- SMART FACTORY 4.0 -
A benefit for
humans and companies

Smart production

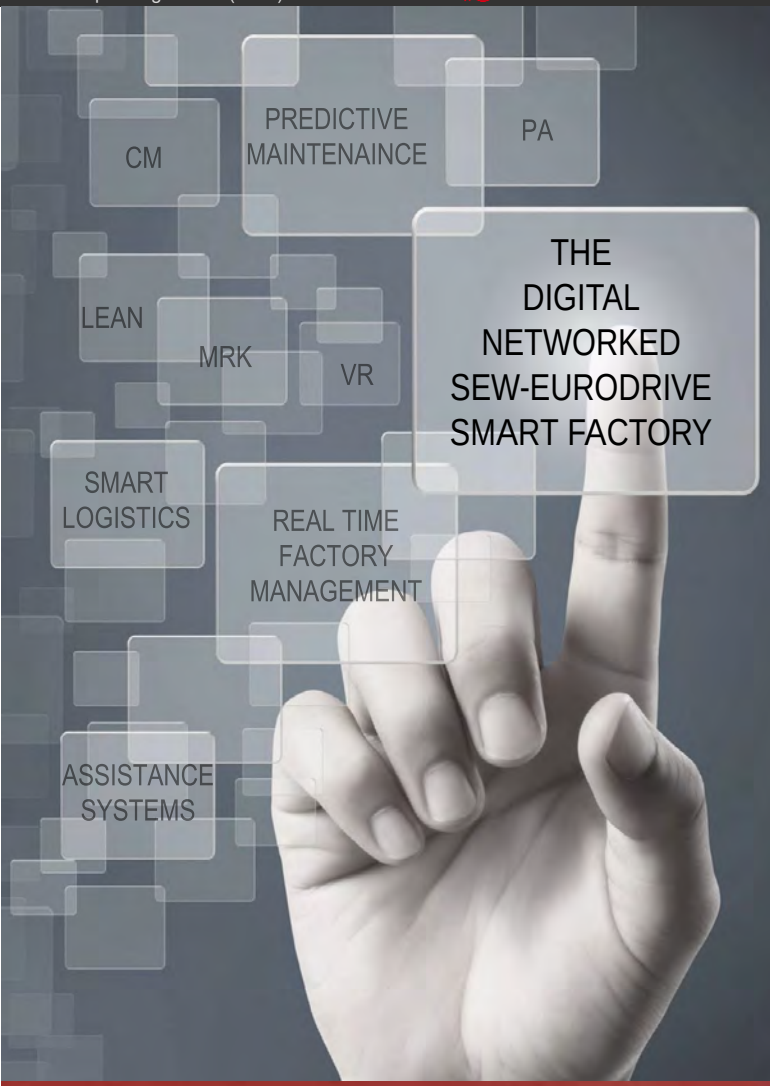
10 years ago
a journey began at the Hannover Fair ....

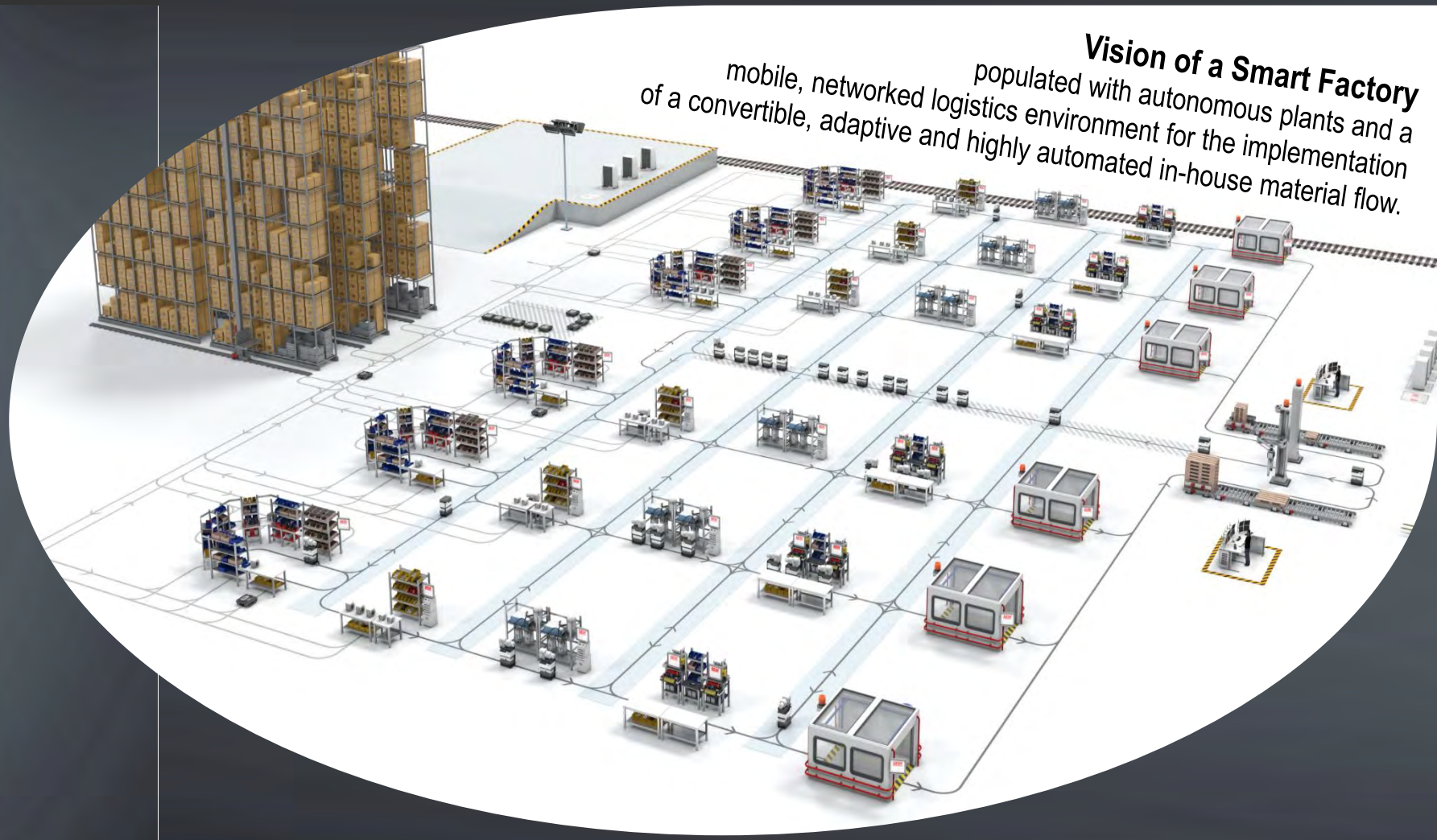
The factory of tomorrow
faster, more efficient, more versatile, more adaptable

In the factory of tomorrow,

- products will be carried from workstation to workstation by mobile assistance systems. The customer order will negotiate its processing itself and process data will be recorded during processing and stored in an orderly manner in a cloud via edge computing.
- Data Science, the coming artificial intelligence permanently optimizes production processes, detects incipient damage and thus prevents unplanned downtimes at production plants. This is the vision behind the buzzword Smart Factory 4.0.

SMART FACTORY 4.0
A vision of the future for production





SMART FACTORY 4.0 - Principle

Modular, scalable, convertible process modules

PROCESS MODULE FOR GLUING AND FILLING APPLICATIONS

PROCESS MODULE CABLE CUTTING MACHINE

PM - CABLE CUTTING MACHINE

PROCESS MODULE DECENTRAL STORAGE

PROCESS MODULE BONDING

The idea of
product- and cycle-time-neutral,
highly flexible production cells

PROCESS MODULE DECOPPLING BOOSTER

PROCESS MODULE LOAD PORTAL

SMART FACTORY 4.0 - Prinzip

Modular, scalable, convertible process modules

Custo-mizable

Mobile logistics assistants

Lot size „one“

CPS Systems

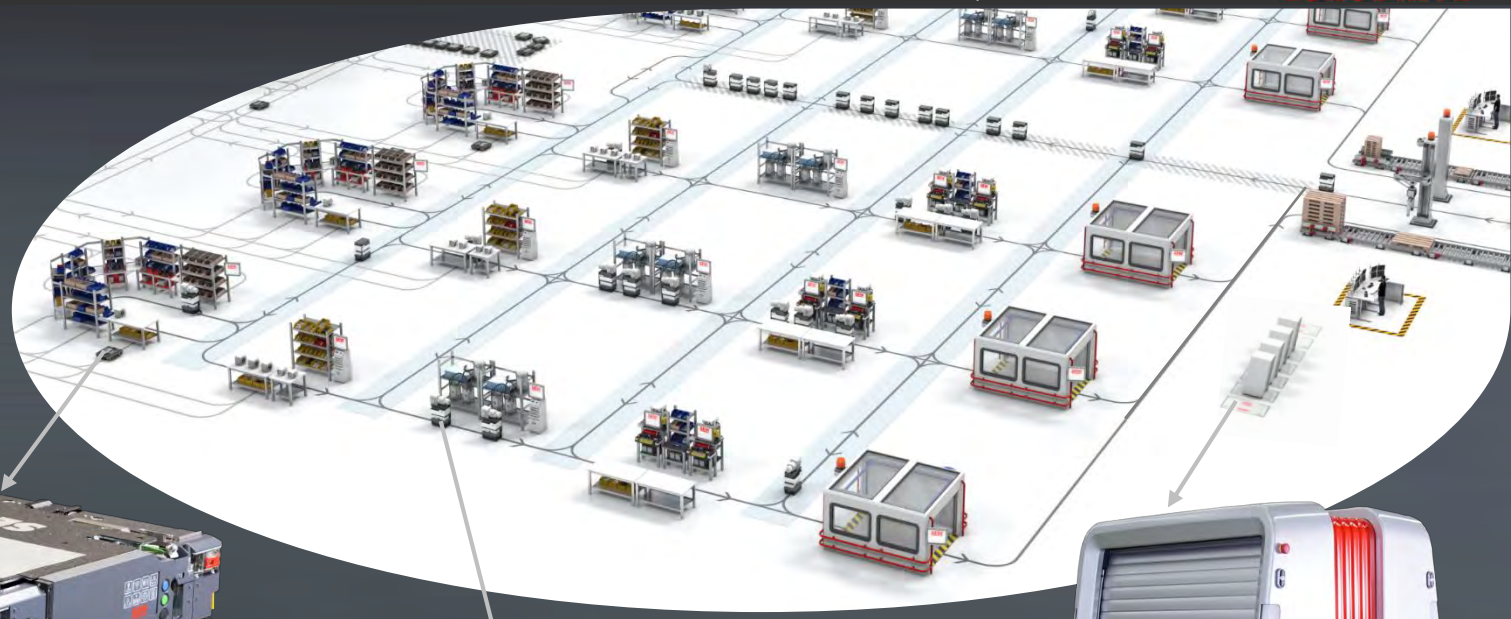
M2M

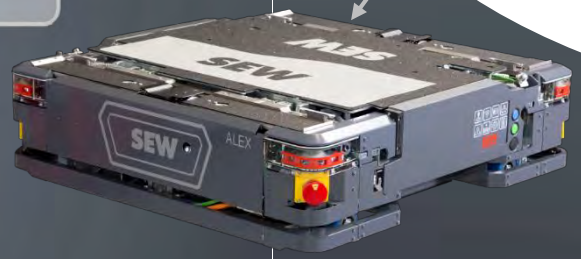
- MOBILE SYSTEMS
  - intelligent
  - networkable
  - configurable

Modular Design

Mobile Transport Systems

IOT CONNECTION

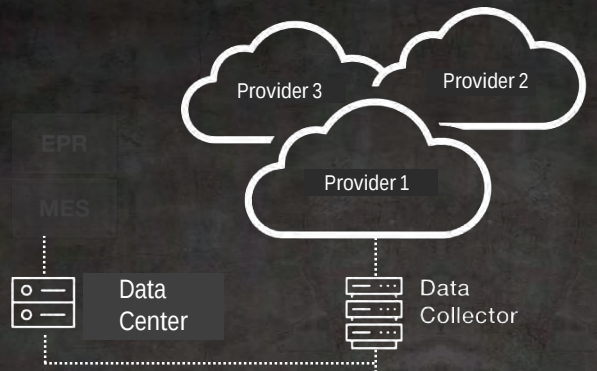




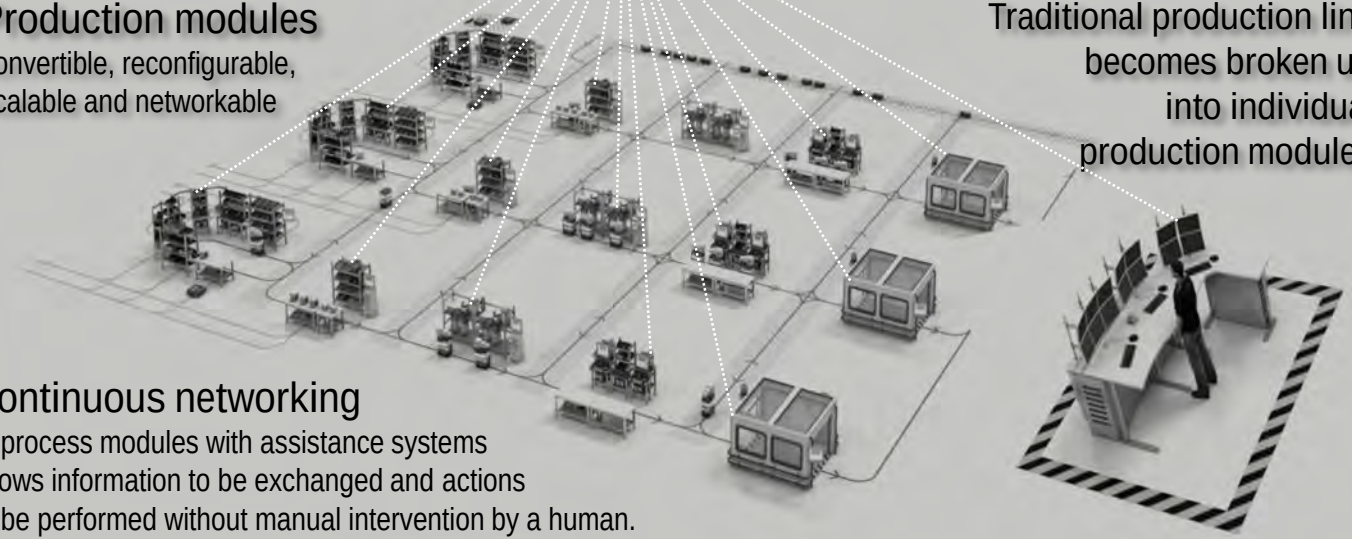
Mobile assistance systems are fully autonomous, intelligent vehicles that connect process modules and orient themselves to the spatial conditions of the plant.

SMART FACTORY 4.0 - Principle

Networking of process modules via mobile assistance systems



Production modules
convertible, reconfigurable, scalable and networkable



Traditional production line becomes broken up into individual production modules

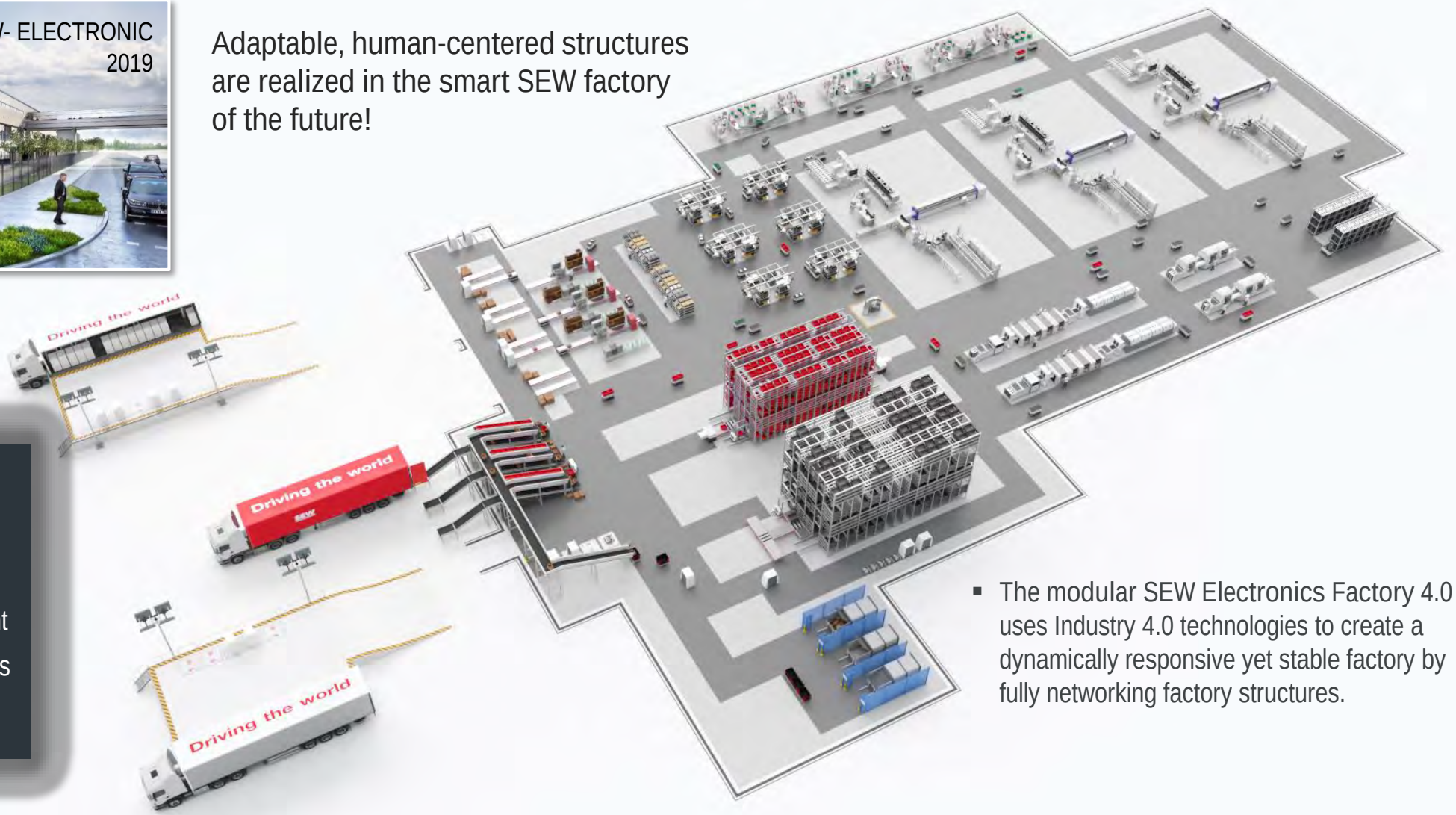
Continuous networking
of process modules with assistance systems allows information to be exchanged and actions to be performed without manual intervention by a human.

Cyber Physical Production System
Production at SEW-EURODRIVE

Assistance systems cooperate in assembly with people in an intelligent way; automated guided vehicles handle logistics orders autonomously.

SMART FACTORY 4.0 - Principle
Deployment cooperative assistance systems

Adaptable, human-centered structures are realized in the smart SEW factory of the future!



- Increased efficiency
- Intelligent logistics
- Faster processes
- Attractive working environment
- Supporting assistance systems
- Adaptable structures

- The modular SEW Electronics Factory 4.0 uses Industry 4.0 technologies to create a dynamically responsive yet stable factory by fully networking factory structures.

SMART FACTORY 4.0
New approaches in SEW electronics production

ASSISTANCE VEHICLE NAVIGATES FREELY THROUGH THE AREA TO THE BASIC EQUIPMENT BUFFERS OF THE SFU

DIRECTOR OF VALUE CREATION

ORDER FULFILLMENT IN TWO

HUMAN-TECHNOLOGY COOPERATION IN ORDER PROCESSING

TRAFFIC-HIGWAY
PARTS SUPPLY AND ORDER PROCESSING

PICK TO LIGTH -
COMMUNICATION ASSISTANCE SYSTEM / DEVICE BUFFER

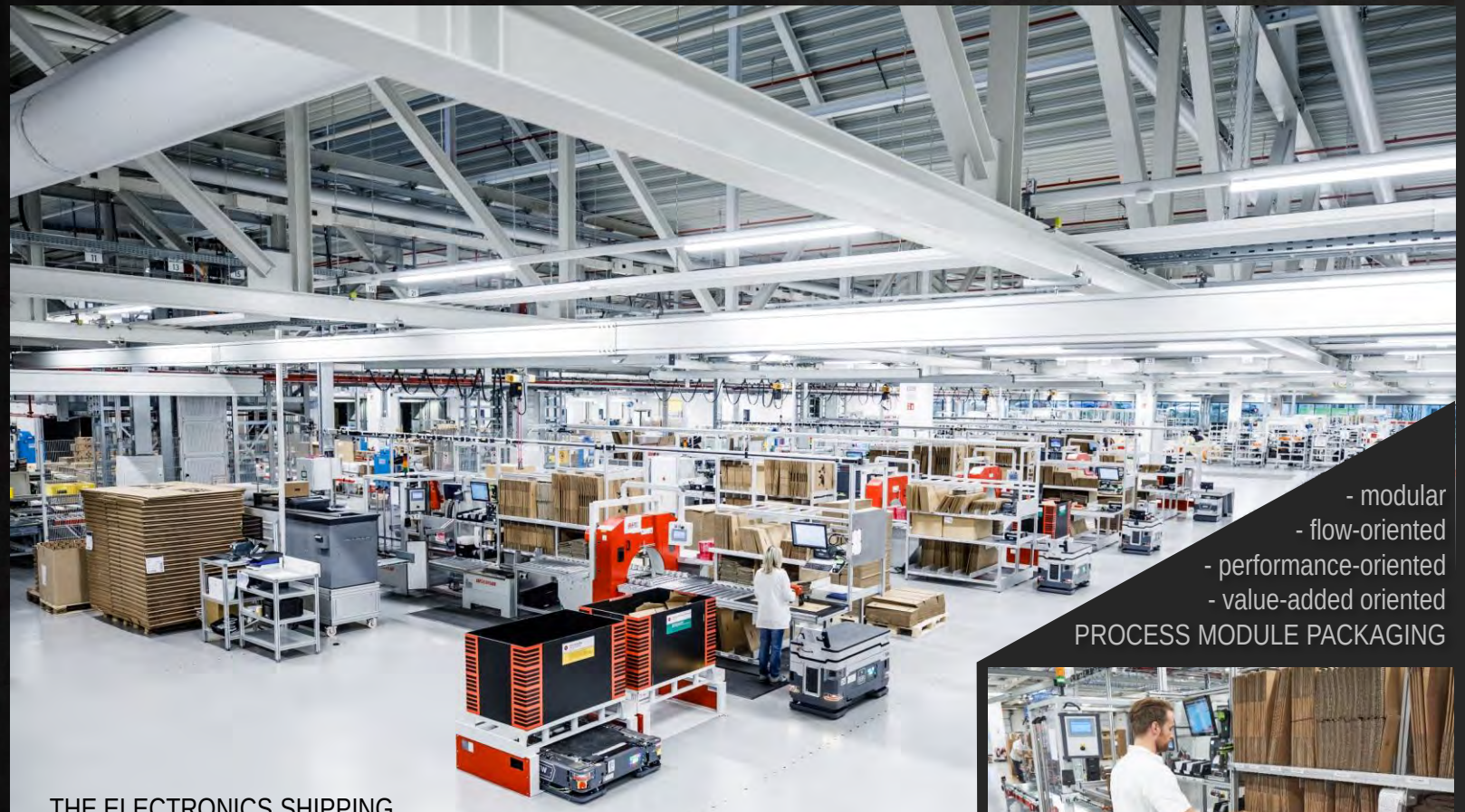
SEW ELECTRONICS PRODUCTION - SMART FACTORY 4.0
Order processing process - Cooperative order processing

SMART ORDER PROCESSING

TRAFFIC-HIGWAY
PARTS SUPPLY AND ORDER PROCESSING

SEW ELECTRONICS PRODUCTION - SMART FACTORY 4.0

Order processing process - Cooperative order processing



THE ELECTRONICS SHIPPING
is connected, transparent, proactive, agile.

ASSISTANCE VEHICLES TRANSPORT COMPLETED ORDERS TO THE SHIPPING LINES

- modular
- flow-oriented
- performance-oriented
- value-added oriented

PROCESS MODULE PACKAGING

HIGH EFFICIENCY PACKAGING LINE

ORDER TRANSFER SMART ORDER FROM THE ASSISTANCE SYSTEM TO ERP

CROSS TRANSFER CAR SORTED ON DELIVERY LINES

SEW ELECTRONICS PRODUCTION - SMART FACTORY 4.0

Shipping process - consistently flow- and performance-oriented

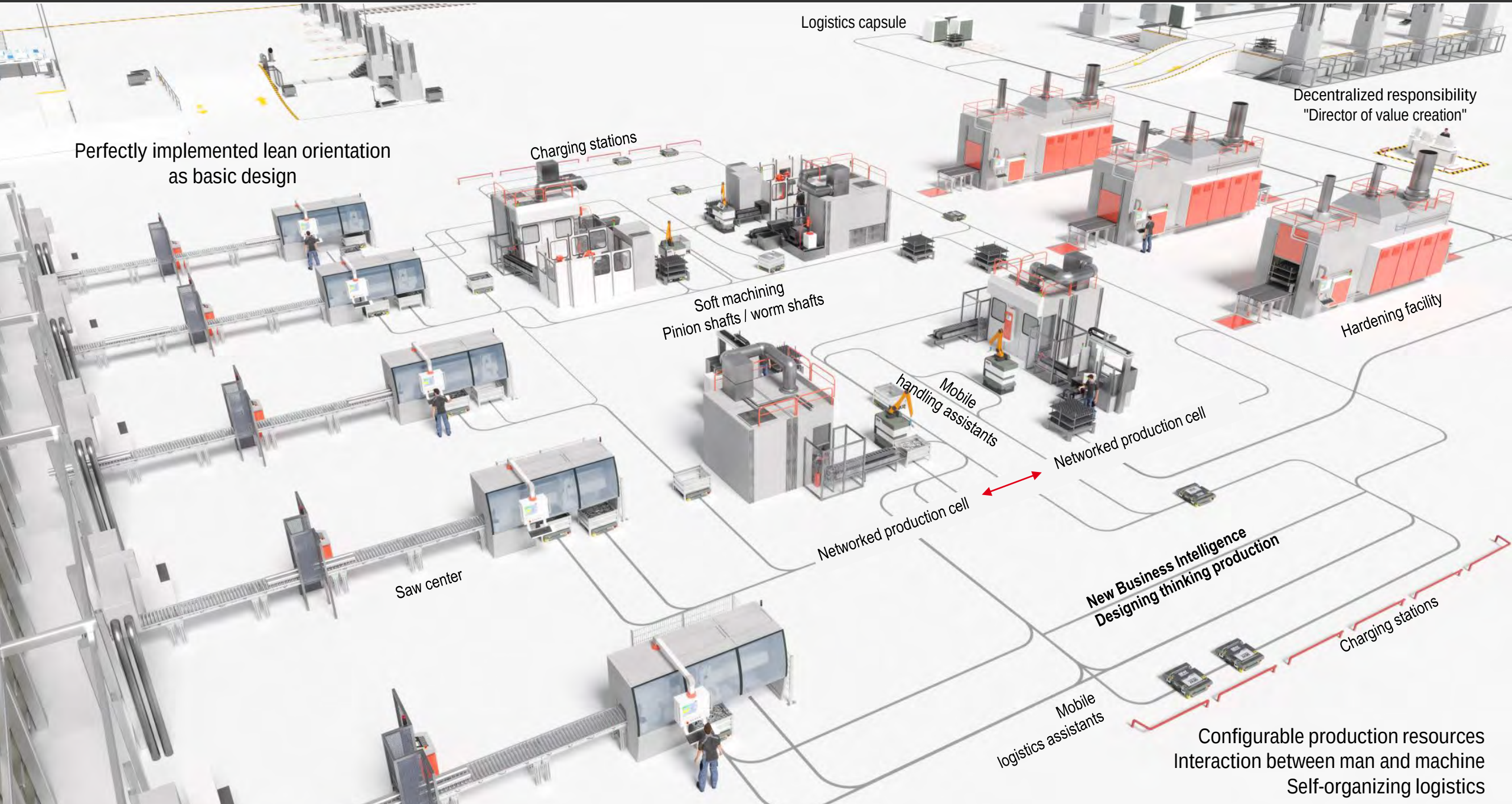
SEW ELECTRONICS PRODUCTION - SMART FACTORY 4.0

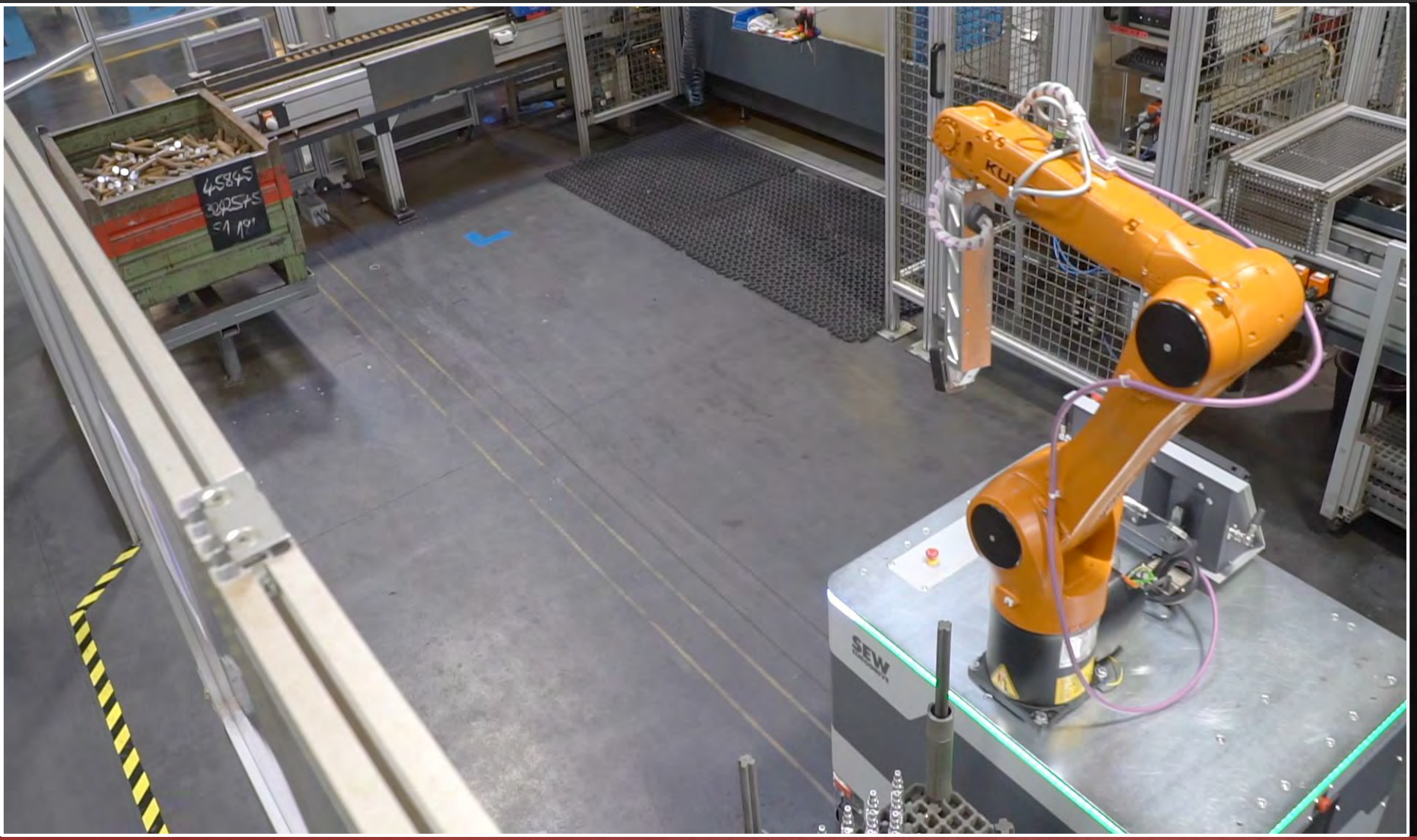
Shipping process - consistently flow- and performance-oriented

Manufacturing 4.0

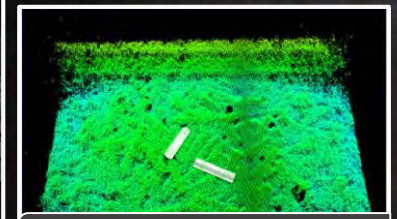
Produce more flexibly and economically

SEW MANUFACTURING SOLUTIONS
Modular, scalable, changeable, networkable, transparent, agile


Logistics capsule
Decentralized responsibility
"Director of value creation"
Perfectly implemented lean orientation
as basic design
Charging stations
Soft machining
Pinion shafts / worm shafts
Hardening facility
Mobile
handling assistants
Networked production cell
Networked production cell
Saw center
New Business Intelligence
Designing thinking production
Charging stations
Mobile
logistics assistants
Configurable production resources
Interaction between man and machine
Self-organizing logistics



PRODUCTION CELL SCREW SHAFT



PARTS DETECTION

ASSISTANT IN THE PROCESS

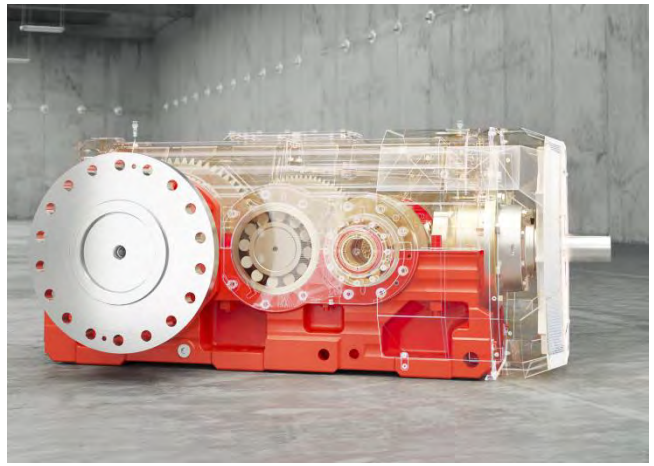
SEW SMART MANUFACTURING
Mobile handling assistant realized ‘grip in the box’

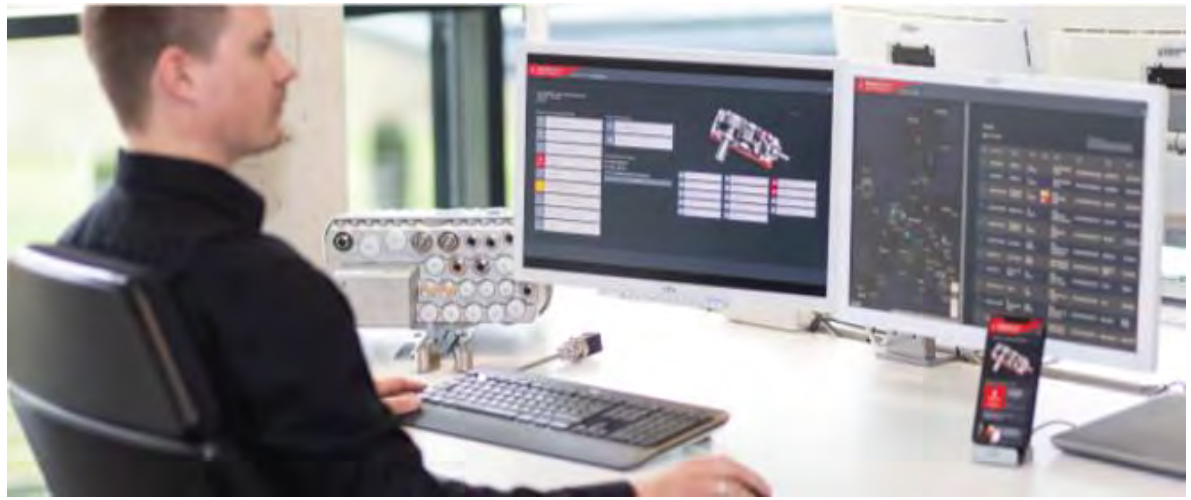
DriveRadar®
IoT Suite

Condition-based monitoring of transmission components and maintenance prognosis

For industrial gears

With DriveRadar® you can plan measures for the maintenance and servicing of your drives in advance and avoid unwanted failures of your systems.





Functional components

Data Analytics
Automatic analysis and evaluation on SEW servers

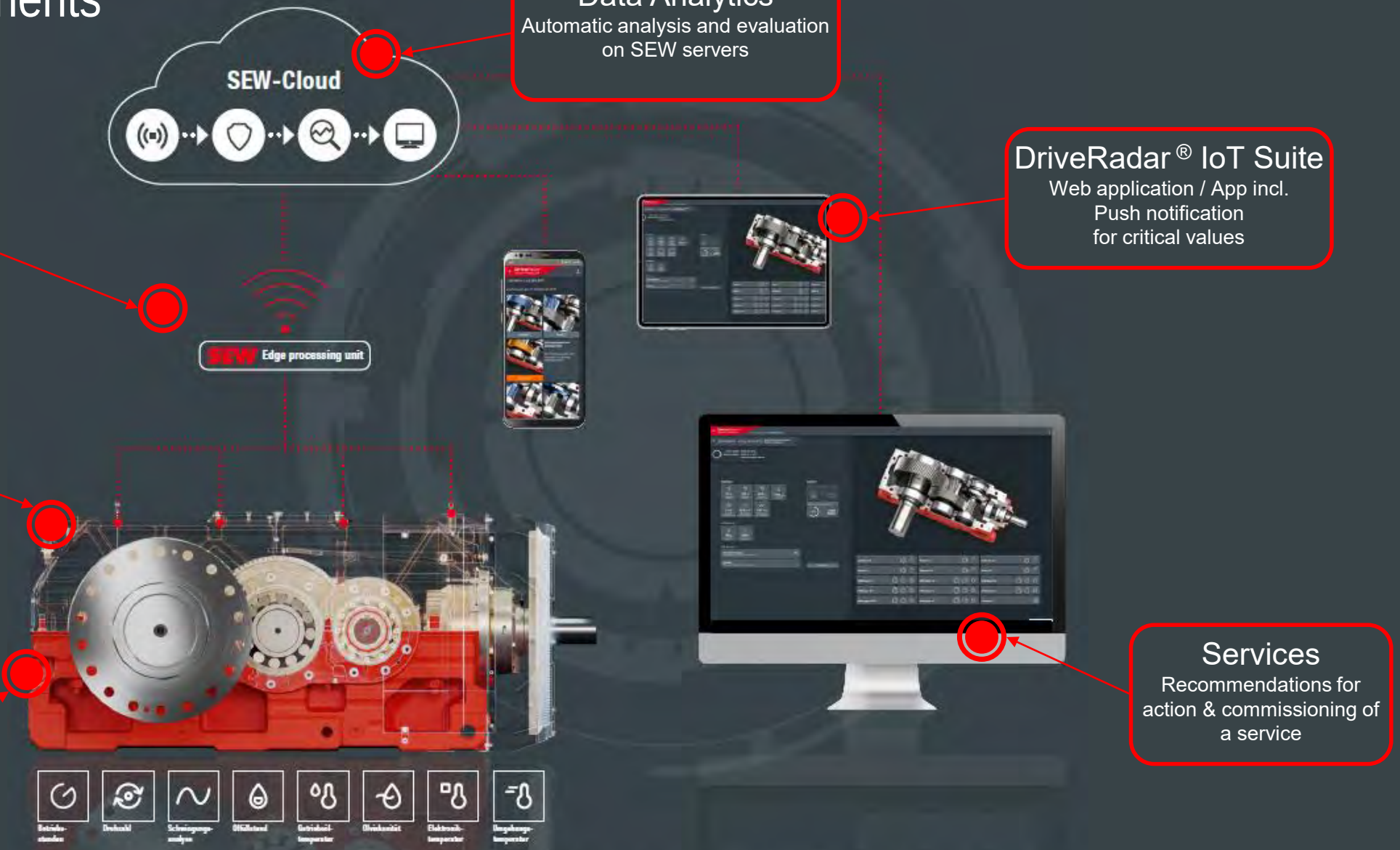
E.P.U.
Industrial PC with I/O modules and LTE modem mounted on the gearbox

DriveRadar® IoT Suite
Web application / App incl. Push notification for critical values

Sensoric
Temperature sensors, oil level sensor, Vibration sensor,…

Industrial gear
Helical and bevel helical gear units X.e

Services
Recommendations for action & commissioning of a service



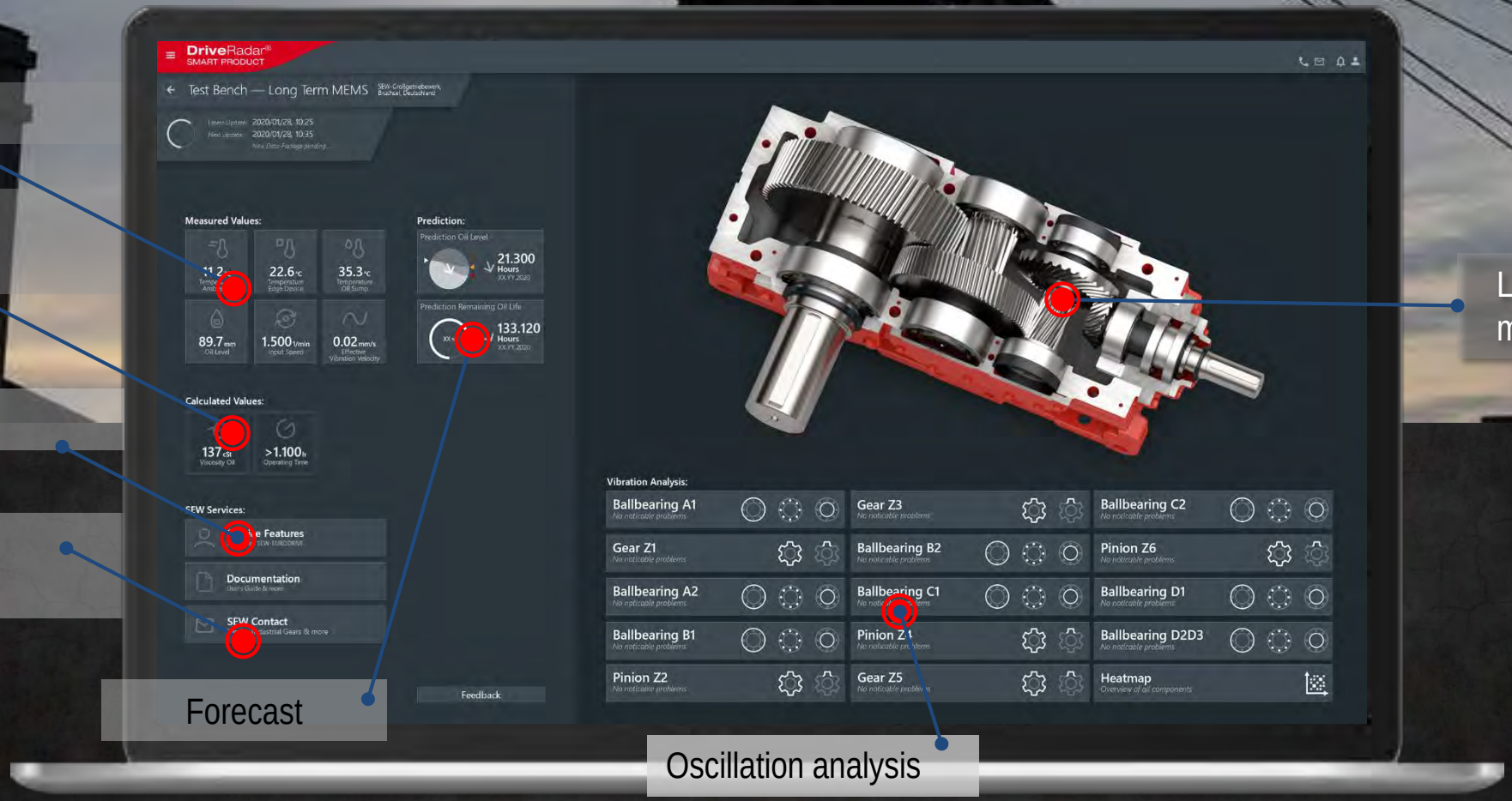
Overview of measured values

Current readings

Current, calculated Values

Available services

Direct contact to SEW



Locating the mechanics

Forecast

Oscillation analysis

SEW-DriveRadar®
IoT Suite for Industrial gear

1. The world will change as much in the next 20 years as it has in the past 100 years.
2. The individual disciplines in the company today work on isolated islands. We need to build bridges that connect these islands.
3. With the organization "Small Factory Unit" and a perfectly implemented human-technology cooperation in the value chain, costs can be reduced by 50% and the adaptability and changeability can be doubled.
4. The factory of the future is more than just a factory - it is a living space for people and creates quality of life.
5. Digitalization and a turbulent environment require a new type of leader. Managers and production teams must react agilely to unexpected developments, like a deep-sea sailing team.
6. In the future, the competitiveness of manufacturing companies will be largely determined by their factories and their excellent results and leadership.

Industry 4.0 / Smart Factory 4.0 has heralded the digital transformation
Previous analog structures are disruptively changed

SMART FACTORY 4.0
A win for humans and the company

Thank you for your attention.