

Q.ANT and Festo agree strategic partnership

Automation technology facilitates large-scale biomass cultivation using artificial photosynthesis // Quantum sensor provides information on algae growth // Prototype with quantum technology to be presented at Hannover Messe 2022

Festo and Q.ANT, a wholly owned subsidiary of TRUMPF, are entering into a strategic partnership to cultivate biomass on an industrial scale. The two companies aim to achieve this using a combination of automation technology from Festo and quantum technology from Q.ANT. Algae offers significant potential in this context.

Algae are tiny climate-change fighters

Algae have an extremely high photosynthetic efficiency in their natural environment, binding ten times more carbon dioxide (CO₂) than land plants. When algae are grown in bioreactors equipped with appropriate sensors, control technology and automation, this efficiency can be increased even further, reaching a hundredfold that of land plants. The substances created in this process can be used as raw materials for pharmaceuticals, packaging and cosmetics and, ultimately, recycled in ways that create a climate-neutral system. This gives algae considerable potential to drive the circular economy.

“We aim to make a decisive contribution toward improving quality of life for both current and future generations. Our automation technology and expertise in control engineering make us the perfect partner for large-scale biomass cultivation,” says Prof. Volker Nestle, Head of LifeTech Product Development at Festo. “Our goal is to develop materials that will be easier to compost in the future. This opens up a whole new chapter in our Bionic Learning Network.”

Festo prototype at Hannover Messe

One of the biggest challenges lies in accurately determining the amount of biomass. To do this, Festo relies on quantum sensor technology from Q.ANT. “Our quantum-based particle sensors open the door to new processes, applications and industrial products. Using this technology for industrial photosynthesis is a great way to demonstrate how much potential it offers for the future,” says Dr. Michael Förtsch, CEO of Q.ANT. A prototype of a system with quantum technology will be presented at Hannover Messe 2022.

Quantum sensor enables cell measurements

The Q.ANT sensor provides precise, real-time information on the organisms’ growth. To obtain this information, algae are conveyed to the sensor automatically and continuously through special microfluidic components made by Festo, such as pumps that can handle extremely small quantities of liquids with outstanding precision. The quantum sensor is able to optically analyze individual cells in order to precisely determine the amount of biomass. It also checks the cells’ vitality with the help of artificial intelligence. Only then is it possible to respond proactively to process events and take steps to regulate them.

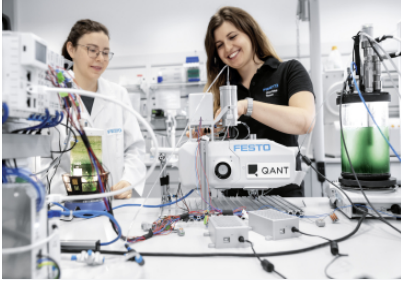
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Festo QANT_1

The Festo developer connects the microfluidic pumps to the Q.ANT sensor to supply the algae fluid.



Festo QANT_2

A major challenge is to accurately determine the amount of biomass. For this, Festo relies on quantum sensor technology from Q.ANT.



Festo QANT_3

The algae are fed to the Q.ANT sensor automatically and continuously by special microfluidic components from Festo.