



Automation Technology With Full Service For Agriculture

## Transplanter 4.0

**The Italian company Checchi & Magli, Vegetable Growing Technology, develops innovative planting machines in close cooperation with Sigma Motion/SIGMATEK, which are used worldwide and fulfill the very different requirements in terms of quality and productivity during the transplanting phase.**

Planting is the most demanding process in the entire cultivation cycle. It is determined by time pressures, climatic risks and the sensitivity of the seedlings. The necessary work must therefore be carried out without interruption and at the right time.

Since the company was founded in 1976, it has been the declared aim of the Italian planting and cultivation expert to supply technologies that guarantee the highest performance, maximum comfort for the operator and, at the same time, compliance with safety standards. This philosophy has ensured Checchi & Magli's international success.

The planting machines for vegetables, tobacco and tree seedlings developed and manufactured in the three factories at the headquarters in Budrio (BO) are supplied all over the world. The company's export quota is stable at over 80%.

### Complete Automation Service

The range includes a variety of models that are built to last and still do the job even after more than 30 years of use. This is the result of the quality and reliability with which each machine is built, based on the growing needs of the market. For the new Qubik transplanter, Checchi & Magli chose the automation expertise of Sigma Motion and SIGMATEK. The SIGMATEK product range, which satisfies the most diverse requirements and is always at the cutting edge, has been developed and produced in Austria for 35 years: CPU, I/O, Industrial PCs, HMIs, motion, safety, the all-in-one

engineering tool LASAL with object-oriented programming and Varan real-time Ethernet.

Sigma Motion, based in Montecchio Maggiore (VI), has been a partner of SIGMATEK in Italy for more than 10 years and offers a complete service: competent in mechatronic design consulting, selecting the ideal solution and supporting the commissioning of machines and systems.

### High Productivity Even at Sub-Zero Temperatures

Cecchi & Magli relies on Sigma Motion/-

ment of the new Qubik transplanter for pressed cubes with seedlings. This machine is designed for professional use, especially for lettuce growers who work with wholesalers – a sector that is increasingly demanding in terms of product quality and delivery times. The development focused on improving productivity by utilizing the principles of mechatronics and automating numerous processes related to the delicate phase of planting seedlings, including inspection and maintenance.

The transplanter is suitable for pressed cubes measuring between 3.2 cm and 5 cm, with adjustable planting and row



More productivity in planting processes with pressed cubes with SIGMATEK technology. The Qubik can handle up to 7,200 plants per hour.

SIGMATEK's in-depth expertise in mechatronics and automation for its new, innovative planting machines. The transplanter 4.0 project not only focuses on the current needs of customers in this area, but also has an eye on the future.

The synergy began with the develop-

spacing. The cubes are separated and planted using an electro-pneumatic system. The Qubik fulfills the principles of Agriculture 4.0: it works precisely even at temperatures as low as -10 °C and plants up to 7,200 seedlings per hour/row.

### High Demands on Planting Machines

To perform their tasks in the best possible way, plant setting machines must meet certain requirements. First, fast and numerous movement sequences are necessary to increase production efficiency. It must also be possible to

adjust the relevant parameters electronically in order to adapt the planting work to the various customer requirements. Alarm management should also not be disregarded to prevent damage to the machine and protect the user. Added to this is the requirement for predictive maintenance to ensure reliability and monitoring of functions for correct diagnosis of any problems that may occur. Final-

for brushless 48V motors with integrated safety. LED signals next to each individual channel provide useful diagnostic information about the device status, such as short-circuit protection, overvoltage and undervoltage monitoring as well as temperature control – ensuring a high level of operational safety. The pocket format of the automation components (12.5 x 104 x 72 mm W x H x D) enables

efficiency. In addition, parameters can be changed while the machine is running, whether on a PC or smartphone, on site or remotely. All of this is possible with the use of the “Remote Access Platform” (RAP) from SIGMATEK, which offers the connectivity required to achieve Industry 4.0 standards: Access to the machine control system via VPN (including SSL encryption), maximum IT security, detailed information about the processed data, intuitive operation and even access via tablet and smartphone (using an app), secure data logging and storage in the cloud (optional). The connection to the RAP can be made using routers (RAR) with an integrated firewall or, more cost-effectively, as an extension of the SIGMATEK CPU operating system (RAE). With the RAR routers installed in the machines, they are always connected to the network, which gives the customer full control over the machine status and simplifies technical support from Checchi & Magli.

Compact SIGMATEK DIN rail modules for motor control: DC series for servomotors, SR series for DC brush motors, ST series for stepper motors.



ly: precise specifications, which means the compactness of the system and therefore less space in the control cabinet and less cabling.

### Scalable and Modular Machines

Thanks to SIGMATEK technology and the support of Sigma Motion, Checchi & Magli is able to develop easily scalable and modular machines that meet the different requirements of each customer. This makes it possible to configure the number of units or lines and any special equipment directly at the human-machine interface during installation and commissioning, without having to intervene in the software.

The modularity is also made possible by the compactness of the SIGMATEK DIN rail modules: CPU, input/output, safety CPU and I/O as well as motor control, such as the powerful DC 062 servo drive

With the SIGMATEK Connect app for the Remote Access Platform, users can access their data from anywhere in the world.

the construction of small control cabinets that contain all the electronics for controlling the individual planting units and can be mounted on the machine in any number. A compact 4.3-inch HMI with IP65 protection is used for operation.

### Remote Production Monitoring: Cloud-Based

The greatest asset of the SIGMATEK solutions used by Checchi & Magli is definitely the ability to monitor the machine's performance online during operation – with remote access via a 4G SIM card or a Wi-Fi connection. The production data can be recorded to achieve greater



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