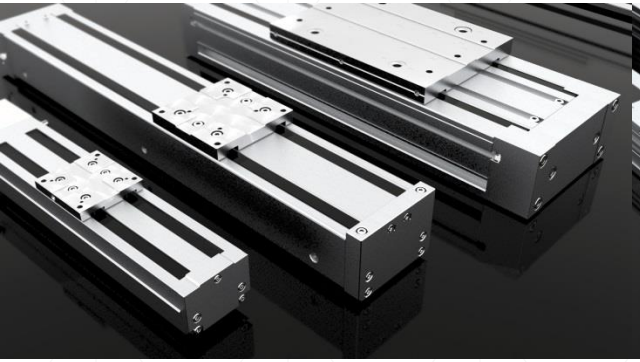
Innovative Reuse of modular knowledge Based devices and technologies for
Old, Renewed and New factories

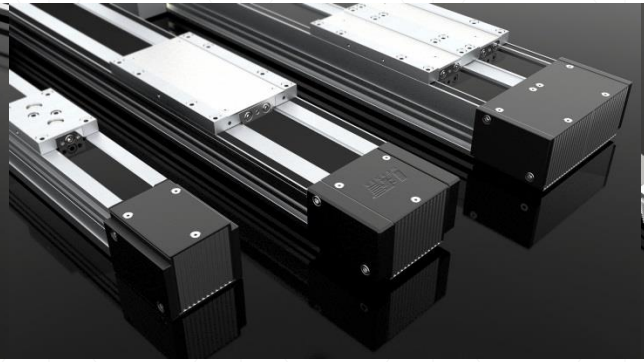
# Demonstrator: Servo press for ultra precise joining applications

IEF-Werner

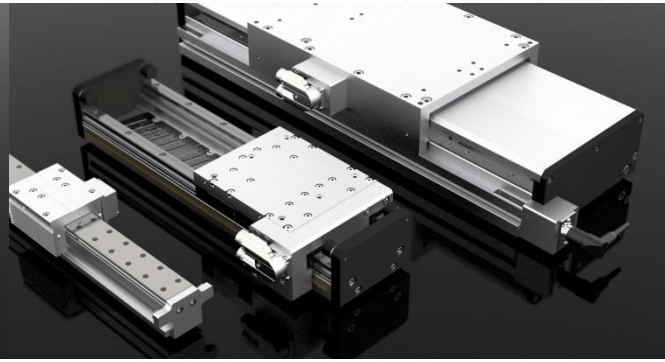
# Products – linear drives



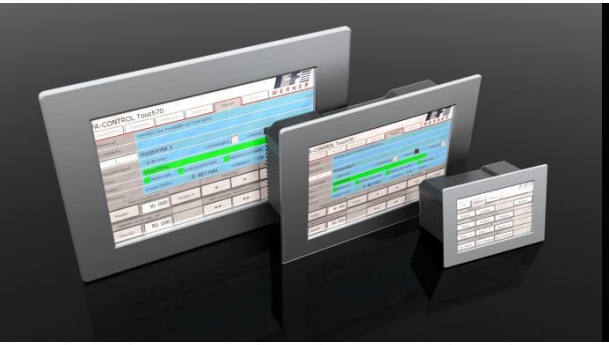
**Spindle drives – max load**



Toothed belt drives – maxi distance

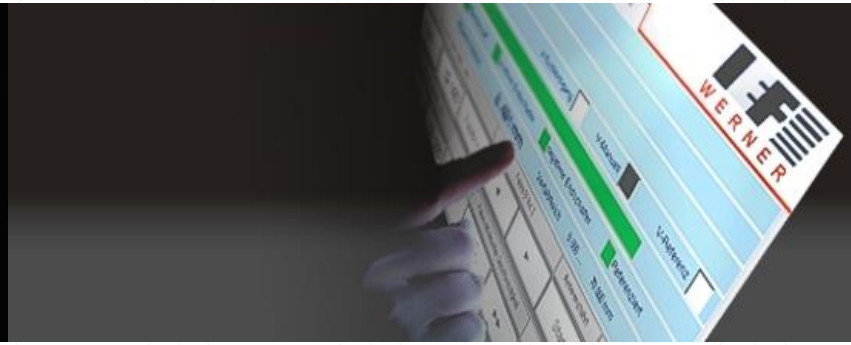


Direct drives - max dynamics



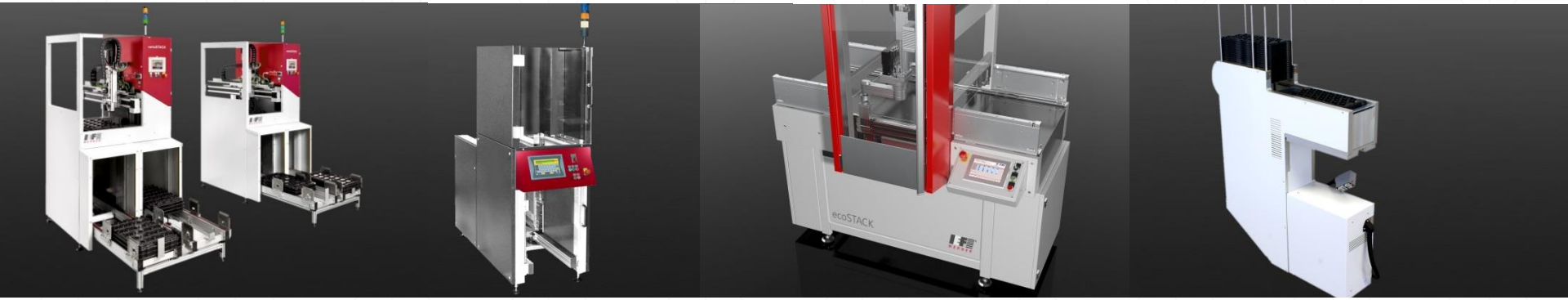
Control technology – up to 16 axes

Servo amplifiers



# Products – Servo presses

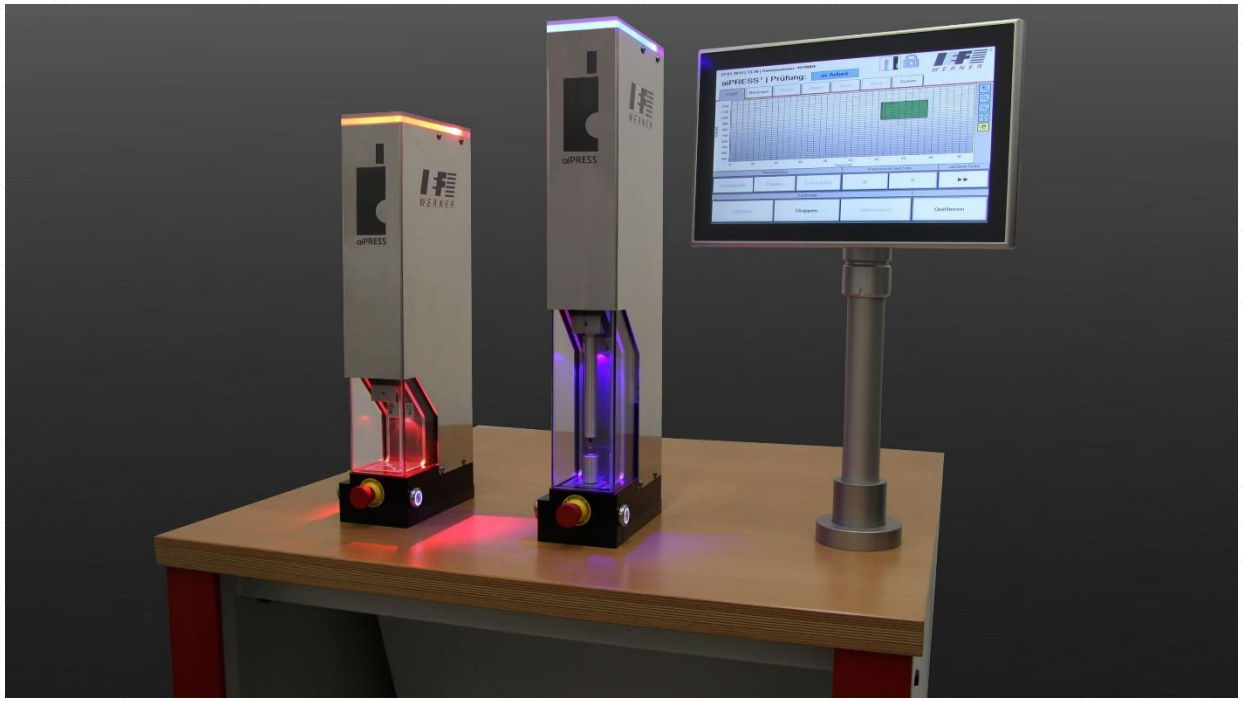

aiPRESS – for high precision joining connections




Palletizers – for save part feeding

# Servo press demonstrator

- Servo press for generating accurate and reproducible joining connections



# Variants

| Variant | Variable | Variable amount | Possibilities |
|---|---|---|---|
| Size | 02-3; 6-12; 6-30 | 3 | 3 |
| Drive | 24; 48; 230; 400 V | 4 | 5 |
| Stroke | 50; 100; 150 mm | 3 | 15 |
| Workspace | 129; 229; 277 mm | 2 | 19 |
| Position sensor | Yes / No | 2 | 38 |
| Force measuring chain | Yes / No | 2 | 76 |
| Turntable | Yes / No | 2 | 152 |
| Drawer | Yes / No | 2 | 304 |
| aiSTART | Yes / No | 2 | 608 |
| E-STOP | Yes / No | 2 | 1.216 |
| Vacuum workpiece holder | Yes / No | 2 | 2.432 |
| aiLIGHT | Yes / No | 2 | 4.864 |
| Protective cover | Yes / No | 2 | 9.728 |
| Table | Yes / No | 2 | 19.456 |
| Lift table | Yes / No | 2 | 38.912 |

# Definition of smart component

- Smart components are part of a network of automation components inside machines
- All these devices are able to send or process signals
- IEF-Werner develop within the EU research projects ReBorn ans SelSus smart components for automation (Linear system, servo press)

# Characterization of a smart component

- Self description of the component
- Access to the documentation
- Integrated wearout and lifetime models
- Integrated dynamic maintenance prediction models
- Active failure analysis of the component
- Active analysis of process data

# Static data

The static data describe the performance of the servo press

- Size, Drive, Stroke, Workspace
- Link to the manual
- Serial no
- Date of manufacture
- Link to acceptance test record
- Link to the spare parts
- Motor, spindle, amplifier type

# Dynamic data

The dynamic data include a wide range of process data that are saved in the memory of the control and that are provided to the network in csv format.

- Motor current and temperature
- Overall travel
- Acceleration, speed, deceleration
- Amplifier temperatur
- Operating hours

# Wearout models:

- Manufacturer of automation systems declare the lifetime of their devices conservatively. Usually the lifetime of most products are specified for 2 to 5 years.
- But for expensive durable goods, the components are not reusable. Therefore, the service life and maintenance activities in the lifetime calculation are a big factor.
- An individual component again consists of subcomponents in which wear has a different effect.
- Typical components for wearout:
  - Motors; gears; bearings; guideways

# Description of the use-cases:

- **#1** Machine with auto-detection function of components
  - Control connection with press
  - Automatic determination of the press subcomponents
  - Providing basic parameters to MES
- **#2** Degradation monitoring of servo press
  - Detection of the basic setup
  - Auto detection of parameters and degradation
  - Determination of the remaining lifetime
- **#3** Self awareness
  - Replace the press
  - Autodetection of setup
  - Evaluation of process usability with current configuration

# Innovations & benefits

- **Benefit 1:** Time reduction for determination of usage of an automation component by 90 %.

- **Benefit 2:** Self-description of component reduces manual setup configuration from hours to minutes.

- **Benefit 3:** Drag & drop function of components parameters reduces the development time of process from days to hours or even minutes.

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