

AUTOMATION IN THE APPLICATION

Data Consistency with OPC

Intelligent process data management

The OPC communication standard ensures the consistent exchange of data between all OPC-enabled automation components and the control system. But sometimes other communication demands need to be met as well. The following article demonstrates how a paper manufacturer approached this task.



Figur 1: The PC-based automation platform enables the intelligent exchange of data between automation components and the control system.

Stora Enso is one of the world's leading forest industry companies. Stora Enso is divided into business divisions for Paper, Packaging and Forest Products which produce publication and catalogue paper, fine paper, packaging board and wood products. The company maintains a leading position in these product fields. Stora Enso achieved revenues of € 12.2 billion in the year 2003. The company employs around 44,000 people in more than 40 countries on five continents, and it has a production capacity of 15.7 million tons of paper and card and 7.4 million cubic meters of sawn wood products. The company's mill in Reisholz, Germany produces uncoated magazine paper for the Publication Paper department. In the course of introducing a new, higher-quality product, the mill's existing production installations – particularly the calendars – were equipped with new measurement and control technology.

Choosing OPC

In order to ensure that the installations would run more smoothly and be easier to service, and to guarantee consistent communication between all measurement and control systems, Stora Enso decided to use the open OPC communication standard as a shared data interface. OPC is being used both for communication between the measurement and control systems and for communication with the Mill Information System (MISystem), a higher-level control system. When the contract was awarded, an OPC interface was requested from all measurement and control technology suppliers.

OPC – The open communication standard

OPC makes it possible for measurement and control components from different manufacturers to exchange data with each other directly without the need for gateways or individual bus protocol adjustments. OPC offers the following benefits:

- OPC is a defined, neutral and open data interface
- OPC ensures the neutral exchange of data between systems from different manufacturers
- OPC allows communication to be standardized
- OPC makes it easier to detect errors

Rules for the production data network

The Reisholz mill places value on the consistent implementation of standards and secure technologies to ensure safe and uninterrupted production, ease of maintenance and rapid troubleshooting. This is why Profibus, OPC, Ethernet and fiber optic cables are used for production automation in the mill. Profibus is increasingly being used for communication between the field and the automation level. To simplify communication between the automation components and the control technology, Stora Enso generally uses OPC in its Reisholz mill. Communication between the newly implemented measurement and control technology installations also takes place via OPC. The automation stations are networked with Ethernet. A 100 MBit Ethernet network is also used for communication between the automation level and the management level. When communication lines leave a room, fiber optic cables are used as the exclusive communication medium due to their high resistance to interference.

Process data manager

In order to better handle the process data it accumulated, Stora Enso decided to use the 4Control automation system from Softing AG as an intelligent process data manager between the MISystem and the measurement and control systems. Since the systems being used have either OPC server or OPC client functionality, it was not possible for all systems to communicate with the MISystem, which only has an OPC client. 4Control solved this problem, since it is equipped by default with both an integrated OPC server and an OPC client.

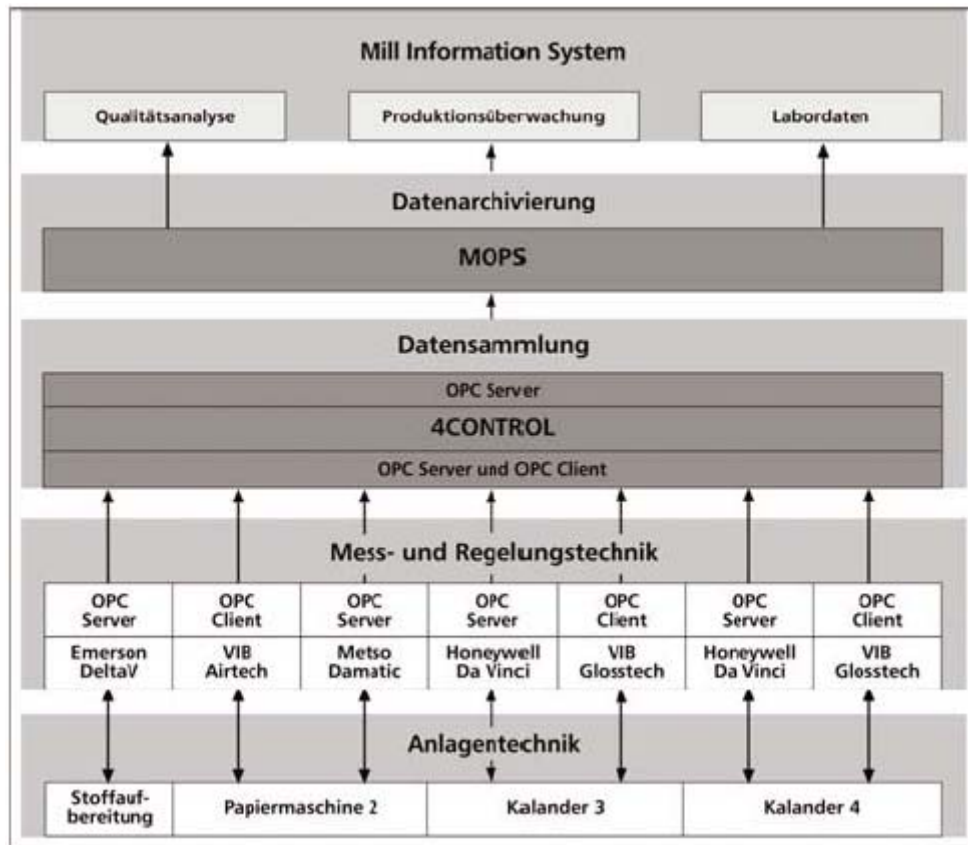
Data integrator

4Control can communicate with the following systems:

- Airtech from V.I.B.
- Glosstech from V.I.B.
- DaVinci from Honeywell

- Damatic from Metso
- DeltaV from Emerson
- MOPS from Tieto Enator

4Control reads the data from these systems via its OPC client and OPC server interface and forwards it to the MISystem (as an OPC client) through the OPC server interface.



Figur 2: Process data management with 4Control and OPC.

OPC communication

The data supplied by the measurement and control installations must sometimes be pre-processed in order to be accepted by the MISystem. In order to eliminate the need to adapt the higher- and lower-level systems to one another, the necessary data processing takes place between the measurement and control systems and the MISystem in 4Control, which is interposed between the systems. With the OPC server and OPC client interface of 4Control and its IEC 61131-3 programming capabilities, it is possible to deliver the data to the MISystem in the format it requires. 4Control made it possible for communication to take place between two systems which only have an OPC client interface. A data mediator in the form of software with OPC server functionality and internal processes for handling the interfaces was essential here. It was also necessary to convert the data from the subordinate systems. An IEC 61131-3 program in 4Control which pre-processes the data ensures that only relevant data in the required format is forwarded to the MISystem. This makes it possible to reduce the amount of data in the database system in advance; redundant data is not sent to the database in the first place, thus preventing a "data graveyard". OPC tag names had to be modified in some cases, which can also be carried out with 4Control. Data structures from the subordinate systems also

had to be adjusted for the quality database. In the MISystem, all installation data (around 15,000 online data points) is collected in an Oracle database. The data is evaluated and analyzed using Windows client PCs. The MISystem is therefore the link between the production network and the company network, and it decouples these networks from one another.

Customer benefits

With 4Control, it was possible to reduce system integration costs and the time needed for integrating the data from the various systems. 4Control also made communication possible between the OPC clients for the first time. The company also wanted to set up a central OPC data collection point in front of the MISystem. Since 4Control receives all raw data from the subordinate systems, the installation operator can now flexibly generate and evaluate production data which is adapted to his needs. This has made it possible to prepare, evaluate and present the installation data more precisely, comprehensively and quickly. Determining average values, which was previously only possible offline, can now take place online as well. Using the remote desktop functionality of Windows, all installation data which is captured by 4Control can be evaluated remotely. Disruptions can be corrected more quickly now, and changes can be made easily and safely. Different data formats can be adjusted easily as well. The installation data is processed and evaluated with 4Control independently of the installation controllers. It is now possible to create data links which were previously impossible or which could only be generated by the supplier's service technicians. None of the systems had to be modified to create more flexible data analyses, since 4Control takes the raw data and converts it into new data for the MISystem. It was also not necessary to adapt the existing measurement and control technology components for this. The programs in 4Control are created in accordance with the IEC 61131-3 programming standard. This means that no special knowledge of how the different systems are programmed is required.