

**HAHN  
AUTOMATION  
GROUP**

**VIRTUAL  
ENGINEERING**



# VIRTUAL ENGINEERING TOOLS



Virtual Commissioning



Virtual  
Reality/Augmented  
Reality



Digital TWIN

# VIRTUAL COMMISSIONING DEFINITION



**environment for software development**

**increase software quality**

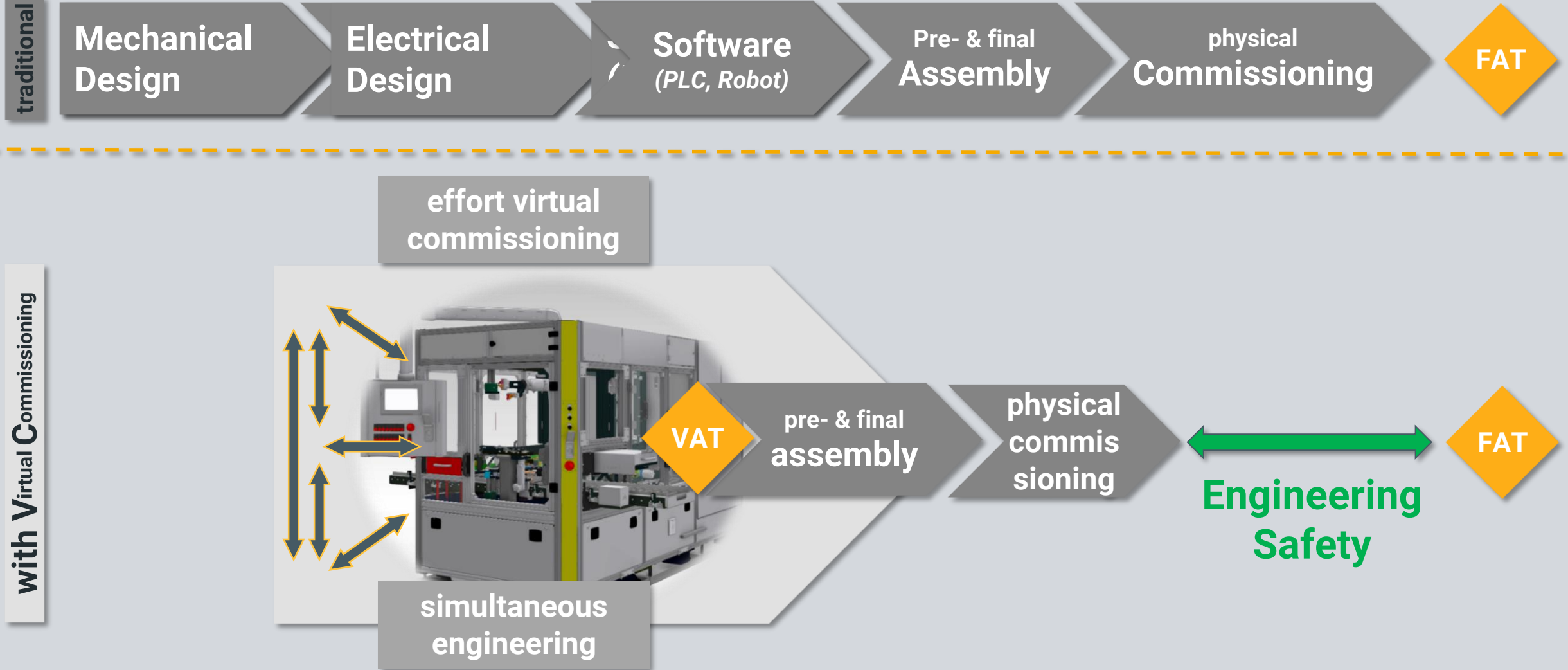
**early error analysis**

**simultaneous workflow**

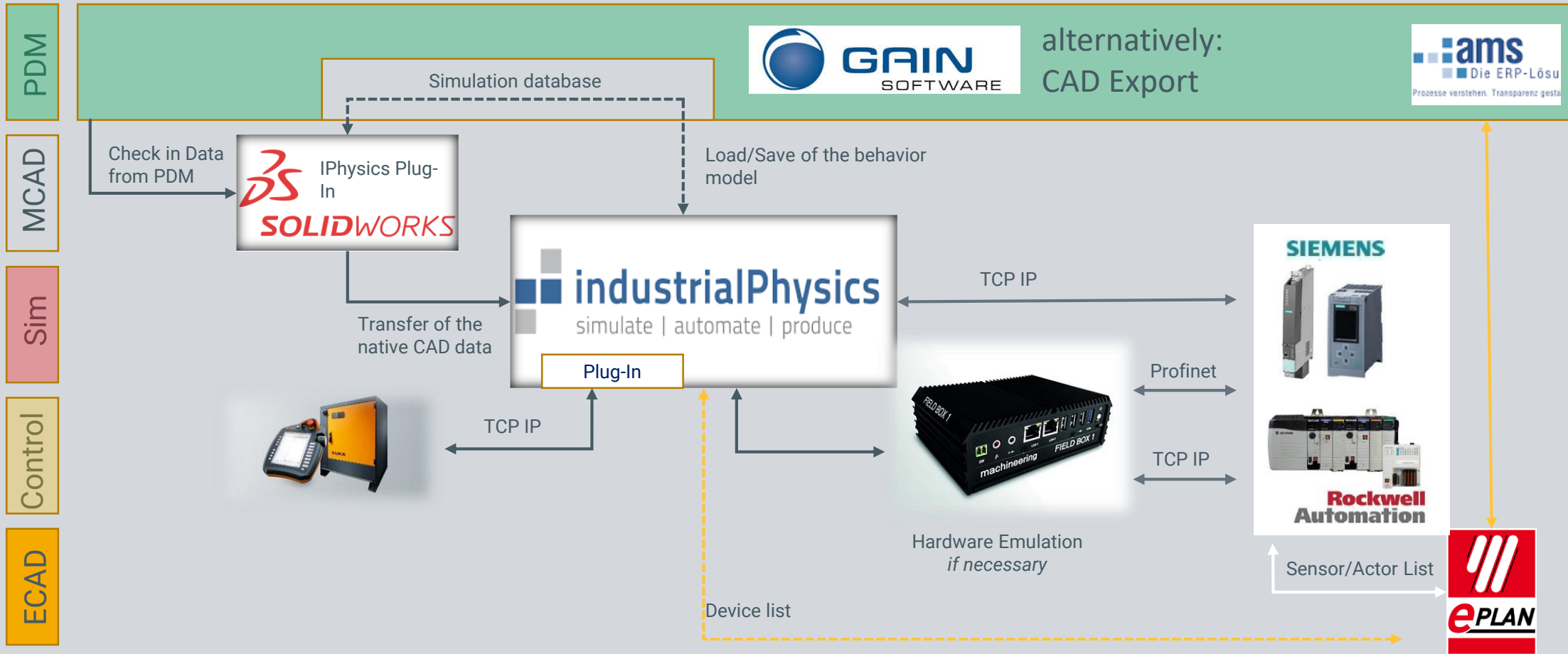
**Digital TWIN**



# WORKFLOW SIMULTANEOUS ENGINEERING



# VC SOFTWARE INTEGRATION





# WORKFLOW VIRTUAL COMMISSIONING

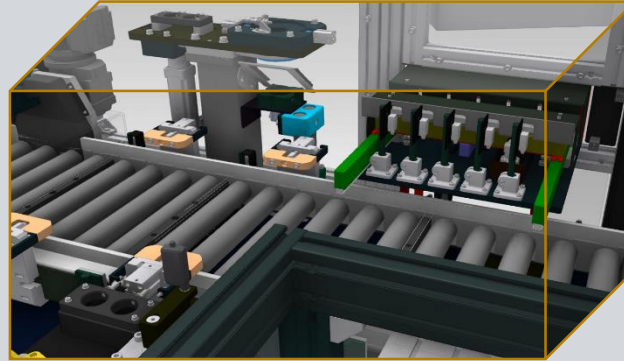
Virtual Engineer  
preperation

Native 3D data 1:1

Setup 3D Model

Import/Export I/O-List

CAD Data



Electrical Data

Exchange 3D Model

Software Engineer  
operation

Controller

Engineer Environments

PLC Controller

PLC Environment

Robot Controller

Robot Environment

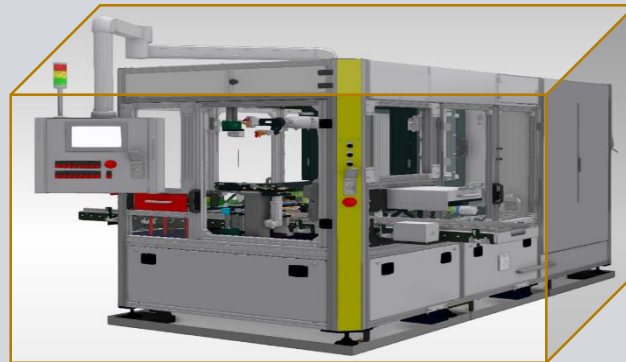
Database Systems

Database Environment

Various controller

various Environment

Software Code 1:1



# METHODS OF VIRTUAL COMMISSIONING

Model in the Loop (MIL)

Software in the Loop (SIL)

Hardware in the Loop (HIL)

## Model in the Loop (MIL)

- Method for simulation in an embedded system

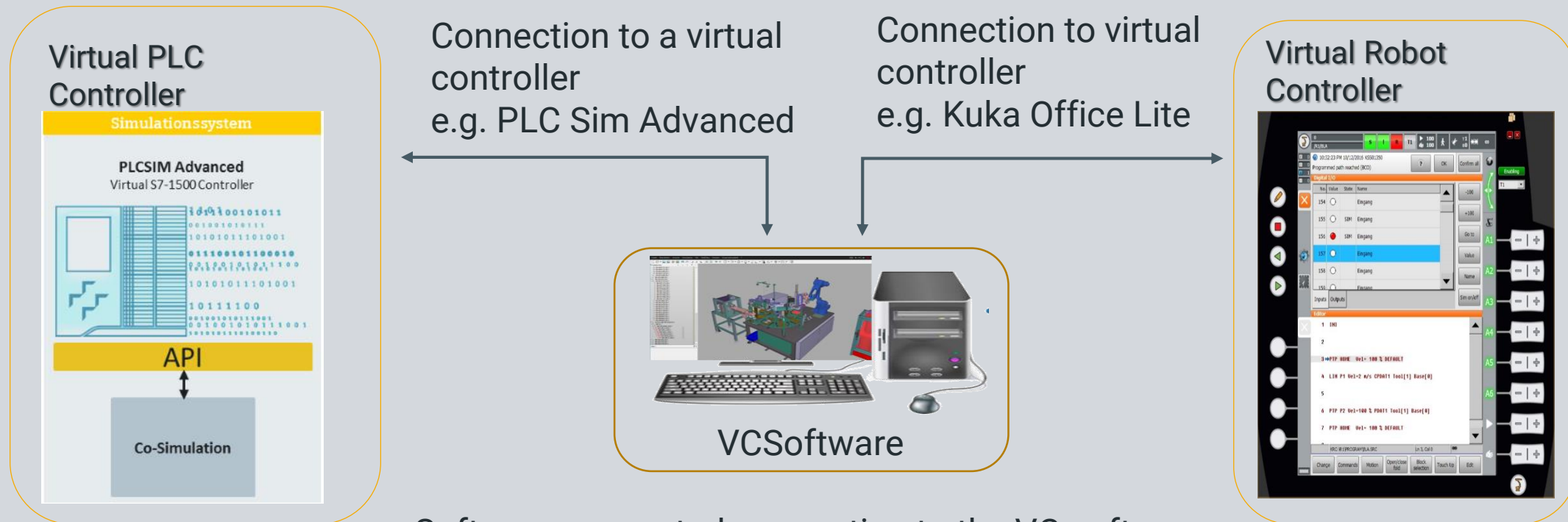






# METHODS OF VIRTUAL COMMISSIONING

## Software in the Loop (SIL)

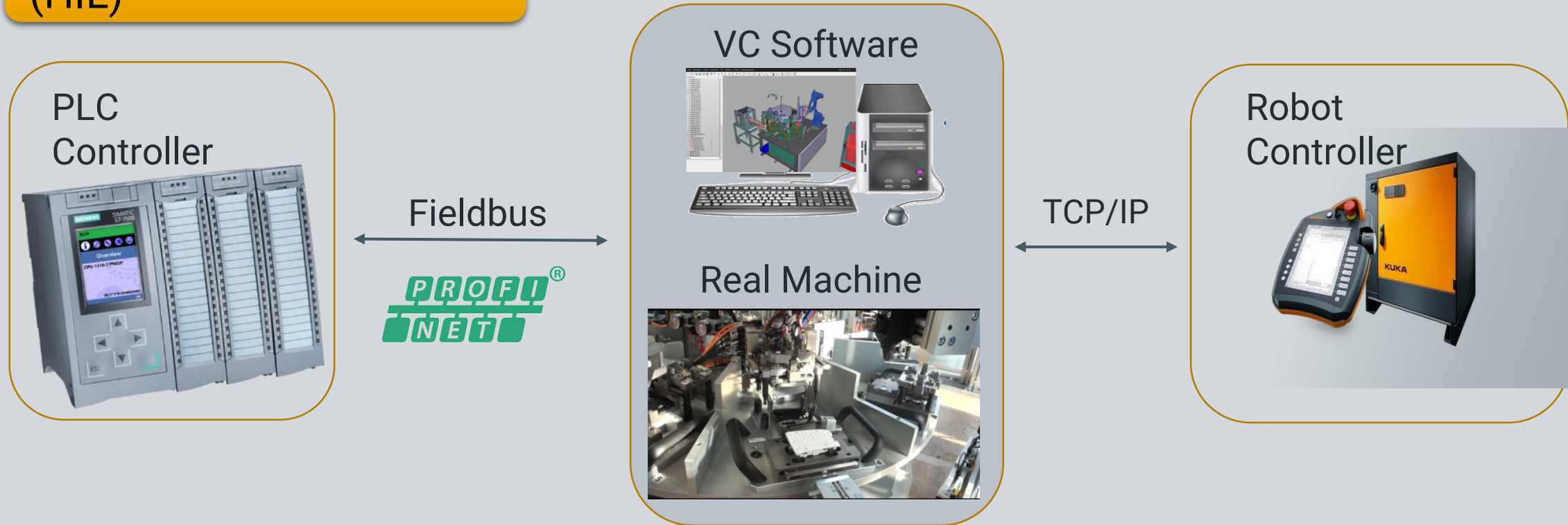


Software-supported connection to the VC software.



# METHODS OF VIRTUAL COMMISSIONING

## Hardware in the Loop (HIL)



Software-supported connection to the VC software



# VIRTUAL ENGINEERING PLATFORM

**virtual engineering server by HAHN**

## VC environments

Virtual Assembly

- 32 virtual locations for 3D machines
- Software iPhysics
- 3D Hardware powered by nVidia
- VR / AR Solutions
- SMART HMI by HAHN

## PLC environments

Virtual PLC Controller & Engineering Software

- Siemens
- Rockwell
- Beckhoff
- B&R
- HMI's
- Multiuser Server
- Database systems



## R&V environments

Virtual Robot Controller & Engineering Software

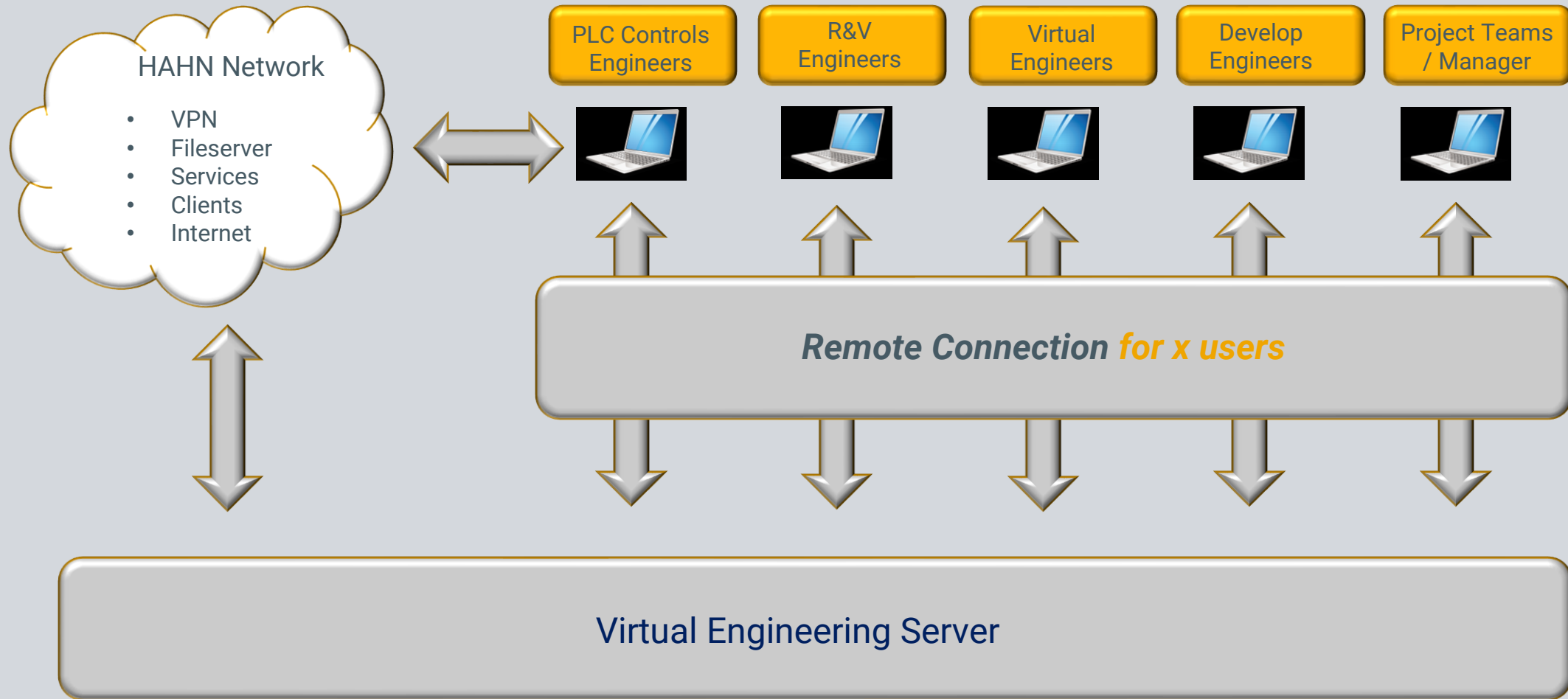
- KUKA
- ABB
- Fanuc
- Stäubli
- Denso
- Mitsubishi
- Kawasaki

## develop environments

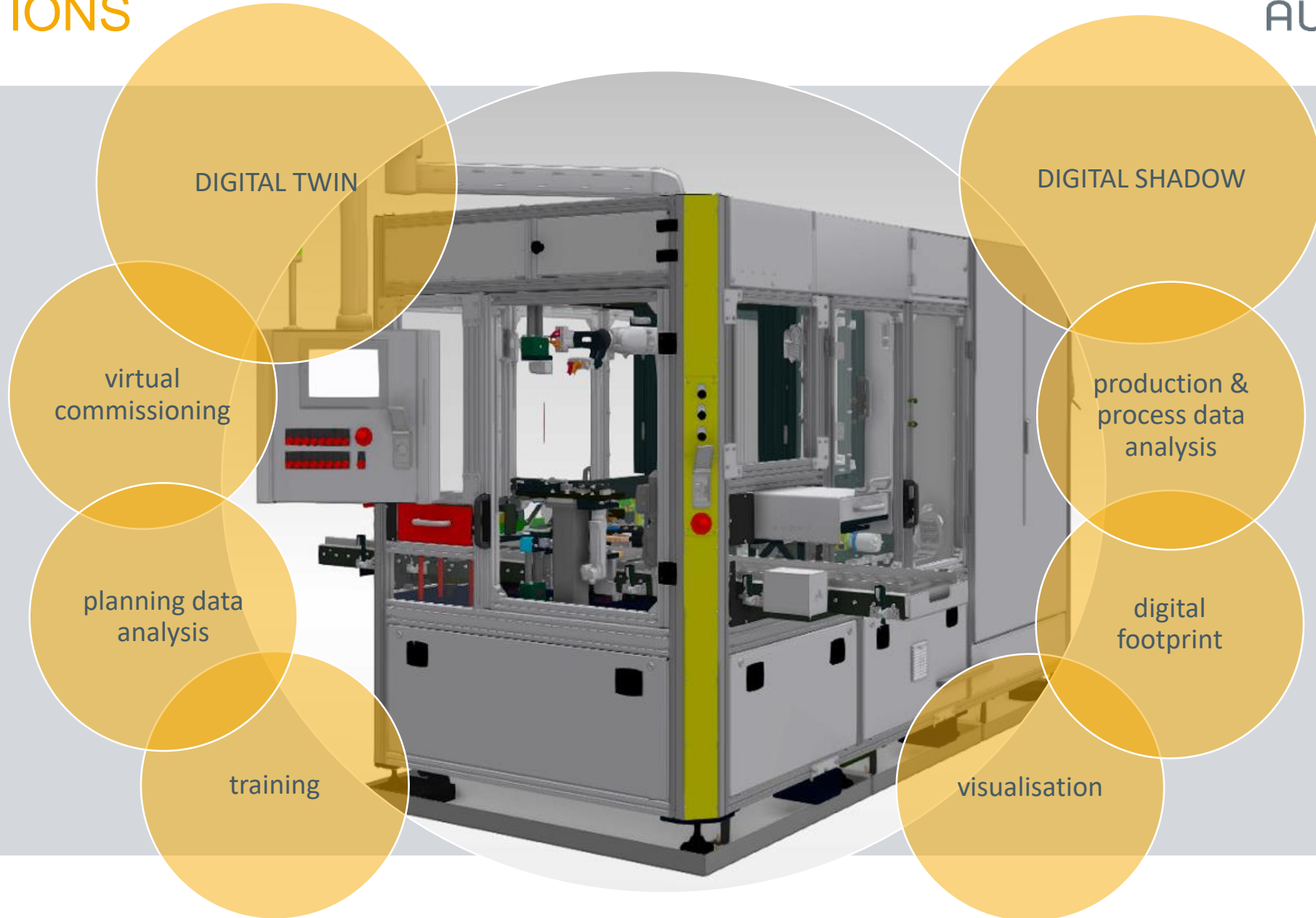
Diverse Machines

- Advanced developments
- Training modules
- Data analysis
- Code generator
- Digital customer support

# VIRTUAL ENGINEERING CONNECTIVITY



# SOLUTIONS



# VIRTUAL COMMISSIONING BENEFIT / OPPORTUNITIES

global collaboration

virtual customer training

retrofit simulation

virtual software training





EVE SUPPORT

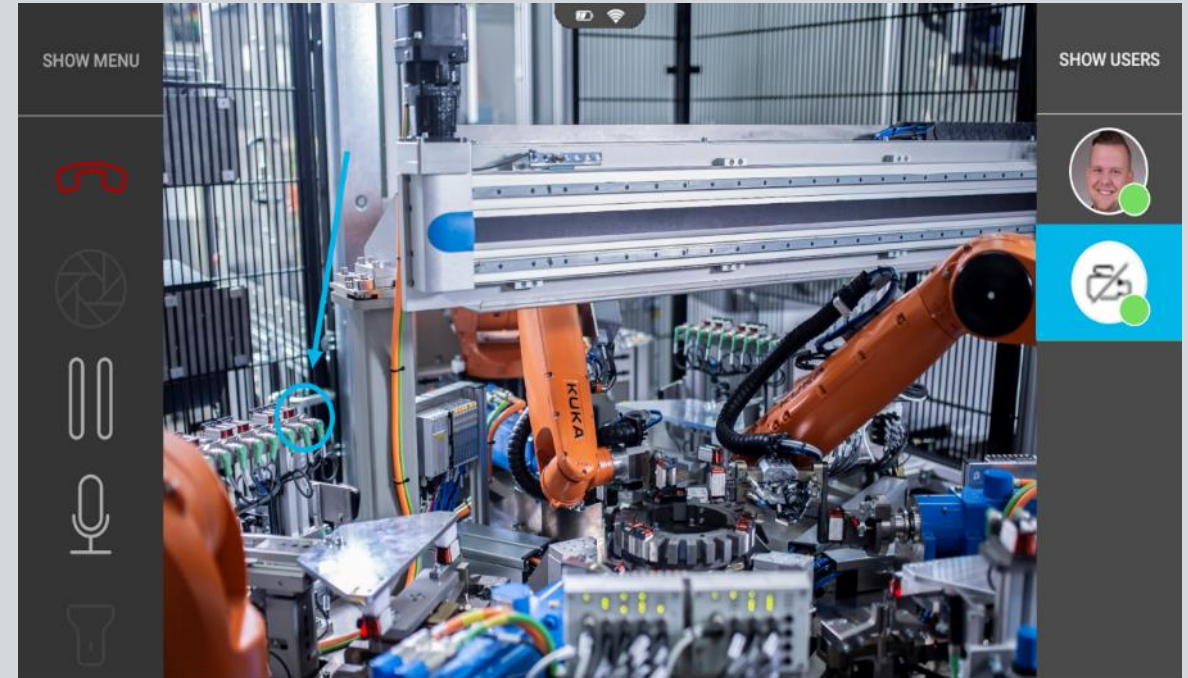
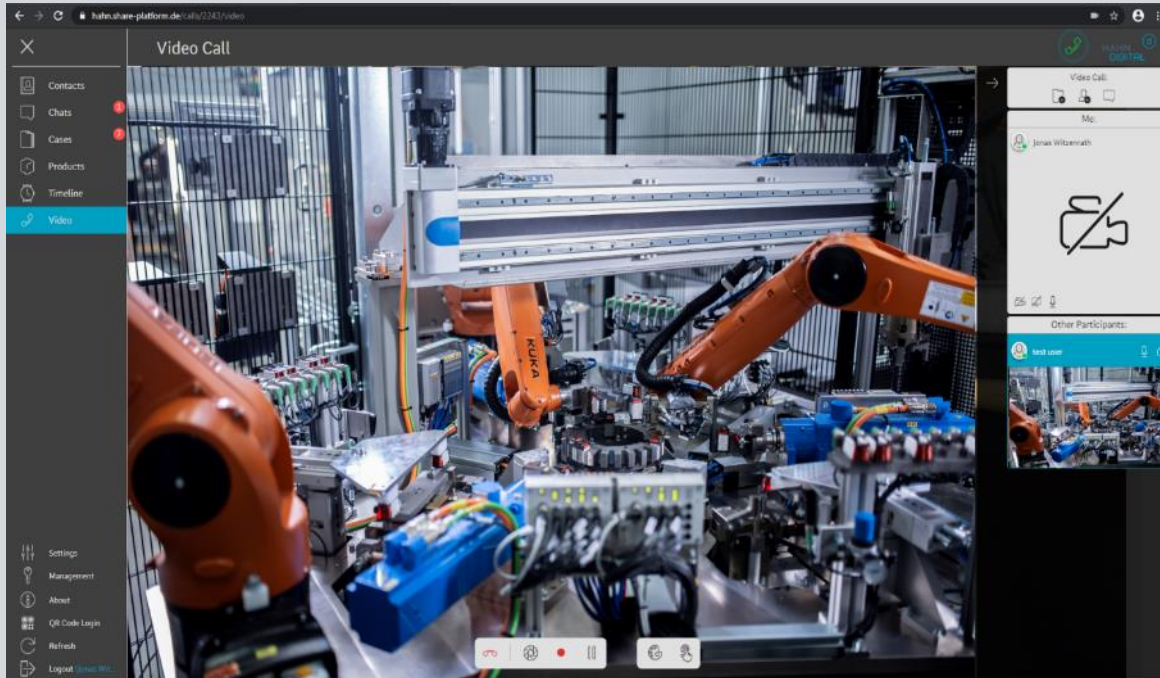


## Augmented-Reality- Powered Communication

**EVE Support** is an interactive augmented reality-powered visual **remote assistance** solution enabling experts to guide on-site technicians through **repair, maintenance, or inspection** steps **remotely**.

Using smart glasses, on-site technicians can show remote experts exactly what they see in a secure connection, allowing the experts to provide real-time assistance from their workplace by adding annotations, drawings, texts and pictures.

# EVE SUPPORT – SHARED VIEW FOR SUPPORT







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