How can we optimize our Factory planning in an integrated approach?

SIMATIC Automation Designer based on Comos increases all potentials of Digital Engineering for both time and cost savings.

Answers for industry.
Merging worlds: Seamless processes from product design to production

Producing companies are facing increasing requirements worldwide. New products featuring top quality have to be launched on global markets in ever shorter time periods and at attractive prices. The only way to ensure success throughout the entire production lifecycle is the application of highly efficient product lifecycle management (PLM). Seamless interaction with the factory lifecycle management represents a further decisive success factor. Therefore, two subjects are increasingly focused: Digital factory and digital engineering.

Common database

The PLM approach comprises a product’s entire lifecycle. A software which provides all information as central database and supports consistent interaction with other programs forms the technical platform for the PLM philosophy’s implementation. This software facilitates the successive incorporation of previous department-specific solutions into company-wide-accessible and homogeneous structures.

The optimization of the production process is increasingly realized within the digital factory, which represents a virtual image of the real factory, with the help of which production processes can be simulated and work flows optimized. Implementation for real production is based on this planning platform.

Previously however, the PLM world was not automatically connected to the production world. To allow for these worlds’ merging, the real production systems have to be supplied with complete circuit diagrams and many more details for the real processes in the factory, e.g. with a PLC program, after completion of all simulations on the “digital factory” level.

SIMATIC Automation Designer creates the prerequisite for digital engineering within the scope of the digital factory – from import of data from the planning phase to configuration of the automation solution, down to utilization during ongoing operation. The software facilitates the seamless transfer of the digital factory into the real production factory and
thus sets new automation standards in terms of machine and factory engineering.

SIMATIC Automation Designer is compatible with the Comos software products for digital engineering and lifecycle asset information management.
Factory engineering well under control: Performance of SIMATIC Automation Designer

Interactive, integrative, innovative

SIMATIC Automation Designer utilizes a common interdisciplinary and consistent database which integrates the various planning data in terms of mechanics, electrics and automation in a factory structure and intelligently manages this data by means of modularization, standardization and library concepts. The software overcomes the borders between all affected disciplines and interconnects mechanical, electrical and control-technical factory planning for a time-optimized dimensioning and engineering phase and consistent documentation of a production factory.

Integrated data management

Factory engineering always entails large data volumes from various sources and systems. This data has to be fault-free, reasonably structured and user-friendly across all disciplines.

The openness of SIMATIC Automation Designer supports seamless integration in existing system environments. Irrespective of the tools employed in the planning process, all data is consolidated in a digital engineering system for further processing on a uniform user interface. This way, SIMATIC Automation Designer merges the previously separate worlds of mechanics, electrics and control technology in a common factory structure and provides integrated data management from the planning to the production phase – throughout all disciplines.

Efficient cooperation redefined

Complex factory planning necessitates major coordination expenditures between the affected disciplines – which often results in redundant expenditures and communication difficulties. SIMATIC Automation Designer facilitates automated, standardized work flows, reduced coordination expenditures and an improved result quality with considerably minimized expenditures, e.g. thanks to the reduction of transmission faults.

Automatic automation solutions

SIMATIC Automation Designer generates projects for various target systems such as SIMATIC STEP 7,
SIMATIC HMI and Eplan. This does away with major expenditures for manual creation and modification. All affected disciplines can comprehend the results, which in turn eases the generation of results.

The software’s object-oriented layout allows for fast responding to individual requirements and created application parts can be easily reused as required.

**Optimal engineering**

The convincing graphical engineering concept of SIMATIC Automation Designer supports configuration and graphical placement via drag & drop as well as interlinking of elements, process steps and many more variables. In addition, object data can be graphically assigned – on each level of the machine, down to the signal.

As a new feature, SIMATIC Automation Designer provides the user with up-to-date and consistent documentation, which can be called up anytime during factory creation and factory operation.
Factory engineering in detail: Operating principle of SIMATIC Automation Designer

The actual factory configuration process starts after all relevant data, also from upstream processes, has been entered in the template library. Creation of interrelations, definition of material flows and generation of projects for target systems – all these steps are realized in an easy, transparent and comfortable manner.

Guided engineering

The desired automation standard and the required engineering steps are specified in SIMATIC Automation Designer. Planners are subsequently guided through a decision process within the projects. Dependencies between the planning disciplines, e.g. between hardware and software, are already taken into account at this stage. Technical planning of the individual affected disciplines can be realized independently of expert knowledge on other disciplines as interdisciplinary consistency is ensured by SIMATIC Automation Designer.

Factory configuration

Planning in the factory layout already bears an influence on the design of the control. For example, the assignment of a motor to an operating area and a safety zone determines the resulting control program. This is already considered for subsequent generation in the background of SIMATIC Automation Designer, thanks to which completion of the PLC program is only a mouse-click away.

The object-oriented basis of SIMATIC Automation Designer both facilitates consistent forward engineering with progress control as well as effective redesign – throughout all engineering disciplines. The current planning status of every object is consistently displayed to support factory-wide control of all elements yet to be edited.

Improved result quality

From the first steps of digital engineering, major parts of the control software are already compiled unnoticed to the planner. This way, the control software can be consistently generated from the factory structure directly after completion of the hardware planning.

After completion of the planned factory’s engineering, the automation solution has to be transferred to various target systems. For this purpose, the software offers diverse specific generators. The expandability of SIMATIC Automation Designer is ensured at all times. Generators for all types of target system can be integrated as required.

SIMATIC STEP 7 Generator

With the SIMATIC STEP 7 Generator, the previously configured automation solution is generated for the S7 target system for direct transmission to SIMATIC STEP 7. With this generator, SIMATIC Automation Designer facilitates the realization of automation concepts in accordance with any SIMATIC user standards.

Sequence Designer

The Sequence Designer supports the graphical creation of sequence controls for devices, machines or systems. The user can alternate between a mechanical and an electrical view and can incorporate specific information, e.g. signals or locking conditions. The S7 Graph Code is then generated from the defined sequence description.

Integrated E-CAD – Comos ET

SIMATIC Automation Designer contains Comos ET as full-fledged and completely integrated E-CAD system. This integration not only allows for the consistent generation of complete circuit diagram manuals, but also supports easy redocumentation of the factory during and after commissioning.
Easy and efficient interaction across all disciplines:

1. Functional engineering:
   Engineering tasks are realized graphically on the basis of factory layouts and guided engineering. The object-oriented data model and uniform user interface are consistently used for all disciplines.

2. Electrical planning:
   SIMATIC Automation Designer features a full-fledged E-CAD functionality and facilitates the generation of complete circuit diagram manuals. Easy factory redocumentation is supported during and after commissioning.
SIMATIC Automation Designer in practice

3. Automation:

PLC programs are automatically created by a powerful, rule-based generator and the editor features intuitive, comfortable user support. STEP 7 is optimally connected.

4. Sequence designer:

The automatic generation of the complete control program, incl. transition conditions and interlocks, is supported by the graphical engineering of complex sequences.
Consistent, integrated, future-oriented:
SIMATIC Automation Designer

Product lifecycle management, factory lifecycle management and automation technology grow together ever more closely. Factors such as data consistency, flexibility and planning quality represent decisive factors for the success of future factory planning throughout the entire production lifecycle.

Time and cost saving potentials are increased by the future-oriented concepts of digital factory and digital engineering. Digital engineering with SIMATIC Automation Designer is characterized by:

Interlinked engineering data

Digital engineering allows for a holistic analysis of the various data in terms of mechanics, electrical construction and automation. Already employed software tools can be further used and integrated in a common data management system. This way, isolated solutions are transformed into consistent and integrated system solutions.

Prompt realization of virtual planning

Production is already optimized in the virtual software environment. Within the scope of the digital factory, SIMATIC Automation Designer facilitates the seamless and time-optimized transfer of the virtual planning results to a real production factory.

Parallel engineering processes

The parallelization of individual processes in the digital world reduces the overall project duration – from product development down to production planning. Production methods and processes are coordinated already at an early development stage.
Thanks to the common database and guidance throughout all disciplines, SIMATIC Automation Designer allows for a parallelization of processes which considerably accelerates the time-to-market and thus improves your competitiveness.

The software’s development options and the resulting benefit potentials for our customers are unrestricted. As a globally operating supplier offering the most comprehensive portfolio in the field of product lifecycle management and industrial automation, we act as your competent and reliable partner for all aspects of digital engineering.

Worlds are merging – new dimensions of consistent, integrated and holistic factory planning represent a guarantor for a successful production future particularly in the complex field of production planning.

SIMATIC Automation Designer offers the following benefits:

- Maximum data consistency
- A new integrated and holistic planning dimension in top quality
- Increased cooperation efficiency across all disciplines
- Reduced lifecycle costs
- Accelerated time-to-market
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