Information for journalists and media representatives
“Industrie 4.0 & the Model Factory”

Industrie 4.0 is a trend that is increasingly moving production work towards smart connectivity. It enables machines, plants, products, warehouses and tools to all communicate with each other – and, thanks to mobile devices, with workers as well. Concentrating primarily on the role of people in Industrie 4.0, Fraunhofer IAO is at the forefront of scientific research and practical action in this area. In setting up the “Production work 4.0” innovation network, it has provided a platform for practice-oriented dialog among industrial enterprises, technology providers and associations. Fraunhofer IAO’s model factory has been selected as one of 100 locations for Industrie 4.0 in Baden-Württemberg. Here, the institute implements prototype Industrie 4.0 solutions, testing them for their practicability.

An overview of Fraunhofer IAO’s research specialties and Industrie 4.0 services:

- Impact, challenges and opportunities presented by Industrie 4.0 for companies and their workforces
- Business models and tailored Industrie 4.0 production solutions, from the initial idea to final implementation
- Innovation networks, e.g. “Production work 4.0” and “HMI 4.0”
- Training concepts and expertise requirements for employees
- New technologies and concepts for human-machine interaction in networked production
- Design and development of human-machine interfaces (HMI)

A range of assembly systems for small and mid-size products can be demonstrated live and tested in the model factory at Fraunhofer IAO. In addition to the frequently used one-piece flow system (U line), the model factory also showcases solutions for manual assembly based on a star configuration or on the one-set flow system (which has not yet been widely adopted). In this way, specific product examples are utilized to illustrate realistically how and for which areas each of the systems can be economically deployed.

Further information:
www.produktionsarbeit.de

Our contact for Industrie 4.0 and the Model Factory:

Dr.-Ing. Moritz Hämmerle
Production Excellence, Fraunhofer IAO
Nobelstrasse 12, 70569 Stuttgart
Phone +49 711 970-2284
moritz.haemmerle@iao.fraunhofer.de
**Photo material**

The following photos may be used free of charge as part of reports on Fraunhofer IAO’s research into Industrie 4.0 or on the Model Factory at Fraunhofer IAO. Requests for high-resolution images should be sent to [presse@iao.fraunhofer.de](mailto:presse@iao.fraunhofer.de). All photos used must be accompanied by the appropriate source reference, and we kindly request a copy of the published material. The photos are to be used exclusively for editorial reporting and under no circumstances in advertising or sales materials. Further circulation, copying, editing or use on websites that is not for the purposes of editorial reporting is not permitted.

**Industrie 4.0 (1)**

*The Fraunhofer IAO model factory as a test environment:*

How to make assembly systems as efficient as possible? Fraunhofer IAO has set up a model factory where a range of assembly systems for small and mid-size products can be demonstrated live and tested.

![Photo: Bernd Müller © Fraunhofer IAO](image)

**Industrie 4.0 (2)**

*Smart connectivity in Industrie 4.0:*

Industrie 4.0 will see production work increasingly move towards smart connectivity. It enables machines, plants, products, warehouses and tools to communicate with each other – and, thanks to mobile devices, with workers as well.

![Photo: Bernd Müller © Fraunhofer IAO](image)

**Industrie 4.0 (3)**

*Data collection and communication in real time:*

Sensors make it possible to gather data in real time and to network machines and plants. As a result, not just people but also machines can communicate with one another and be part of a smart factory.

![Photo: Bernd Müller © Fraunhofer IAO](image)
Industrie 4.0 (4)
Real-time data collection using sensors:
Thanks to real-time sensor data collection, production workers benefit from a new level of data processing.

Photo: Bernd Müller © Fraunhofer IAO

Industrie 4.0 (5)
The robot as a new colleague:
Close collaboration between people and lightweight robots calls for new modes of work organization and a participatory design. Fraunhofer IAO helps companies identify and create suitable applications within their business.

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Industrie 4.0 (6)
The robot as a new colleague:
Close collaboration between people and lightweight robots calls for new modes of work organization and a participatory design. Fraunhofer IAO helps companies identify and create suitable applications within their business.

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**Industrie 4.0 (7)**
Using lightweight robots in production:
A mobile lightweight robot can be used at various points within a given work system or in a variety of different work systems. This increases operating times and cost effectiveness.

**Industrie 4.0 (8)**
Integrating lightweight robots into work organization:
Lightweight robots can be programmed as easily as a smartphone app – facilitating easy integration into the work organization. Fraunhofer IAO is researching new types of work organization and highlighting the requisite competencies.

**Industrie 4.0 (9)**
Working in partnership with robots:
This is what direct collaboration between people and lightweight robots could look like. Processes with lightweight robots have to be designed so that people continue to set the pace and can intervene in the process at any time.
**Industrie 4.0 (10)**
*Working in partnership with robots:*
This is what direct collaboration between people and lightweight robots could look like. Processes with lightweight robots have to be designed so that people continue to set the pace and can intervene in the process at any time.

![Image](image1)

**Industrie 4.0 (11)**
*U-shaped assembly lines in the model factory:*
U-shaped assembly lines with special personnel assignment strategies support workstations outside the workflow and workers with a range of abilities.

![Image](image2)

**Collaborative assembly (1)**
*Robot colleague:*
Close collaboration between people and lightweight robots calls for new modes of work organization and a participatory design. Fraunhofer IAO helps companies identify and create suitable applications within their business.

![Image](image3)
Manual assembly (1)
Individual work stations in the model factory:
Creating individual workstations for manual assembly: Easy-to-reach containers and change carts for quick retooling.

Manual assembly (2)
One-set flow in the model factory:
In most cases, small product assembly using the one-set flow principle further increases productivity compared to the one-piece flow principle in the U-shaped assembly line. In such cases, a set of parts is laid out ready for processing on a workpiece holder. This boosts productivity because the tool needed to process all the parts on the work tray now has to be picked up and returned only once – and not for every product, as with the one-piece flow principle.