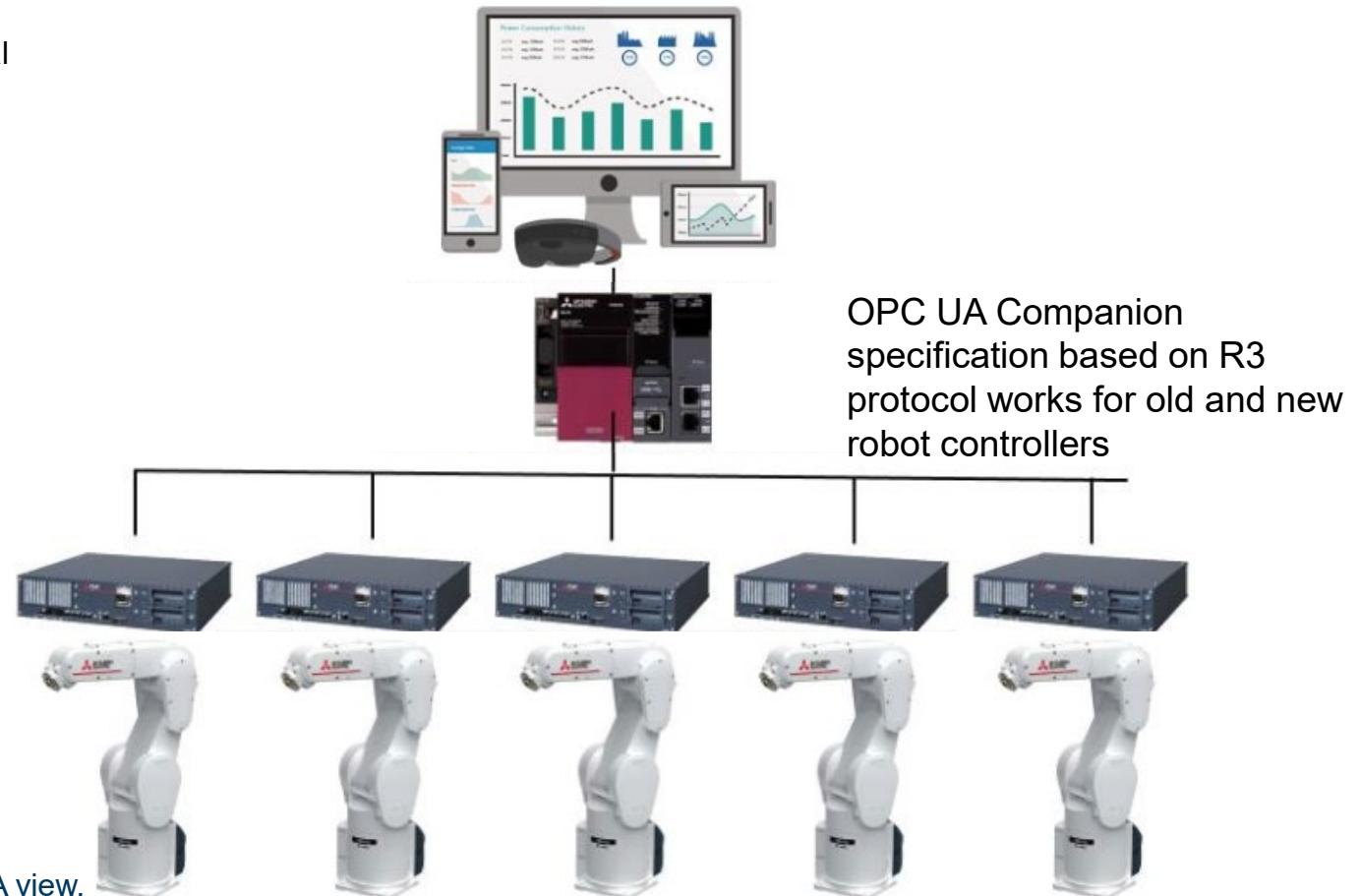


OPC UA, MQTT, ...



The concept

- PC with ICONICS GENESIS64, OPC UA or GENESIS64 Virtual Machine in the Cloud with MS Azure, MQTT Communication
- OPC UA Client/Server and MQTT Publisher
- iQ-R: Backplane + PS + CPU + IoT Gateway
- The robot controller can be equipped with a MELFA SmartPlus card for improved maintenance



SmartPlus cards are fully integrated and appear automatically in the OPC UA view.
=>No programming in the RT Toolbox required!



Robot cloud connection

Maintenance overview - Info of all robots

Maintenance

< Maintenance

Home

Maintenance Overview

Alarms (46)

Reporting

Elements

iconics © 2022

V2022.01

Jan 14 2022 - 11:10 AM

Online

Asset ID	Robot Model	Controller Model	Contr. Serial No.	Controller IP	Contr. Temperature	Battery Remaining	Accumulated	Robot Status:
Showroom Ratingen, RV-4	RV-4FRLM-D	CR-8xx	B18010072M	192.168.3.19	49 °C	0h	32723 h	OPERATING / ALL RUNNING

Battery Remaining: 0h
Accumulated: 32723 h
Robot Status: OPERATING / ALL RUNNING

Remaining Time maintenance parts: 24000 h
Remaining Time Servo On Time: 23566 h
Total Consumption Maintenance Parts: 0.239 %
Total Consumption Overhaul Parts: 0.000 %

Online

Asset ID	Robot Model	Controller Model	Contr. Serial No.	Controller IP	Contr. Temperature	Battery Remaining	Accumulated	Robot Status:
ROBOT MQTT JSON Format	RV-7FRLM-D	CR8xx-DM-D	AR0703001	192.168.0.20	0 °C	0h	0h	OPERATING / ALL RUNNING

Battery Remaining: 0h
Accumulated: 0h
Robot Status: OPERATING / ALL RUNNING

Remaining Time maintenance parts: 22216 h
Remaining Time Servo On Time: 23700 h
Total Consumption Maintenance Parts: 1.329 %
Total Consumption Overhaul Parts: 1.780 %

Online

Asset ID	Robot Model	Controller Model	Contr. Serial No.	Controller IP	Contr. Temperature	Battery Remaining	Accumulated	Robot Status:
Robot_Simulator1	RH-6FRH55	CR800-DD	#C70456	192.168.0.101	32 °C	2311 h	4811 h	OPERATING / ALL RUNNING

Battery Remaining: 2311 h
Accumulated: 4811 h
Robot Status: OPERATING / ALL RUNNING

Remaining Time maintenance parts: 23504 h
Remaining Time Servo On Time: 23532 h
Total Consumption Maintenance Parts: 0.202 %
Total Consumption Overhaul Parts: 0.782 %

Online

Asset ID	Robot Model	Controller Model	Contr. Serial No.	Controller IP	Contr. Temperature	Battery Remaining	Accumulated	Robot Status:
Robot_Simulator2	RH-20FRH100	CR800-DD	#C10234	192.168.0.102	32 °C	1311 h	8811 h	OPERATING / ALL RUNNING

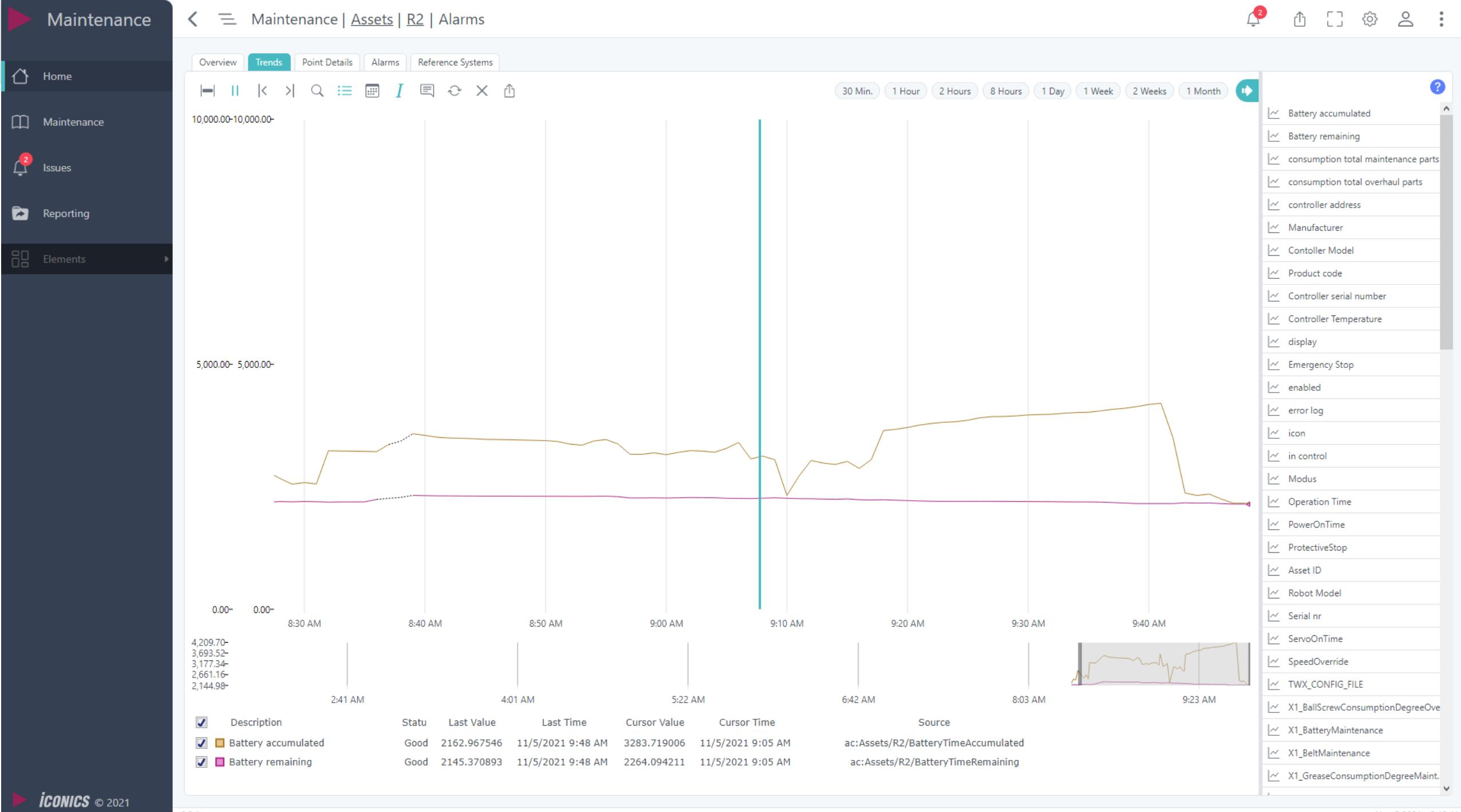
Battery Remaining: 1311 h
Accumulated: 8811 h
Robot Status: OPERATING / ALL RUNNING

Remaining Time maintenance parts: 15504 h
Remaining Time Servo On Time: 12766 h
Total Consumption Maintenance Parts: 17.367 %
Total Consumption Overhaul Parts: 13.834 %

Iconics © 2022

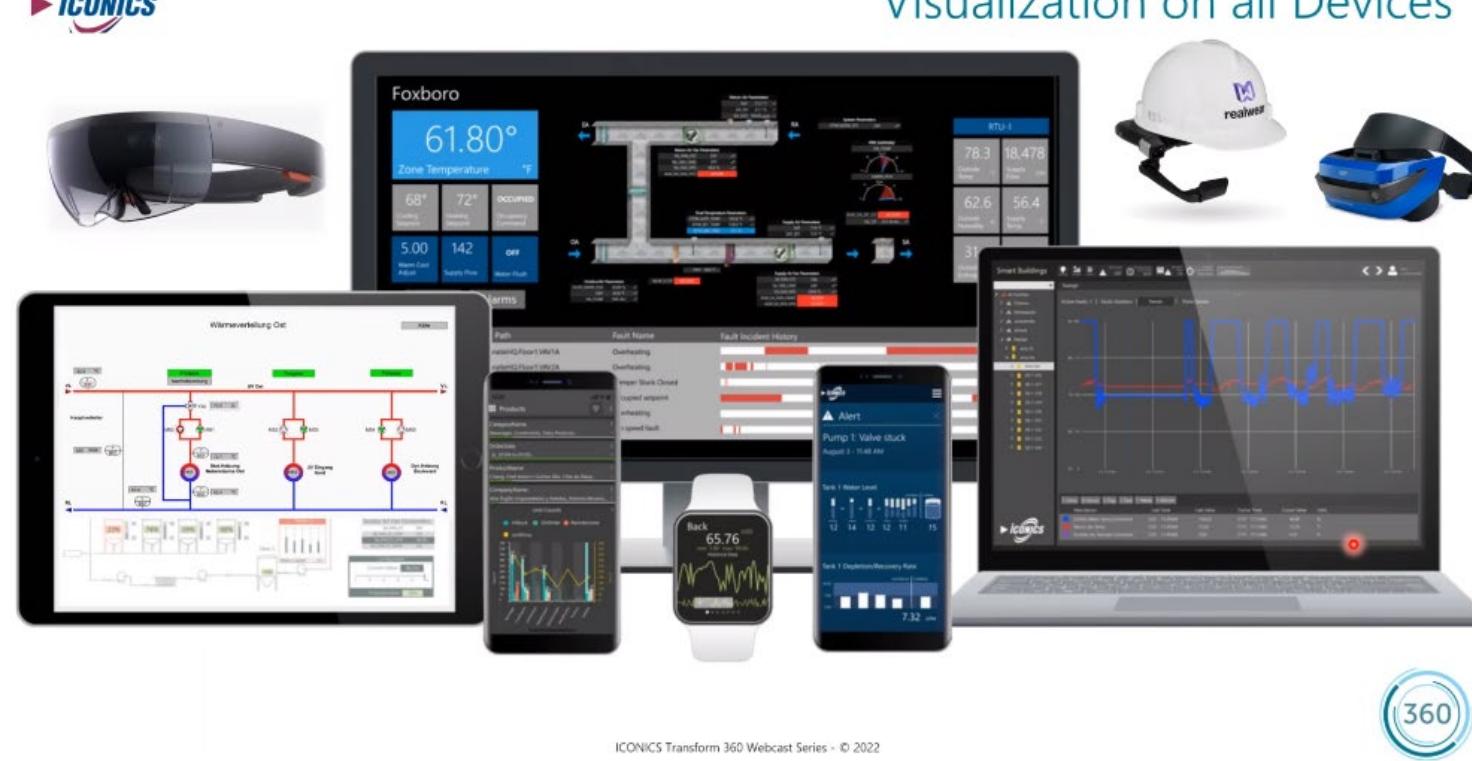
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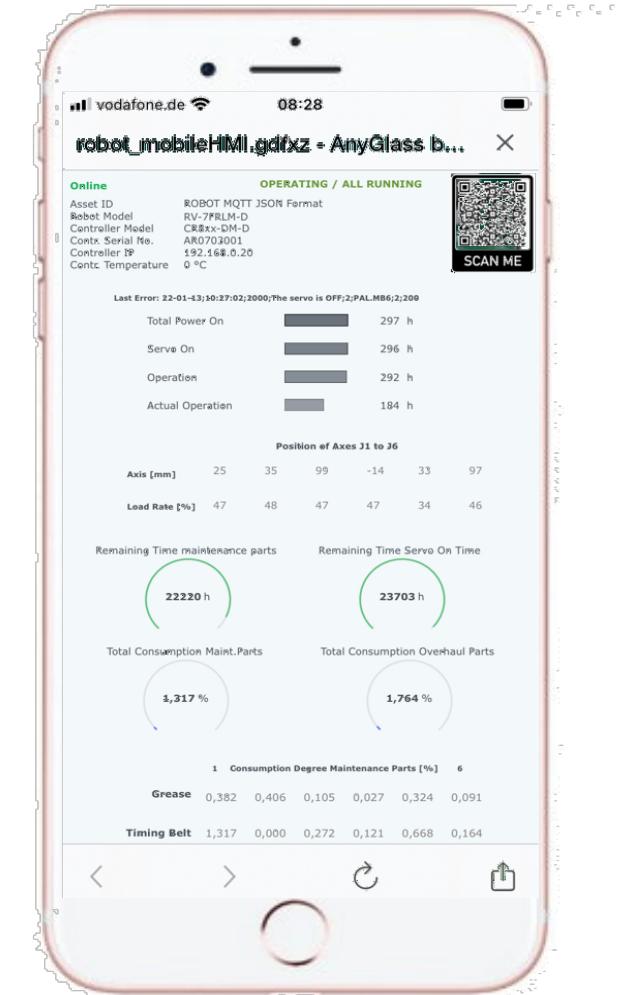
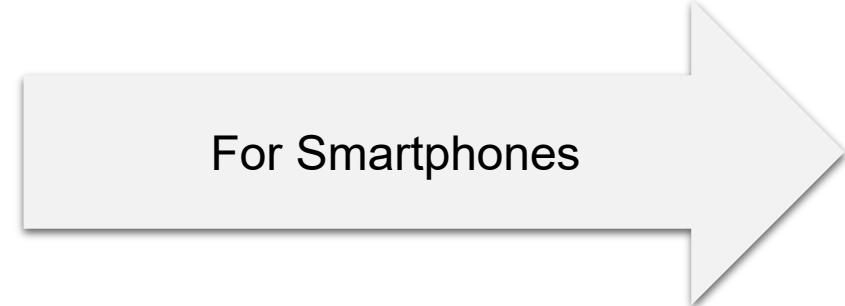
Maintenance overview



360

ICONICS Transform 360 Webcast Series - © 2022

Have a look?



Automation hero





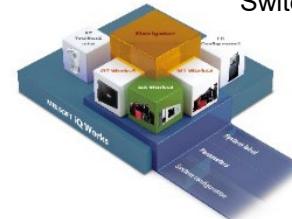
- Automation products



- Compact PLC iQ-F
- Modular PLC iQ-R
- HMI / operating devices



- Servo / Motion
- Frequency converter
- Low voltage Switchgear



- e-F@ctory Partner Products
- Software





- BUILDING SYSTEMS



- AIR CONDITIONING



- SPACE SYSTEMS



- ENERGY SYSTEMS



- FACTORY AUTOMATION



- SEMICONDUCTORS/
DEVICES



- TRANSPORTATION



- AUTOMOTIVE EQUIPMENT



- INFORMATION/
COMMUNICATION
SYSTEMS



- VISUAL INFORMATION



- PUBLIC SYSTEMS



- HOME PRODUCTS

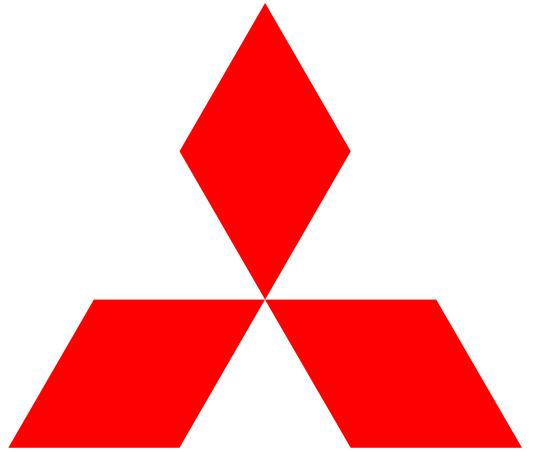


Thank you!



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ELECTRIC**

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