



THE SIGNIFICANCE OF INDUSTRY 4.0

The significance of Industry 4.0 in screwdriving and feeding systems

Everyone is talking about Industry 4.0. But, what is it exactly, in particular to the specialty field of screwdriving and feeding systems? The term "smart factory" is essential for this explanation. Smart factories are created by the digital linking of embedded production systems and dynamic engineering change processes. That is precisely what Industry 4.0 is about: combining production and automation systems with modern information and communication technology. Digital processes provide employees of a Group of companies – including any worldwide operations – with simpler and faster methods for communicating and evaluating data. Production, logistics and machine operation run more smoothly with fewer faults.

How Industry 4.0 changes screwdriving and feeding systems

In the event of production downtime, modern companies can now share production information much faster in real time and react accordingly. In the end, **Industry 4.0** also allows for better management of the companies in a group that operates all over the world. WEBER also offers all standard interfaces that can be integrated with our customers' systems. For screw connections, we record the results of the connections and torque curves then transfer them to in-house manufacturing execution systems (MES). All data is therefore always accessible through standardized interfaces. This system also allows for local statistics functions. Our customers can use their own tools to carry out global analyses. This allows for speedy detection of anomalies in the production process and the corresponding reactions. In addition to this, other statistical functions and evaluations are possible through artificial intelligence. This offers a crucial advantage, in particular for **screwdriving and feeding systems** in the automotive industry. Subsequent verification of screw connections avoids recalls and saves money. In addition to this, the networking of devices generally increases productivity. Problems are detected immediately and eliminated quickly.

What is so revolutionary about Industry 4.0?

Industry 4.0 is revolutionary because of the optimized self-organization of companies. Digital development promotes better cooperation machines and between. But, it is not only optimized communication strategies that play a role here. In light of the increasing global interconnection, companies now have attractive opportunities to improve their value chain, making their production flexible and customizing their products and services.



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How current business models for screwdriving and feeding systems are changing with Industry 4.0

Business models in connection with screwdriving and feeding systems are changing with Industry 4.0 because more services are available for the product. Remote services, for example, can be used by engineers to work remotely and carry out programming changes off-site. Electronic QR codes offer customers worldwide easy access to descriptions of machine commissioning, detailed documentation or services. Additional software functions can easily be ordered for data-driven business models.

How companies can save Industry 4.0

It is much easier today for modern companies to avoid product recalls, which **saves time as well as money**. How does that work? Automatic screw connections, for example, all data is recorded and checked in random samples. The error rate is reduced towards zero with continuous (including retroactive) re-testing. For automotive customers, it is possible that a supposed OK curve shows minimal deviations which will be identified as false OK results with continuous digital checks very early on. This avoids grinding in rework. Of course, money has to be invested in digital applications initially. In the medium to long term however, this investment will definitely pay off for companies with complex, worldwide operations. So-called "digital twins" now make it possible to visualize all prototypes perfectly on digital platforms. This means advanced simulations can be used to save time during commissioning and start of production.

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Implementation Industry 4.0

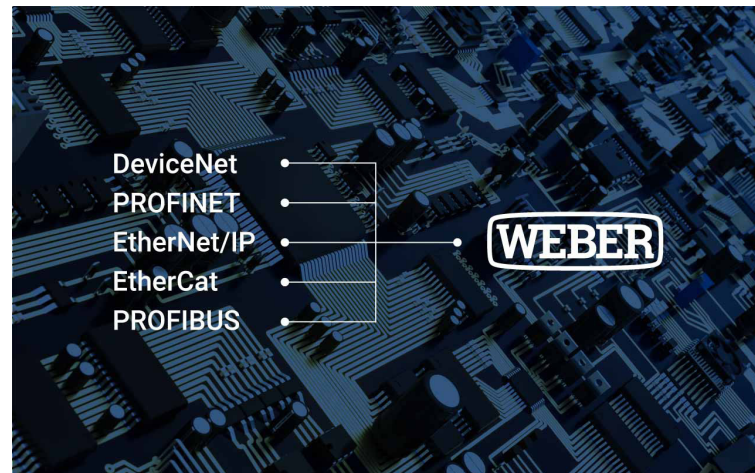
Industry 4.0 links physically remote production machines, transport systems and storage systems with the corresponding planning and control systems. This interconnection creates interfaces that require a common standard (stage 1). The real-time control of the machines changes daily work processes. Machines are operated not only by employees, but by humans and machines working collaboratively (stage 2). All this results in cost-efficient production. It also allows manufacturers of screwdriving and feeding systems to better address customer requirements (stage 3). Each stage is the prerequisite for the next.



Here is an overview of all 3 stages:

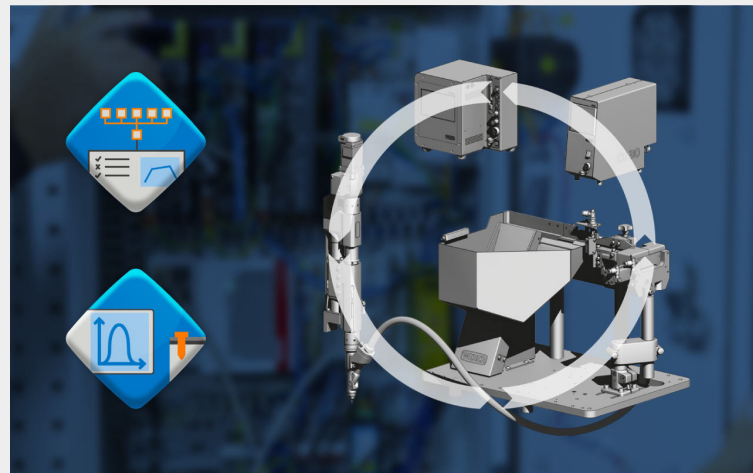
Stage 1: Cyber-physical system (CPS)

- Ubiquitous computing: Information processing with embedded hardware and software, intelligent production equipment, products and machines
- Standardized interfaces
- Internet of things and services: Linked over the Internet (IPv6), provision of services over the Internet
- Cloud Computing: Big Data Analysis, Bereitstellung of IT-Resource
- Cyber Security required



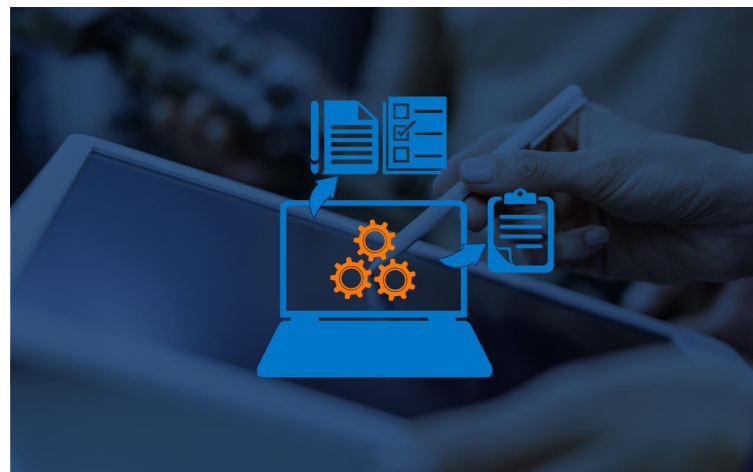
Stage 2: Cyber-physical production system (CPPS)

- Machine-to-machine communication: partially autonomous control
- Human-machine interaction, e.g. virtual reality
- Automated data transmission to MES systems
- Big data analysis (using artificial intelligence)



Stage 3: Industry 4.0

- New company visions
- Strategy adaptation
- New business models and processes



Bottom line: Opportunities with Industry 4.0 – Overview

In summary, the development of Industry 4.0 offers extensive opportunities particularly for manufacturers with a high standard of automation.



Automatic data evaluation



Faster action times



Higher economic efficiency



Better production flexibility



Control across companies



Location-independent



Saving resources and
energy

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