Maximizing Crane Productivity
Let’s get together.

solutions for cranes

www.siemens.com/cranes
Siemens drive technology for cranes

Wherever cranes are needed – terminals, industry and shipyards –, the transportation of loads requires high-performance cranes that operate with great precision and safety. Availability, reliability and maintainability are crucial factors – as is cost-effectiveness. The transportation of goods and containers is a fast-growing market. The need to handle an increasing volume of goods places greater requirements on the performance of cranes. Every delay costs money. In the industry, cranes position the largest loads with the greatest of precision. For all industry applications, we have the safest and most reliable solutions. We supply crane drive technology for every industry sector – ports, steelworks, power stations and shipyards. Siemens cranes is your reliable partner all over the world, with a strong presence in nearly every country.

Your experienced partner for comprehensive solutions

Siemens is one of the world’s largest electrical and electronics companies. With a history of more than 160 years, Siemens has more than 100 years of working experience in solutions for cranes.

We provide a wide range of drive control systems and components for all kinds of cranes. In-house hardware includes switchgear, transformers, drives, especially new-generation SINAMICS® drives and our market-leading SIMATIC® control as well as the new motion control system SIMOTION®.

Our branch-specific knowledge allows us to handle everything from initial consulting, design, supply, erection to commissioning, training and after-sales service. We also offer a fully comprehensive service for refurbishment: fast, direct and worldwide.

No matter how difficult and complex the tasks, Siemens technology can be used to transfer any load. Customers benefit from our worldwide experience. We are always at the leading edge of technology with the goal to achieve the highest productivity. Experience, proven reliability and constant striving for innovative technology underlie our success.

Our wide-ranging experience, combined with our state-of-the-art technology and contacts with international crane-builders, partners and system integrators, assures you optimum performance. And our technology is designed to be compatible with tomorrow’s solutions.

We can optimize traditional crane applications step by step. We are present in nearly every country in the world, so we are able to install and service your installation wherever you are.
Crane technology for all applications

For crane systems and hoisting equipment, the formula for success is speed, reliability and availability. It’s also crucial to ensure that systems are adaptable for the future by designing them to have the highest flexibility and longest lifetime. We supply crane drive technology for every industry sector – harbors, steelworks, power stations and shipyards. Whether you are transferring coal, scrap, waste, goods, parcels or containers, we offer a comprehensive portfolio of fully automated systems for high or medium performance, ensuring the optimum solution for every application.
Ship-to-shore container cranes: extremely precise handling

At container terminals, every delay costs money. Our innovative drive and control technology guarantees smooth, fast and precise handling. Siemens crane drive systems have proven their value in the largest ports in the world. Production improves with our sway control and automation systems. We also offer a crane management system for monitoring the container handling process locally or even worldwide via Internet.

Grab ship unloaders: fast unloading

Grab unloaders offer unloading capacity in handling bulk products up to 5,500 tph. We have experience in bulk transshipment of scrap, coal and ore. Our systems for grab unloaders are installed in cranes to service ports throughout the world, unloading barges and bulk carriers.

Rubber Tired Gantry cranes: high-capacity, flexible stacking

The Rubber Tired Gantry crane (RTG) enables low investment cost with high flexibility to change stack-lane. The RTG is powered by a diesel-generator set and equipped with AC motors and SINAMICS for hoist, trolley and gantry. The RTGs are equipped with remote crane monitoring via wireless communication.

(Automated) Rail Mounted Gantry cranes: efficient stacking

Like the RTG, the Rail Mounted Gantry crane (RMG) is used for stacking. Our automation technology makes high-capacity fully Automated Stacking cranes possible. Our Totally Integrated Automation is used to interface the crane automation to the Terminal Operating System.

Industry cranes: durable and safe transport

Steel mills require cranes with enormous power and ruggedness. Overhead cranes for blast furnaces must function with the utmost reliability. Products must be transported quickly, efficiently and safely. We offer redundant solutions for these applications, guaranteeing optimum availability so there is no risk of loss of production. Heavyweight shipyard cranes are able to position the largest loads with the greatest accuracy. Our SIMOTRAS® HE/HD stator phase angle controllers are in operation in many steel mills around the world. With our crane systems, cranes load and unload goods quickly and efficiently.

Tower cranes:

At building sites, where demands on cranes are continuously changing and growing, SINAMICS booksize units offer a clear space advantage. It is multitalented for a diverse range of tasks, the right fit for luffing or mobile cranes.

ECO-RTG – a revolutionary hybrid drive concept

The ECO-RTG drive system is based on well-proven hybrid drive components. The variable-speed generator set enables fuel savings of 50% or more. The efficiency of the crane can even be improved through installing an energy storage such as ultracapacitors.
**SIMATIC – the world’s leading automation system**

We offer a complete program to automate and monitor all of the various processes: our crane control stations with rugged master switches and high level of user-friendliness for operator control and monitoring.

For everything from the small compact device to the heavy-duty PLC and the PC-based control, there are SIMATIC controls to meet all demands and every requirement, in all types and sizes. What they all have in common is excellent processing performance in the tightest of spaces, robustness in the face of the toughest mechanical and climatic stresses, high speed and expandability. Excellent performance is the hallmark of the SIMATIC family. The high degree of standardization provides additional benefits, speeding training, lowering maintenance costs and reducing the number of spare parts required.

With SIMATIC controls, you have the best equipment for automation tasks. Counter and closed-loop control functions are already integrated into the SIMATIC S7 CPU.

**SIMOTION D – the new drive-based motion control system**

SIMOTION is the new motion control system from Siemens. Motion control, logic control and technological functions are integrated in one single control program processed by one single processor. This allows automation solutions to be programmed very easily because the former coordinating efforts between different types of controls are no longer needed. Software interfaces between the different tasks replace time-consuming communication between different hardware controls, providing a rise in performance.

SIMOTION D is the drive-based variant of the SIMOTION system. As the controller is designed as an integrated module of the SINAMICS S120 drive system, the whole drive and control system is very compact and enables another increase in system performance as a whole.

Based on this high-performance platform, using the Siemens crane technology software you can easily implement professional solutions for controlling cranes, which can be adapted very easily to your specific needs if necessary, due to its flexible architecture.

**Perfect solutions for every task**

With crane drive technology from Siemens, you can start work immediately.

We provide a wide range of components: switchgear, transformers, drives and especially new-generation SINAMICS drives as well as the new motion control system SIMOTION. All our drives and switchgear technology for networking and automation systems come from a single source.
Siemens crane technology provides a solution for both ready-to-run and ready-to-apply.

At the end, with SIMOTION D you have a powerful crane control solution based on an innovative, economic motion control system.

**Scalable Platforms – a concept to serve all types of cranes**

With the available automation and drive systems SIMATIC, SIMOTION and SINAMICS we can build scalable platforms to meet the optimal performance and cost requirements from harbor cranes to industrial cranes. Our goal is to ensure your crane operation is fast, smooth and reliable.

**Siemens solutions for cranes are using the following well-proven automation components:**

- **SIMATIC HMI (Human Machine Interface)** provides the right operator interface solution for every automation task.

- With the SIMATIC ET 200 distributed I/O system, digital and analog inputs/outputs can be connected to the central control. Intelligent decentralized I/O modules can also be employed via the ET 200.

- **PROFIBUS® DP bus system flexibly provides the best link to SIMATIC and is ideal for redundant configurations in crane safety circuits.**

- **PROFINET®** is the manufacturer-independent Industrial Ethernet Standard enabling uniform communication from the office to the field. Communication occurs in real time and is protected against illegal access with Industrial Security Components.

- **MOBIC®**: The mobile industrial communicator is your innovative Internet pad from SIMATIC NET. Whether you want to acquire quality data, view spare parts lists, make the process status viewable, acknowledge work orders or receive detailed work plans on the road.

- **SIWAREX®**: With its SIWAREX weighing system incorporated into Totally Integrated Automation, Siemens has an integrated range for weighing systems, from weighing processors for force measurement right up to load cells and the appropriate installation accessories.
SINAMICS S120 – the perfect drive system for every type of crane

SINAMICS is the new family of Siemens drives designed for machine and plant engineering applications. Within this family, SINAMICS S120 is the new, flexible drive system designed especially for high-performance and sophisticated motion control tasks. Due to the modular design and its scalability, SINAMICS S120 allows the creation of dedicated multiaxis drive solutions for every kind of motion control application. Standardized powerful tools allow easy and safe configuration, commissioning and operation of drive solutions based on SINAMICS S120.

SINAMICS keeps the valued features of SIMOVERT® MASTERDRIVES, like Active Front End (AFE), embedded technology and Safety Integrated whose functions allow economic implementation of state-of-the-art safety concepts. The new function of operating several infeed modules and inverters in parallel mode guarantees high availability, because the crane can go on working even if one of these modules malfunctions.

SIMOTRAS HD: digital controller for slip ring motors

With our digital SIMOTRAS HD control technology, old analog thyristor converters or conventional contactor-controlled hoist motors are transformed into smoothly operating digital drives. SIMOTRAS HD is a rugged slip ring motor controller with a compact, economically priced power section. It is the solution for retrofit jobs on cranes where slipring motors and resistor banks are already present, yet space in the electrical house is limited. Maintenance work is simplified – when replacing electronic cards, just download the previous parameters from your notebook and the crane is ready to run again. Many crane-specific functions such as interfacing of limit switches and joystick signals are preprogrammed in the digital control card. This largely eliminates extensive external relay logic. For steel mill cranes, an extended temperature range up to 65 °C is available.
SIMOREG DC Master: offering top performance

State-of-the-art DC motors with drive converters, e.g. SIMOREG® DC MASTER featuring high dynamic performance through feed-forward control algorithms for armature current and EMF in field weakening. Single converters with rating up to 2000 A are available.

Electrical motors: the best fit for every crane application

Our crane motors handle every task for outdoor installation (nonventilated gantry travelling motors in IP55) or inside the machinery house (main hoist, boom hoist and rope-towed trolley motors in IP23). Our motor spectrum is the optimum fit for every crane application – whether for standard tasks or special, high-performance applications.

AC squirrel-cage motors with SINAMICS are the optimum solution for high-performance hoists with field weakening. New low interia hoist motor series in frame 355 with rated power up to 1200 kW. We have optimized our series of low-voltage motors to suit our AC drives. They fulfil the dynamic and mechanical requirements of your cranes.

GEAFOL static transformers: highly efficient and reliable

Wherever space is limited and safety and environmental aspects are paramount, GEAFOL® static converter transformers offer many advantages. Our rigorous manufacturing quality control ensures optimal reliability due to each primary coil being tested for partial discharge. GEAFOL avoids the limitations of liquid-filled transformers, while meeting high safety standards and possessing a long service life. GEAFOL cast-resin transformers are essential where safety cannot be compromised. GEAFOL transformers used in cranes cover an output range from 50 kVA to 3,500 kVA with operating voltages up to 36 kV.
Medium-voltage switchgear: proven daily around the world

We design, manufacture and supply equipment and other associated items for medium-voltage power supplies. Siemens switchgear offers dependable technology, ease of operation and high efficiency, as well as operator safety and operational reliability – not to mention extremely low life cycle costs. The gas-insulated (SF₆) and maintenance-free switchgear in the 8DH series have proven themselves over and over. More than 350,000 8DJ/8DH series panels have been put in operation worldwide. SIMOSEC switchgear combines the benefits of the well-proven SF₆ insulated 3-position load break switch with the cost advantage of air insulation.

Panel building: durable and resistant to corrosion

Siemens solutions for electrical cabinets are smart solutions for intelligent integrated systems. Siemens SICUBE® 8MF panels are corrosion-resistant and sturdy. With the sophistication of today’s electronic systems, and increasing price competition, more customers and OEMs are finding it profitable to purchase electrical cabinets from an electrical cabinet specialist. It saves time, reduces costs and frees up capacity for more profitable maintenance and/or manufacturing processes. We design the controls, circuitry and cabinet, assemble and deliver on time to your facility with Siemens on-site assistance. We can handle the whole process or just take care of your assembly work.
Siemens crane management system

For efficient service and maintenance, the innovative crane management system from Siemens continually checks the condition of crane systems, performing fault monitoring, tracking and tracing, managing operational data and monitoring current wear status. It senses, evaluates and displays all control points in a transparent fashion to make preventive maintenance easy, resulting in the highest availability.

Sway control: transferring loads smoothly, quickly and precisely

The Siemens sway control system offers the perfect synthesis of speed, precision and safety. It moves heavy loads quickly and precisely to their destinations, accelerates and brakes rapidly, lifts and sets down softly, without pendulum motion. Siemens sway control proves itself in every crane type. The touch screen operator interface makes sway control and automation systems easy to use. The result is increased turnover of full- or semiautomated cranes.
Service and support
Top support – no matter where you are

If you operate cranes, you need reliable partners who offer excellent service and support. You can depend on Siemens or our preferred partners. We handle the whole process, from the initial support, through the design phase, supply, erection and commissioning up to training and maintenance. Our global network of know-how, experience and state-of-the-art technology stands behind all our cranes. We are represented in nearly every country in the world, so we are able to install and service your installation wherever you are.

Logistics: extremely reliable throughout the world

Fast on-time delivery is part of our service to minimize any possible downtime. We can supply crane components on short notice, across the globe and anywhere you need them.

Support: highly experienced in all areas

Our service employees are experts who know the requirements of the various industry sectors. We also provide our personnel with ongoing training, to keep them on top of new developments.

Planning: the basis of the right solutions

Our specialists take care of all of the planning issues, analyzing the actual conditions and the future requirements, precisely tailoring the system and optimizing all of the processes.
Refurbishment service available:

We offer a comprehensive service for modernization and refurbishment of systems.

Start-up: optimize profit from the beginning

Our team's expertise and our state-of-the-art technology guarantee an efficient start-up, which allows our customers to concentrate on their core business right away.

After-sales service: the perfect partner

Whatever your maintenance needs, we can offer the appropriate service and maintenance approach, from local support to complete full-stop service encompassing remote monitoring and diagnostic services. Our service personnel are there to support you in every situation, from regular maintenance and service to urgent problems. They are available throughout the world, providing professional support for our drive technology.

Training: take advantage of our innovations

We pass our know-how and communicate innovations to your operating personnel, so they are always ready to start right away. We offer courses in our training centers, or alternatively we can hold them directly on your premises.
Selection of References:

Container Terminal Algeciras, Maersk España S.A.

24 ECO RTG fuel consumption optimized hybrid drive system in 2007.
• 50 ton version:
• Manufacturer ZPMC

Handan Iron & Steel Works, China

4 Ladle Cranes 450t/80t in 2006. Equipped with:
• Full AC System SIMOVERT MASTERDRIVES with active front end
• SIMATIC S7-400, PROFIBUS DP
• WinCC

SPMP Ninghai Power Plant, China

4 Grab Ship Unloaders in 2005. Equipped with:
• AC SIMOVERT MASTERDRIVES
• SIMATIC S7-400H (Hot Standby)
• WinCC
• Semiautomatic antisway system

Patrick – Port Botany, Australia
Automated RMG Cranes 2008

5 automated intermodal yard cranes with SIMOVERT MASTERDRIVES, SIMATIC S7 PLC in 2008. Equipped with:
• Road Truck/Train/Stack/Straddle exchange with manual override via remote control station
• Safety interlocking via PROFIsafe interface bus connection
• Laser-based stack mapping and vehicle recognition systems for anticollision
• Laser-based rail wagon/container recognition system for positioning
Europe Combined Terminals, Netherlands

Equipped with:
• Full AC with SIMOVERT MASTERDRIVES
• SICMA crane management system

Container Terminal CTB Hamburg, Germany

2 STS cranes delivered in 2007.
Equipped with:
• AC System with SINAMICS controlled by
• SIMOTION D
• SIMATIC S7-400F fail-safe

Hudong Zhonghua Shipyard, Shanghai, P.R.C.

Equipped with:
• 2 hoists of 300 ton and 1x 350 ton
• Full AC System SIMOVERT MASTERDRIVES AFE, 2 x 710 kW
• SICMA management system
• Anticollision by laser
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