

Integrated Drive Systems

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Discover Siemens Integrated Drive Systems

Integrated Drive systems are Siemens' trendsetting answer to the high degree of complexity that characterizes drive and automation technology today. The world's only true one-stop solution for entire drive systems is particularly characterized by threefold integration:

Horizontal, vertical, and lifecycle integration ensure that every drive system component fits seamlessly into the whole system, into any automation environment, and even into the entire lifecycle of a plant.

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- > Sal Spada
Market Analyst, ARC Advisory Group
- > Sebastian Garimort
Electrical Engineer Knauf Integral KG

Integration creates value added

Siemens Integrated Drive Systems deliver a unique answer to today's complex challenges in the field of automation and drive technology: perfectly interacting components as part of an integrated drive portfolio, integrated into automation, and with software and services for all stages of the lifecycle. That means value added through shorter time to market and shorter time to profit.

 [Discover more](#)



Overview

Horizontal integration

Vertical integration

Lifecycle integration



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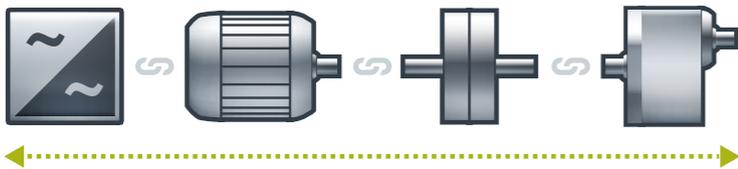
Integrated Drive Systems

Siemens Integrated Drive Systems are the only true one-stop solution for entire drive systems worldwide. This consistent approach for the complete drive train is particularly characterized by the concept of threefold integration: horizontal, vertical, and comprehensive lifecycle integration. For improved reliability, productivity, and efficiency.

Horizontal integration

Integrated drive portfolio: all frequency converters, motors, couplings, and gear units available from a single source.

Perfectly integrated, perfectly interacting. For all power and performance classes. As standard solutions or combined to an individual solution.



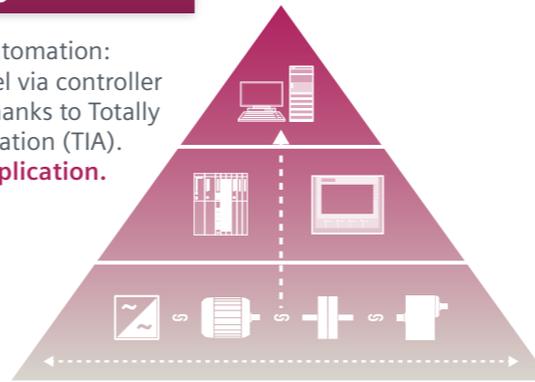
You can boost the availability of your application or plant to up to

99%*
*e.g., conveyor application

> Learn more about horizontal integration

Vertical integration

Integrated into automation: from the field level via controller level up to MES thanks to Totally Integrated Automation (TIA). **Whatever the application.**



With TIA Portal you can cut your engineering time by up to

30%

> Learn more about vertical integration

Lifecycle integration

Integrated software and services throughout the entire lifecycle. **For better performance and maximum investment protection.**



With Integrated Drive Systems you can reduce your maintenance costs by up to

15%

> Learn more about lifecycle integration

Integrated drive portfolio

All frequency converters, motors, couplings, and gear units available from a single source. Perfectly integrated, perfectly interacting. For all power and performance classes. As standard solutions or combined to create a customized solution.

Your benefits:

- Unrivaled portfolio from a single source
- Ensured drive train compatibility
- Reliable system performance
- Optimized components and ideally tuned drive train for productivity and efficiency gains



MultipleDrive



Conveyor drives



SIMOGEAR



Mining trucks



16.5 MW

Ideal for mills
up to 16.5 MW

Solution: MultipleDrive

Improved productivity and reliability in cement production and in the milling of limestone, clinker, slag, lime, plaster, and ore.

Technology:

- Modular system for high-power vertical mills
- Two to six variable-speed drives in various arrangements
- Optimally matched components
- Prealigned, interchangeable standardized components
- Ability of the grinding dish bearing to absorb static radial loads
- Direct transfer of grinding forces into the foundation

Your benefits:

- High-quality standard components
- Best possible energy efficiency and optimal grinding results thanks to variable speed control
- Maximum availability of the drive system thanks to modularity
- Suits mill power ranges of up to 16.5 MW
- Reduced building height
- Less civil works thanks to economies of scale
- Greatest possible design flexibility according to customer requirements
- Easy servicing and maintenance of drives
- Tuned one-stop system from a single source



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Drive your Mining Business with Siemens

Solution: conveyor drives

Gearless drive solutions and multiple drives are available for larger systems with power requirements greater than 2 MW.

Technology:

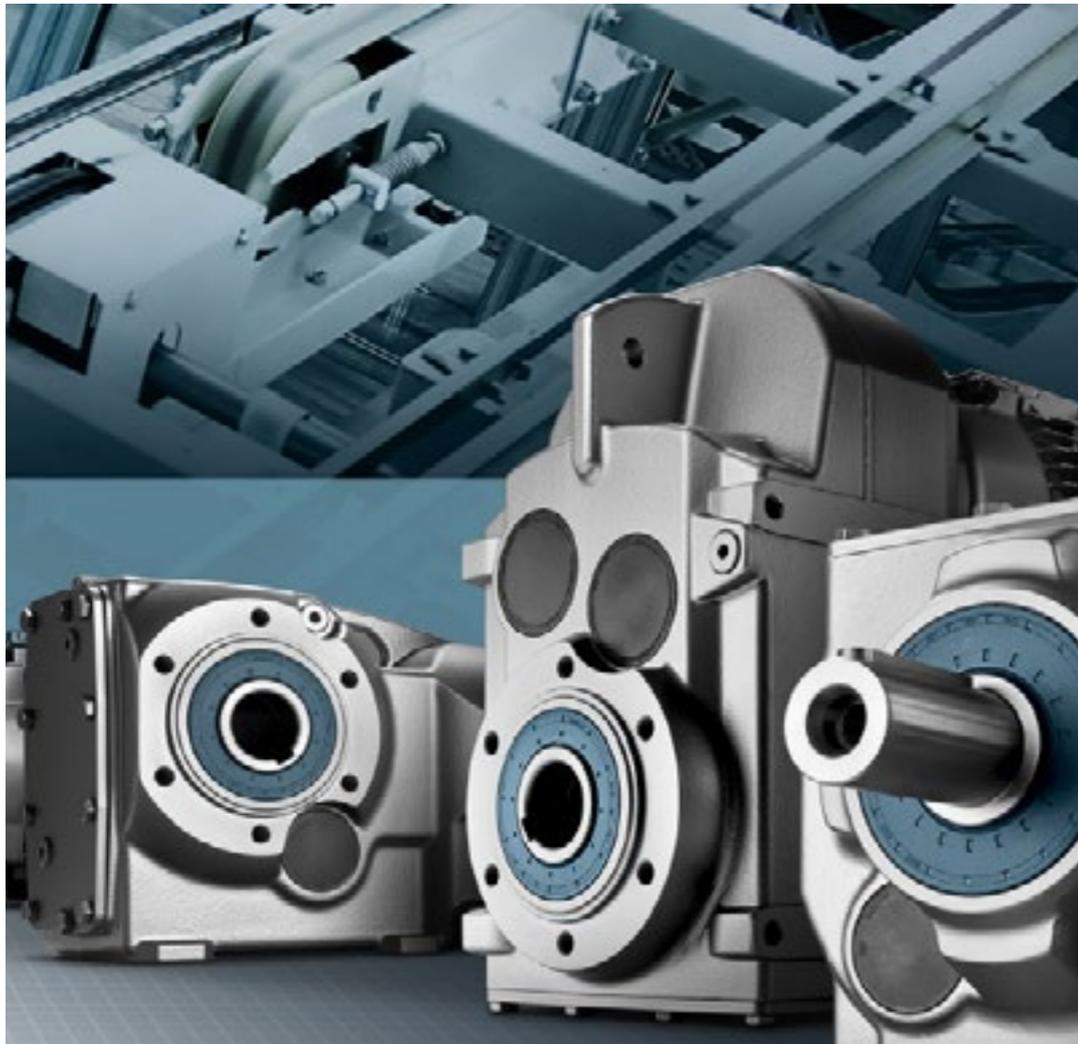
- Drive units optimized for belt conveyors
- Drive solutions for different applications, e.g.:
 - For fixed speed or variable speed
 - With squirrel cage motor or slip ring motor
 - With fluid coupling or flexible coupling
 - With converter
- Drives with control functions, e.g.:
 - Slip control
 - Load control (for multiple drives)
- Energy recovery for down hill conveying

Your benefits:

- Highly standardized components ensure cost efficiency
- Maximum availability thanks to proven components
- Robust construction
- High degrees of effectiveness save energy costs
- Low noise emission



Discover more on the Internet



96% Improvement in gear unit efficiency to up to 96%

Product: SIMOGEAR

Increased productivity in conveyor technology for industrial applications, with cranes and hoists, and in environmental, water, and sewage technologies

Technology:

- New modular geared motor series with all market-relevant gear types (helical, parallel shaft, bevel, and worm gear units)
- New series fulfills customer-relevant mounting dimensions generally used in the market
- New series designed to mount induction motors and synchronous motors with high efficiencies according to IE2, IE3, and IE4 in an integrated design

Your benefits:

- High energy efficiency for fast return on investment thanks to
 - Two-stage bevel and helical gear units
 - High-efficiency motors
 - Two-stage helical/parallel shaft gear units with ≥ 96 percent efficiency instead of three-stage gear units with approx. 94 percent efficiency
- Very compact and low weight for easy handling in the smallest space

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360 tons

For trucks with 240 to 360 tons of payload

Application: mining trucks

Improved productivity and reliability with mining truck drives

Technology:

- Integrated variable-speed drive system
- Adaptive torque and speed control
- Optimally matched components

Your benefits:

- High reliability
- High efficiency
- Electrical braking to zero speed
- Siemens MD gears for 240 and 360-ton trucks
- Trolley ready



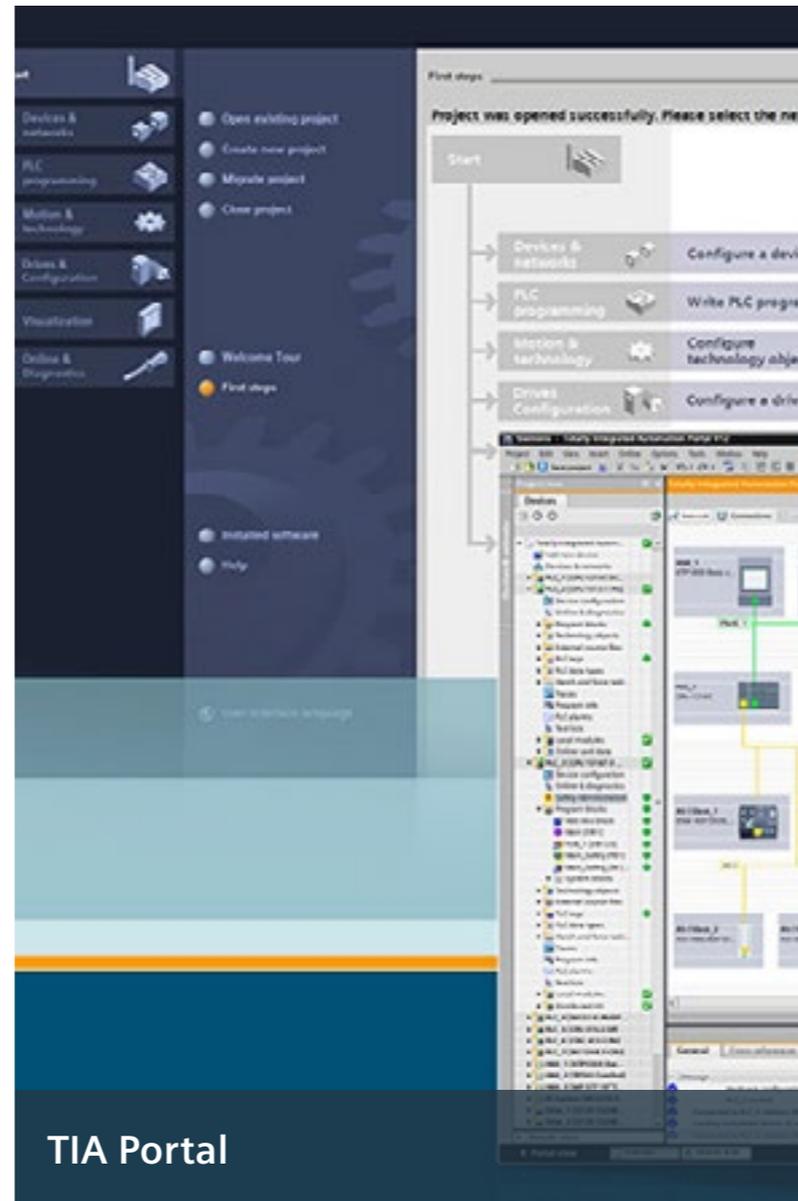
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Integrated into automation

From the field level via the controller level up to MES thanks to Totally Integrated Automation. Whatever the application

Your benefits:

- Drive train as an integrated part of Totally Integrated Automation (TIA) reduces time to market and complexity in operation and service
- Intelligent Monitoring and controls ensure maximum availability
- Perfectly interacting automation system components including control, sensors, HMI, and communication



In practice: converters within the TIA Portal

Shorter time to market and reliability gains due to a single seamless commissioning and diagnosis tool for both the automation and drive system.

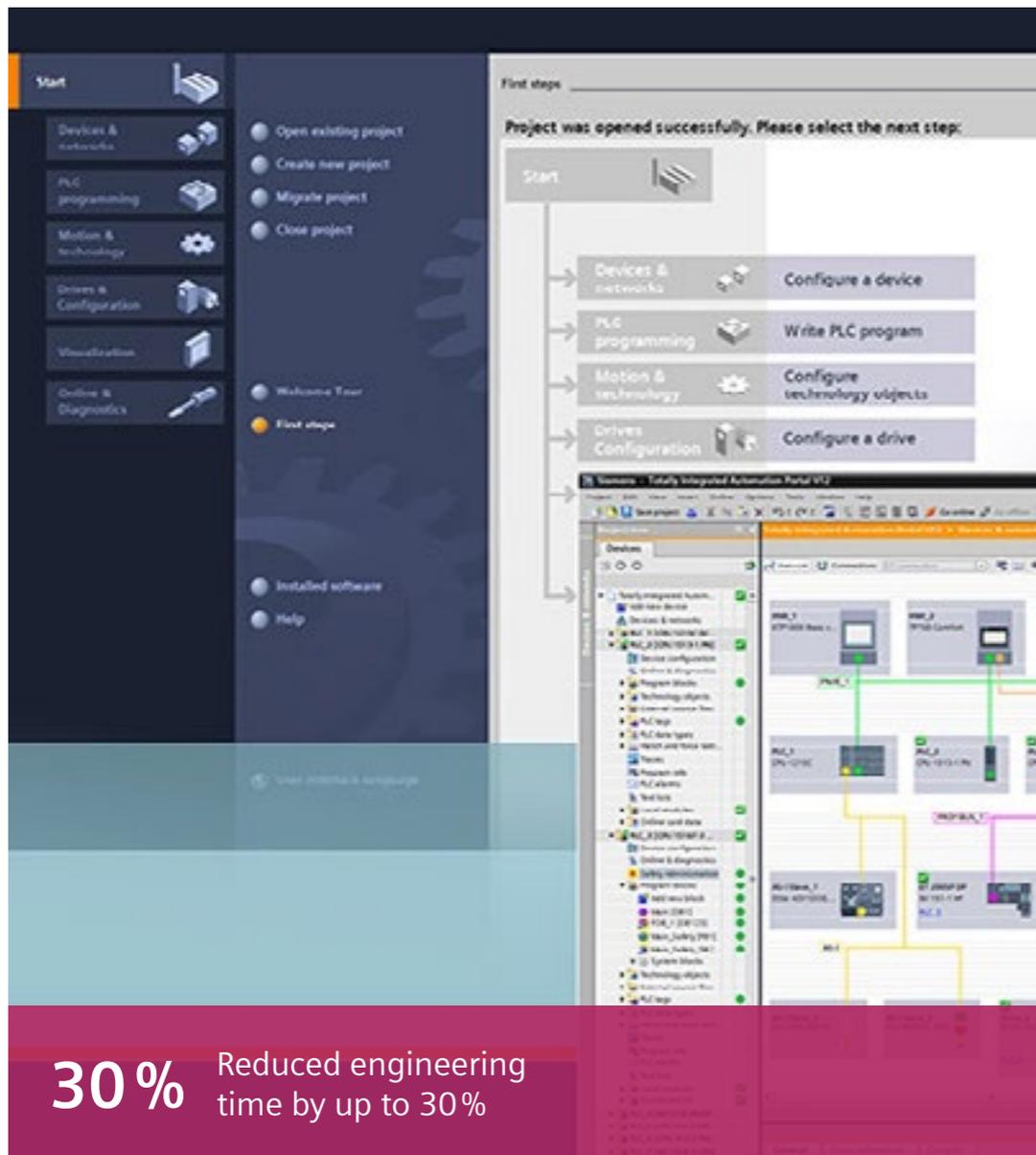
Technology:

- SINAMICS Startdrive as the new way of parameterizing motion in the Totally Integrated Automation Portal (TIA Portal)
- Efficient engineering of the complete application thanks to TIA Portal's user-friendliness for converters
- Perfect interaction with SIMATIC
- Integrated powerful system diagnostics functions

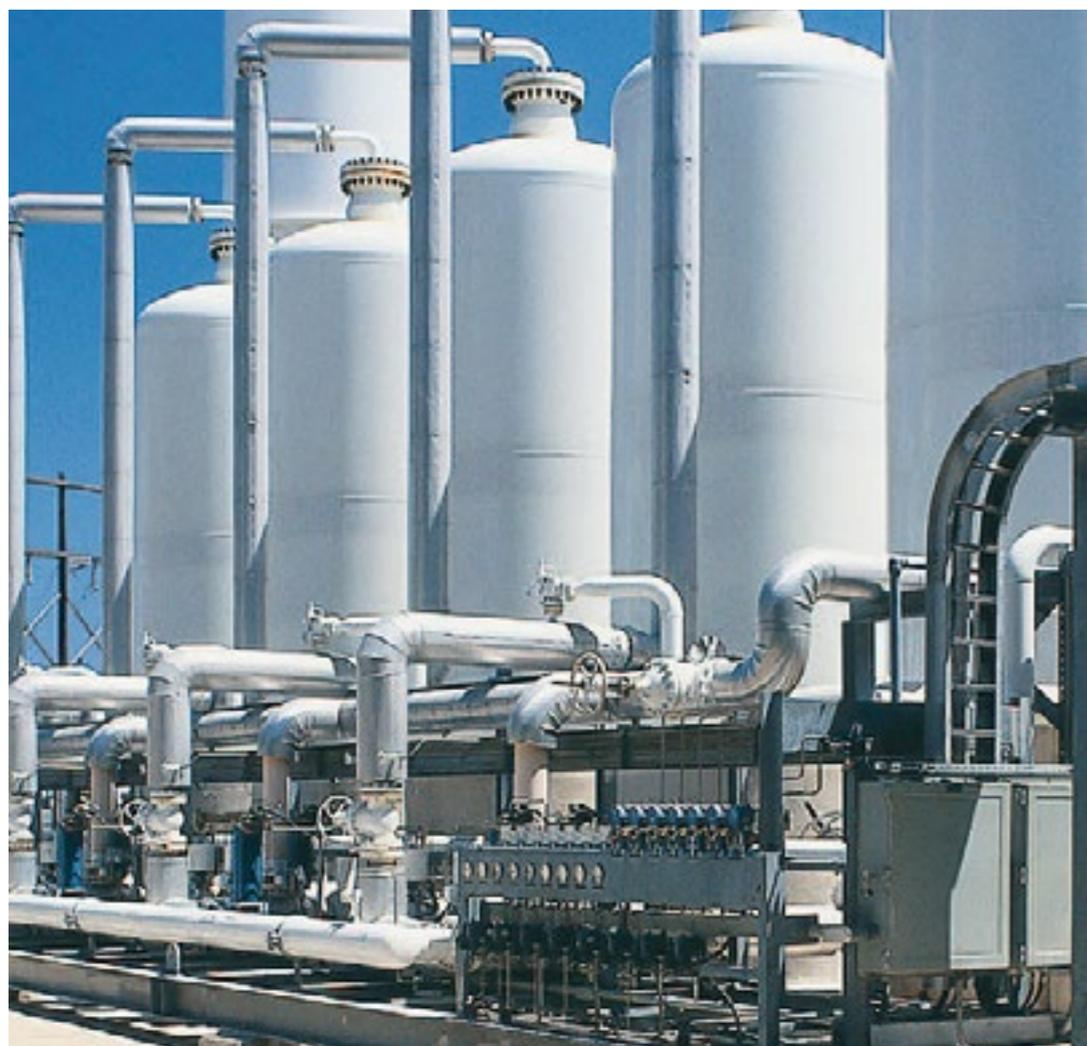
Your benefits:

- Reduced engineering and training costs as well as reduced downtimes
- Single application database for consistent data
- Existing knowledge – from configuring the controller, for instance – can easily be applied to configuring a converter
- Fewer program errors with task-oriented workflow

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30% Reduced engineering time by up to 30%



Pumps, fans and compressors

Pump, fan, and compressor applications from a single source

With Totally Integrated Automation, Siemens is the only manufacturer that offers a seamless portfolio of products, systems, and solutions that are perfectly coordinated with one another. These are used to create seamless and integrated automation solutions for pump, fan, and compressor applications. All of the substeps as well as the information flow across all production levels – from the field level up to the company supervisory level – can be fully integrated.

This means more productive engineering, efficiency, and a higher degree of profitability across all processes. As a result of the consequent integration and unification, Totally Integrated Automation also plays a significant role in minimizing costs over the complete lifecycle – and reduces the complexity of industrial plants and systems.



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130 years

Innovation for marine & shipbuilding –
for 130 years

Industry: shipbuilding

Meeting the ever-increasing demand of the shipbuilding market for solutions that enable more efficient, safer, and environmentally friendly ship operation. That includes an intelligent combination of vertical-specific competitive products and systems: turbines, converters, switchgear transformers, automation, and IT.

Technology:

- SISHIP EcoMAIN provides a platform for the acquisition, aggregation, and logging of all onboard plant and system data, and processing of this data in a uniform manner, making it available on a common data platform. Energy consumption, emissions, liquid bunkering, maintenance plans, document and knowledge management, and a lot more data can be evaluated and subsequently optimized.
- SISHIP WHRS recovers and utilizes exhaust gas heat from a ship's diesel engine to enhance the energy efficiency of the vessel
- SISHIP eSIPOD – podded propulsion drive
- SISHIP EcoProp – innovative, energy-efficient hybrid propulsion system



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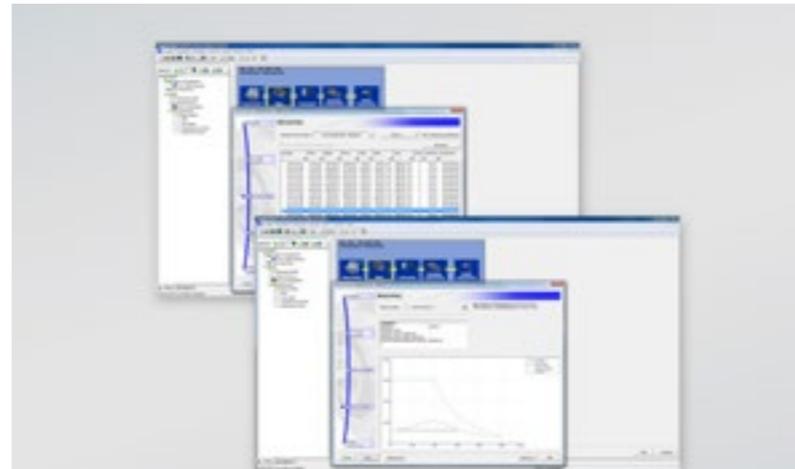


Tools for efficient engineering of drive products and systems as well as services

Intuitive, easy-to-use software tools support you during the entire lifecycle. During selection, configuration, project planning, or commissioning of drive systems, Siemens offers individually tailored services and competent support. All this ensures greater performance and maximum investment security.

Your benefits:

- Tool-based support in all phases of the lifecycle for greater performance and productivity
- Evaluation of potential energy savings of products and applications
- Tools and services for the entire drive technology portfolio



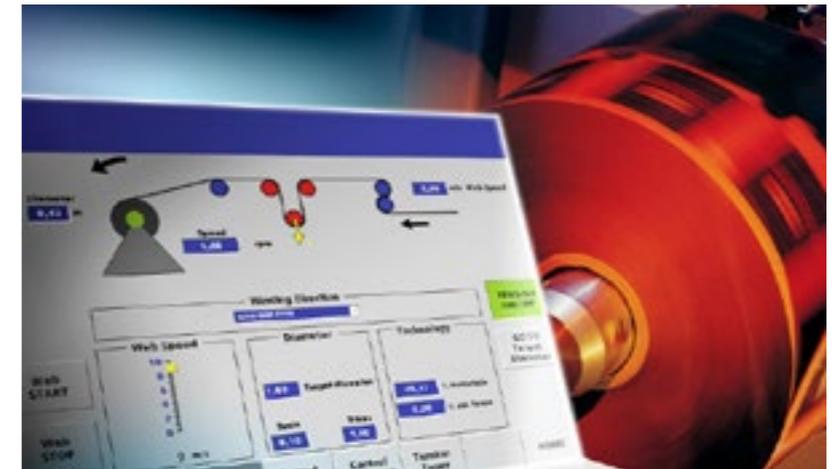
Configuration and engineering tools



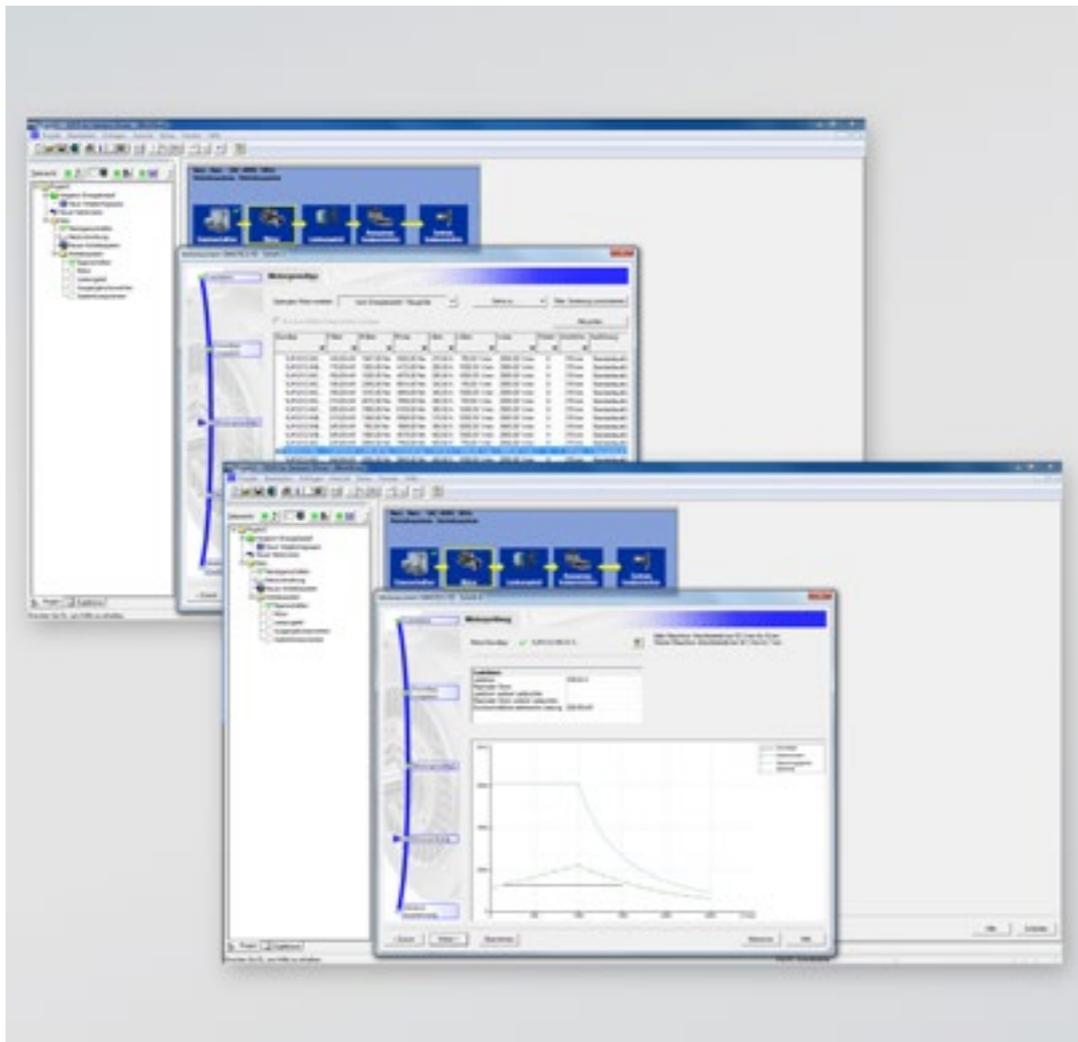
Forming technology



Condition Monitoring



Mechatronic support



70% Energy saving potential of up to 70%

Tools for all phases of the lifecycle

Web-based drive engineering and energy efficiency software tools help find the solution for any particular drive application and calculate possible cost savings.

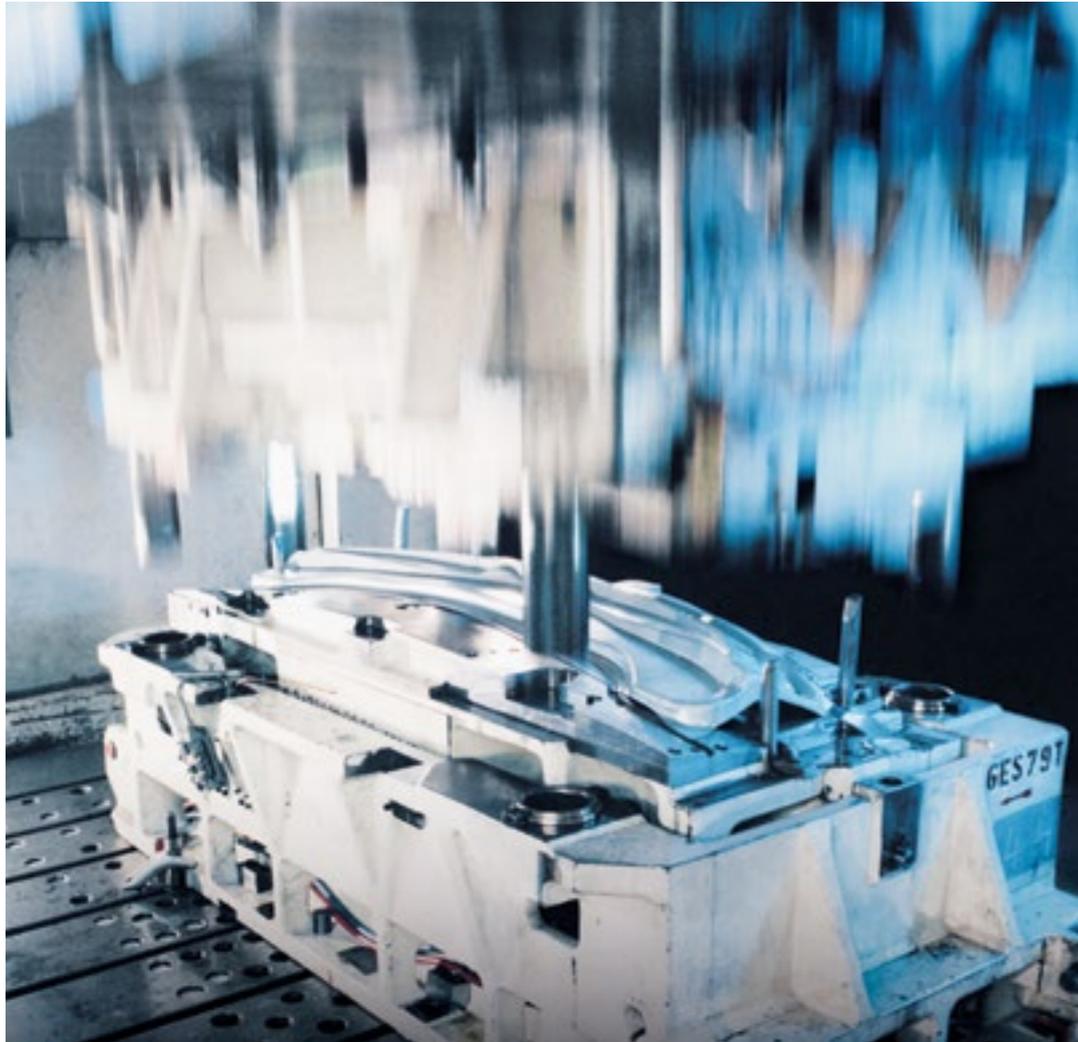
Configurators and engineering tools:

- Evaluation of potential savings and payback periods via SinaSave
- Simple and efficient product and PLK system configuration with technical documentation with the DT Configurator
- Mechanical components such as gear units and couplings via the DT Configurator
- Drive engineering for “standard products” as well as individual specialized solutions with greatest flexibility via SIZER WEB ENGINEERING
- Professional support via individually tailored services

Your benefits:

- Configuration and engineering tools for shorter time to market and thus higher productivity through simple, intuitive operation
- Configuration and project planning of individual drive components up to an individual, perfectly coordinated drive system
- Extensive technical documentation: product data sheets, CAD dimension drawings, location diagrams, start-up calculations for motor characteristics, starting inrush observations, and description of the load-dependent energy demand

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96% Availability increased by at least 96%

Metal Forming Solution Package

When implementing mechanical and hydraulic presses and handling equipment, for instance in the automotive industry, a predominantly modular design ensures the highest degree of flexibility and shortest engineering and installation times for customized systems. The Metal Forming Solution Package provides all of the functions required to automate press systems, supporting press manufacturers in quickly implementing their specific press concepts.

Standard components, such as SINAMICS drives and the SIMOTION motion control system, are employed to ensure the required flexibility. From a comprehensive range of preconfigured software modules, the user selects the optimum ones, configures them individually with just a few operations and integrates them into the machine-specific software. The wellproven SIMOTION diagnostic tools minimize the time from the initial concept to the completed automation solution.

Any modules used to monitor and control presses and press peripherals can be combined at the standard SIMOTION automation platform and the Metal Forming Solution Package to quickly create complex, customized automation solutions. However, the machine software remains open so that it can be expanded in a modular fashion.

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Condition Monitoring

Service: Condition Monitoring

Increased availability and productivity through consistent monitoring of highly stressed components.

Challenge:

Drive components are typically highly stressed components that are exposed to varying levels of constant wear and tear, depending on service life and load. That's why it is crucial to be able to correctly assess the condition of the components at all times.

Technology:

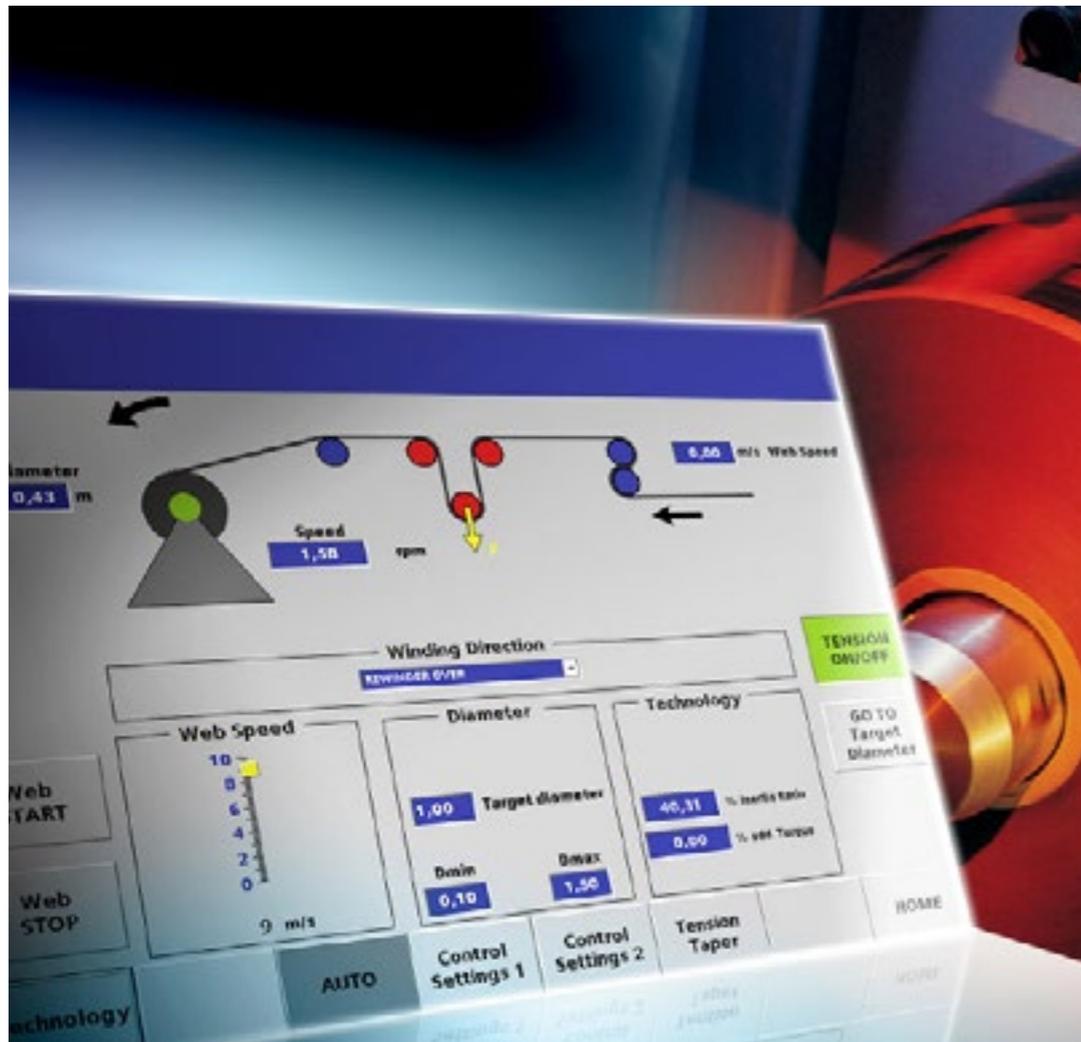
Continuous monitoring of drive components makes it possible to recognize changes in operating conditions early on and take appropriate action to prevent costly plant downtimes and production losses.

- Higher transparency about the condition of components and machines
- Increased plant availability and hence productivity
- Lower inspection and maintenance costs

Your benefits:

- Utilization of all components right up to their wear limit
- Minimization of unscheduled plant shutdowns and reduction in consequent damage
- Time and cost savings thanks to early planning and optimization of maintenance and service activities
- Improvement in machine and plant availability

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Mechatronic support

Mechatronic support

Increased productivity by mechatronic simulation and optimization of machinery and shorter time to market

Solution:

- Optimization, experimental analysis, and simulation of machines
- Consideration of the entire mechatronic system including mechanics, drive train, motors, encoders, drive control, NC or motion control

Your benefits:

- Early proof of concept and assessment of the plant/system productivity without time-consuming and expensive prototype building
- Optimal use of Siemens drives and controllers
- Analysis of complex mechatronic problems for OEMs – customer support for critical situations, such as an end customer refusing to accept a machine



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Integrated Drive Systems in practice

Whatever the application, whatever the automation environment: Siemens Integrated Drive Systems can be seamlessly integrated – over the complete lifecycle.

The bottom line: greater reliability, higher efficiency, outstanding productivity, and shorter time to profit. Siemens Integrated Drive Systems boost the competitive edge of production facilities and entire companies in any branch of industry.



Aumund Conveyor Systems

Aumund Fördertechnik GmbH, Rheinberg, Germany is a leading specialist in transport and storage solutions for difficult bulk materials. The company now relies on Siemens Integrated Drive Systems that come as complete wing-based mounted units ready for installation. »This speed up delivery, prevents common interface problems, and provides the company with a competitive edge on the world market,« says Aumund's technical director Reiner Furthmann.



Watch this video
on the Internet

See how preconfigured Integrated Drive Systems help to improve the competitiveness of bulk material handling systems.



KASTO Machine building

High-bay storage (65 x 19 x 15 meters) with approximately 8,000 bays for pallets and pallet cages with a net load of up to 1.5 tons.

» We have used all options the new drive system provides, were able to further reduce auxiliary process times, and this way improve the cycling time of our storage system by approximately eight percent. «

Joachim Huber, electrical engineer with KASTO

Since the pilot project installation of a highly available automated one-stop solution for rack feeders in long goods and sheet metal storage systems, KASTO has equipped some 30 storage systems for customers around the world with SINAMICS drives. Practical experience with the new drive system has been thoroughly positive so far. The forecast cost saving of about 15 percent have been achieved in practice thanks to shorter engineering time, reduced hardware and wiring efforts, and faster commissioning of the rack feeders. Operators benefit from energy efficiency and shorter cycling times – enough reason for the German company to convert further storage systems to the new drive system SINAMICS S120.



EVT Eiberger Verfahrenstechnik

In close cooperation with the customer, Siemens developed a modular system for the entire fully integrated automation and drive technology used in the degreasing plants made by EVT.

Thanks to the use of Integrated Drive Systems, EVT plants boast outstanding availability. EVT even provides a three-year warranty for its plants, which is not usual in the industry.



Watch this video
on the Internet

This video features Ralf Götz, head of electric and software engineering at EVT, and illustrates the benefits the medium-sized German engineering specialist enjoys in day-to-day operations thanks to the use of Integrated Drive Systems.



Kunming Iron & Steel

Siemens delivered the control and drive system for the blower of a new 2,500 cubic meters blast furnace at the Kunming Iron & Steel Group Co., Ltd. – the largest iron and steel mill in Yunnan, a province in southwest China.

The Integrated Drive Systems concept ensured fast installation and less work for project management during construction and commissioning as well as an optimized system that boasts high efficiency and safe operation with an availability rate of more than 99 percent.



Watch this video
on the Internet

This video provides impressive facts about the new blast furnace system at Kunming Iron & Steel, which produced two million tons of steel in 2012, and the unique performance of Integrated Drive Systems during installation, commissioning, and operation of the plant.



Antapaccay

Integrated Drive Systems is used in a huge mining conveyor system.

The Integrated Drive Systems approach was an important contribution to a new conveyor system in the Peruvian Andes that transports tons of copper ore in a efficient and reliable manner.



Watch this video
on the Internet

Steve Kasper, Sales Manager of ThyssenKrupp Robins explains why Siemens was chosen to supply the entire drive technology for the project and what benefits the Integrated Drive Systems approach entails.



Sklostroj

Czech container glass machine specialist Sklostroj commissioned Siemens with a new concept for plant automation. Part of the modernization was the replacement of the previous pneumatic solution with a new, innovative motion control solution based on SIMOTION, the SINAMICS S120 drive system, and SIMOTICS 1FK7 and 1FK6 servomotors.

The implementation based on Integrated Drive Systems increased the energy efficiency by 40 percent and the availability by 15 percent.



Watch this video
on the Internet

In this video Rolf Themann, technical director with Sklostroj, reports on the successful project and the improvements that Integrated Drive Systems made possible.



Volkswagen

Siemens modernized three press lines including drive technology and automation components for the Volkswagen factory in Wolfsburg, Germany. The integrated drive system with SINAMICS S120 and SIMOTION D had been tested through virtual simulation before installation. During operation, the condition monitoring system SIPLUS CMZ ensures preventive maintenance.

The solution based on Integrated Drive Systems improved productivity, reduced maintenance costs, lowered energy consumption by 40 percent, and increased availability to at least 96 percent.



Watch this video
on the Internet

This video demonstrates how the retrofit of the press lines with energy-efficient technology made the Volkswagen plant fit for the future.



Vattenfall Europe Mining

Vattenfall Europe Mining commissioned Siemens with the construction of a 13.5-kilometer conveyor belt system for the open-cast mining site at Reichwalde, Germany. The scope of supply comprised all of the engineering, manufacturing, delivery, and construction of the drive system as well as the construction of the transport system. The integrated drive systems employ SINAMICS S120 converters and SIMATIC S7-400 controllers.

Thanks to the implementation on the basis of Integrated Drive Systems, Vattenfall benefits from energy and maintenance cost savings of up to 15 percent – with an availability of 98 percent.



Watch this video
on the Internet

This video lets you experience how the innovative drive system ensures the efficient operation of the gargantuan coal conveyor system.



Lafarge

Lafarge Hungary commissioned Siemens with the construction of Europe's most modern cement plant. The innovative package solution comprised power supply and building technology as well as all of the drive systems based on Integrated Drive Systems: motors, converters, and the CEMAT automation system.

The integrated drive system from Siemens is particularly characterized by low maintenance costs, outstanding efficiency, and very low energy requirements.



Watch this video
on the Internet

In this video Karen Chong from Siemens describes the details of this solution.



Experts on Integrated Drive Systems

The obvious advantages offered by the concept of Integrated Drive Systems in terms of productivity, reliability, and efficiency receive high acclaim from the expert community. Experience why technology and industry experts hold Integrated Drive Systems from Siemens in such high regard.

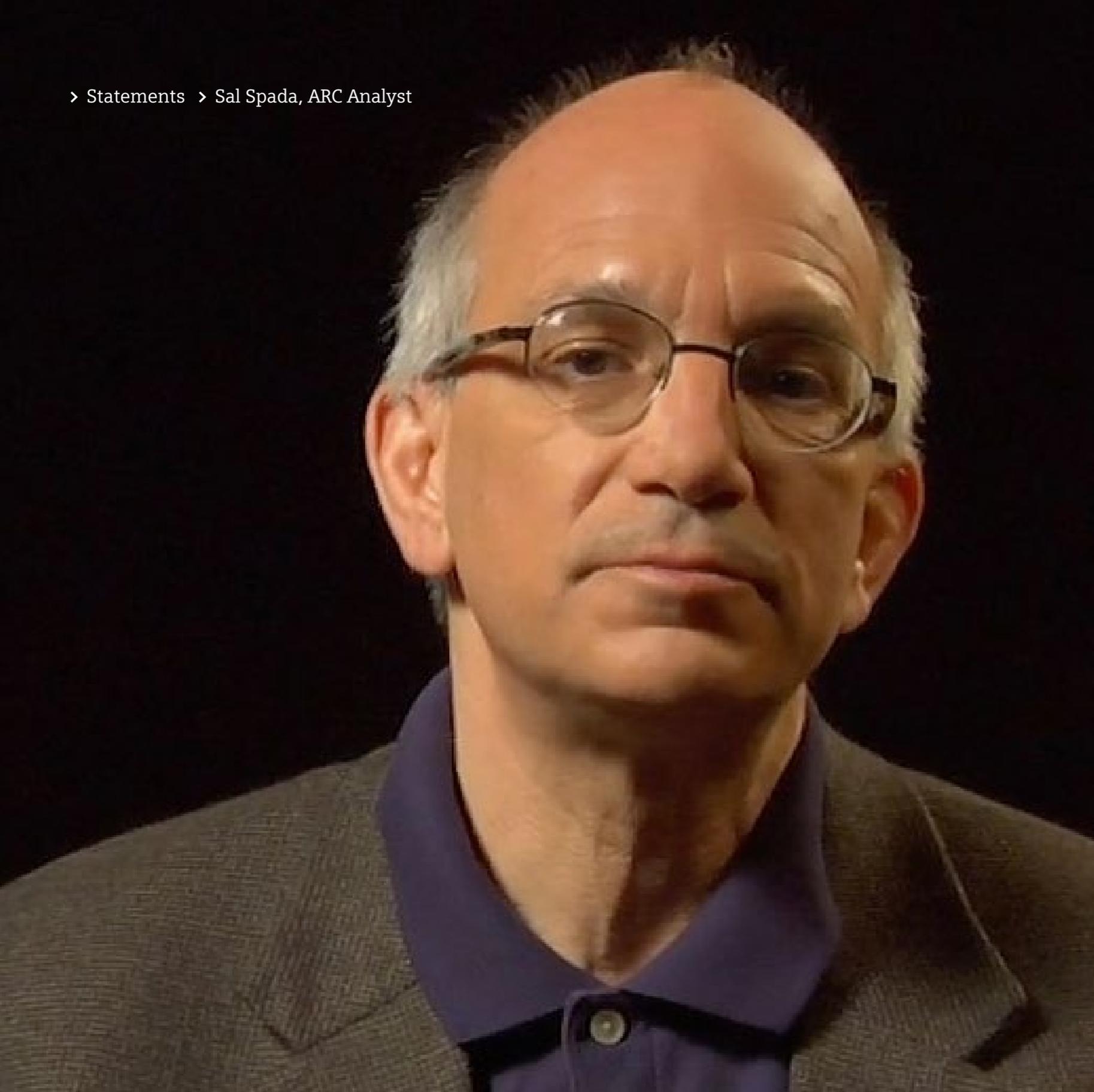
The unanimous conclusion is that Integrated Drive Systems is a sustainable and up-to-date concept that provides solutions for today and tomorrow.



Sebastian Garimort
Electrical Engineer Knauf Integral KG



Sal Spada
Market Analyst, ARC Advisory Group



Sal Spada

*Member of the Discrete Automation Team
at ARC Advisory Group*

» I'm confident that manufacturers will perceive drive systems as a direct source of revenue rather than the cost of running the business. «



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Market analyst Sal Spada explains why the Integrated Drive Systems approach is a novelty, what benefits it offers, and why it has the potential to permanently shift the perspective on drives.





Sebastian Garimort

Electrical Engineer Knauf Integral KG

» It was very good that we were able to obtain everything from a single source, firstly the SPS, then the reluctance motor and also the Siemens converter. That helped us a lot during the commissioning process. «



Watch this video
on the Internet

Sebastian Garimort explains how Knauf Integral KG profits from Synchronous-reluctance drive system with SIMOTICS motor and SINAMICS converter.





There's more to it

www.siemens.com/ids

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