New Webviewer Merges Web and Control Applications

Central Control Unit Makes Use of Web Technology

The central control unit of the injection-molding machine is used by the machine operator for control, regulation and optimization of the entire production process. In order to directly integrate external systems as well as proprietary solutions that do not have a standardized interface, Engel uses a technology that is already widespread in day-to-day routine. Via a browser, the new Webviewer can be reliably integrated into the CC300 control panel of the injection-molding machines.

The Webviewer in the machine control system integrates not only ancillary equipment with web interfaces, but also data from internal and external systems that are accessible via browsers. © Engel

The CC300 control unit offers extensive options for the easy and reliable control and continuous optimization of the entire production process. To be able to really benefit from digitalization in production, it is crucial to be able to access data and information, not only about the injection-molding machine and automation, but also about ancillary equipment and systems, as well as outside the manufacturing cell. There are various ways for the control unit to communicate, for example, with temperature-control equipment or hot runner control systems.

Widely used approaches to integration are OPC UA and VNC Viewer, which are already used to allow visualization of different systems to be integrated into the CC300 control unit of the Engel injection-molding machine. However, the challenge is that by no means all equipment manufacturers offer standardized interfaces such as OPC UA or VNC. Proprietary systems, such as exist in mature production environments, usually cannot be integrated either. These equipment and systems then require their own additional operating equipment, which is installed above or next to the machine operating panel (**Fig. 1**). Data islands grow up, self-contained systems, which lead to much of the information remaining unused.

Digital Worlds Grow Together

Engel is filling this gap with the Webviewer. The solution is an integrated browser, via which external web servers and web pages can be called up directly on the monitor of the CC300 machine control system (**Title figure**). The web user interface allows the data of the external systems to be not only viewed, but also modified. Complex data interfaces are just as unnecessary for this as separate monitors on the injection-molding machine. As a shortcut, individual screen pages can be saved as favorites, just like on a smartphone. The Webviewer can be retrofitted to all Engel injection-molding machines with CC300 control system that have been delivered since October 2021.

One application may be, for example, the visualization of a filling simulation that had been produced in the develop-

ment department hitherto and could not be viewed at the machine. The simulation results and filling simulations from the particular software solution that is used, for example Cadmould from Simcon, can be viewed in the Webviewer (**Fig. 2**). The advantage is a faster, more direct and closer exchange between engineering and machine setting. In addition, the calculation is performed in an external system and does not affect the injection-molding machine. Another advantage of the Webviewer is that the machine software version is independent of the simulation program – provided that the results can be displayed via a browser.

Integration along the Entire Value Creation Chain

As digitalization advances, the number of overlaps in the application of data from the machine, production planning, maintenance, development and other areas along the value-creation chain increases. The same applies to the amount of data that is retained in a web-based format. Because any desired web pages can be integrated into the control interface of the production cell, there are no limits to the machine operator's use of data. Error catalogs and expert systems can be just as easily integrated as mold documentation, set-up instructions and customer-specific checklists.

Another possible application is the integration of production planning systems. If the machine operator wants to know which tool has to be set up next, he no longer has to turn to the central process control system server. Via the MES web view, he can call up the planning directly in the control system. For authentig, the MES of Engel's subsidiary TIG, the Webviewer is already preconfigured.

The user also benefits from the integrated overall data view in case of a fault. The fault can be logged in the MES directly via the Web interface, resulting in shorter downtimes and improved machine utilization.

Fig. 1. Additional monitors are unnecessary; web-based dashboards can be directly displayed on the CC300. © Engel

Data Containers Secure the Road to the Future

The merging of the data worlds has significant advantages for the machine operator and positive effects on production efficiency. This presupposes maximum data security. In developing the Webviewer, Engel has therefore opted for encapsulating the systems within the machine control system. The Webviewer is integrated in the control system via so-called containerization. Data exchange with the production system is therefore not possible and work in external systems does not result in a loss of performance. In addition, the Webviewer can use certificates and transfer data in encrypted form.

With the new Webviewer, Engel supports its customers with the digital transformation of the injection-molding process, well beyond optimization of the injection-molding process and automation solutions. In the production systems of the future, participants and components of the injection-molding cell will merge with the adjoining systems and platforms throughout the value-creation process. To enable this, Engel has reconceived the traditional control of the injection-molding machine. The Webviewer is a key module of the smart factory of the future. ■

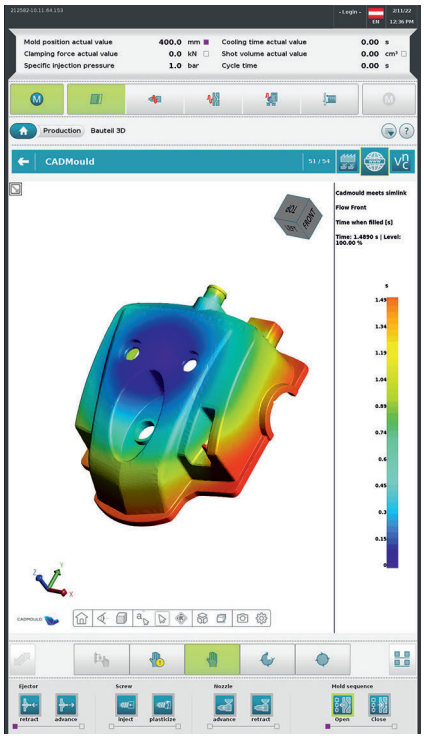

Fig. 2. In a filling simulation, users can benefit from the new Webviewer. The result of the filling study can be displayed independently of the simulation program. © Engel

Info

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