



Power from the Land

Promoting New Energy: Biogas System with easyControl

Raw materials such as biomass and slurry can be converted into valuable energy: electricity, heat, fertiliser for the agricultural needs of the operators and energy for others. The resource-conserving alternative based on biomass uses renewable raw materials and only releases as much CO₂ for energy utilisation as has been bound in the plants beforehand. PlanET Biogastechnik, a company based in Vreden, uses the easyControl (EC4P) compact controller with the easySoft-CoDeSys programming system, CANopen and Ethernet interface in its biogas plants for implementing data links to the controllers of the CHP plant.

THE COMPANY

PlanET Biogastechnik GmbH is a company based in Vreden and was founded in 1998. With over 120 employees it is one of the leading suppliers of biogas plants. PlanET Biogastechnik has up to now over 110 installations in Germany, the Benelux countries, Canada and Japan with an electrical output ranging from 50 kW to over 5 MW. The company holds a wide range of patents and utility patents in the fields of process engineering, substrate supply systems and process auxiliary substances. (www.planet-biogas.com)



MOELLER 

We keep power under control.

A biogas plant basically consists of vessels, state-of-the-art technology and piping systems. However, the principal elements of the system are the micro organisms which actually set the process into operation. The fermentation process starts with the powering up of the plant and is then continued by the inoculation with active cultures.

The model plant built by PlanET Biogastechnik GmbH in Gronau-Epe near Münster is a community biogas plant for five farms based on the NaWaRo concept. All renewable raw materials such as maize, cereals and grass are grown by the farmers on their own land. The slurry is supplied by farms with livestock. The biogas is generated in the fermenter, a biological reaction area, under airtight conditions from the biomass at a temperature of around 42 degrees Celsius. The biogas is then converted to electricity and heat in a separate CHP plant. The agricultural biogas plant has an electrically installed output of around 500 kW.

Converting signals with easyControl

PlanET Biogastechnik uses Moeller's easyControl and DS4 soft starters in its plant controls. Data exchange between the CHP station and the biogas plant is required in order to make the current output, the generated electrical energy, the ignition oil consumption and the consumed biogas volume available as operating data for the biogas plant and for display in the process visualization system. For this it has to be ensured that the signals can be incorporated by an electrical fitter into the central control system of the biogas plant without having to modify the software. The external CHP plant control system from the CHP manufacturer only provides the required data

via CAN bus. In the first solution, the signals were converted from CAN bus to Profibus DP via a gateway. However, this always required a software modification onsite, and this solution proved to be time consuming and costly in practice.

In the model plant described, a second more pragmatic solution was chosen. The easyControl compact PLC converts the data received via CAN bus into digital and analog output signals that are then processed by the central biogas plant control as input signals. The easyControl only required the creation of a suitable program that is now used as soon as the CANopen data has to be converted to physical output values. This solution has now proved itself and has considerably reduced costs.

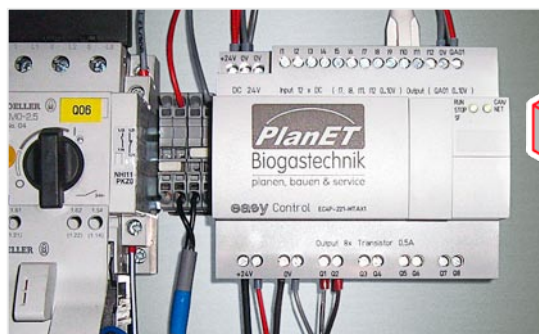
easyControl meets CoDeSys

The new and powerful easyControl controller family now combines the simple easy concept with the benefits of EN61131-3 programming. easyControl uses the CoDeSys programming system and offers an even greater functionality than that required by the EN61131-3 standard. easyControl also offers CFC (Continuous Function Chart) as an additional programming language. EC4P controllers use the already existing extensive easy range. Their 16-bit processor ensures a high CPU performance and thus shorter cycle times. Program and data memory are also generously sized with 256/224 KB. EC4P controllers are available in 16 different versions. All devices feature 12 digital inputs of which up to four can be used as analog inputs. Eight transistor outputs or six relays are provided on the output side. Versions with or without integrated display, as well as different versions for analog processing and different communication interfaces are

available. A memory card enables program or recipe data updates to be carried out simply. A standard CANopen fieldbus master is integrated on all EC4P devices in addition to the easyNet network. This allows connection to a wide range of fieldbus stations such as visualization systems, remote I/O systems or drives. The EC4P versions with an integrated Ethernet interface are a special technical highlight. Ethernet offers remote programming from any location, data exchange to higher-level systems (e.g. via OPC), faster processing speed, simple connection to the office world.

CONCLUSION

Karl-Heinz Gerling, the technical designer for process automation at PlanET Biogastechnik is impressed by the simplicity of easyControl and the solution he has implemented with it: "easyControl impressed us both in terms of hardware and software. No programming specialists were required to integrate the easyControl in the ongoing operation of a biogas plant. easyControl allows all the signals required to be integrated in the plant control. With easyControl we were able to implement an astonishingly simple solution that offers us everything we need to implement customer-oriented features. Ultimately, the price/performance ratio was the decisive factor. And in this easyControl achieved a lot..."



The easyControl converts the CHP data fed to it via CANopen into analog and digital signals.

Quicklink ID:

MS1615

Moeller GmbH
Hein-Moeller-Str. 7-11
53115 Bonn
Fax: +49 (0)228 602-2275
E-Mail: info@moeller.net
Internet: www.moeller.net

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