

AUTOMATION

baumann

# THE UNIVERSAL HANDLING CELL



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**feed|box**



## From simple component loading to quality assurance

Robust, rapid, flexible and accurate – characteristics that make the Baumann feed|box a compact, high-performance system for the automation of manufacturing processes. The feed|box is available in various sizes. Additionally, tried-and-tested modular components enable it to be adapted to specific requirements. It is suitable for simple component handling for various loading and unloading processes and comes as a stand-alone solution or can be connected to other

machines. Its wide range of applications enables the integration of complex technical machining processes or the testing of components as part of quality control. The feed|box is equipped for the requirements of Industry 4.0 and basically represents a valuable addition to the customer's production plant in terms of high productivity and cost optimisation.

## Handling with maximum precision

When connected to a precision machine tool, this feed|box is used for the direct loading and unloading of components. As a special solution, unmachined and finished parts are fed for handling by a double-level belt with an integrated lift and positioning unit. The cell features two robots, laser marking, blow-off unit, measuring system, rotary indexing table and component, SPC and pass/fail part sorting. The full electronics package is situated in the standard structure of the cell so that an additional control cabinet is not required. After measuring a piston, the software interface transfers the data to the connected honing machine, where the perfectly matching cylinder is manufactured. Laser marking is used for the clear linking of both components in the MES. The integrated blow-off unit for part cleaning ensures optimum results when marking and cross-checking the codes.









## feed|box – the right choice for every application

Flexibility is key – based on the modular design principle, the feed|box is equipped using tried-and-tested standard components and robots or gantry-style systems and tailored to individual customer requirements. Virtually all industrial manufacturing processes can be integrated – the examples below are therefore only a small selection of the extensive range of applications. Even after purchase, the feed|box can, at any time, be quickly converted or extended to provide additional functions. This high degree of flexibility in adapting to the customer's manufac-

turing requirements increases the return on your investment. The machines are available in various sizes and can be operated on a stand-alone basis or inline. Various material feed options enable bulk goods to be processed just as effectively as components on trays, in tool holders or in washing baskets. Whatever the case, the Baumann feed|box ensures the customer's valuable products are "in good hands".

### Component cleaning



### Quality control (SPC/NOK)



### Deburring



### Component labelling and identification (DMC)





## High performance at the highest intensity

Designed for demanding everyday manufacturing needs, each feed|box is suitable for intensive use. In this regard, the overall performance of the cell and its high level of performance capabilities in terms of speed, safe component transport and accuracy come to the fore. Ergonomic solutions ensure easy operation and provide optimum access, including

for maintenance purposes. The guarantee of absolutely clean components, especially when handling partially aggressive media, such as acids and oils, is another important aspect. In addition, other criteria such as component traceability, safety, sustainability and efficiency, for instance through short cycle times, play a significant role.



## Trolley module for safe transport

This feed|box is designed for handling and measuring components with unit weights of roughly 2.5 kg. Supply and removal takes place using a trolley module developed by Baumann that can transport 70 kg baskets. The system features SPC and pass/fail part sorting, a cleaning unit, a DMC alignment unit and fully-integrated trolley module technology.

The feed|box is connected directly to a grinding machine. A servomotor-driven shuttle system ensures the availability of unmachined and finished parts. A special interface is responsible for data transfer to the customer's MES system.



## Vision systems for quality control

A stand-alone solution for inspecting defined quality features using industrial image processing is shown here. In this example, the transportation of components is once again carried out by a Baumann trolley module. The individual baskets can be registered for machining via the MES connection using the DMC reader. An articulated arm robot feeds a rotary indexing table that can be accessed by two camera units and two turning units. To prevent vibrations when capturing

images, the test unit is not coupled to the cell structure. This feed|box checks a total of twelve different characteristics, e.g. scratches or points of impact, on five different types of component. In the preliminary stages of the project, a feasibility study that determined the error limits was developed in close cooperation with the customer in a series of trials.





## Stress-free handling for delicate components

Total freedom from stress for the components is guaranteed by this feed|box for the production of crystal silicon wafers for photovoltaic applications. This system is responsible for loading and unloading a so-called graphite boat, which transports the individual wafers via a transport unit system to a special furnace (PECVD) for coating. Roughly 3,600 coated wafers can be produced per hour, which still maintain a temperature of roughly 100 degrees Celsius even at the end of the process. To ensure safe and vibration-free transport of the unmachined

and finished material, Baumann has developed and produced a special cassette handling system especially for this application. Characteristics such as layer thickness, colour runs or edge cavities are detected during the visual inspection without contact according to the 'on-the-fly principle'. These are classified in four different error classes without affecting the gross throughput of the system. Integration into the MES system meets the requirements of the SECS/GEM standard.





## Local presence worldwide

The use of robotics to facilitate automation and the process integration required for this are among Baumann's core strengths. The standard products are robot cells whose modular design principle is tailored to individual customer requirements and can thus be combined to generate complete production lines. The systems are used for assembly and

handling tasks. Further focus is on test systems and vision systems for quality control. The company, based in Amberg, Germany, currently employs over 500 people. Service support centres for China, Romania, Taiwan, the Philippines, the USA and Mexico ensure a local presence worldwide.

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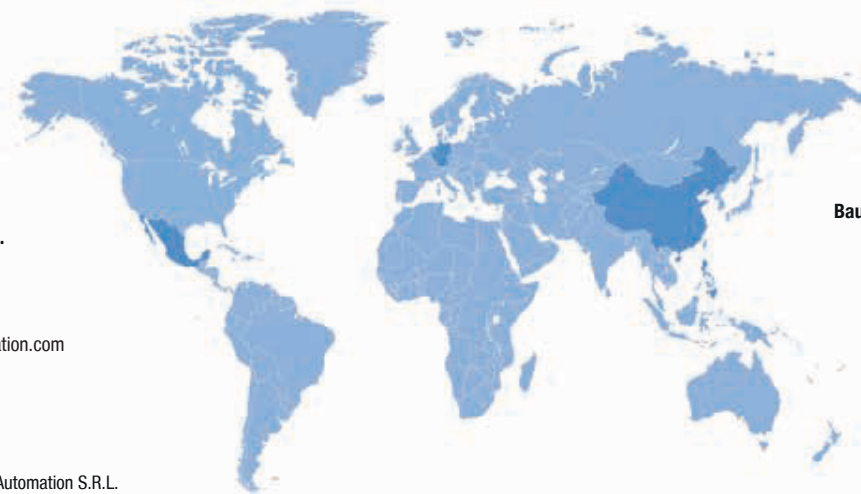
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