

FACTORY AUTOMATION

Customer reference

Hambi Terhoeven GmbH & Co KG | Orgassa GmbH

The world's first fully automated line for reinforcing steel mesh
Separating, cutting and stacking made easy

The construction industry needs many busy hands. After all, manual work is still standard in many areas. Terhoeven GmbH & Co. KG has now tackled a typical example - the monotonous and time-consuming cutting of reinforcing steel mesh. The medium-sized mechanical engineering company relies on drive and automation technology from Mitsubishi Electric and the expertise of Orgassa GmbH. The result is an innovative system that is unique to the market.

Short and sweet

- Fully automated cutting, handling and stacking of reinforcing steel mesh
- Outstanding precision despite difficult conditions
- Drive and automation technology from a single source



The system is six meters high and over 40 meters long.

The Challenge: **Cutting and lifting the mesh is complex**

ASA (Automatic Cutting System) is the name of the newly developed machine that handles, cuts and stacks the reinforcing meshes fully automatically. Lifting the top mat from the stack is a major challenge because the manufacturing tolerances of the rebar mats are in the centimetre range, but handling requires an accuracy of less than one millimetre.

In addition, the individual mats do not lie neatly in the stack. 3D image processing is therefore used to identify six suitable pick-up points. When the grippers lift the mat, the next challenge comes: the mat bends.

So three separate drives are needed for each of the six points to move the grippers in all three spatial directions. During operation, the drives must be controlled precisely and synchronously.



Six grippers lift the structural steel mesh, while servo drives from Mitsubishi Electric move it in all three spatial directions



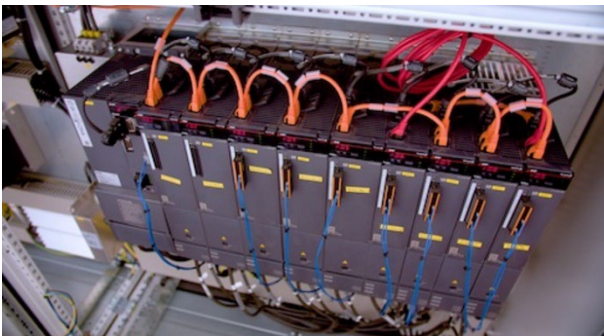
Handling reinforcing steel mesh is a challenging task for automation technology

The solution:

Drive and automation technology from a single source

To compensate for the deformation of the mats during lifting, 18 drives are required for the lifting gear, plus four drives for transporting the mats within the system. Mitsubishi Electric servo drives with the corresponding servo amplifiers are used here. The MR-J5 series motors are very compact and offer high dynamics.

The matching servo drives can be coupled via intermediate circuits, which contributes to the high energy efficiency of the system. The required synchronisation of the drives can be optimally implemented with the motion controller. All other automation components are also supplied by Mitsubishi Electric. FR-E800 frequency inverters are used for simple conveyor tasks. And a safety PLC from the MELSEC iQ-R series controls all the processes in the system.



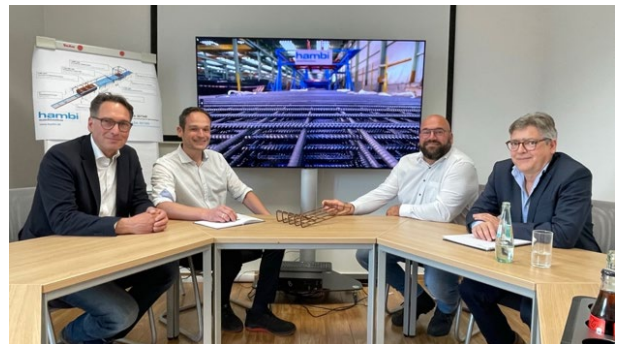
The servo drives have a DC link coupling and thus ensure energy-efficient drive technology.

This is supplemented by three C-Controllers which run the image processing. The protocol used is CC-Link IE TSN, which provides real-time capability as well as the necessary safety-related communication. With the gigabit bandwidth offered by the open CC-Link IE TSN standard, communication between the controller, motion control and safety can be easily integrated into one network.

The Result:

Huge system can be operated by one person

After almost two years of development, the first ASA, measuring six metres in height and more than 40 metres in length, was commissioned in the spring of 2024. It is operated by a GOT control unit from Mitsubishi Electric. In addition to the touch screen, a number of buttons and switches are integrated to facilitate operation with gloves. Conversion of the system, for example to a new mat size, is very easy with the GOT control unit. Only a few manual operations are required during set-up. In routine operation, the system can then be operated by one person.



A strong team: Jörg Springsguth Mitsubishi Electric, Stefan Broeckmann, Stephan Terhoeven and Marc Orgassa (from left to right)

Video and further information

Further information and the video can be found on the Hambi Maschinenbau homepage.

[ASA 307540](#)