Highest efficiency across the line
Intelligently address complex challenges with Optimized Packaging Line

Whether in the food and beverage or pharmaceutical industry, the name of the game is to connect machines from a wide variety of manufacturers. Though frequently the consequences are high integration costs, long production ramp-up times, as well as responsibilities between the OEMs that are not clearly defined. In addition, these types of heterogeneous automation environments also frequently result in higher maintenance costs and in turn, higher operating costs. We have not even touched on the poor or even complete lack of transparency and the high service costs, as a result of malfunctions and often time-intensive troubleshooting. With its Optimized Packaging Line (OPL), Siemens offers the intelligent response to all of these challenges.
Seamless and integrated automation solutions for packaging
As your automation partner, with OPL, we supply a holistic and integrated concept for the complete and integrated automation of packaging lines and machines. Based on Totally Integrated Automation – our open system architecture for seamless automation – OPL integrates the complete packaging line based on a standard automation and communication platform. Consequently, it minimizes the complexity from the word go.

Our well-conceived concept creates the basis to fully leverage the optimization potential over the complete lifecycle of a packaging machine. This relates to the productivity, flexibility, reliability, and energy efficiency. When all is said and done, OPL plays a decisive role in sustainably improving your competitiveness.
Profit through consequential standardization throughout the plant

Less is more: advantages through standardization

- Lower integration costs
- Less complexity
- Lower engineering costs
- Fewer sources of faults and shorter downtimes
- Lower training costs
- Smaller spare parts inventory
- Fewer version checks and updates

Optimized Packaging Line

Standard Machine Interface

Machine 1  Machine 2  Machine 3  Machine 4
OPL consequentially implements international standards such as Weihenstephan and PROFINET – and fulfills international directives for open and modular automation architectures defined by the OMAC User Organization. It is far simpler and faster to integrate lines applying these international standards. Also, the communication details via PROFIBUS or PROFINET are defined – up to plant-wide standard and clearly allocated interfaces for messages and alarms, as well as a standard operating concept.
Higher transparency and line efficiency
With OPL, you can depend on a standard line overview as well as a standard operating concept for diagnostics and maintenance. Consequently, you have a complete overview of the state of your machine or system. The resulting advantages are enormous: machine data and status, as well as diagnostics information, are defined in the machine according to international standards and line components are uniquely and electronically identified. Additionally, the information flow is integrated and documentation is seamless. With OPL, you profit from a whole raft of scalable tools – for example, for line visualization, downtime management, power management, asset management, etc. This range of tools can be flexibly adapted on a customer-for-customer basis and can be expanded when required – from basic functions up to a complete MES infrastructure. All of this creates the preconditions for a higher degree of control and monitoring as well as high availability, and when all is said and done, for improved quality.

Perfectly tailored to the packaging sector
OPL is based on our many years of experience in the widest range of sectors, as well as the know-how of our experts in the application centers for packaging solutions. Our holistic and integrated concept allows, for instance, order and batch-related acquisition of production data – depending on the particular requirement. In addition, operating and fault messages can be directly transferred into an archive. Comprehensive software libraries, typical applications, and best practice examples for machines and plants were harmonized to create an integrated and standardized overall system. This includes all of the powerful hardware and software components for all packaging-related automation tasks. The result: the highest degree of integration over the complete packaging line, which can always be adapted to address current requirements thanks to its modular design.
Higher efficiency using preconfigured software modules

By using open, standardized software structures, OPL minimizes engineering, maintenance and integration costs. Preconfigured software libraries and modules that are simple to adapt for basic automation tasks (e.g. for handling modules) reduce the amount of application software required. In turn, this increases the functional safety of the machines. The scalable OMAC PackTags for the SIMOTION® motion control system and the SIMATIC® automation system offer a standard interface for all packaging machines – for homogeneous communication, from machine to machine as well as from the machine to the Manufacturing Execution System (MES). This speeds up construction, commissioning, and line integration for all of the machines. In addition, operator control, maintenance, and diagnostics are standardized and data links to the master computer and IT systems are simplified.

Higher productivity and cost efficiency through the operator-friendly human machine interface

Frequently, plants and systems stop due to the fact that a machine cannot be appropriately operated. This clearly underscores why the operator interface design is increasingly becoming a decisive quality feature of state-of-the-art machines and which must address the requirements of the particular filling line. When designing an optimized operator interface, navigation and the operating areas are standardized together with OEMs and users in various associations and committees. A user-friendly HMI template and a library of icons have been created from this cooperation. This sets standards and minimizes training costs, downtimes, as well as waste as a result of incorrect operation. Additionally, it ensures a significantly higher constant production rate in multi-shift operation where there are operators with different levels of qualification at the machine.
Increased reliability and safety

OPL consequentially uses well-proven, communication-capable standard hardware and software components. This facilitates well-founded diagnostics of status messages and system faults in all areas of modern filling and packaging lines – from the network through the PCs and controls, as well as the connected sensors and actuators up into the machines, which up until now were just considered as black boxes.

**Simply better diagnostics functionality**
When integrating the lines, with OPL, every effort is made to ensure that system faults and status messages are quickly, consistently and reliably displayed – without incurring any appreciable engineering costs. This is realized as a result of the consequential standardization of all system-related components. This allows a level of diagnostics capability to be reached, which has scarcely been achieved until now. All of the components “speak” the same language, and all interfaces and network connections are designed primarily for bidirectional communication, and the complete topology of a machine can be read out by simply pressing a key.

**Higher degree of availability with less maintenance costs**
The diagnostic functionality of OPL pays off over the complete lifecycle of your system. This is manifested in the form of significantly higher levels of availability and lower maintenance costs. If a system fault occurs at any location in the system, or if a fault message is output, then the responsible machine operators are informed, either locally or via remote access with one mouse click, as to which machine or component is involved. In addition, they are informed as to which materials will soon run-out, the serial numbers and the software versions of the replacement parts, and what is especially important, the precise location of this part.

OPL ensures the transparency of all system-related components in a line – and therefore, the complete system. This simplifies and speeds up troubleshooting and repair, reduces downtime and creates the prerequisites for proactive diagnostics. This is an efficient lever in order to completely avoid downtime and the unnecessary replacement of components. Consequently, planning tools such as PM-MAINT used in the production environment also facilitate real performance and event-controlled maintenance in addition to a pure calendar-controlled maintenance. From the very start, all of these measures secure a high availability of your system – over the complete lifecycle.
The complete range of services from a single source

- Project manual, which defines the standardization scope: specification, components list, machine architectures, software libraries, standard operating interfaces, documentation and program management
- Comprehensive support within the framework of our global network of application centers: conversion service for OEMs, local support, training, back-office support center, compatibility tests and project coordination
- Close cooperation between the project coordinator, OEMs and operating company: Plant and system planning, gap analysis, project coordination, online knowledge platform, commissioning support for the operating company, operator training and OPL partner database

Increased machine safety with drive-based safety functions
With OPL, safety functions can be implemented with the highest degree of flexibility – with minimum engineering costs and without the previous obligatory key-operated switch. To achieve this, we offer drive-based safety functions, which are coordinated from small, favorably priced and fail-safe controllers. The safety functions of the SINAMICS® drives prevent potentially hazardous motion from the very start. For the advanced safety functions, the closed-loop position control of the drive remains fully active. This is not only decisive for fast resumption of operation, but also allows drive-based setting-up functions to be provided with protective covers and guards open. The advantage for you: shorter idle times and less waste – therefore, a higher degree of productivity.

Global competent support
We support you in the complete process of OPL-compliant automation. A project team made up of packaging automation specialists and personnel from the application centers support your project locally – for your complete project, starting with the planning phase. This guarantees the highest degree of homogeneity and consistency, no matter which manufacturer had supplied which machine. You can count on our support when integrating your lines, no matter where you are in the world.
Higher system-based energy efficiency

For OEMs and plant operating companies, energy efficiency is increasingly becoming a decisive success factor. This is because the enormous cost savings that can be achieved with efficient energy management, directly impact the competitive advantages. As your partner, we support you in optimizing your energy efficiency – with an extensive range of products, systems and solutions for efficient energy management.
Identify, interpret and implement cost-saving potential
Siemens approaches the energy management topic in a comprehensive and systematic fashion. We see energy management as a process and we split it up into three phases:

• **Identify energy flows**
  The optimum hardware and software acquires, visualizes and analyzes the energy flows in the plant or system: energy flows become transparent

• **Interpret energy-saving potential**
  Based on plant parameters, powerful software tools calculate the energy-saving potential, also taking into account different (alternative) drive concepts. This supplies the basis for cost-effective evaluation of possible measures – for the drive system, the monitoring and supervisory control levels and higher-level management

• **Realize specific measures**
  Based on our portfolio, specific measures can be implemented in order to fully utilize the energy-saving potential that has been determined. Special emphasis is placed on the drive technology, as this represents two thirds of the electrical power consumption in industrial plants and systems

Act with foresight and a vision, save energy costs
For processes with a high degree of motion control, OPL permits the highest degree of efficiency with significantly lower lifecycle costs – especially by using energy-saving motors with the corresponding drive systems that are capable of energy recovery; for example, our SINAMICS S120 drive. This allows braking energy and reactive power to be used within the DC link, and when required, to be fed back into the line supply – and when using the Active Line Module (ALM), without any harmonics. An additional module to increase energy efficiency: SENTRON PAC multi-function measuring devices, which make consumption, line quality and demand peaks transparent.

Just the hardware configuration alone allows energy costs to be slashed by up to 40%. As energy costs make up a significant percentage of the lifecycle costs of a plant or system, these represent enormous cost savings. Further, the measures specified not only impact the power consumption, but also the line quality, allowing transformers and line components to be dimensioned according to the actual demand. Buzzword, downsizing: In many instances, intelligent planning tools such as SIZER make overdimensioning superfluous.

Standardizing drive technology, increasing the flexibility of processes and innovative energy technology allow the energy consumption to be minimized – while still maintaining the performance – therefore, reducing lifecycle costs. Consequently, not only should the pure capital investment costs be taken into consideration for packaging machines and lines, but more importantly, the costs over the complete lifecycle. This approach helps to secure your business success, and to protect our environment.

A reliable handle on energy costs
The integrated SIMATIC powerrate load management system supports you when it comes to maintaining the average power value per period that you negotiated with your power utility company. Up to 100 loads can be monitored with the settings in the priority list, and when required shut down specifically to avoid energy peaks.

Also, in brief non-operational periods, you can save energy and costs without any time-consuming manual switching operations. To achieve this, hardware and software are simply integrated into the energy management system via the PROFlenergy-capable power modules belonging to the ET 200S distributed I/O. In conjunction with the PROFINET functionality I-Device, PROFlenergy allows complete plant sections to be switched in and out in a coordinated fashion, without any high associated engineering costs – by using the appropriate function blocks.
Lower lifecycle costs and shorter time to market

**Simple line integration**
OPL significantly speeds up integration of all of the machines into the line. This is because interconnections are realized easier and faster than for conventional concepts. Further, as responsibilities between the OEM and integrator are clearly defined, risks in the ramp-phase of a packaging line are minimized, and at the same time, the complete maintenance as well as expansions are simplified. We support you by offering a comprehensive range of training courses – perfectly harmonized and coordinated to meet your requirements as machine manufacturer or user. All of this significantly increases your effectiveness and thanks to shorter commissioning times reduces your time to market.

**Fewer components – lower costs**
Thanks to consequential standardization, OPL reduces the complexity of the line. Additionally, having fewer component types simplifies maintenance, minimizes the spare parts that have to be stocked, therefore, reducing line downtime for maintenance. Last but not least, you have significantly lower training, maintenance and engineering costs, which in turn sustainably reduce your costs as a whole. We would be more than happy to calculate just how high your cost savings are when standardizing your lines based on OPL: Using what we call our Benefit Calculation tool, you obtain concrete results – and within the scope of analysis, precisely defined for your specific machine or system.
Automatically monitoring the line efficiency
You can automatically monitor the line efficiency using OPL. This means that it is possible to identify bottlenecks regarding quality, performance and failure times – and to obtain detailed information down to the machine and module levels. As a consequence, you can quickly respond to specifically minimize downtime and optimize your quality.

Highest energy efficiency
Reap the benefits when it comes to energy efficiency across the complete line – and profit from lower energy costs, which in some instances can be significant. Based on our comprehensive portfolio, the power consumption of your drives in your plant can be slashed by up to 40%. It should be no surprise that investments in energy-efficient drive technology frequently have payback times of less than two years.

High degree of reliability and operator friendliness
As a result of the standard operator control and integrated engineering systems, OPL secures a high degree of operator friendliness over the complete line – for operators and maintenance personnel. This means fewer service calls and in turn lower overall lifecycle costs. Possible downtimes are also shortened – and in addition, eliminates numerous time-consuming version checks and updates. In conclusion, it is far simpler to comply with legal stipulations, such as audit trail, user management etc.

Our innovative and highly reliable tracking and tracing solutions also play an important role in conjunction. They secure unique product identification and traceability in compliance with international regulations (e.g. those stipulated by the FDA).
The information in this brochure only provides a general description and performance features. For a specific application, this information will not always be applicable in the form described here. This information can also change due to ongoing product development. The required performance features are only binding if they have been expressly agreed upon in the form of a written contract.

All product designations could be trademarks or product names of Siemens AG or other companies, which, if used by third parties, could infringe the rights of their owners.