

Cross-factory central control system for engine and automobile production at AUDI HUNGARIA MOTOR Kft.

Flexible, efficient and sustainable – building automation with zenon

With an extensive factory expansion, Audi Hungaria was also facing the challenge of implementing a cross-plant central control system (CCS). The aim was platform-independence, the introduction of a comprehensive energy management system and the targeted and easy evaluation of historic and actual data. Kropf Solutions implemented this major project on the basis of the HMI/SCADA solution zenon and the reporting software zenon Analyzer.

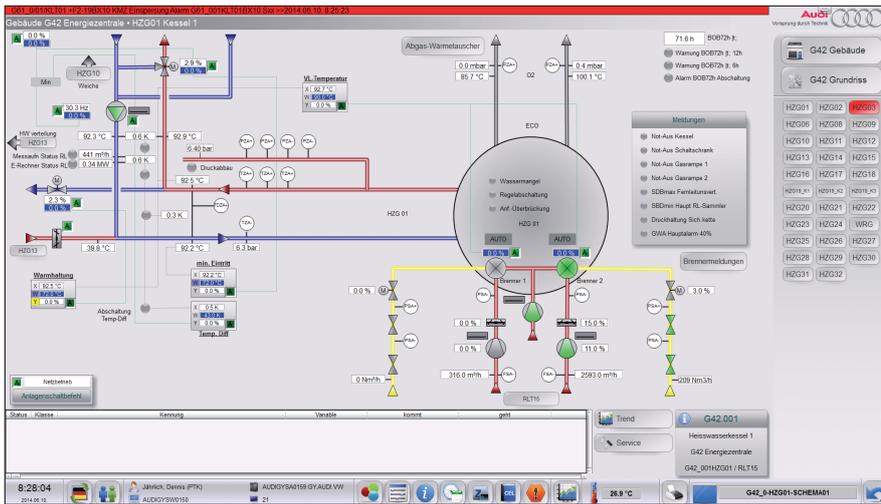


AUDI HUNGARIA MOTOR Kft. in Győr, Hungary, has been developing and manufacturing engines for AUDI AG and other companies of the Volkswagen Group for over 20 years. In 2014, the company started series production of various models. That year, with more than 11,200 employees, Audi Hungaria manufactured a total of 1,973,734 engines and 135,232 cars. In order to be able to master car production in addition to the development and pro-

duction of engines, Audi invested in comprehensive factory expansions. Part of this factory expansion was also to implement a central control system and equipment monitoring. The car manufacturer's objective was to set up a central control room allowing the control and monitoring of energy and production materials for over 15 buildings, over a factory area of 395 hectares.

HIGH DEMANDS ON THE NEW CCS

One of the main requirements was to find a central control system that is platform independent: "Our objective was to introduce an open control system that had a large number of inter-



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dual-monitor system. Two workspaces are used for the engineering (development and test of the GLT applications). The central control system of the factory building is monitored in a four-shift operation. This ensures that the necessary supply materials for the automotive and engine production can be provided without interruption. In addition, Kropf Solutions has installed 20 kiosk terminals with touch panels (CCS clients) at the most important locations in the production hall, so that the CCS team or the maintenance workers can easily inform themselves about the supply of production materials and energy at a central point in the hall. There are 156 information focus points (IFPs) in the halls and buildings: Each of the 156 IFPs is equipped with a panel for on-site operation. The PLCs of the information focus points are monitored with a watchdog. Kropf Solutions has also implemented an instrumentation and control engineering technology in the halls for the bodywork, the bodywork storage area (sequencer), the paint shop and the tool manufacture. zenon is also in use there as an HMI system (VIPA panels) at over 60 IFPs. Microsoft solutions are used for the complete infrastructure: Windows 2008 R2 for the servers, SQL Server 2012 for zenon Analyzer, Windows 7 for the operating PCs, notebooks and kiosk systems as well as Windows CE for the touch panels.

OVERCOME COMPLEX TASKS WITH ZENON

In order for the timing of the different processes in the central control system to be controlled optimally, Audi uses the Production & Facility Scheduler (PFS), which is fully integrated into zenon. Depending on the date, time or result, the people in

charge of the control system can then use the factory calendar to define which processes are triggered and when. An example: In the PFS, it has been defined that the ventilation equipment is to be shut down in the bodywork section when production is not taking place. For equipment with heavy consumption, considerable savings can be achieved very quickly this way. Audi uses the Historian and an SQL database to record and archive all data in relation to the supply of materials and energy, for five years. All values (such as, for example, the consumption of hot water) are initially saved in the PLC, where they are safe from a failure, whereby zenon can write the values block-wise to the zenon archive using real-time data acquisition (RDA). Each set of data that is saved in an archive also contains, in addition to the variable value, the time stamp in milliseconds and the variable status. The data can thus also be arranged historically and analyzed correctly. The alarm management alerts users to critical process events, logs all alarms and supports the CCS team in localizing problems or faults in the equipment and rectifying these. At Audi Hungaria, over 50,000 fault message data points are analyzed and evaluated in detail. That is approximately 365 theoretical possibilities where problems can arise for each information focus point. In the Alarm Message List (AML), the employees can see at a glance when and why an alarm was triggered, how they need to intervene and where. It is precisely with large plants such as this where it is thus easy to orientate oneself in a targeted manner and to only display the events that are important at that moment. With the Extended Trend module of zenon, the users and people in charge of the central control system can have information such as energy values, the measured values of the heating

“zenon makes it possible to check and analyze the functionality of our building services equipment quickly and in a targeted manner and to detect faults early and work more efficiently overall. Thanks to the trend analyses, we have the possibility to optimize the existing infrastructure in a targeted and prompt manner.”

NORBERT NÉMETH, TEAM LEADER OF CCS DISPATCHER TEAM AT AUDI HUNGARIA MOTOR KFT.

and ventilation systems, temperatures and air flow displayed in curve form, in order to analyze this, to compare it and to use it as a basis for making decisions. The complete documentation of the automation stations is also stored in the control system. This is how the CCS employees can, for example, view the equipment interconnections, the lists of components and their functionality and quickly and easily get their bearings. The notebook function is for transferring additional information – when handing over a shift for example – to colleagues. The user administration at Audi in Győr is structured on the basis of roles or functions: Defined is who can carry out which actions – such as the acknowledgment of a fault, the setting of target values, the suppression of faults, the amendment of system settings, etc. Thanks to the online language switching in zenon, employees from the CCS team can use the solution in their respective national language. Norbert Németh is satisfied with the new, comprehensive central control system: "What convinced us in particular was the performance of the overall system, the quick and clear trend queries and the easy handling of the application. The effort required for training was low for the user and was ultimately only one to two days. Changes or enhancements to the software can be rapidly achieved and without extra programming. zenon is the optimum platform for our building services systems."

ZENON ANALYZER – ANALYZE, EVALUATE, OPTIMIZE

Audi Hungaria also uses zenon Analyzer for data analysis and reporting on ten clients. Kropf Solutions has created an equipment model for this, which portrays the structure of the control

technology and groups it according to buildings, generation and consumption. The car manufacturer uses zenon Analyzer to evaluate and analyze alarms per building and per information focus point – according to time period, frequency or duration. In addition, Audi also records and evaluates consumption and evaluation of all materials and buildings. There are reports for the individual halls and buildings, which display either the daily or monthly consumption (of hot water, cold water, compressed air, etc.) or also show monthly comparisons. Also, the manufacturer can use a second load curve to set a correlation between the energy consumption and the outside temperature, for example. zenon Analyzer also allows central administration of the reports. In addition, all people in charge receive the reports by email. Because the solution also allows the analysis of real time data, employees at Audi can gain an overview at all times regarding the current situation of the supply of materials and energy. "One of the objectives of Audi Hungaria is to reduce the expenses for energy on a long term basis, to deploy all resources effectively and to operate sustainable environmental management. zenon Analyzer gives us the possibility to analyze and evaluate the actual status and to uncover optimization potential. In the future, employees will also be trained how to apply zenon Analyzer, so that they can use this tool to develop their own ideas for optimum energy management", adds Norbert Németh from Audi Hungaria. An example for initial improvements: The gates for incoming and outgoing deliveries are shown in the control system. If the gates are open too long, allowing warm air from the halls to get outside, the system sends a message and informs the people in charge. This alone is how 42 megawatt hours per year can be saved.