

# AI and Automation in the daily usage

B&R has integrated AI into its current development toolbox, Automation Studio Code. We demonstrate how this makes daily work much easier and how quickly we can now write the glue code.

We also demonstrate the AI camera and present a use case of a solution we have already implemented for a machine builder.

—  
**Presenter**



Use Machine Vision like a Sensor  
– in the control loop to increase  
your machine performance

**Martin Buchmann**

Application Manager Switzerland

E-Mail: [martin.buchmann@br-automation.com](mailto:martin.buchmann@br-automation.com)

Phone: +41 52 728 56 31

Location: B&R Industrie-Automation AG

Langfeldstrasse 90

8500 Frauenfeld

# Agenda

**01**

B&R who and what

**02**

AI supports programmers

**03**

AI integrated in the Vision Camera

**04**

automationLAB – open for you



**Vision systems**



**Mechatronic Systems**



**Frequency inverter**



**Motion control**



**Industrial PCs**



**Operation and monitoring**



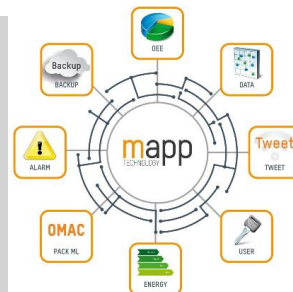
**Integrated safety technology**



**PLC systems & I/O systems**



**Scalability+ | Integrated Automation**



# Agenda

- 01** B&R who and what
  - 02** AI supports programmers
  - 03** AI integrated in the Vision Camera
  - 04** automationLAB – open for you
-

# Artificial Intelligence

## Let's capture the opportunity



Generative

Internal



Analyse

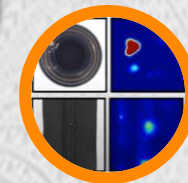
Products



AS Copilot



Conversational Help



Anomaly Detection



ACOPOS Trak App

Fast Market Development

our approach to AI

our product

# Automation Studio Copilot

Your AI partner for code generation



## Your 24/7 B&R sparring partner

AI in automation programming, providing developers with an AI partner for coding



## Seamlessly integrated in Automation Studio Code

Copilot understands B&R libraries and naming conventions of the automation world



## Faster innovation - Generate automation code in seconds

Seamlessly generate code for structured text  
Support for code commenting and optimizations



## Boost coding efficiency

Copilot is connected with Automation Studio help, sample codes and projects, as well as cognitive services, indexing and GPT



# **Live demo**

Ask for help by hardware question

# B&R-Innovationen

Mehr erfahren



## Intelligente Automatisierung für eine adaptive Fertigung



# **Live demo**

Ask for Help during coding –  
first steps

AS COPILOT (BETA): AS COPILOT

Welcome ✕

You may encounter results that are not yet fully accurate. Continuous improvements are underway to enhance performance and reliability.

## AS Copilot

### Welcome to Support Assistant !

Here are some example prompts you can try out:

- Usage of X20IF10D1-1: "What do I need to use X20IF10D1-1?"
- Installing User Certificates: "How can I install user certificates to T50 panel?"
- Blackout Mode in B&R Safety: "Which additional functions provide the blackout mode in B&R Safety?"

Let me know how may I help you?

# Automation Studio Code (Beta)

Version 6.3.2

## About Automation Studio Code

Automation Studio Code is a modern development environment designed to seamlessly integrate with [Automation Studio 6](#). It provides a powerful code editor, debugging support, AI-powered assistance, and source control integration to enhance your automation development workflow.

## Key Features

- **PLC Coding View:** Manage your AS6 projects with a structured view of software components, allowing efficient navigation and editing.
- **AS Copilot:** Leverage AI-powered assistance for automation projects, offering chat-based help and context-aware code suggestions.
- **Debugging:** Debug C, C++, and IEC-ST code seamlessly, setting breakpoints, inspecting variables, and stepping through execution.

## Start

[Open Automation Studio project](#)

[Open File](#)

[Open Folder](#)

## Recent

[ASV60\\_base](#) C:\projects\ASV60\_base

[StOOP](#) C:\projects\ASCodeTest\StOOP

[ASV60\\_base](#) C:\projects\ASV60\_base

## Settings

[Open Automation Studio Settings](#)

[Open Settings](#)

[Open Keyboard Shortcuts](#)

[Search for Extensions and Themes](#)

[Change Color Theme](#)

## Output ✕

AS Backend

```
[20:54:34 INF] Starting up:
```

```
[20:54:35 INF] Now listening on: http://localhost:27000
```

```
[20:54:36 INF] Application started. Press Ctrl+C to shut down.
```

```
[20:54:36 INF] Hosting environment: Production
```

```
[20:54:36 INF] Content root path: C:\Program Files\BRAutomation\Automation Studio Code\resources
```

```
[20:54:36 INF] Request starting HTTP/1.1 GET http://localhost:27000/api/jsonrpc/theia - null null
```

```
[20:54:36 INF] WebSocket request received
```

[Virtual Support Agent](#)[Code Generator](#)[Coding Guideline Checker](#)[More ▾](#)

Enter your prompt here



# **Live demo**

Ask for Help during coding –  
generate glue code

## PLC CODING



Welcome

Types.typ ×

Variables.var



Global.typ Global data types

Global.var Global variables

Libraries Global libraries

Program

Main.st Init, cyclic, exit code

Types.typ Local data types

Variables.var Local variables

Package

mappView

Logical &gt; Program &gt; Types.typ &gt; ...

```
1
2  TYPE
3     enMachineStateEnum :
4         (
5             MACHINE_IDLE,
6             MACHINE_STARTING,
7             MACHINE_RUNNING,
8             MACHINE_STOPPING,
9             MACHINE_ERROR
10        );
11 END_TYPE
12
```

Output × Debug Console

AS Backend



```
[21:36:13 INF] Application started. Press Ctrl+C to shut down.
```

```
[21:36:13 INF] Hosting environment: Production
```

```
[21:36:13 INF] Content root path: C:\Program Files\BRAutomation\Automation Studio Code\resource
```

# **Live demo**

Ask for Help during coding –  
Guideline Check

# Guideline Check

Upon reviewing the updated code, the following coding guidelines are still broken:

## Rule C001: Give meaningful names to variables

- The variable name `Counter` is too general and does not clearly indicate its purpose.

## Rule C201: Describe all elements

- The variable `Counter` and the function block instance `MyStFunctionBlockInst` still lack descriptions.

## Rule C205: Delete commented-out code

- The comment `// TODO fix this` remains and should be addressed or removed.

## Suggested Changes:

- Rename `Counter` to a more meaningful name, such as `CycleCounter`.
- Add descriptions for `CycleCounter` and `MyStFunctionBlockInst`.
- Remove the `// TODO fix this` comment.

## Updated Code:

```
PROGRAM _INIT
  (* Insert code here *)

END_PROGRAM

PROGRAM _CYCLIC
  CycleCounter := CycleCounter + 1; // CycleCounter
  IF CycleCounter > 42 THEN
    CycleCounter := 0; // Reset CycleCounter
  END_IF
  MyStFunctionBlockInst.newParam := 33; // Set
END_PROGRAM

PROGRAM _EXIT
  (* Insert code here *)

END_PROGRAM
```

```
1
2 PROGRAM _INIT
3   (* Insert code here *)
4
5 END_PROGRAM
6
7 PROGRAM _CYCLIC
8   Counter := Counter + 1
9   IF Counter > 42 THEN
10    Counter := 0;
11  END_IF
12  MyStFunctionBlockInst.newParam := 33;
13  // TODO fix this
14 END_PROGRAM
15
16 PROGRAM _EXIT
17   (* Insert code here *)
18
19 END_PROGRAM
20
21
```

Output Type Hierarchy Debug Console

# UseCase

Ask for Help during coding –  
code checks

# Code Optimize

```
PROGRAM _CYCLIC
  IF counter = 0 THEN
    counter := counter + 1;
  ELSIF counter = 3 THEN
    counter := counter + 1;
  ELSE
    counter := counter + 1;
  END_IF;
END_PROGRAM
```

```
PROGRAM _CYCLIC
  counter := counter + 1;
END_PROGRAM
```

AS COPILOT (BETA): AS COPILOT



Welcome


Types.typ

Main.st ×

Variables.var



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Let me know how may I help you?

Logical &gt; Program &gt; Main.st &gt; ...

```
1 PROGRAM _INIT
2     (* Initialization code can be placed here *)
3 END_PROGRAM
4
5 PROGRAM _CYCLIC
6     (* NOT SURE WHAT HAPPENS *)
7     IF counter = 0 THEN
8         counter := counter + 1;
9     ELSIF counter = 3 THEN
10        counter := counter + 1;
11    ELSE
12        counter := counter + 1;
13    END_IF;
14
15
16
17
18
19
20
21
22
23
24
25
```

Output ×

Debug Console

AS Backend



Virtual Support Agent

Code Summary Agent

More ▾



Enter your prompt here



```
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automationLAB – open for you

# The Importance of Machine Vision


AI Driven Vision is revolutionizing traditional manufacturing processes



- AI and automation in manufacturing can **boost productivity** by **10–20%**
- **25–50% less downtime** via AI Driven predictive maintenance
- Up to **99% defect detection accuracy**
- Reinventing the way machines operate **as part of the control loop**

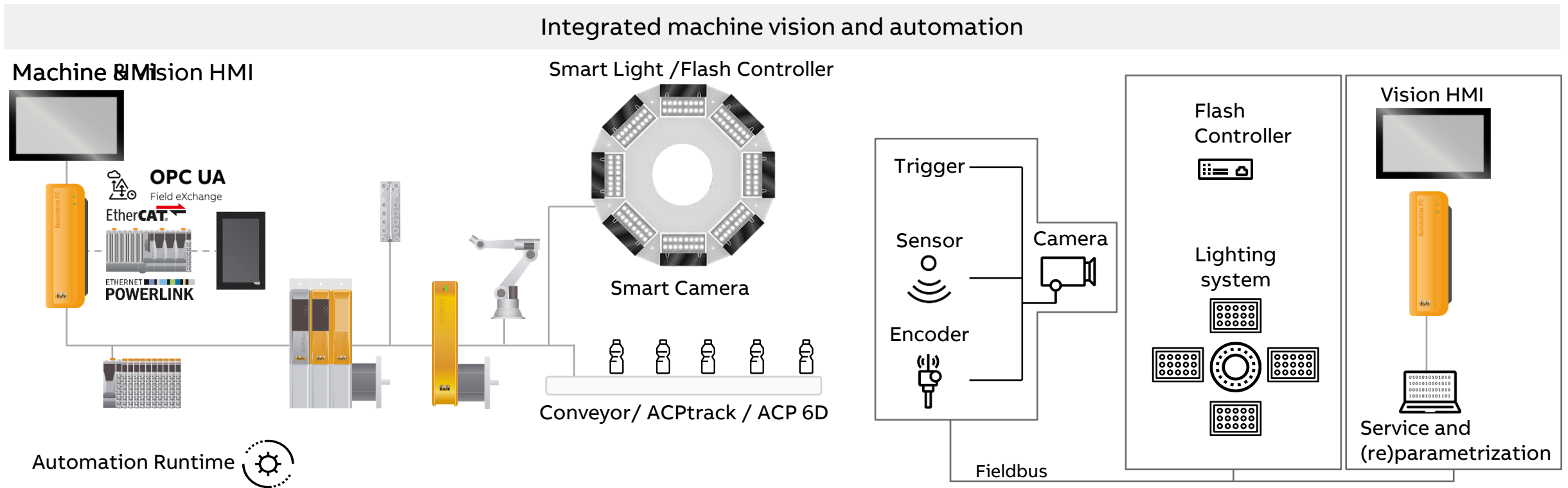


**1  $\mu$ s**

empowered by  
**26 TOPS** 

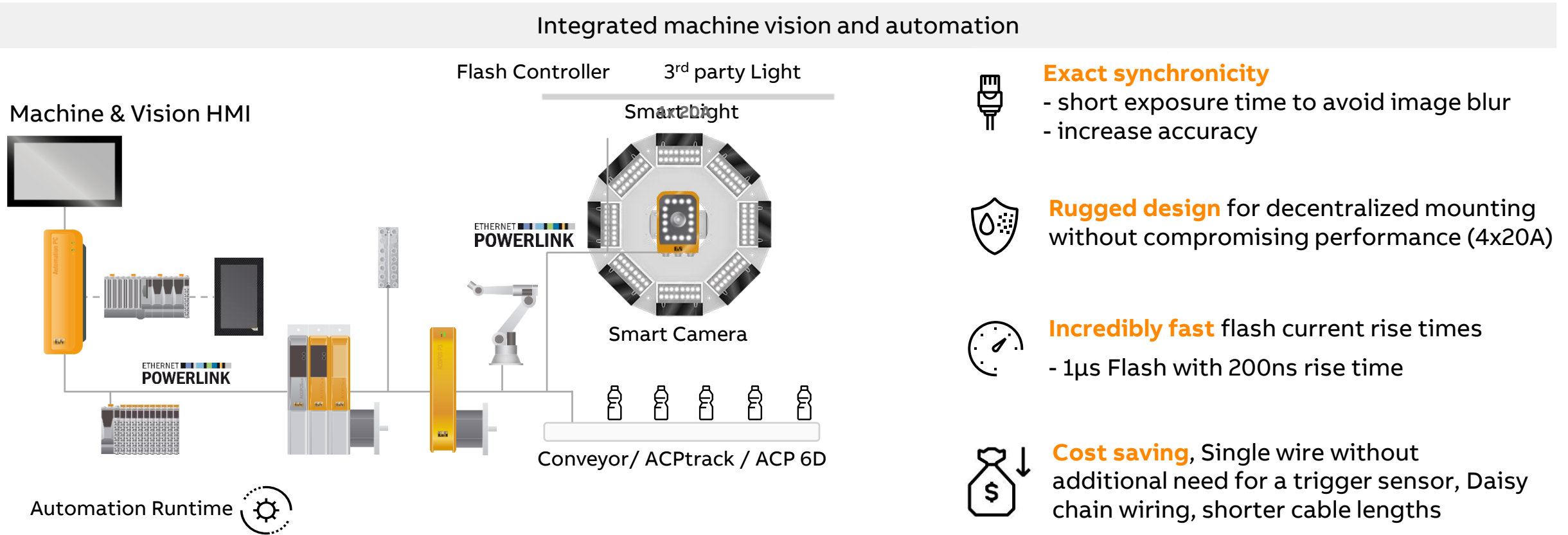
# State of the art

... is not enough for us!



# Flash Controller

... faster, more accurate, more flexible



High Power Flash Controller for designed for high performance machines

# Smart Camera

... Factory Calibrated and tailored to factory automation needs



# Light



**Flash Controller**  
4x20A – in total 80A/3840W

**Backlight variants**

- 150 x 150mm
- 150 x 300 mm
- 150 x 450 mm
- 150 x 600 mm
- 300 x 300 mm
- 300 x 450 mm

**Light bars LED optic**  
wide, regular, narrow

**Light bars variants**

- Light bar row
- Assembly of two, three or four light bars
- Light bar ring
- Assembly of four, six or eight light bars



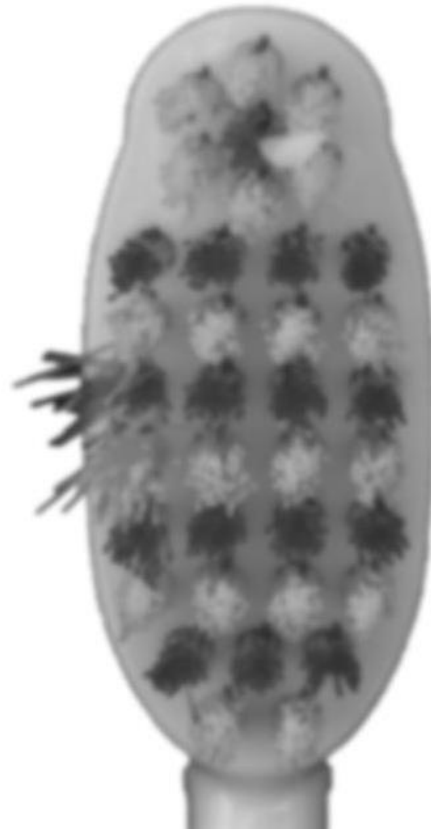
**Colors (light bar and backlight)**  
IR, red, green, lime, blue, white

**Filter options (backlight 150x150 mm)**  
Polarizing filter  
Collimator filter

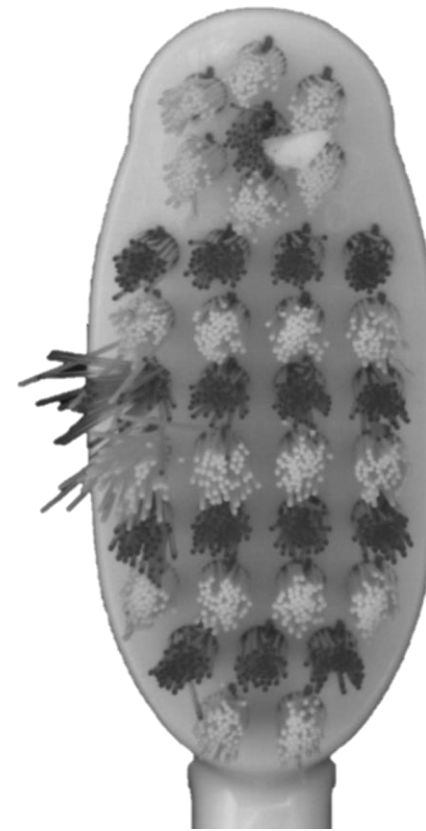
**Light bar functions**  
Electronic angle adjustment  
from -45° to +90°

# Image Quality is key (also for AI)

... unleash the power of integrated Machine Vision



Machine Vision w/o a flash-light



Integrated Machine Vision with flash-light

# AI Vision for "Dark Factories"

Is B&R AI Vision the missing link to Autonomous "Dark Factories"?

**Adjust/correct the machine during runtime**

**Boost** machine **performance**

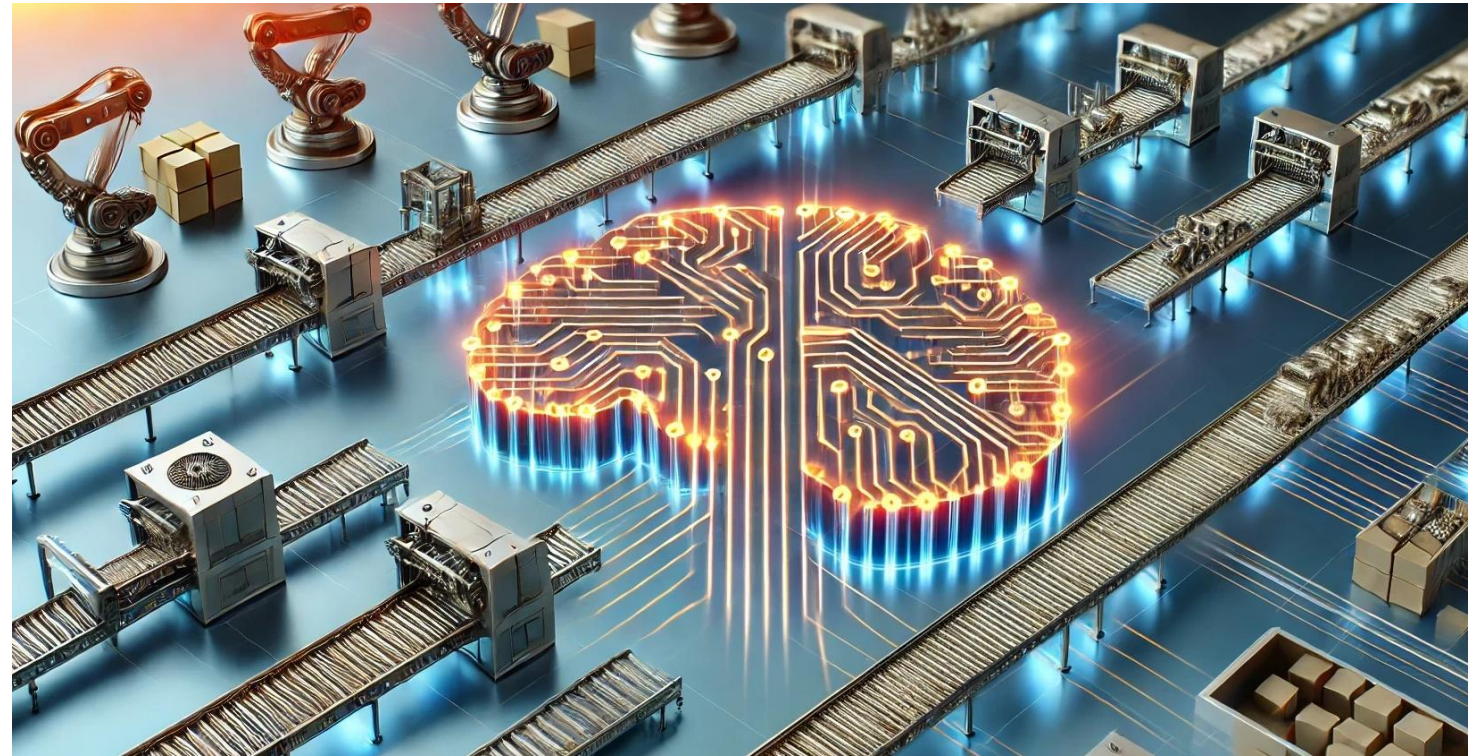
**Avoid** unnecessary product **waste**

**Avoid** costly **downtime**

Avoid relying on the skillset and efficiency of operators

**Increase** productivity and OEE

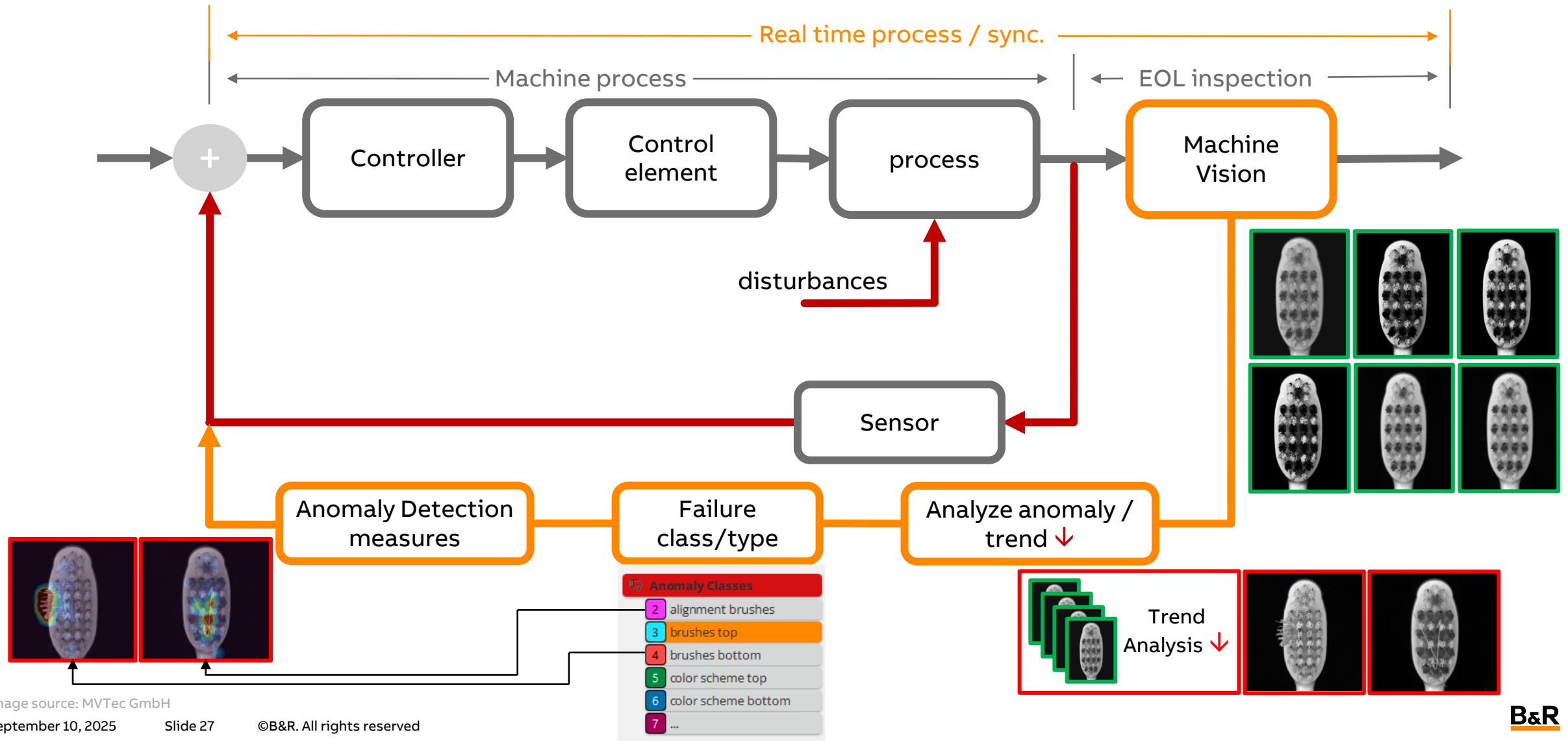
Ultimately, adding to your overall revenue and profitability



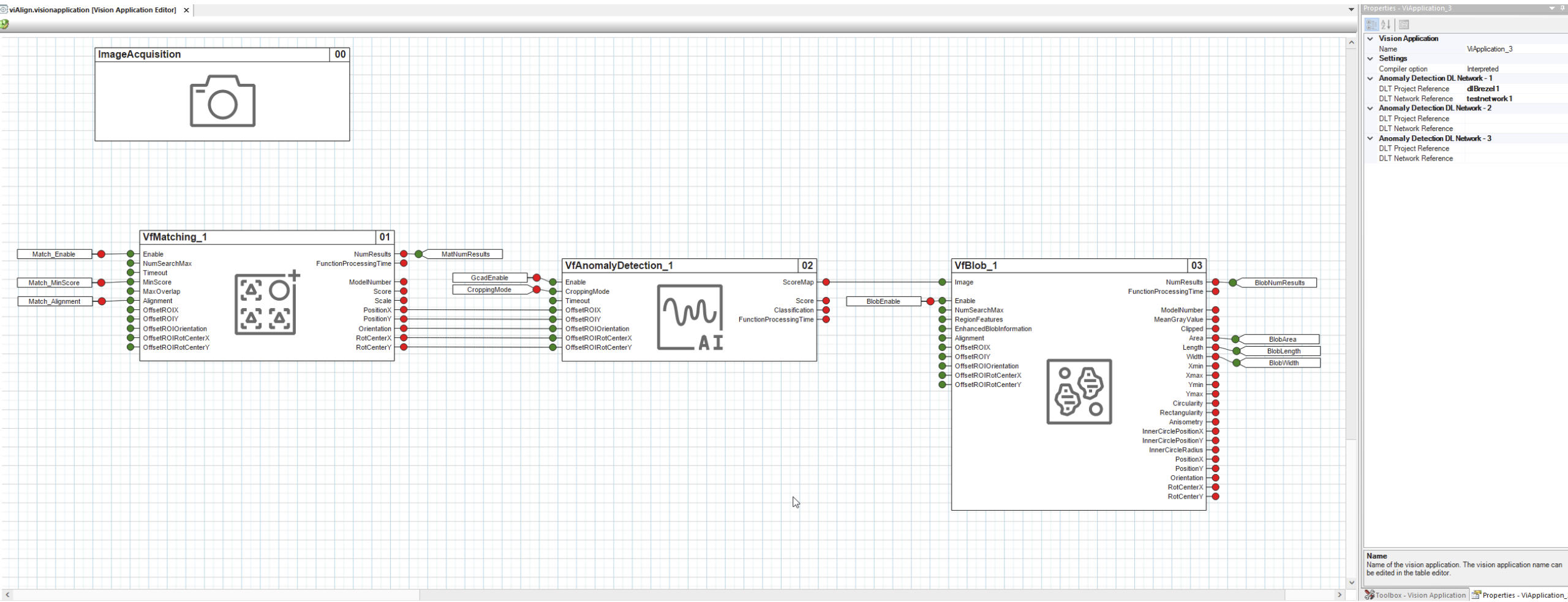
Through tough economic times the manufacturing sector can't stop innovating

# Deep Learning

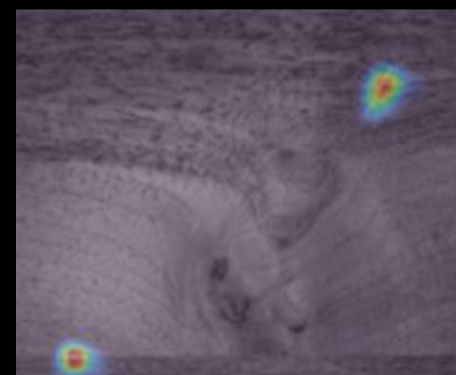
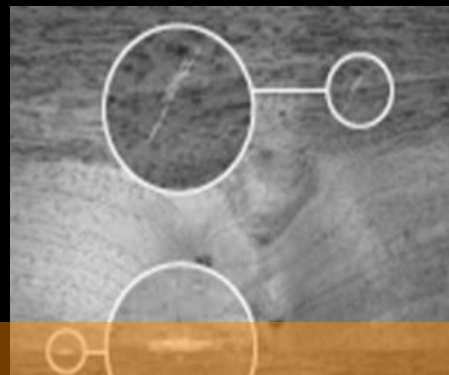
... AI as part of the control loop



# Deep Learning ... on the edge.



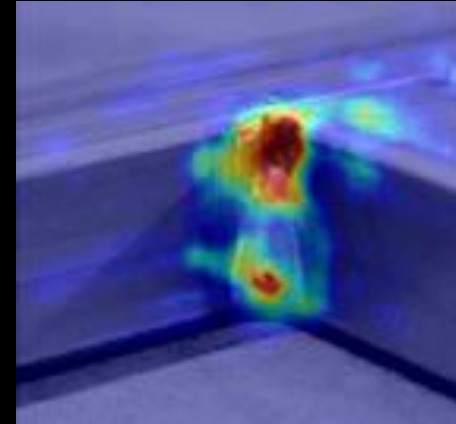
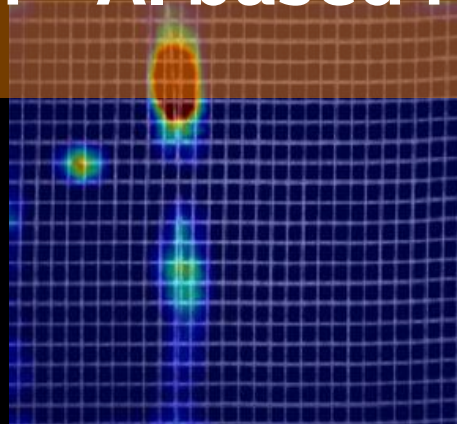
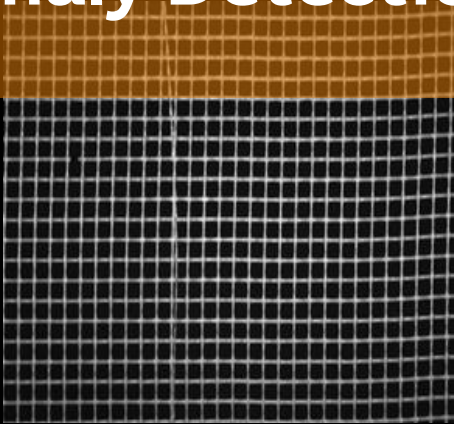
50 Images



40 Images

# Anomaly Detection – AI based Machine Vision

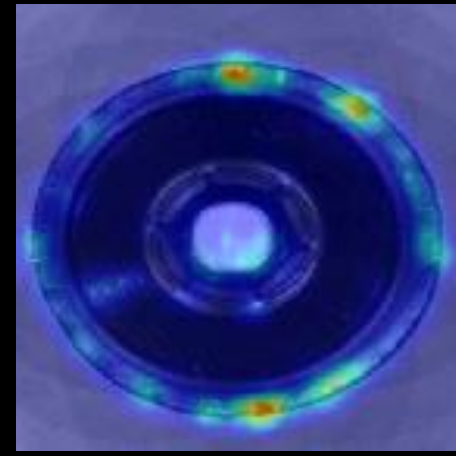
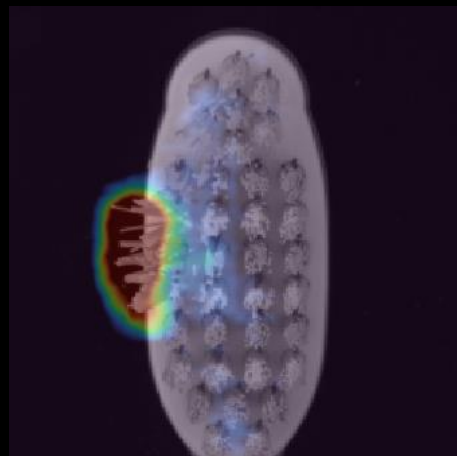
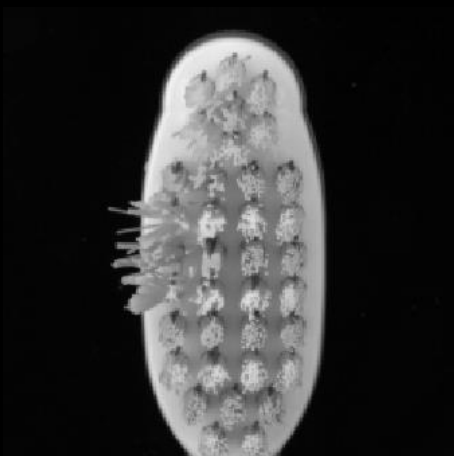
10 Images



290 Images

341 defects

60 Images



30 Images

# Deep Learning

... on the edge.

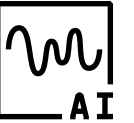


## Deep OCR

- No training for characters, read a wide variety of fonts, even on inhomogeneous backgrounds (textures or reflections)



empowered by  
26 TOPS



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automationLAB – open for you

# Passion4AutomationDay 2025

[www.passion4automationday.ch](http://www.passion4automationday.ch)



PASSION4AUTOMATION DAY  
**Jetzt kostenlosen Platz sichern!**  
20. November 2025

[Mehr erfahren](#)




"The following pages offer a glimpse into the future of machine automation. As they unfold, they reveal new potential – much like how our open solutions expand possibilities at every turn."

**Florian Schneeberger**  
Chief Technology Officer


**1 Cloud-based collaboration**  
Agile teams get to market faster with a new cloud-based engineering environment. A modern, efficient way for teams to interact with their projects and each other.  
AUTOMATION STUDIO CLOUD

**2 AI-assisted programming**  
Automation engineering gets a generative AI boost. Turn ideas in natural language straight into executable machine code.  
NEVER CODE AGAIN  
AUTOMATION STUDIO COPILOT




**3 Data-driven optimization**  
Go from "finger in the air" to finger on the pulse of the machine. Tune performance, improve energy use, and extend the life of your assets.  
IIOT CONNECTOR / ACOFOSTRAK MONITOR


**4 Connected IT-OT intelligence**  
Enterprise systems and machine control meet at the edge to enable advanced production optimization.  
X20 EDGE



**5 AI-enhanced vision**  
Increase uptime and production quality with new AI capabilities that give machines the power to recognize patterns and spot subtle differences.  
DEEP LEARNING FUNCTIONS FOR MACHINE VISION




**6 Powerful servo for harsh environments**  
Performance boost with 50 µs loops, double the power density, savings in wiring and maintenance, all with a smaller cabinet footprint.  
ACOPOS P3 UP TO 80 kW



**7 4 dimensions of efficient motion**  
New ways to lower costs, shrink footprint, simplify design and enable energy-efficient operation.  
X20 DRIVE / MOTOR ENDAT 3


**8 Adaptive safety**  
Open engineering and advanced collaboration in safety programming for enhanced efficiency and accelerated time to market.  
SAFETY+ / SAFEDESIGNER+



**9 Future-proof PC performance**  
Always ready for future demands with scalable state-of-the-art processors and flexible connectivity.  
2300 AND 3200-SERIES PC AND HMI

**10 Track and conveyor hand-in-hand**  
Small changes, big impact: Sometimes one section of track is all it takes for personalized, small batch production.  
ACOFOSTRAK HYBRID

**Congratulations! You've reached the beginning.**  
Where will your next steps lead you?  
br-automat.com/en/innovations



automationLAB  
Frauenfeld



# automationLAB

A good idea? Get in contact with us!

## Mechatronic Systems

- Machine Centrics Robotics (COMAU RebelS, COMAU Racer3, Codian Delta D4/D5)
- Linear Transportsystem (ACOPOStrak, SuperTrak)
- ACOPOS 6D

## Simulation

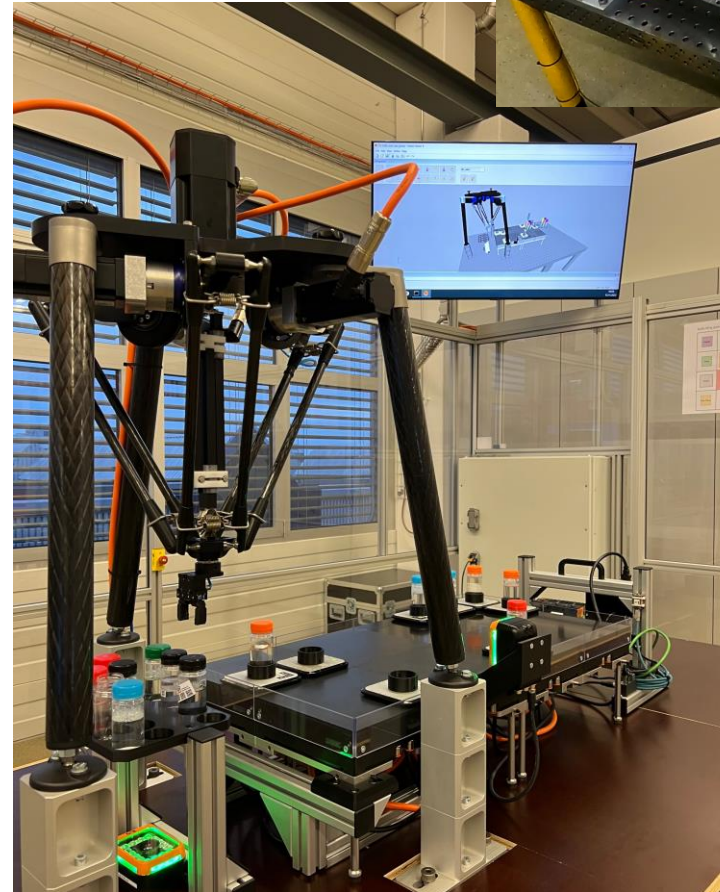
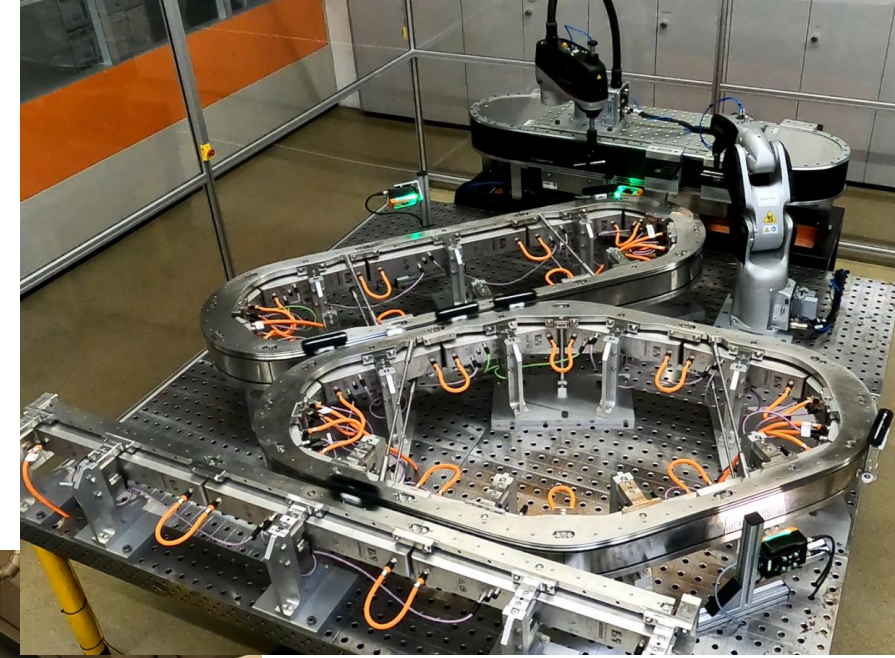
- Digital Twin (Cell 1 / Cell 2)

## Vision

- Vision SmartCamera / SmartSensor
- Synchronization with Motion (ACOPOStrak, ACOPOS 6D)

## Purpose

- Presentation
- Training
- Testing



# QnA



**B&R**



**A member of the ABB Group**