



B.T.S. Italia srl | 39031 Bruneck | Italy

Mature Solution

Innovative control of biogas plants



bachmann.



B.T.S. Italia srl belongs to the TS energy Group headquartered in Bruneck (Italy). The company's 50 employees design, install and maintain biogas plants. An installed power of over 30 MW makes BTS the leading provider in the Italian market. The Bachmann M1 automation system, they have been using for some time, allowed a noteworthy increase in the capability of the plants.



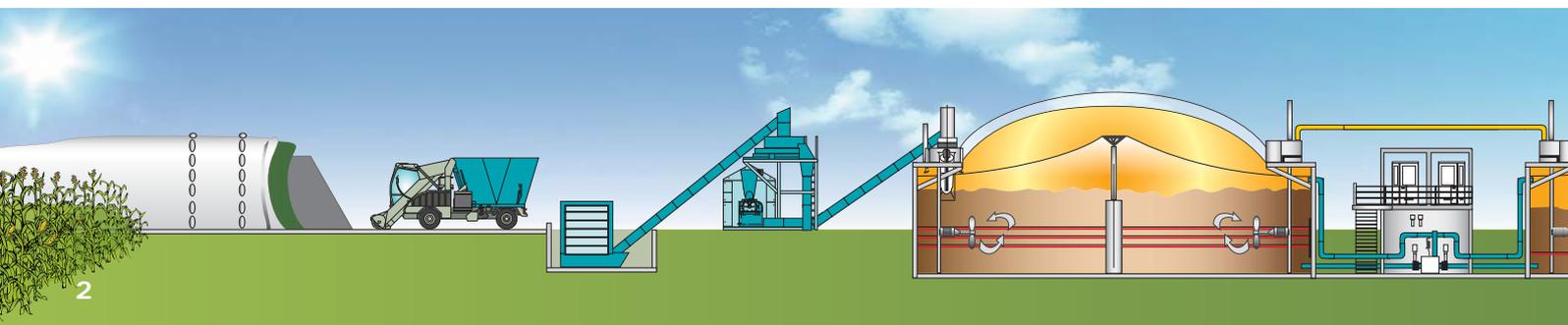
Controlled filling

The Bachmann M1 system controls the loading equipment for the fermentation tanks, the fully automatic stirring, the heating and the gas production in the biogas plant. The control of the fermentation process is crucial to the efficiency of the plant. A controlled and defined filling of the loader is possible with the aid of the filling program. The system operator can select the desired fill level of the loader with the push of a button, and the program automatically calculates the amounts of the various products that are necessary to make a controlled feeding of the biogas plant possible.

In biogas plants, the gas arising from the fermentation of biomass is primarily used on-site to generate power and heat. BTS builds plants for these purposes with installed power of 50 kW to 1 MW. Animal excrement (liquid or solid manure) or plant silage genially serves as the fermentation substrate. In the largest BTS plant, power for about 2700 households and thermal energy for up to 800 households can be generated every day from 20 m³ of cattle manure, 22 tons of corn silage and 18 tons of ryegrass silage.

Two-controller solution

Depending on the complexity of the loading, two separate M1 systems linked via Profibus are used. This topology was preferred over a detached solution, because in this way the extruder and the loader can continue to operate in case of a failure of communication. »At the same time, it enables us to retrofit the loading technology without problems as part of a plant optimization for biogas plants that were not built by BTS,« explains Stefan Mutschlechner, director of the Automation Department at BTS.



Optimized feeding

A feeding program guarantees and documents the proper feeding of the system. To achieve an optimal yield of biogas, the program predicts and projects the correct substrate combination and thus optimizes the loading of the fermentation chamber. This is an important parameter for assessing the biological loading of the process, so that the bacteria are not overfed and the process becomes unstable (acidification of the process).

The communication with the gas quality measurement unit takes place via TCP/IP Modbus. BTS has developed an alarm module for this that informs the system operator via the GSM network of possible malfunctions.

Communication via different fieldbuses

Additional subsystems, such as the fermentation residue drying unit or the frequency converter, are easily integrated into the system via PROFINET or Modbus RTU: »This is a decisive advantage of the Bachmann solution, because the protocols we use are already integrated by default,« as Stefan Mutschlechner explains.

Complete simulation saves time

The BTS engineers simulate the entire operation of the biogas plant with a second PLC program, which runs as a separate task on the controller. »This saves us a lot of time,« says program-

ming specialist Florian Hofer, »because we can test the plant completely offline in the factory before delivery and thus markedly reduce the commissioning time.«

Highest level of technology

»By switching to the Bachmann system, we were able to achieve a level of technology in the automation of our biogas plants that is unusual in the industry,« says Stefan Mutschlechner. Nearly 50 plants are currently in the projecting or construction phase. Impressive proof of the performance level of this South Tyrolean company.

▼ **Comprehensibly displayed:**
process parameters of the overall plant.

