Sustainability and green thinking –
Migration and modernisation of a process control system during ongoing operation at Werner & Mertz

Even a process control system that was state-of-the-art years ago needs to be replaced at some point. The crucial question is then: How is it possible to modernise the all-controlling system of a production process without jeopardising or even interrupting ongoing production? The example of the successful manufacturer of cleaning and care products Werner & Mertz, boasting traditional brands such as Erdal, Frosch and Emsal, shows how it is done. Parallel to ongoing production, the existing control system was migrated in two steps to the cutting-edge Plant iT process control system.

Technical plants are a living thing; they grow and are always being adapted to new tasks and specifications. This means that, over time, process automation also has to face up to new challenges. The consequences of this are complex and thus delicate structures between process instrumentation, management, MES and ERP levels. These matured and flexible structures often deviate from the original, integrated process control concept, possibly forcing certain areas to be excluded from automation and to be operated manually. Transparency, traceability and quality assurance may all fall by the wayside.

The aim of every migration measure is, therefore, to re-establish a consistent, uniform automation structure. However, the fundamental question is always: Can hardware, especially process peripherals, be retained and only the software migrated? Or does the control technology have to be replaced fully? Plant iT is suitable for both. The decision as to which route is the better depends on the existing automation infrastructure. ProLeiT draws on a wealth of experience from a large number of modernisation projects. This allows both an all-at-once or step-by-step approach to migration. Which route is eventually taken depends on the requirements for production readiness. In addition, it must be clarified whether Plant iT needs to be combined with existing automation systems. Or whether the controls have to be changed or extended. By using Plant iT, the open, hardware-independent, scalable process control system, both migration and replacement are possible effectively and efficiently with hardly any plant downtime or breaks in production.

Migration with minimum downtime

A current example of fast and economic migration with minimum production downtime is the modernisation of a production unit at Werner & Mertz in Mainz, Germany.
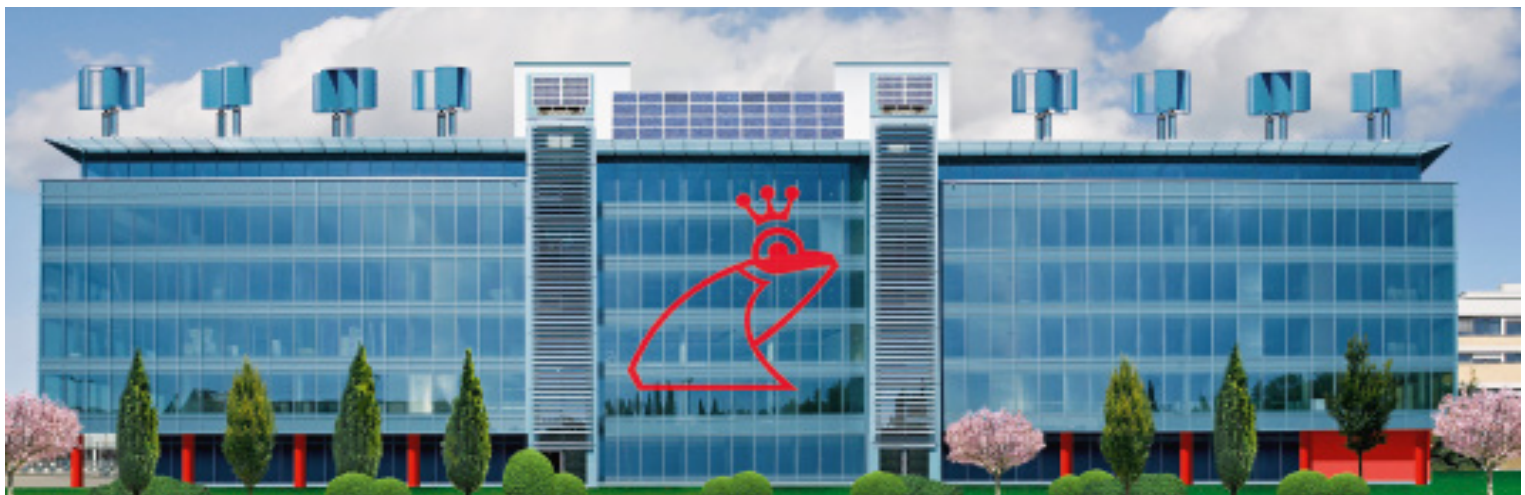
According to its principles, the company has been committed to 'the care of all good things' for over 140 years. The company's well-known

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brands include, for example, Erdal, Frosch, Emsal, tuba, tarax, tofix, rorax and ratzfatz, thereby offering an extensive product portfolio for both professional bulk consumers – e.g. in the building cleaning and catering sector – and for private end users when performing daily cleaning activities in the home.

The happy frog: Werner & Mertz produces cleaning and care products of the widely-known brands Erdal, Frosch and Emsal in Mainz.

As a family-run business, Werner & Mertz is proud of its long-standing commitment to the principles of a sustainable economy, as a glance into the foyer proves

To manufacture these products, the company uses a wide variety of basic raw materials, which are stored in tank farms. These products are mixed with around 1000 other additives in small quantities to form the end products in batch processes and then filled into suitable packaging (500 ml bottles and 1000 l containers) or into tankers. As a family-run business, Werner & Mertz is proud of its long-standing commitment to the site in Mainz and the principles of a sustainable economy. The company therefore attaches great importance to the consistent and resource-saving optimisation of its processes, which led to it winning the German Sustainability Prize in 2009. Since production had been gradually expanded over the course of time, it almost inevitably led to semi-automated areas in which a lot of manual operation was still necessary. Another critical factor was the supply of spare parts for the old automation systems. These spare parts became increasingly difficult to obtain and therefore more expensive.

Werner & Mertz therefore decided to fundamentally modernise the automation platform. The main criteria were to employ a system that could operate using freely available and, therefore, cost-effective hardware. In addition, the existing process peripherals were to be retained and a modern process control system implemented

that would meet the following requirements, especially for fine chemicals:
- Flexibility when adapting to the technological particularities of each production process
- Flexibility when implementing new systems, extensions, conversions and adjustments during operation
- Low total cost of ownership
- Low entry costs with step-by-step implementation

After deciding in favour of the Plant iT process control system, a solution for the migration was developed. The aim was to be able to maintain the operation of the plants as far as possible without having to interrupt them or shut them down. During the migration phase, which was designed for a time window of six months, it was therefore imperative that the previous automation system and the new Plant iT V8 system ran parallel and exchanged information.

The key feature of the migration was an intelligent connector concept that allows the process level to be simply encapsulated between the controllers of the old process control system and Plant iT. This enables production to be maintained on the existing system and at the same time to be converted, tested and optimised step by step by successively transferring the peripheral signals and software from sub-segments to Plant iT. This clear electrical and programming concept additionally offers the safety of the relapse strategy. If, especially during short breaks in production, new programs do not run immediately, the control processes can be switched back to the old system in just a few simple steps. The reason why this works is quite obvious: No cabling or wiring has been changed in the process peripherals. The same applies to the existing instrumentation, actuators and valves.

A key aspect is also that the entire plant is not divided into two islands with regard to automation and monitoring during the migration phase. This is ensured by the fact that Plant iT takes over the existing automation processes – bit by bit

– once the changeover has been completed. In the aforesaid procedure, the plant operator also has a number of design and influencing options with regard to project planning. This method ensures fundamental process changes or larger necessary procedural adaptations to be carried out only after migration to the new process control system. As a result, Werner & Mertz now has process control technology that is precisely adapted to the individual requirements of its production.

Integrated MES-functionality

The new process control system operates on the basis of standard and freely available hardware, Siemens components are used as controllers, and the peripherals are coupled with controllers from Phoenix Contact. Migration to Plant iT V8 eliminates the many previous manual controls and incorporates them into an integrated overall automation system. Productivity of the system has been improved by coupling the individual sub-areas and eliminating manual operation. At the same time, the time sequences in the processes have been significantly shortened. Process reliability and quality monitoring have been optimised. Overall, migration to Plant iT V8 results in flexible control technology with integrated MES-functionality, the latter being a prerequisite for conclusive reporting.

Within six months, the previous control system was replaced by the modern Plant iT V8 process control system