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SIEMENS

MOTION CONTROL DRIVES

SINAMICS Converters for Single-Axis Drives

SINAMICS G200
Standard Converters

siemens.com/d36-4

Catalog D 36.4

Edition July 2026

Next Generation



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Related catalogs

Motion Control Drives D 31.1
SINAMICS Converters for Single-Axis Drives
Built-In Units

PDF (E86060-K5531-A111-A5-7600)



Motion Control Drives D 31.2
SINAMICS Converters for Single-Axis Drives
Distributed Converters

PDF (E86060-K5531-A121-A4-7600)



Motion Control Drives D 31.5
SINAMICS Converters for Single-Axis Drives
SINAMICS G120X infrastructure converters
for HVAC/Water/Wastewater

PDF (E86060-K5531-A151-A5-7600)



Motion Control Drives D 32
SINAMICS S210 Servo Drive System

PDF (E86060-K5532-A101-B2-7600)



Motion Control Drives D 36.1
SINAMICS Converters for Single-Axis Drives
SINAMICS G220 built-in and wall-mounted units

PDF (E86060-K5536-A111-A6-7600)



Motion Control Drives D 37.1
SINAMICS S200 Servo drive system

PDF (E86060-K5537-A111-A3-7600)



SINAMICS S120 D 21.3
Chassis Format Converter Units
Chassis-2 Format Converter Units
Cabinet Modules, Cabinet Modules-2
SINAMICS S150
Converter Cabinet Units
PDF (E86060-K5521-A131-B1-7600)



Motion Control Drives D 21.4
SINAMICS S120, SINAMICS S220 and
SIMOTICS

PDF (E86060-K5521-A141-A2-7600)



Motion Control Drives D 23.1
SINAMICS DCM
series of converters
DC Converter, Control Module

PDF (E86060-K5523-A111-A4-7600)



SIMOTICS S-1FG1 D 41
Servo geared motors
Helical, Parallel shaft, Bevel and
Helical worm geared motors

PDF (E86060-K5541-A101-A6-7600)



Motion Control Drives D 60
SIMOTICS E
Drive system for extra low voltage

PDF (E86060-K5560-A101-A3-7600)



Motion Control System PM 21
SIMOTION
Equipment for Production Machines

PDF (E86060-K4921-A101-A4-7600)



Industrial Controls IC 10
SIRIUS

PDF (E86060-K1010-A101-B7-7600)



Low-Voltage Power Distribution and
Electrical Installation Technology LV 10
SENTRON • SIVACON • ALPHA

PDF (E86060-K8280-A101-C1-7600)



SIMATIC ST 70
Products for
Totally Integrated Automation

PDF (E86060-K4670-A101-C1-7600)



SIMATIC HMI / ST 80/ST PC
PC-based Automation
Human Machine Interface Systems
PC-based Automation

PDF (E86060-K4680-A101-D3-7600)



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D 36.4

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July
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SIEMENS

Next
Generation



Combining the real and digital worlds ...
Transformation

MOTION CONTROL DRIVES

SINAMICS Converters for Single-Axis Drives

SINAMICS G200
Standard Converters

siemens.com/d36-4

Dear Customer,
We are happy to present you with the new PDF version of the Catalog D 36.4 · July 2026.

The catalog provides a comprehensive overview of the SINAMICS G200 standard converters. SINAMICS G200 is an easy, wise, reliable frequency converter for general applications. Typical use cases include conveying, mixing, pumping, ventilation, and compression in intralogistics, consumer goods, packaging, life science, general machinery and other.

The products listed in this Catalog are also included in SiePortal.
Please contact your local Siemens office for additional information.

Up-to-date information about SINAMICS G200 is available online at www.siemens.com/sinamics-g200

You can access SiePortal on the internet at https://sieportal.siemens.com

Your personal contact will be glad to receive your suggestions and recommendations for improvement. You can find your representative in our personal contacts database at www.siemens.com/automation-contact

We hope that you will often enjoy using the new Catalog D 36.4 · July 2026 as a selection and ordering reference document and wish you every success with our products and solutions.

With kind regards



Frank Golüke
Vice President
General Motion Control
Siemens AG, Digital Industries, Motion Control

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SINAMICS Converters for Single-Axis Drives

SINAMICS G200 standard converters

Motion Control Drives



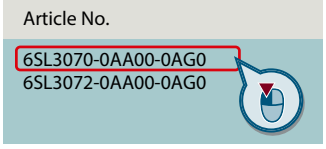
Catalog D 36.4 · July 2026

Refer to SiePortal for current updates of this catalog:
https://sieportal.siemens.com

Please contact your local Siemens branch.

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Click on an Article No. in the catalog PDF to call it up in SiePortal and to obtain all the information.



Or directly on the internet, e.g.
www.siemens.com/product_catalog_DIMC?6SL3070-0AA00-0AG0

The products and systems described in this catalog are manufactured/distributed under application of a certified quality management system in accordance with EN ISO 9001. The certificate is recognized by all IQNet countries.

System overview 1

SINAMICS G200 standard converters 2

SINAMICS Drive Software 3

Services and documentation 4

Appendix 5

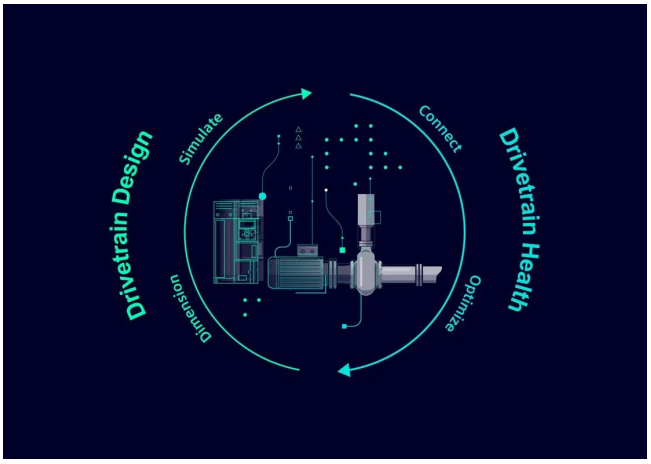
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Motion beyond expectations

Drives move the industries. But how can they make them more efficient, more reliable and more sustainable – and exceed all expectations while they are doing it? Our answer: Siemens Xcelerator for Digital Drivetrain.

Digital solutions for Drivetrain Design and Drivetrain Health

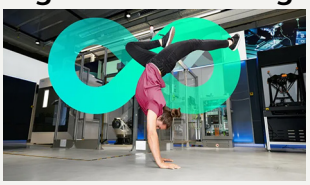
Combine the real and the digital world to reach the next level of efficiency and sustainability in your drivetrain value chain: with suitable digital solutions for drivetrain design and drivetrain health.
Drivetrain Design:
Simplify and shorten the engineering steps to get faster and more efficiently from concept to the commissioned drive-train.
Drivetrain Health:
Reduce total cost of ownership for your equipment and machine park – energy, maintenance, downtime.



siemens.com/digital-drivetrain

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Digitalization along the drivetrain value chain



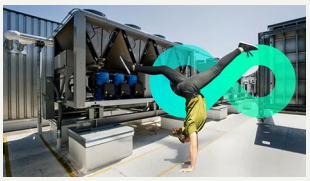
Dimension

Accurate in motion: Dimension your motors, gearboxes, and complete drivetrains digitally with greater precision – for greater reliability and energy efficiency.



Simulate

Faster in motion: Add the digital twin of the drivetrain to your machine simulation to speed up your design and engineering phases and to accelerate your time-to-market!



Connect

Data in motion: Acquire high-quality raw data and connect your entire drive-trains or machines to cloud or on-premise platforms – for a consistent and secure data flow.



Optimize

Better in motion: Analyze and visualize drivetrain and machine data in digital solutions and apps to identify optimization potentials and concrete actionable measures how to tap it.

Use cases for digital drivetrain technology



Condition monitoring for drivetrains

Healthy in motion: Gain valuable insights into your drivetrain to optimize maintenance, system availability, cost efficiency, and sustainability: Discover intelligent digital condition monitoring for your drivetrains!

Are your drivetrains fit enough for tough times?

The industries are expected to produce ever more efficiently, ever more sustainably and ever more cost-effectively. And if you can't do that, it's easier to be left behind by the competition. Use digitalization and the data from your motors and converters to optimize your competitiveness – and to keep your production in motion.



What if you consume too much electricity?

With digital solutions and digital drive technology, you can significantly reduce your share of this!



What if you waste too much energy?

Digitalization enables you to detect energy waste and impending system down-times at an early stage so that you can take counter-measures in due time!



What if your motors are incorrectly designed?

Digital tools make it quicker and easier to correctly design your drive components!



What if your drives fail unexpectedly?

With digital solutions, you can identify risks in your drivetrain at an early stage and react before a failure occurs.

"Our digital solutions transform your drivetrain value chain to the next level of efficiency and sustainability."

siemens.com/digital-drivetrain

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Next Generation

SINAMICS VARIABLE FREQUENCY DRIVES

Driving **next generation applications**



SINAMICS frequency converters

SINAMICS frequency converters – the ultimate solution for all drive applications. From low voltage to direct current (DC), our frequency converters meet your needs. With increased efficiency and versatility, take your applications to the next generation for a digital and sustainable future.

Driving next generation applications

When it comes to driving industry advancements, look no further than our SINAMICS frequency converters. They fuel the creation of innovative, next-generation applications that meet the unique needs of every industry.

From pumping and ventilating to moving, positioning, processing, and machining, our converters have you covered. Get ready to take your applications to new heights.

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Low voltage converters

Low voltage frequency converters are suitable for a huge range of applications. For example, if materials must be moved, processed, positioned, pumped or compressed. Variable-speed operation saves energy and also increases process quality and process availability.



Servo converters

These servo converters meet the highest dynamic requirements for single and multi-axis applications. The perfect solution for machine tools, packaging machines, continuous material handling, cranes, rolling mills, test stands, material handling, robotics and many other applications requiring high-precision, dynamic motion control.



DC converters

The dynamic performance, ruggedness, and cost-effectiveness of DC technology continue to make it the most cost-effective and proven drive solution for many applications today – with numerous advantages in terms of reliability, ease of use, and operational performance.



Accelerating the digital and sustainable transformation of industry

How can you make production more efficient? Accelerate your digital transformation? And become more sustainable?

The answer is our SINAMICS frequency converters. They are energy efficient, offer the versatility you need for any application, and drive your digital transformation by providing the data to continuously improve production efficiency and sustainability. Our converters offer you integrated safety and security features, efficient engineering and software tools as well as comprehensive lifecycle services. In other words: Everything you need to address the next generation of applications – today and tomorrow.

EFFICIENT

Implement energy-efficient applications easily, quickly, and safely with efficient motion control.

- Sustainable drive systems
- Efficient Motion Control solutions
- Drive System Services

VERSATILE

Drives equipped with tailored safety features to ensure optimal machine safety in a wide range of industrial applications.

- Safety and Security Integrated
- Drive applications
- Drives for any industry

FUTURE-PROOF

Efficient engineering, powerful software tools, and cloud and edge connectivity for greater transparency.

- Digitalization in drive technology
- Efficient drive engineering
- Drive Software for all applications

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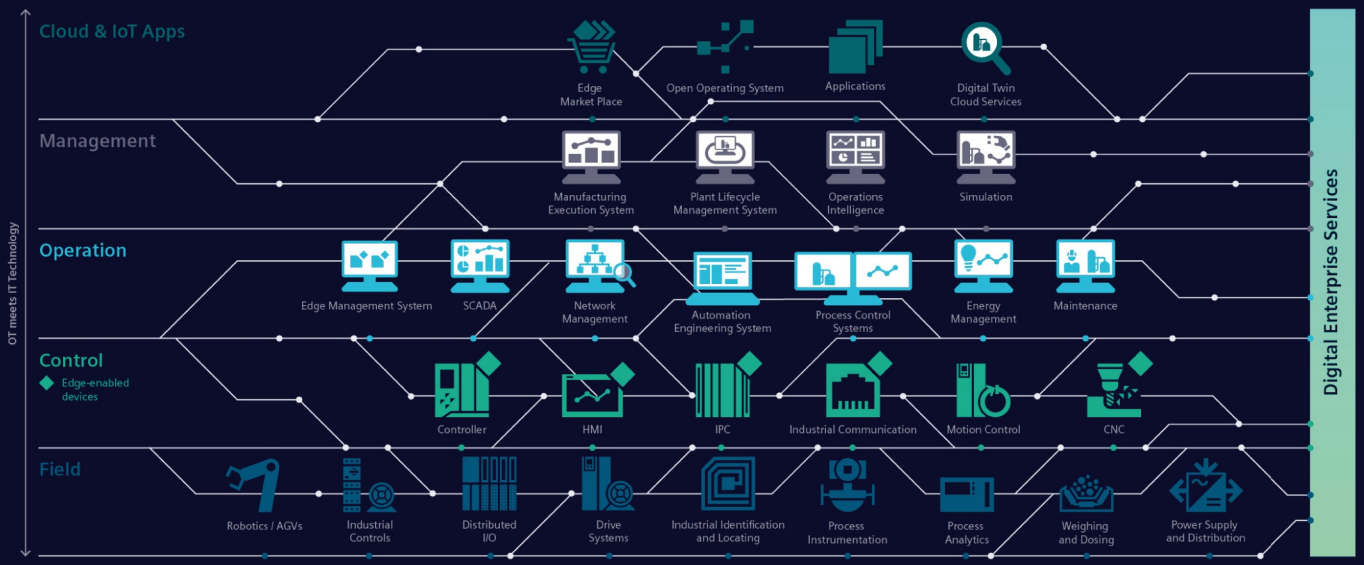
Totally Integrated Automation



Totally Integrated Automation (TIA) offers smart automation development, flexible machine concepts, transparent operation, and sustainable solutions that enable access to data to calculate and optimize the product carbon footprint. We are constantly improving and expanding TIA to be future-proof and adaptive to existing and upcoming challenges.

A comprehensive portfolio for the challenges of today and tomorrow

The TIA offering is integrated seamlessly and it's so comprehensive that it provides the right automation solutions for every industry. We will continue to improve and expand our proven automation portfolio and are constantly including innovative technologies and solutions that pave the way towards the factory of the future.



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Real added value for the automation of your production

From the development of innovative machine concepts to engineering and optimized production:
TIA offers real added value along the entire value chain.

Smart Automation Development

Innovative machine concepts made easy: When you use standardized library concepts and preconfigured expertise, you can count on efficient engineering. Thanks to the integration of safety features, diagnostic functions, and cybersecurity, you also save valuable time.

Flexible Machine Concepts

No matter what new requirements emerge in the market, TIA supports modular machine concepts and the simple integration of new machines into existing lines – thanks to standardized hardware interfaces and engineering libraries. As a machine builder, this enables you to meet any challenge quickly and reliably.

Transparent Operation

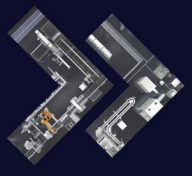
Integrated interfaces let you achieve a new level of transparency for the essential performance indicators in your processes and plants. The connection between IT and OT along with efficient data management lay the foundation for new service models such as predictive maintenance.

Future-proof Automation

Our TIA portfolio is constantly being refined with a view to integrating automation technologies more and more efficiently. The components can then interact with modern IT capabilities, which are becoming increasingly important for specific applications in automation. TIA provides a solid foundation, whether for working with our Industrial Operations X portfolio or for everything the future has in store.

Sustainable Solutions

Sustainability starts with the acquisition of data. With the TIA portfolio, you can measure energy and resource data and make it transparent, providing a solid foundation for calculating the Product Carbon Footprint. This is crucial for drawing the right conclusions and responding to sudden changes in order to lastingly reduce CO_2 emissions and save more resources in production.



www.siemens.com/tia

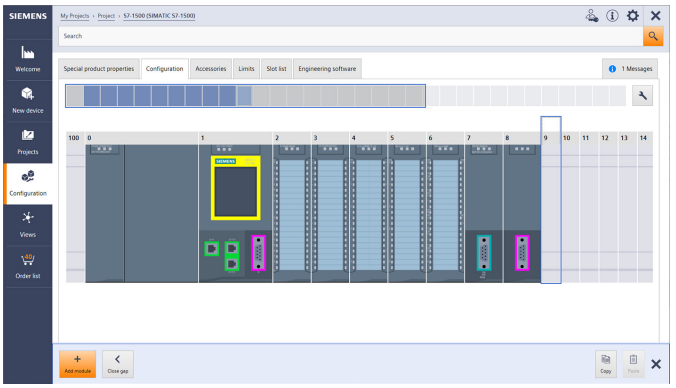
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TIA Selection Tool – quick, easy, smart configuration

For you to get the most out of our portfolio quickly and easily.

Do you always need the optimum configuration for planning your project?
For your application we offer the TIA Selection Tool to support all project planners, beginners and experts alike.
No detailed portfolio knowledge is necessary.
TIA Selection Tool is available for download as a free desktop version or a cloud variant.



Your Advantages

Quick

- Configure a complete project with just a few entries – without a manual, without special knowledge
- Import and export of hardware configuration to TIA Portal or other systems
- Ideal visualization of the projects to be configured

Easy

- Tool download either as desktop version or web-based cloud version
- Technically always up-to-date about product portfolio and innovative approaches
- Highly flexible, secure, cross-team work in the cloud
- Direct ordering in SiePortal

Smart

- Smart selection wizard for error-free configuration and ordering
- Configuration options can be tested and simulated in advance
- Library for archiving sample configurations

The TIA Selection Tool is a completely paperless solution.
Download it now:
www.siemens.com/tst

For more information, scan the QR code

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Sustainability @Siemens

Transforming the everyday to create a better tomorrow.



For more information, see www.siemens.com/sustainability figures

As a company, Siemens considers environmental, social and governance (ESG) criteria from all angles with its DEGREE framework (decarbonization, ethics, governance, resource efficiency, equity and employability). We are not only committed to reducing the carbon footprint in our own operations to net zero by 2030, but also helping our customers achieve their decarbonization and sustainability goals.

Mission & strategy

As a focused technology company, Siemens is committed to addressing the world's most profound challenges by leveraging the synergies between digitalization and sustainability.

Technology with aim and purpose

We develop technologies that connect the real and digital worlds and enable our customers to positively transform the industries that form the backbone of our economy: industry, infrastructure, transportation and healthcare.

Our contribution

Siemens makes an impact every day by providing innovative solutions in response to challenges relating to environmental protection, decarbonization, health and safety. Innovative solutions that have a clear goal: to make the world more sustainable, more integrative and a better place to live.

Sustainability facts

For almost 175 years, Siemens has been driven by the desire to improve the lives of people around the world with our technologies.

Siemens EcoTech

Siemens EcoTech is an environmental product performance label designed to drive the sustainable transformation of industry and infrastructure. The label gives you transparency on the performance of our certified products across environmental relevant criteria, enabling you to make informed choices to support your sustainability goals, see www.siemens.com/SiemensEcoTech.

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1/2	The SINAMICS converter family
1/3	Drive selection
1/5	SIMOTICS motors
1/6	Energy efficiency classes in accordance with IEC 61800-9-2
1/10	SINAMICS G200 standard converters

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Overview

SINAMICS frequency converters

SINAMICS frequency converters are the ultimate solution for all drive applications. From low voltage to direct current (DC), our frequency converters meet your needs.
With increased efficiency and versatility, take your drive applications to the next generation for a digital and sustainable future.
www.siemens.com/sinamics

Low voltage									Direct voltage
Standard performance frequency converters		Distributed frequency converters	Industry-specific frequency converters	Servo converters		High performance frequency converters			DC converters
									
SINAMICS V20 G120C G120 G200 G210	SINAMICS G130 G150	SINAMICS G115D G120D SIMATIC ET 200pro FC-2	SINAMICS G120X G210X	SINAMICS V90 S200	SINAMICS S210 (6SL5...)	SINAMICS G220	SINAMICS S120 S120M S220	SINAMICS S150 S220	SINAMICS DCM DCP [1]
0.12 kW to 250 kW	75 kW to 2700 kW	0.37 kW to 7.5 kW	0.75 kW to 630 kW	0.05 kW to 7 kW	0.05 kW to 7 kW	0.55 kW to 160 kW	0.55 kW to 5700 kW	75 kW to 1200 kW	6 kW to 30 MW
Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines, refrigerated display counters, fitness equipment, ventilation systems, single-axis positioning applications in machine and plant engineering	Pumps, fans, compressors, conveyor belts, mixers, mills, extruders	Conveyor technology, single-axis positioning applications (G120D)	Pumps, fans, compressors, building management systems, process industry, HVAC, water/waste water industries	Handling machines, packaging machines, automatic assembly machines, metal forming machines, printing machines, winding and unwinding units	Packaging machines, handling equipment, feed and withdrawal devices, stacking units, automatic assembly machines, laboratory automation, wood, glass and ceramics industry, digital printing machines	Pumps, fans, compressors, conveyor belts, mixers, mills, spinning machines, textile machines, refrigerated display counters, fitness equipment, ventilation systems, single-axis positioning applications in machine and plant engineering	Production machines (packaging, textile and printing machines, paper machines, plastic processing machines), machine tools, plants, process lines and rolling mills, marine drives, test bays	Test bays, cross cutters, centrifuges	Rolling mill drives, wire-drawing machines, extruders and kneaders, cableways and lifts, test bay drives
Catalog D 31.1 D 36.3 D 36.4	Catalog D 11	Catalog D 31.2	Catalog D 31.5 D 36.5	Catalog D 33 D 37.1	Catalog D 32	Catalog D 36.1	Catalogs D 21.3, D 21.4 D 38	Catalog D 21.3 D 38	Catalog D 23.1, SiePortal
Engineering tools (e.g. Siemens Product Configurator, TIA Selection Tool, DriveSim Engineer, STARTER and SINAMICS Startdrive)									

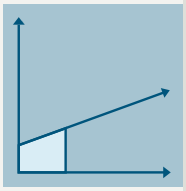
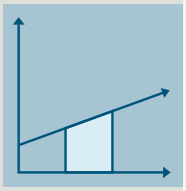
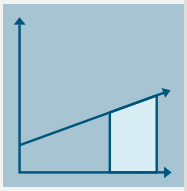
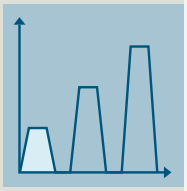
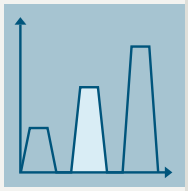
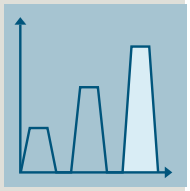
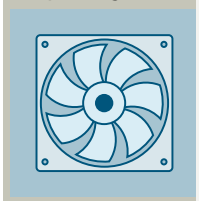
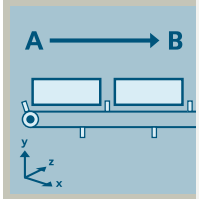
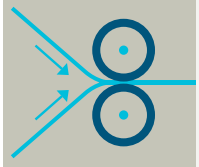
[1] DC/DC controllers, see SiePortal.

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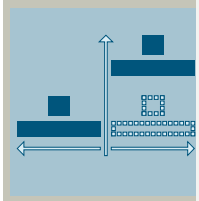
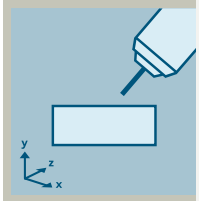
Application

SINAMICS selection guide – typical applications

Use	Requirements for torque accuracy/speed accuracy/position accuracy/coordination of axes/functionality					
	Continuous motion			Non-continuous motion		
	Basic	Medium	High	Basic	Medium	High
						
Pumping, ventilating, compressing	Centrifugal pumps Radial/axial fans Compressors	Centrifugal pumps Radial/axial fans Compressors	Eccentric screw pumps	Hydraulic pumps Metering pumps	Hydraulic pumps Metering pumps	Descaling pumps Hydraulic pumps
	V20 G200 G120X/G210X	G120X/G210X G130/G150 DCM	G220 G210X S120/S220	G120 G220	S210 S220	S120/S220
Moving	Conveyor belts Roller conveyors Chain conveyors	Conveyor belts Roller conveyors Chain conveyors Lifting/lowering devices Elevators Escalators/moving walkways Indoor cranes Marine drives Cable railways	Elevators Container cranes Mining hoists Excavators for open-cast mining Test bays	Acceleration conveyors Storage and retrieval machines	Acceleration conveyors Storage and retrieval machines Cross-cutters Reel changers	Storage and retrieval machines Robotics Pick & place Rotary indexing tables Cross-cutters Roll feeds Engagers/disengagers
	V20 G115D G120C/G200 ET 200pro FC-2 [1]	G120/G210 G120D G130/G150	G220 S120/S220 S150 DCM	S200 G120 G220 G120D	S210 DCM	S120/S220 S210 DCM
Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders/unwinders Lead/follower drives Calenders Main press drives Printing machines	Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles	Tubular bagging machines Single-axis motion control such as • Position profiles • Path profiles	Servo presses Rolling mill drives Multi-axis motion control such as • Multi-axis positioning • Cyclic cams • Interpolations
	V20 G120C/G200	G120/G210 G130/G150	G220 S120/S220 S150 DCM	S200 G120 G220	S210	S120/S220 S210 DCM

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Application (continued)

Use	Requirements for torque accuracy/speed accuracy/position accuracy/coordination of axes/functionality					
	Continuous motion			Non-continuous motion		
Positioning	Positioning	Dynamic Positioning	Coordinated Motion	Indexing	Dynamic Indexing	Synchronized Motion & Camming
	G120 G210	G120 G120D G210	G220	S200	S210	S120 S150 DCP S210 S220
Machining	Main drives for • Turning • Milling • Drilling	Main drives for • Drilling • Sawing	Main drives for • Turning • Milling • Drilling • Gear cutting • Grinding	Axis drives for • Turning • Milling • Drilling	Axis drives for • Drilling • Sawing	Axis drives for • Turning • Milling • Drilling • Lasering • Gear cutting • Grinding • Nibbling and punching
	S200	S120/S220	S120/S220	S200	S120/S220	S120/S220

[1] Information on the SIMATIC ET 200pro FC-2 frequency converter is available in Catalog D 31.2 and at www.siemens.com/et200pro-fc

Using the SINAMICS selection guide

The varying range of demands placed on modern variable frequency converters requires a large number of different types. Selecting the optimum converter is becoming a significantly more complex process. The application matrix shown simplifies this selection process considerably, by suggesting the ideal SINAMICS converter for examples of typical applications and requirements.

- The application type is selected from the vertical column
  - Pumping, ventilating, compressing
  - Moving
  - Processing
  - Positioning
  - Machining
- The quality of the motion type is selected from the horizontal row
  - Basic
  - Medium
  - High

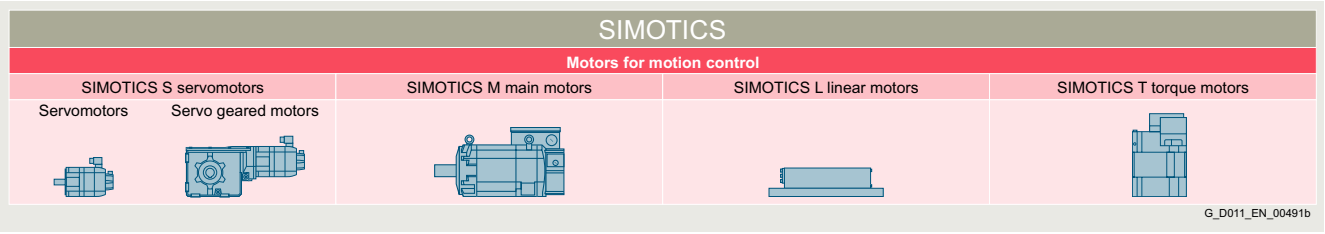
More information

More information about SINAMICS is available on the internet at www.siemens.com/sinamics

Practical application examples and descriptions are available on the internet at www.siemens.com/sinamics-applications

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Overview



SIMOTICS stands for

- 150 years of experience in building electric motors
- The most comprehensive range of motors for motion control applications
- Optimum solutions in all industries, regions and power/performance classes
- Innovative motor technologies of the highest quality and reliability
- Highest dynamic performance, precision and efficiency together with the optimum degree of compactness
- Our motors can be integrated into the drive train as part of the overall system
- A global network of skill sets and worldwide service around the clock

An outstanding performance for any job

A key characteristic of all SIMOTICS motors is their quality. They are robust, reliable, dynamic and precise to assure the requisite performance level for any process and deliver exactly the capabilities demanded by the application in hand. Thanks to their compact design, they can be integrated as space-saving units into installations. Furthermore, their impressive energy efficiency makes them effective as a means of reducing operating costs and protecting the environment.

A dense network of skill sets and servicing expertise around the world

SIMOTICS offers not only a wealth of sound experience gleaned from a development history which stretches back over around 150 years, but also the know-how of hundreds of engineers. This knowledge and our worldwide presence form the basis for a unique proximity to industries which feeds through in tangible terms to the specific motor configuration which is tailored to suit your application.

Our specialists are available to answer all your queries regarding any aspect of motor technology. At any time – wherever you are in the world. When you choose SIMOTICS, therefore, you reap the benefits of a global service network which is continuously accessible, thereby helping to optimize response times and minimize downtimes.

An end-to-end automation concept that sets new standards in efficiency and cost-effectiveness

Our portfolio includes perfectly matched components: SIMOTICS motors work precisely with the SINAMICS frequency converter family and are seamlessly integrated into the SIMATIC control landscape. The combination of SIMATIC industrial automation and SINUMERIK CNC systems as well as the MOTION-CONNECT system cabling and cabinet integration enables a holistic solution. The system is supplemented by HMI devices, peripherals, power supplies and measuring systems.

Benefit from a complete system from a single source that meets your requirements in any industry.

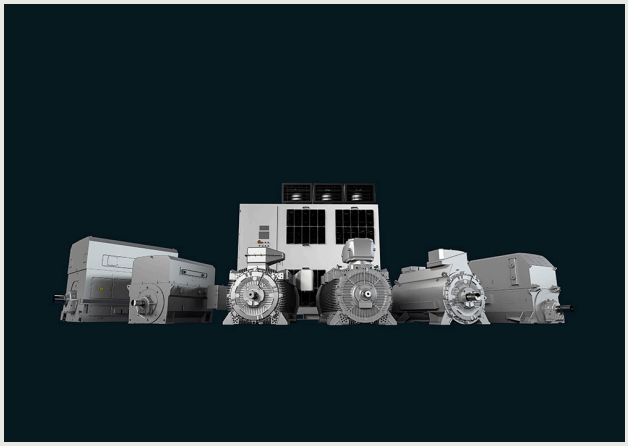
A clearly structured portfolio

The entire SIMOTICS product portfolio is transparently organized according to application-specific criteria in order to help users select the optimum motor for their application.

Whatever it is that you want to move – we can supply the right motor for the task.

www.siemens.com/simotics

Motors from Innomotics



You can also find suitable motors from our product partner Innomotics
www.innomotics.com

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Overview

Step by step to more efficiency

One of the core objectives of the European Union is a sustainable power industry. In industrial plants today, around 70 % of the power demand is from electrically driven systems. This high percentage contains huge potential for saving energy in electrical drives. For that reason, the European Union introduced minimum requirements for the energy efficiency of electric motors in the form of a statutory motor regulation as early as 2011.

These activities are expanded by EU Directive 2019/1781, which deals with more stringent requirements for DOL motors (Direct On Line) and defines the efficiency limits for frequency converters. The directive offers a legal basis for technical content in terms of the efficiency of specific products and services. However, standardization plays a leading role in determining the range and available market technology.

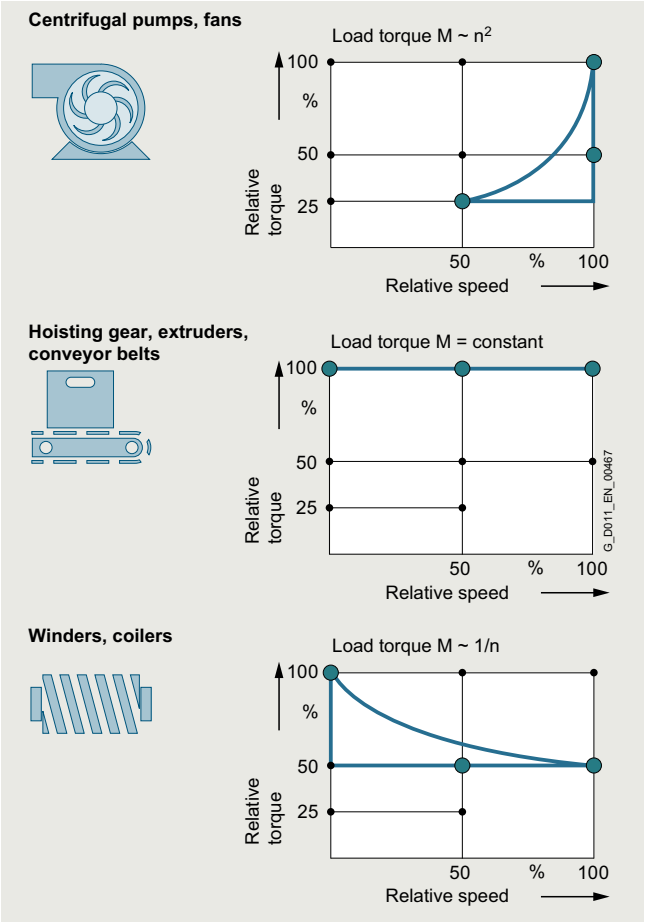
Improving energy efficiency is supported by a systematic selection of the most efficient converter and drive system technologies on the IEC 61800-9 series of standards. Part 1 specifies the methodology to determine the energy efficiency index of an application on the basis of the expanded product approach (EPA) and semi-analytical models (SAMs), whereas part 2 entails indicators for the evaluation of the energy efficiency performance and classification of converters and drive systems.

First of all, the consideration of eight application-relevant operating points is introduced as mandatory, in order to take the different applications into account in a targeted manner. Determination of loss values at these eight points and definition of efficiency classes are laid down by the standard in a uniform way. This enables data relevant to operation, such as application-specific load profiles, to now be taken into account more easily in the energy efficiency analysis.

The standard is especially important for variable-speed drives of the following types:

- for AC/AC converters without energy recovery functionality
- for motors with integrated converters
- for supply voltages of 100 V to 1000 V
- for power ratings of 0.12 kW to 1000 kW

To cover all applications of driven machines, the IEC 61800-9-2 standard defines operating points in full-load and partial-load operation, at which the losses of the motor and drive systems have to be determined. Based on the loss data at the operating points in partial-load operation, variable-speed drives can be explicitly considered in more detail. This makes their advantages especially clear.



Duty cycles for different driven machines

Moreover, frequency converters and motor systems are classified in efficiency classes, which permit an initial rough estimate of the potential saving. Definition of reference systems is a key aspect of this because they provide standard reference values. The positioning of these reference systems defines the efficiency class. The relative distance from the reference system can be used as an absolute measure of the efficiency at the operating point in question.

Advantages of the detailed loss consideration of IEC 61800-9-2 over the previous consideration of efficiencies and maximum loss values

For motors, the efficiency consideration was previously only defined for operation without a converter at 50/60 Hz. It provides a good way of comparing the energy efficiency of motors from different manufacturers for this use case.

The more detailed loss analysis of IEC 61800-9-2, on the other hand, is aimed at speed-controlled operation and therefore now also includes motors especially designed for converter operation in the energy analysis. These were previously not covered by the applicable standards.

Moreover, a loss analysis over the entire setting and load range of the motor is possible. This is done in accordance with the standard IEC 61800-9-2 with typical values.

For holistic consideration, it is essential to include all the relevant components of a drive system. The IEC 61800-9-2 standard defines this in detail. The standardized expression of power loss data as a

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Overview (continued)

percentage makes comparison considerably easier and more transparent.

The method also makes it possible to consider a motor that produces a holding torque at speed zero, for example. In this case, the efficiency is zero, but a power loss from current producing magnetization and holding torque does occur. In summary, the key advantage of standard IEC 61800-9-2 is the ability to perform the energy analysis of an electrical drive system based on standardized load profiles in all operating ranges due to uniform general conditions. This provides the user with complete transparency irrespective of the manufacturer.

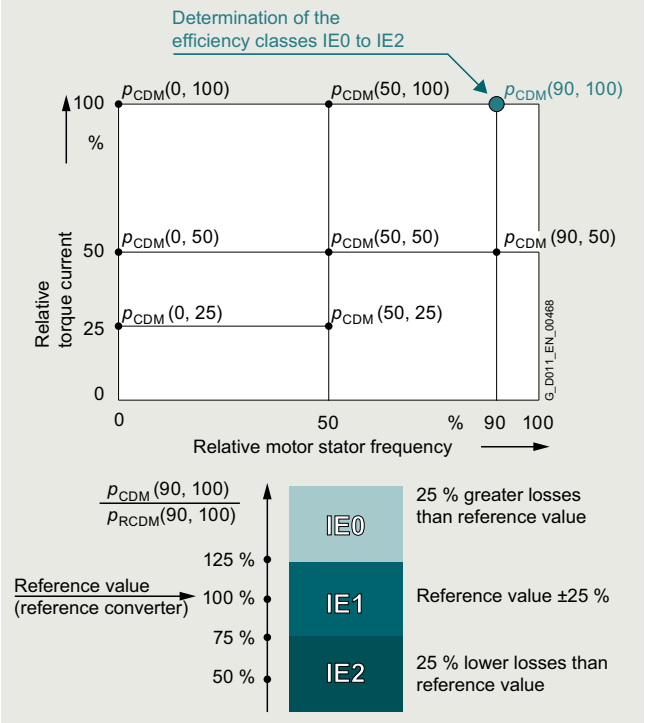
Establishing efficiency classes of frequency converters (Complete Drive Modules CDM)

To avoid overmodulation and to ensure comparability between makes, which cannot be achieved otherwise, the efficiency classes of CDMs refer to the 90/100 operating point (90 % motor stator frequency, 100 % torque current).

Standard IEC 61800-9-2 defines the relative losses of a CDM in efficiency classes IE0 to IE2. With reference to the value of a CDM of efficiency class IE1 (reference converter), a CDM of efficiency class IE2 has 25 % lower losses and a CDM of efficiency class IE0 has 25 % higher losses.

The publication of EU Directive 2019/1781 makes compliance with the eco-design requirements for the product declaration of conformity mandatory.
AC/AC transformers, that belong to the aforementioned categories (specific voltage and performance level without regenerative feedback capability), must meet efficiency class IE2, in order to be authorized for installation/use within the EU.

Operating points for CDMs



Complete Drive Module (CDM) – determining the efficiency class

Establishing the efficiency classes of drive systems (Power Drive Systems PDS)

What is possible for the individual systems, of course, also applies to the entire electrical PDS (frequency converter plus motor). Detailed comparisons are now possible at this level, too. The reference values for the reference system provide clear indications of the energy performance of the PDS.

Because targeted matching of the motor and CDM provides additional potential for optimization in electrical drive systems, it is especially important for the user to consider the entire drive system.

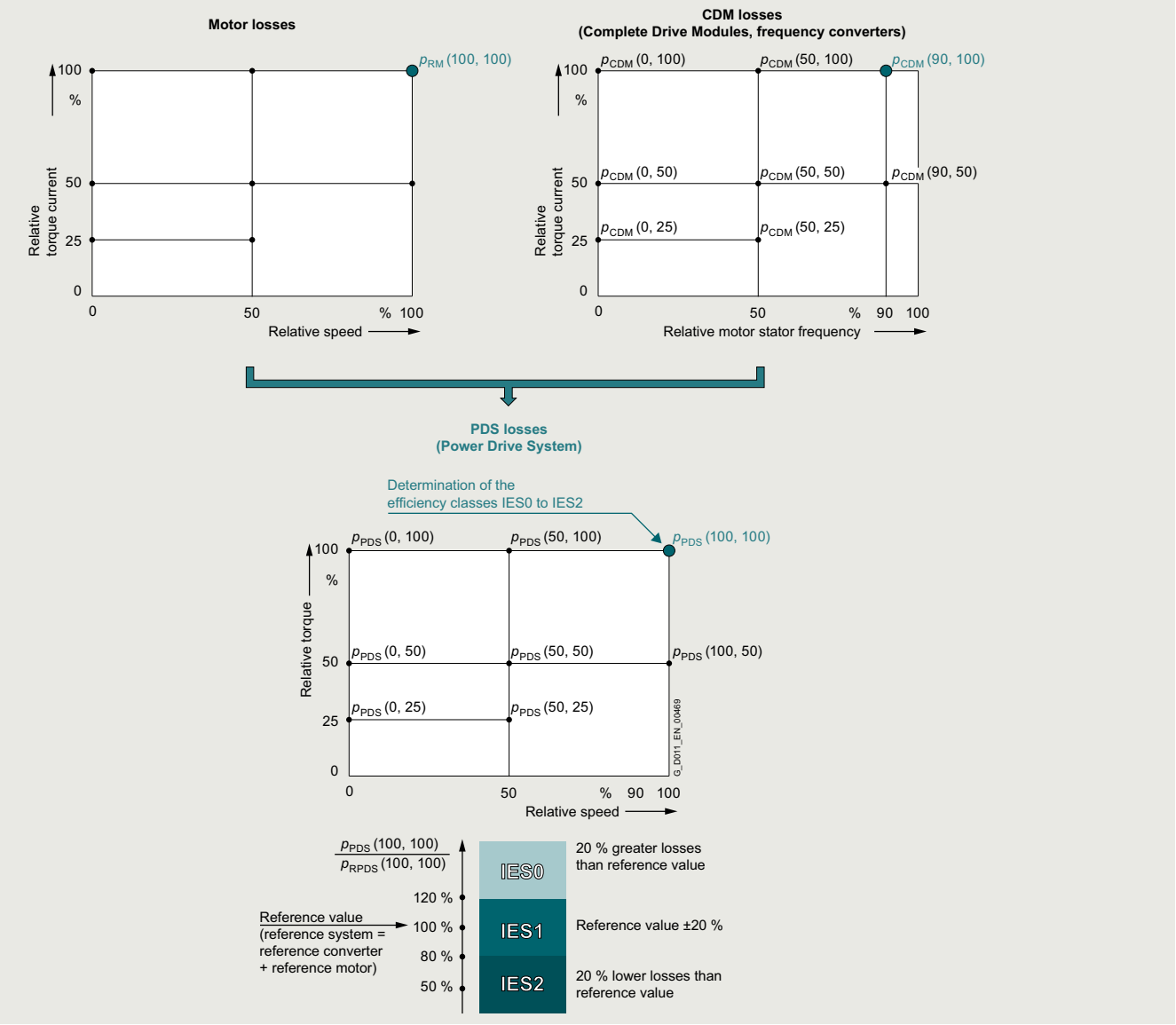
For the efficiency class of a PDS, too, a specific load point is defined. In this case, the reference point used is the 100/100 operating point (100 % motor stator frequency, 100 % torque).

Standard IEC 61800-9-2 defines the relative losses of a PDS in efficiency classes IES0 to IES2. With reference to the value of a PDS of efficiency class IES1 (reference drive), a PDS of efficiency class IES2 has 20 % lower losses and a PDS of efficiency class IES0 has 20 % higher losses.

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Overview (continued)

Operating points for PDS



Power Drive System (PDS) – determining the efficiency class

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More information

Power loss data of SINAMICS converters for single-axis drives are available

- for SINAMICS V20, SINAMICS G115D/G120/G120C/G120D/G120X/G130/G150 and SINAMICS S120/S150 on the internet at https://support.industry.siemens.com/cs/document/94059311
- for SINAMICS frequency converters of the next generation (from firmware V6.1) via ID-Link or Siemens Product Configurator in SiePortal at www.siemens.com/spc

More information on current laws and standards, new standards, and mandatory guidelines is available on the internet at www.siemens.com/legislation-and-standards

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Overview



Example: SINAMICS G200 standard converters, version with SINAMICS SDI Lite, frame sizes FSA1, FSA2, FSA3 and FSB1

SINAMICS G200 standard converter is an easy, wise and reliable frequency converter for general applications.
It is used in general industrial applications where reliable, easy-to-use drives are required. Typical use cases include conveying, mixing, pumping, ventilation, and compression in intralogistics, consumer goods, packaging, life science, and general machinery. It is also relevant for the ceramics and glass as well as woodworking and textile industries.

Voltage versions and power ratings:

- Degree of protection IP20 / UL Open Type:
  - 200 V to 240 V 3 AC: 0.55 kW to 4 kW (0.75 hp to 5 hp)
  - 380 V to 480 V 3 AC: 0.55 kW to 11 kW (0.75 hp to 15 hp)

Easy by Nature
SINAMICS G200 offers an out-of-the-box user experience and eliminates complex setup steps. A single order number simplifies the selection and ordering process and reduces procurement time and errors. With a multilingual operator panel (SINAMICS SDI Lite and SINAMICS SDI Pro 5.5") and a SINAMICS Smart Adapter, it enables immediate and intuitive operation. Integration into the SINAMICS Startdrive commissioning tool integrated into the TIA portal as well as the webserver integration make the commissioning process and diagnostics effortless. Seamless integration of next-generation portfolios eliminates redundant learning requirements.
From selection and ordering to commissioning and maintenance, SINAMICS G200 reduces overall effort while maximizing operational efficiency through simplified, standard performance operation.

Wise by Value
SINAMICS G200 can be seamlessly integrated with SIMATIC PLC, HMI and other Siemens options via PROFINET communication protocol. It connects effortlessly to your existing system. Its ultra-compact footprint optimizes cabinet utilization, while native support for IE4/IE5 high-efficiency motors (ASM, PMSM, SRM), an integrated EMC filter, braking chopper and ECO mode reduce energy consumption and eliminate additional component costs. Customized solutions tailored to unique operational requirements can be designed with SINAMICS DCC (Drive Control Chart) in the TIA Portal for custom logic and automation.
From effortless integration to long-term energy and space savings, SINAMICS G200 offers both immediate and lasting cost efficiency.

Reliable by Proof
SINAMICS G200 is designed with a 3C2 coating, an EMC category C3, and independent air duct PCB cooling. It can withstand harsh industrial environments, minimizing unplanned downtime and ensuring consistent performance even in demanding conditions. With Safety integrated functions (STO, SS1-t), User Management and Access Control (UMAC), and built-in cybersecurity, it protects your personnel, equipment, and critical data with industry-leading protection. Supported by universal global certifications and a worldwide service network, it enables seamless go-to-market and guaranteed support wherever your business operates.
SINAMICS G200 delivers a proven and reliable solution. It keeps your operations running smoothly, securely, and compliantly.

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2/2	Built-in units - 0.55 kW to 11 kW (0.75 hp to 15 hp)
2/7	SINAMICS SDI Lite
2/8	SINAMICS SDI Pro 5.5"
2/15	SINAMICS Smart Adapter
2/17	Memory cards
2/18	SINAMICS Drive Software Options
2/19	Safety Integrated for SINAMICS G200
2/20	Security Integrated Functions
2/22	SINAMICS web server for SINAMICS G200
2/28	SINAMICS Startdrive commissioning tool
2/32	SINAMICS DCC (Drive Control Chart) in the TIA Portal
2/34	Drive system dimensioning with SIZER (integrated in TIA Selection Tool)

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Overview



Example: SINAMICS G200 standard converters, version with SINAMICS SDI Lite, frame sizes FSA1, FSA2, FSA3 and FSB1

SINAMICS G200 standard converter is an easy, wise and reliable frequency converter for general applications.
It is used in general industrial applications where reliable, easy-to-use drives are required. Typical use cases include conveying, mixing, pumping, ventilation, and compression in intralogistics, consumer goods, packaging, life science, and general machinery. It is also relevant for the ceramics and glass as well as woodworking and textile industries.
Voltage versions and power ratings:

- Degree of protection IP20 / UL Open Type:
  - 200 V to 240 V 3 AC: 0.55 kW to 4 kW (0.75 hp to 5 hp)
  - 380 V to 480 V 3 AC: 0.55 kW to 11 kW (0.75 hp to 15 hp)

Easy by Nature

SINAMICS G200 offers an out-of-the-box user experience and eliminates complex setup steps. A single order number simplifies the selection and ordering process and reduces procurement time and errors. With a multilingual operator panel (SINAMICS SDI Lite and SINAMICS SDI Pro 5.5") and a SINAMICS Smart Adapter, it enables immediate and intuitive operation. Integration into the SINAMICS Startdrive commissioning tool integrated into the TIA portal as well as the webserver integration make the commissioning process and diagnostics effortless. Seamless integration of next-generation portfolios eliminates redundant learning requirements.
From selection and ordering to commissioning and maintenance, SINAMICS G200 reduces overall effort while maximizing operational efficiency through simplified, standard performance operation

Wise by Value

SINAMICS G200 can be seamlessly integrated with SIMATIC PLC, HMI and other Siemens options via PROFINET communication protocol. It connects effortlessly to your existing system. Its ultra-compact footprint optimizes cabinet utilization, while native support for IE4/IE5 high-efficiency motors (ASM, PMSM, SRM), an integrated EMC filter, braking chopper and ECO mode reduce energy consumption and eliminate additional component costs. Customized solutions tailored to unique operational requirements can be designed with SINAMICS DCC (Drive Control Chart) in the TIA Portal for custom logic and automation.
From effortless integration to long-term energy and space savings, SINAMICS G200 offers both immediate and lasting cost efficiency.

Reliable by Proof

SINAMICS G200 is designed with a 3C2 coating, an EMC category C3, and independent air duct PCB cooling. It can withstand harsh industrial environments, minimizing unplanned downtime and ensuring consistent performance even in demanding conditions. With Safety integrated functions (STO, SS1-t), User Management and Access Control (UMAC), and built-in cybersecurity, it protects your personnel, equipment, and critical data with industry-leading

Overview (continued)

protection. Supported by universal global certifications and a worldwide service network, it enables seamless go-to-market and guaranteed support wherever your business operates.
SINAMICS G200 delivers a proven and reliable solution. It keeps your operations running smoothly, securely, and compliantly.

Benefits

Key benefits

- **Ready to use**
  - Equipped with intuitive commissioning and diagnostic tools as standard, saving time
  - Simple and straightforward selection and ordering process
- **Effortless commissioning and diagnostics**
  - Multilingual LCD control panel (SINAMICS SDI Lite, SINAMICS SDI Pro 5.5")
  - SINAMICS Smart Adapter for Wi-Fi connectivity
  - Engineering tools (SINAMICS Startdrive commissioning tool integrated in the TIA Portal, SINAMICS web server for web-based commissioning)
  - Elimination of redundant learning requirements
- **Seamless integration into your existing system**
  - PROFINET communication protocol
  - Integration with SIMATIC PLC, HMI and other options
- **Resource savings**
  - Compact design
  - Support for IE4/IE5 high-efficiency motors (ASM, PMSM, SRM)
  - Integrated EMC filter and braking chopper
  - ECO Mode
- **Customized solution**
  - Integration into SINAMICS DCC (Drive Control Chart) in the TIA Portal for individual logic and automation
- **Robust design**
  - 3C2 coating & EMC category C3
  - PCB cooling with independent air duct

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Benefits (continued)

- **Safety and security**
  - Safety Integrated functions (STO, SS1-t)
  - SIL 3/PL e/Cat. 4
  - User Management and Access Control (UMAC)
  - Integrated cybersecurity (security level 2) according to IEC 62443-4-2

- **Worldwide reach**
  - Universal certification (UL, cUL, EAC, KC, RoHS II, REACH, RCM)
  - Global warranty and service

Extended warranty

For SINAMICS G200, Siemens offers an optional extended warranty of up to 7.5 years via **Service Protect**:

- Free for the first 30 months after registering the product at: https://www.siemens.com/serviceprotect
- Subject to a charge for a further 3 or 5 years of extended warranty. You can find detailed information here: https://support.industry.siemens.com/cs/ww/en/sc/4842

You can find the correct Service Protect product number for your SINAMICS G200 converter using our simple configurator https://www.siemens.com/serviceprotect

Concerning standard warranty please ask your partner at Siemens. Your partner can be found in our Personal Contacts Database at: https://www.siemens.com/automation-contact

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Selection and ordering data

SINAMICS G200 standard converters · IP20/UL Open Type · 200 ... 240 V 3 AC · 0.55 kW to 4 kW (0.75 hp to 5 hp)

Product selection

Rated power Low overload (LO)		Rated output current Low overload (LO)	High overload (HO)	Frame size	SINAMICS G200 without line filter		SINAMICS G200 with integrated line filter class C3	
Acc. to IEC 230 V kW	Acc. to NEC 240 V hp	Acc. to IEC 230 V A	Acc. to IEC 230 V A		Without control panel	With control panel	Without control panel	Without control panel
200 ... 240 V 3 AC								
0.55	0.75	3.2	2.3	FSA1	6SL4512-0CA05-0YF0	6SL4512-0CA05-0AF0	6SL4512-0CA05-3YF0	6SL4512-0CA05-3AF0
0.75	1	4.2	3.2	FSA2	6SL4512-0CA06-0YF0	6SL4512-0CA06-0AF0	6SL4512-0CA06-3YF0	6SL4512-0CA06-3AF0
1.1	1.5	6	4.2	FSA2	6SL4512-0CA08-0YF0	6SL4512-0CA08-0AF0	6SL4512-0CA08-3YF0	6SL4512-0CA08-3AF0
1.5	2	7.8	6	FSA2	6SL4512-0CA10-0YF0	6SL4512-0CA10-0AF0	6SL4512-0CA10-3YF0	6SL4512-0CA10-3AF0
2.2	3	11	7.8	FSA3	6SL4512-0CA11-0YF0	6SL4512-0CA11-0AF0	6SL4512-0CA11-3YF0	6SL4512-0CA11-3AF0
3	4	13.6	11	FSA3	6SL4512-0CA12-0YF0	6SL4512-0CA12-0AF0	6SL4512-0CA12-3YF0	6SL4512-0CA12-3AF0
4	5	17.5	13.6	FSB1	6SL4512-0CA13-0YF0	6SL4512-0CA13-0AF0	6SL4512-0CA13-3YF0	6SL4512-0CA13-3AF0

Further technical specifications and documentation are available on the internet at: www.siemens.com/sinamics-g200/documentation
and concerning ordering and configuration via the Siemens Product Configurator in SiePortal: www.siemens.com/sinamics-g200/configuration

Power options

SINAMICS G200 IP20/UL Open Type · 200 ... 240 V 3 AC							
SINAMICS G200 without or with integrated line filter	Recommended line-side overcurrent protection devices More information at: www.siemens.com/sinamics-g200/ocpd				Braking resistors	Output reactors	dv/dt filters plus VPL
	Fuses IEC-compliant		Fuses UL/cUL-compliant Rated voltage 600 V AC		The prefix "JJY:" is part of a Siemens internal order code which does not belong to the product number of the original equipment manufacturer Heine Resistor GmbH		
	Current A	Article No.	Fuse type Class / Article No.	Current A	Article No.	Article No.	Article No.
200 ... 240 V 3AC							
6SL4512-...05-...0	–	–	–	–	JJY:023146720008	–	–
6SL4512-...06-...0	–	–	–	–	JJY:023151720007	–	–
6SL4512-...08-...0	–	–	–	–		–	–
6SL4512-...10-...0	–	–	–	–		–	–
6SL4512-...11-...0	–	–	–	–	JJY:023163720018	–	–
6SL4512-...12-...0	–	–	–	–		–	–
6SL4512-...13-...0	–	–	–	–		–	–

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Selection and ordering data (continued)

SINAMICS G200 standard converters · IP20/UL Open Type · 380 ... 480 V 3 AC · 0.55 kW to 11 kW (0.75 hp to 15 hp)

Product selection

Rated power		Rated output current		Frame size	SINAMICS G200 without line filter		SINAMICS G200 with integrated line filter class C3	
Low overload (LO)		Low overload (LO)	High overload (HO)					
Acc. to IEC 400 V kW	Acc. to NEC 460 V hp	Acc. to IEC 400 V A	Acc. to IEC 400 V A		Without control panel	With control panel	Without control panel	Without control panel
380 ... 480 V 3 AC								
0.55	0.75	1.7	1.3	FSA1	6SL4513-0CA05-0YF0	6SL4513-0CA05-0AF0	6SL4513-0CA05-3YF0	6SL4513-0CA05-3AF0
0.75	1	2.3	1.7	FSA1	6SL4513-0CA06-0YF0	6SL4513-0CA06-0AF0	6SL4513-0CA06-3YF0	6SL4513-0CA06-3AF0
1.1	1.5	3.2	2.3	FSA1	6SL4513-0CA08-0YF0	6SL4513-0CA08-0AF0	6SL4513-0CA08-3YF0	6SL4513-0CA08-3AF0
1.5	2	4.2	3.2	FSA2	6SL4513-0CA10-0YF0	6SL4513-0CA10-0AF0	6SL4513-0CA10-3YF0	6SL4513-0CA10-3AF0
2.2	3	6	4.2	FSA2	6SL4513-0CA11-0YF0	6SL4513-0CA11-0AF0	6SL4513-0CA11-3YF0	6SL4513-0CA11-3AF0
3	4	7.7	6	FSA2	6SL4513-0CA12-0YF0	6SL4513-0CA12-0AF0	6SL4513-0CA12-3YF0	6SL4513-0CA12-3AF0
4	5	10.2	7.7	FSA3	6SL4513-0CA13-0YF0	6SL4513-0CA13-0AF0	6SL4513-0CA13-3YF0	6SL4513-0CA13-3AF0
5.5	7.5	12.8	10.2	FSA3	6SL4513-0CA15-0YF0	6SL4513-0CA15-0AF0	6SL4513-0CA15-3YF0	6SL4513-0CA15-3AF0
7.5	10	18	12.8	FSB1	6SL4513-0CA16-0YF0	6SL4513-0CA16-0AF0	6SL4513-0CA16-3YF0	6SL4513-0CA16-3AF0
11	15	26	18	FSB1	6SL4513-0CA17-0YF0	6SL4513-0CA17-0AF0	6SL4513-0CA17-3YF0	6SL4513-0CA17-3AF0

Further technical specifications and documentation are available on the internet at: www.siemens.com/sinamics-g200/documentation
and concerning ordering and configuration via the Siemens Product Configurator in SiePortal: www.siemens.com/sinamics-g200/configuration

Power options

SINAMICS G200 IP20/UL Open Type · 380 ... 480 V 3 AC							
SINAMICS G200 without or with integrated line filter	Recommended line-side overcurrent protection devices More information at: www.siemens.com/sinamics-g200/ocpd				Braking resistors	Output reactors	dv/dt filters plus VPL
	Fuses IEC-compliant		Fuses UL/cUL-compliant Rated voltage 600 V AC				
	Current A	Article No.	Fuse type Class / Article No.	Current A	Article No.	Article No.	Article No.
380 ... 480 V 3AC							
6SL4513-...05-...0	–	–	–	–	**6SL3201-0BE14-3AA0**	–	–
6SL4513-...06-...0	–	–	–	–		–	–
6SL4513-...08-...0	–	–	–	–		–	–
6SL4513-...10-...0	–	–	–	–		–	–
6SL4513-...11-...0	–	–	–	–		–	–
6SL4513-...12-...0	–	–	–	–	**6SL3201-0BE21-0AA0**	–	–
6SL4513-...13-...0	–	–	–	–		–	–
6SL4513-...15-...0	–	–	–	–		–	–
6SL4513-...16-...0	–	–	–	–	**6SL3201-0BE21-8AA0**	–	–
6SL4513-...17-...0	–	–	–	–		–	–

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Accessories

Accessories for SINAMICS G200 standard converters

Description	Article No.
SINAMICS Drive Control Chart Extended license for SINAMICS G200 [1] • Certificate of License (CoL) in electronic form	**6SL5977-0AA00-2FA0**
SINAMICS SDI Lite 1.77" Powerful and user-friendly operator panel for use with SINAMICS G200 standard converters Operating languages: German, English, French, Italian, Spanish, Chinese Simplified	**6SL4950-0AH21-2AA0**
SINAMICS SDI Pro 5.5" Powerful and user-friendly operator panel for the next generation of SINAMICS converters	**6SL4950-0AH35-2AA0**
SINAMICS Smart Adapter Wi-Fi solution for the next generation of SINAMICS converters	**6SL4950-0AJ00-0AA0**
Shield plate kit for SINAMICS G200 • For frame size FSA1 • For frame size FSA2 • For frame size FSA3 • For frame size FSB1	**6SL4960-0AE11-0AA0** **6SL4960-0AE12-0AA0** **6SL4960-0AE13-0AA0** **6SL4960-0AE14-0AA0**

[1] Available soon with a hotfix for firmware V6.7.

Technical specifications

	SINAMICS G200 standard converters 6SL451 . -0CA . .- . . . .
Supply voltage / power range	200 V ... 240 V 3 AC, - 20 % / +10 %: 0.55 kW to 4 kW (0.75 hp to 5 hp) 380 V ... 480 V 3 AC, - 20% / +10 %: 0.55 kW to 11 kW (0.75 hp to 15 hp)
EMC	Unfiltered / Category C3, removal of functional grounding (IT system) possible
Cooling	Air cooling using an integrated fan
Inputs/outputs	• 4 DI • 1 F-DI (could reused also as 2 DIs) • 1 DO • 1 RO • 1 AI • 1 AO
Communication	PROFINET
Ambient temperature	-20 ... +60 °C (-4 ... +140 °F) With derating: • > 50 °C (122 °F) high overload (HO) • > 45 °C (113 °F) low overload (LO)
Motor cable length	No EMC category: 50 m shielded / 100 m unshielded EMC category C3 with shielded cable: • Frame sizes FSA1 / FSA2: 10 m • Frame sizes FSA3 / FSB1: 25 m
Motor control	U/f, FCC, ECO, Vector control (speed) w/o encoder
Overload	High overload (HO): 150 % for 60 s, Low overload (LO): 110 % 60 s every 300 s
Degree of protection	IP20/UL Open Type
Certificate of suitability	CE, UKCA, RCM, UL/cUL, EAC, KC, ROHS

Further technical specifications and documentation are available on the internet at: www.siemens.com/sinamics-g200/documentation and concerning ordering and configuration via the Siemens Product Configurator in SiePortal: www.siemens.com/sinamics-g200/configuration

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Overview



SINAMICS SDI Lite

SINAMICS SDI Lite is a user-friendly operator panel for SINAMICS G200 standard converters. It connects via the operator panel interface and offers structured menus, control keys, HAND/AUTO modes, start/stop, speed and direction control, diagnostics, and security.

The operator panel provides intuitive navigation, status and footer icons, and nine control keys for HAND/AUTO, ON/OFF, arrows, ESC, and OK. It supports commissioning, operation and monitoring (continuous motion, JOG), diagnostics of faults/alarms, system settings (interfaces, date/time, display, language, autosave, security via UMAC), support functions with QR codes for IP and product info, and user management for logon and passwords. It shares menu structures with the converter web server, enabling consistent operation and quick access to drive data and configuration.

Selection and ordering data

Description	Article No.
SINAMICS SDI Lite 1.77" for use with SINAMICS G200 standard converters Operating languages: German, English, French, Italian, Spanish, Chinese Simplified	**6SL4950-0AH21-2AA0**

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Overview



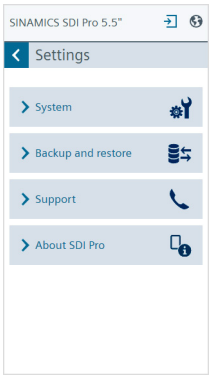
SINAMICS SDI Pro 5.5"

The SINAMICS SDI Pro 5.5" represents a powerful and user-friendly Operator Panel for SINAMICS frequency converters of the next generation (from firmware V6.1). The SINAMICS SDI Pro 5.5" supports both newcomers and drive experts. Thanks to its touch interface and high-contrast 5.5" color display, it goes hand-in-glove for commissioning, diagnostics, operator control and monitoring as well as on-site maintenance and servicing of converters.

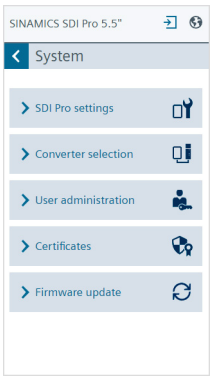
The user interface to the converter is provided by the converter's built-in web server. The technology of the SINAMICS SDI Pro 5.5" grants full access to the functionality of the web server.
The web server functions supported for the respective converter can be called up in the sections on the SINAMICS web servers.

In addition, the SINAMICS SDI Pro 5.5" offers its own configuration interface with the following settings options:

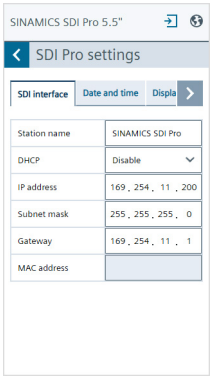
- SINAMICS SDI Pro 5.5" main menu



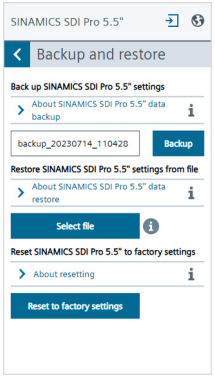
Overview (continued)



- Set the SINAMICS SDI Pro 5.5" system settings such as user interface language, real-time clock, interface settings, display settings, change background image of the home screen



- Back up and restore the SINAMICS SDI Pro 5.5" device settings

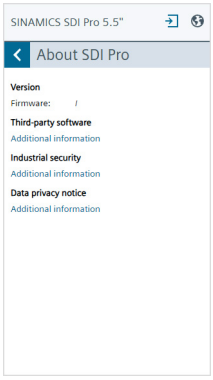


- Access product-specific information (e.g. manuals, downloads, FAQs) and information on SINAMICS SDI Pro 5.5" (e.g. currently installed firmware version, security notifications)

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Overview (continued)





The additionaly available options in the form of the SINAMICS SDI Pro 5.5" handheld kit and SINAMICS SDI Pro 5.5" door mounting kit extend the operating range of the device. With the SINAMICS SDI Pro 5.5" handheld kit, the device can be equipped with a rubber oversheath for mobile use. The SINAMICS SDI Pro 5.5" door mounting kit enables the SINAMICS SDI Pro 5.5" to be installed in control cabinet doors.

Benefits

- User interface
  - Intuitive user interface for the drive provided by the converter itself
  - High-contrast 5.5" color touch display
  - SINAMICS SDI Pro 5.5" device design open for future function expansions (e.g. device functions, languages)
  - Easily upgradable to latest features via USB C interface
- Commissioning
  - Easy commissioning of the connected converter via the Quick/Advanced Commissioning Wizard. Neither variant requires expert knowledge of converter parameters.
  - Quick commissioning gives the user simple and fast access to all the basic parameters required to commission simple applications.
  - Advanced commissioning provides the parameters required to commission more complex applications, dispensing with the need to switch between different areas within the user interface.
  - Fast series commissioning of frequency converters thanks to cloning function (backup/restore)
  - For quicker access right on the SINAMICS SDI Pro 5.5", the names of the backup files you wish to create can be entered or modified with the on-screen keyboard.
  - Context-sensitive help functions provide support for the user during commissioning.
  - Simple local commissioning on-site using the handheld kit
- Operator control and monitoring
  - Simple, individual local drive control (start/stop, setpoint value specification, change in direction of rotation)
  - Actual values from the converter are displayed clearly. You can change the parameters you wish to monitor depending on the requirement.
- Diagnostics
  - Rapid diagnostics thanks to on-site plain text display
  - Integrated plain text help function for local display and resolution of fault messages

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Benefits (continued)

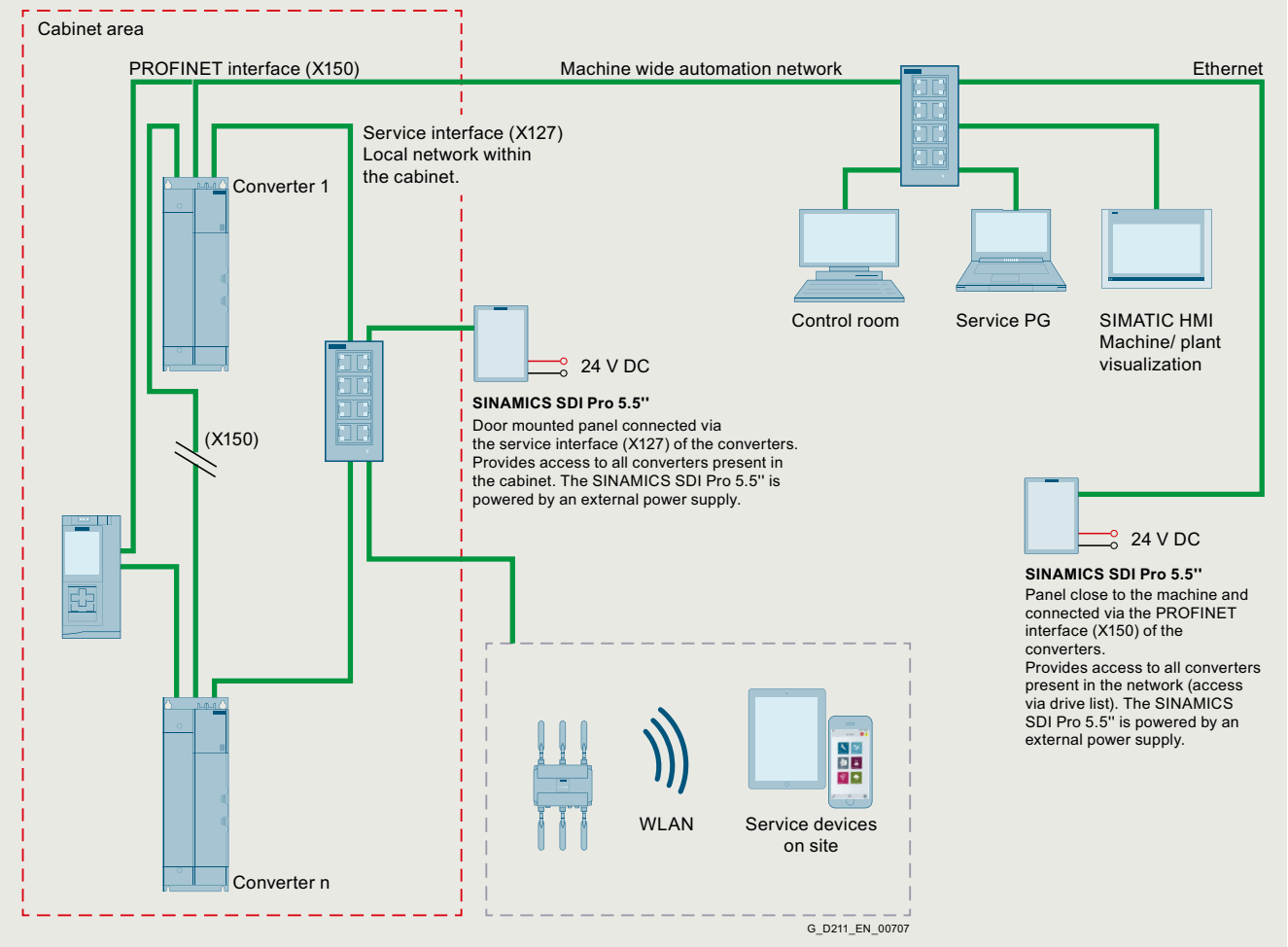
- Service and Support function
  - Input/output of a service contact person
  - Easy access to component information via QR code shown on the display
    - Quick access to product information, documentation, FAQs using mobile devices (e.g. smartphones, tablets) by scanning a QR code generated on the SINAMICS SDI Pro 5.5"
    - Optional scanning and evaluation of the QR code with the Industry Online Support app (https://support.industry.siemens.com/cs/ww/en/sc/2067)
  - Simple cloning of specific settings of the SINAMICS SDI Pro 5.5" such as the language setting, backlight timer, date/time settings, interface settings (IP address), list of available converters, user administration of the SINAMICS SDI Pro 5.5". Settings made once can thus be transferred easily to many other SINAMICS SDI Pro 5.5" devices.
  - Firmware upgrade for the SINAMICS SDI Pro 5.5"
    The SINAMICS SDI Pro 5.5" can be updated and expanded with the integrated USB C port.
    Data can be transferred from a PC to the device for future expansions. Furthermore, the USB interface allows user languages and firmware updates[1)] that will become available in future to be downloaded.
- Management of users allowed to have access to the SINAMICS SDI Pro 5.5" settings (UMAC)
- Management of certificates for encrypted communication to the converter (https)

1) For information on updates to the SINAMICS SDI Pro 5.5", see www.siemens.com/sinamics-sdi-pro-dl

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Integration

- Flexible deployment in point-to-point and network configurations
  - The SINAMICS SDI Pro 5.5" can either be connected to the service interface (X127) or the PROFINET interface (X150) of the converter.
  - The SINAMICS SDI Pro 5.5"can be directly supplied with power via the converter service interface. An external power supply is not required. [1)]
  - If the SINAMICS SDI Pro 5.5" is operated in a network with n converters (1 < n ≤ 20), the converters can be accessed in a flexible way via a drive list. As such, a wide range of converters can be operated or diagnosed via an SINAMICS SDI Pro 5.5", for instance. The drive list can be conveniently created on the SINAMICS SDI Pro 5.5" either automatically or manually.



Application example in which multiple converters in a control cabinet can be reached with one SINAMICS SDI Pro 5.5"

[1)] To use the operator panel without an additional power supply at the service interface of the converter (X127; point-to-point connection), an 8-wire RJ45 Ethernet cable is required. Pre-assembled cables can be ordered as an accessory.

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Selection and ordering data

Description	Article No.
SINAMICSSDI Pro 5.5" [1] for use with SINAMICS frequency converters of the next generation (from firmware V6.1) Operating languages: German, English, French, Italian, Spanish, Chinese Simplified	**6SL4950-0AH35-2AA0**
Accessories	
SINAMICS SDI Pro 5.5"handheld kit [1] for use with the SINAMICS SDI Pro 5.5" Included in the scope of delivery: • Handheld housing • Ethernet connecting cable Length 3 m (9.84 ft), can be used to connect a SINAMICS SDI Pro 5.5" with a converter	**6SL4950-0AH65-0AA0**
SINAMICS SDI Pro5.5" door mounting kit [1] for mounting a SINAMICS SDI Pro 5.5" in control cabinet doors with metal thicknesses of 1 ... 3 mm (0.04 ... 0.12 in) Degree of protection IP55 Included in the scope of delivery: • Metal plate for installing the SINAMICS SDI Pro 5.5" • Fixing accessories	**6SL4950-0AH55-0AA0**
IE TP Cord RJ45/RJ45 [2] Patch cable, available fully assembled • With 4 x 2 cores for 10/100/1000 Mbps Ethernet • Small cable diameter • Cat6$_A$ (4 x 2) of the ISO/IEC 11801 and EN 50173 international cabling standards	
0.3 m	**6XV1870-3QE30**
0.5 m	**6XV1870-3QE50**
1 m	**6XV1870-3QH10**
2 m	**6XV1870-3QH20**
3 m	**6XV1870-3QH30**
4 m	**6XV1870-3QH40**
6 m	**6XV1870-3QH60**
10 m	**6XV1870-3QN10**
15 m	**6XV1870-3QN15**
20 m	**6XV1870-3QN20**
25 m	**6XV1870-3QN25**
30 m	**6XV1870-3QN30**

[1] The Ethernet connection cable to connect the SINAMICS SDI Pro 5.5" to the service interface of the converter (X127) or the PROFINET interface (X150) must be ordered separately. To use the operator panel without an additional power supply at the service interface of the converter (X127; point-to-point connection), an 8-wire RJ45 Ethernet cable is required. Pre-assembled cables can be ordered as an accessory.

[2] For applications where the space behind the SINAMICS SDI Pro 5.5" is very limited, a cable with angled connectors can be used. Such cables can be purchased from HARTING under the article number 09 48 858 5745 050. For information on HARTING cables visit www.harting.com.

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Accessories

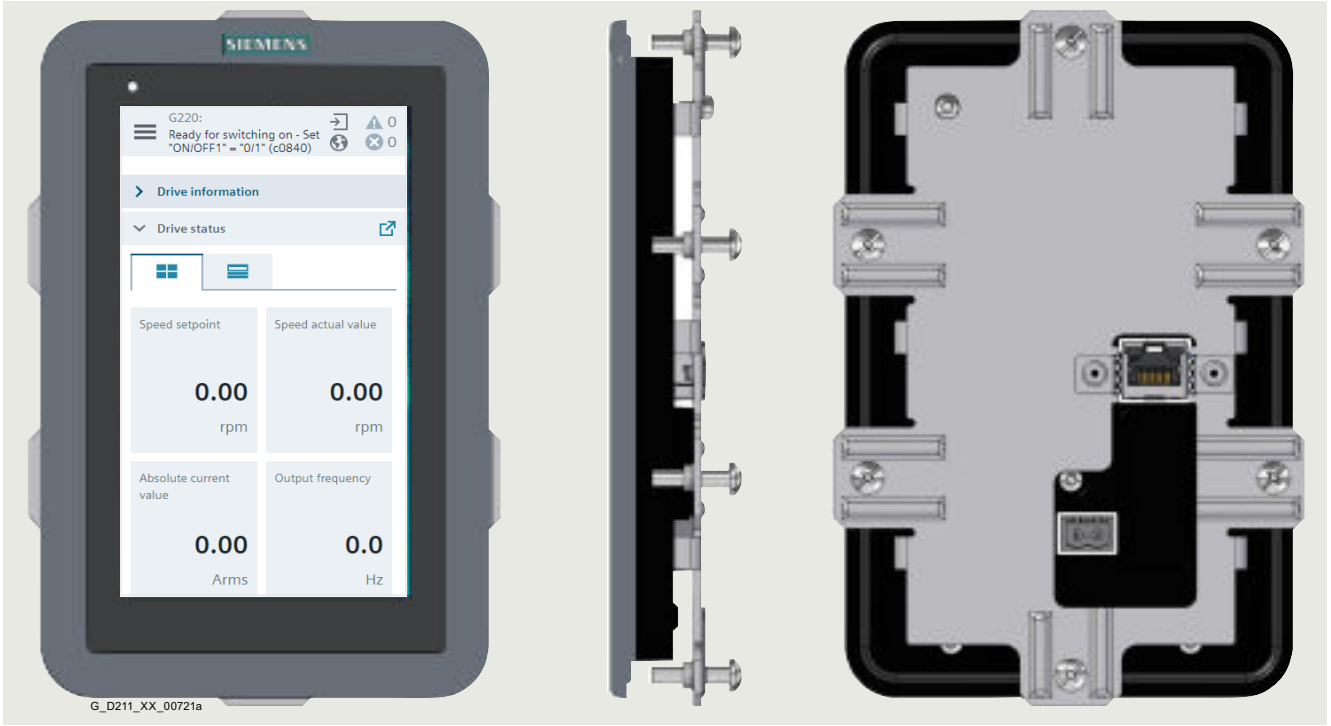
SINAMICS SDI Pro 5.5" handheld kit



SINAMICS SDI Pro 5.5", Handheld

A handheld kit can be ordered to assist with using the SINAMICS SDI Pro 5.5" while on the go. It contains a rubber housing and a 3 m long Ethernet connecting cable.

SINAMICS SDI Pro 5.5" door mounting kit



With the optional SINAMICS SDI Pro 5.5" door mounting kit, a SINAMICS SDI Pro 5.5" can be easily installed in a control cabinet door in just a few steps. The door mounting kit includes a metal plate for installing the SINAMICS SDI Pro 5.5"e.g. in a cabinet cutout. [1)]

In case of door mounting with the SINAMICS SDI Pro 5.5" Operator Panel, the degree of protection IP55/UL type 12 enclosure is achieved for the front side.

[1)] The Ethernet connection cable to connect the SINAMICS SDI Pro 5.5" to the service interface of the converter (X127) or the PROFINET interface (X150) must be ordered separately. To use the operator panel without an additional power supply at the service interface of the converter (X127; point-to-point connection), an 8-wire RJ45 Ethernet cable is required. Pre-assembled cables can be ordered as an accessory.

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Technical specifications

	SINAMICS SDI Pro 5.5" 6SL4950-0AH35-2AA0
Display	High-contrast color display
• Resolution	320 × 580 pixels
Operator panel	Touch display
User languages	German, English, French, Italian, Spanish, Chinese Simplified
Power supply	20 … 29 V DC 24 V DC via the RJ45 (8-core) X127 cable connection from the converter [1] or external power supply via the external power supply terminals on the Operator Panel
Current, max.	300 mA
Ambient temperature	
• During transport and storage	-40 … +70 °C (-40 … +158 °F)
• During operation	When using the SINAMICS SDI Pro 5.5" handheld kit: -20 … +55 °C (-4 … +131 °F) If installed with the SINAMICS SDI Pro 5.5" door mounting kit: -20 … +55 °C (-4 … +131 °F)
Air humidity	Relative air humidity < 95 %, non-condensing
Environmental class/harmful chemical substances	
• Operation	Class 3C3 per IEC 60721-3-3: 2002
Degree of protection	IP20 on the rear side or when in use with the SINAMICS SDI Pro 5.5" handheld kit IP55 on the front side, mounted with the SINAMICS SDI Pro 5.5" door mounting kit
Dimensions (H × W × D)	167 mm × 111 mm × 16.1 mm (6.57 in × 4.37 in × 0.63 in)
Weight, approx.	0.275 kg (0.61 lb)
Certificate of suitability	CE, UKCA, RCM, cULus, EAC, KC-REM-S49-SINAMICS

1) The Ethernet connection cable to connect the SINAMICS SDI Pro 5.5" to the service interface of the converter (X127) or the PROFINET interface (X150) must be ordered separately.
To use the operator panel without an additional power supply at the service interface of the converter (X127; point-to-point connection), an 8-wire RJ45 Ethernet cable is required. Pre-assembled cables can be ordered as an accessory.

	SINAMICS SDI Pro 5.5" handheld kit 6SL4950-0AH65-2AA0
Ambient temperature	
• During transport and storage	-40 … +70 °C (-40 … +158 °F)
Air humidity	Relative air humidity < 95 %, non-condensing
Degree of protection	IP20
Weight, approx.	0.265 kg (0.58 lb)

Technical specifications (continued)

	SINAMICS SDI Pro 5.5" door mounting kit 6SL4950-0AH55-0AA0
Ambient temperature	
• During transport and storage	-40 … +70 °C (-40 … +158 °F)
Air humidity	Relative air humidity < 95 %, non-condensing
Degree of protection	IP20 on the rear side or inside of the cabinet IP55 on the front side, mounted with the SINAMICS SDI Pro 5.5" door mounting kit
Dimensions	
• Door mounting kit dimensions	Cabinet cutout: 93 mm × 153 mm (3.66 in × 6.02 in), Screws: M4 × 20, 6 pcs., Tightening torque: 0.1 Nm (0.89 lbf-in) / M3 × 6, 2 pcs., Tightening torque: 1.2 Nm (10.6 lbf-in)
Weight, approx.	0.214 kg (0.47 lb)

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Overview



SINAMICS Smart Adapter

SINAMICS Smart Adapter is a Wi-Fi solution for engineering, service and maintenance tasks for the next generation of SINAMICS converters (from firmware V6.1). The adapter is designed to be plugged into and powered from the service interface (X127) on the converter.

Benefits

- Wireless access to the converter-integrated web server via mobile users device
- Wireless access with SINAMICS Startdrive to the SINAMICS converters
- Portable and compact Wi-Fi solution for engineering, service and maintenance tasks for the next generation of SINAMICS converters (from firmware V6.1)
- Advanced security technology
- Plug and Play interface for easy connectivity
- User friendly

Application

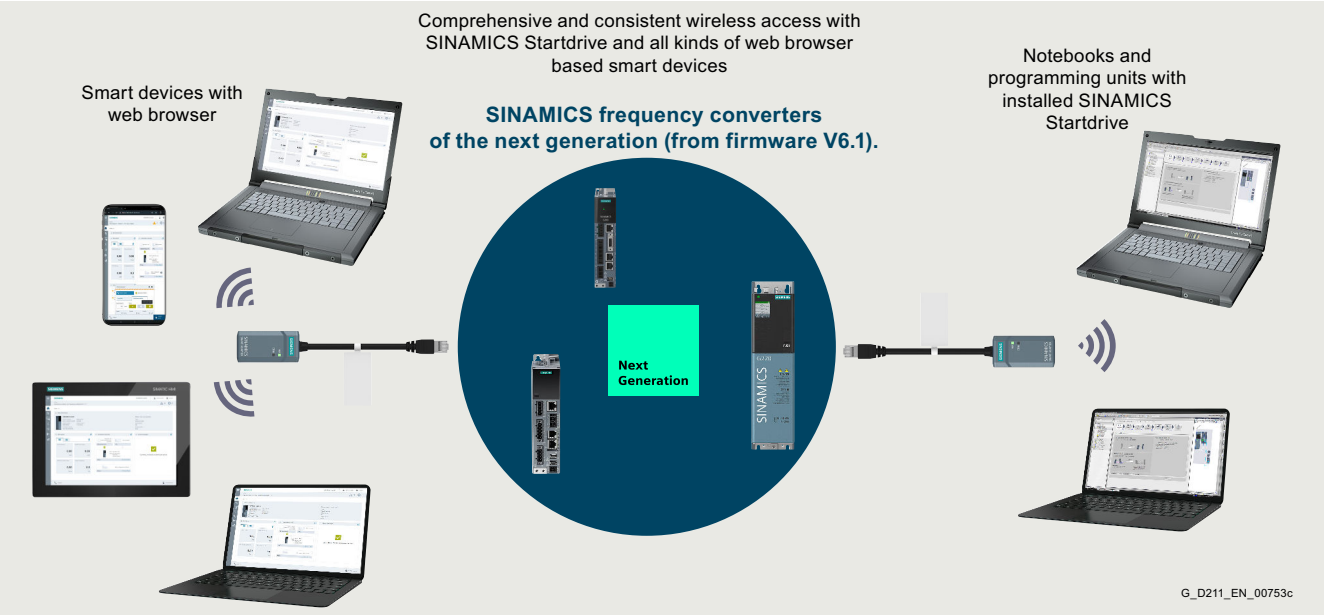
SINAMICS Smart Adapter is used in general industrial applications as an engineering solution for quick commissioning and service.

The adapter is especially valuable in areas, which are difficult to access due to their mechanical mounting locations. The use of SINAMICS Smart Adapter avoids cable clutter and tripping points during commissioning and service tasks and therefore prevents from occasional accidents.

Function

- Easy and quick service and commissioning via a wireless solution using the converter-integrated web server
- Interface compatible with the next generation of SINAMICS converters (from firmware V6.1) and allows power supply of SINAMICS Smart Adapter directly from the converter.
- Advanced security with WPA3 protocol

Integration



Wireless access with SINAMICS Startdrive via SINAMICS Smart Adapter

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Selection and ordering data

Description	Article No.
SINAMICS Smart Adapter Wi-Fi solution compatible with the next generation of SINAMICS converters (from firmware V6.1)	**6SL4950-0AJ00-0AA0**

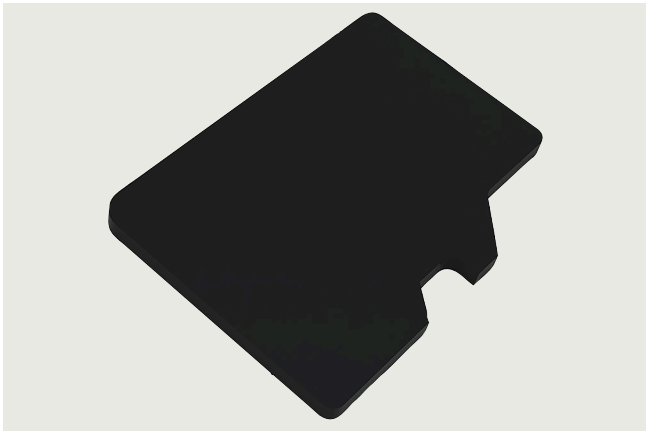
Technical specifications

	SINAMICS Smart Adapter 6SL4950-0AJ00-0AA0
Supported operating systems	Apple iOS (from 12.2), Android, Microsoft Windows, Mac OS (from 10.15)
Recommended browsers	Google Chrome (from 69.0), Microsoft Edge (from 80.0), Safari, Opera (from 56.0)
Ambient temperature	
• During storage and transport	-40 °C ... +70 °C (-40 ... +158 °F)
• During operation	-10 °C ... +40 °C (-40 ... +104 °F)
Humidity	< 95 %, without condensation
Rated voltage	24 V DC
Wireless technology and frequency range [1]	
• At 2.4G:	Wi-Fi 2400 MHz ... 2483.5 MHz
• At 5G:	Wi-Fi 5150 MHz ... 5250 MHz
Wireless modulation type	
• At 2.4G:	802.11 b/g/n
• At 5G:	802.11 a/n
Maximum output power (EIRP)	
• At 2.4G:	17.66 dBm
• At 5G:	14.50 dBm
Type of modulation	DSSS (DBPSK, DQPSK, CCK), OFDM (BPSK, QPSK, 16QAM, 64QAM)
Maximum wireless communication distance	50 m (164 ft)
Maximum antenna gain	
• At 2.4G:	1.2 dBi
• At 5G:	1.6 dBi
Maximum radio frequency output power	
• At 2.4G:	18 dBm
• At 5G:	15 dBm
Degree of protection	IP20/UL Open Type
Dimensions	
• Width	30 mm (1.18 in)
• Height	200 mm (7.87 in)
• Depth	18 mm (0.71 in)
Weight, approx.	0.032 kg (0.071 lb)
Compliance with standards	CE, UKCA, UL, CRC, IMDA, NBTC, KCC, NCC, ICASA, SDPPI, UkrCEPRO, JRF, RED, FCC, IC, WPC, ANATEL, TRA, MIC, SRRC, RCM, ENACOM, SUBTEL, MTC, SDOC, MOC

[1] The actual frequency range may vary depending on market.

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Overview



Example microSD card

The parameter assignment, firmware and licenses for a converter can be stored on a microSD card. When service is required, e.g. after the converter has been replaced and the data have been downloaded from the memory card the drive system is immediately ready for use again.

The memory card has the following functions:

- Parameter settings can be written from the memory card to the converter or saved from the converter to the memory card
- The memory card supports series commissioning without the use of a commissioning tool
- If firmware is stored on the memory card, the firmware can be upgraded/downgraded during startup
- It is used for storing licenses when using functions under license, e.g. the safety license for enabling the Extended Functions

Notes:

In general, the converter can be operated without a memory card. However, it is necessary if licenses, such as the Extended Safety license, are required via memory card. The card must then remain permanently inserted.

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Options

SINAMICS Drive Software Options (licenses)

The SINAMICS Drive Software Options offer a flexible way to expand the range of functions of SINAMICS frequency converters in a targeted manner. Many functions are already included in the standard scope, but additional software options can further increase performance. These options enable the use of special additional functions, such as „SINAMICS Safety Integrated Extended", which offers extended safety functions compared to the basic version.

A major advantage lies in the easy expandability: The options can be ordered directly when purchasing the frequency converter or at a later date. This offers maximum flexibility, especially if it is not clear at the beginning which functions are actually needed.

Overall, the SINAMICS Drive Software Options enable a needs-based, scalable and future-proof solution for a wide variety of industrial applications – from simple control tasks to complex safety and automation solutions.

The following are the SINAMICS Drive Software Options for the next generation of SINAMICS converters SINAMICS G200.

SINAMICS Drive Software Options (licenses) Current firmware [1] Description	Low voltage Standard Performance converters SINAMICS G200 V6.7 Article No.
Motor Control Functions	• Standard functionality with current firmware • No additional SINAMICS Drive Software Options (licenses) available
Technology Functions	
• SINAMICS Drive Control Chart Extended	✓ (from V6.7)
- Supplied without memory card in electronic form (eCoL)	**6SL5977-0AA00-2FA0**
- Supplied with memory card SINAMICS SD-Card, with current firmware	**6SL4570-1GH00-1AA0-Z J03** [2]
Safety Integrated Functions	• Standard functionality with current firmware • No additional SINAMICS Drive Software Options (licenses) available
Connectivity functions	• Standard functionality with current firmware • No additional SINAMICS Drive Software Options (licenses) available

1) Overview and further information on all available firmware versions can be found here:
https://support.industry.siemens.com/cs/document/109999225
2) Available soon.

More information

Further information about SINAMICS Drive Software is available on the internet at:

www.siemens.com/sinamics-drive-software

For more information on ordering and configuration, see catalog D 99 and SiePortal at:

www.siemens.com/d99
www.siemens.com/sinamics-drive-software/sieportal

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Overview



Safety Integrated overview

The SINAMICS G200 frequency converter offers as a standard the safety functions Safe Torque Off (STO) and Safe Stop 1 time controlled (SS1-t).

The Safety Integrated function is completely integrated into the drive system. The STO function is already enabled in the converter at the factory and assigned to the fail-safe digital input F-DI 0. When wiring an emergency stop control device, the STO function can therefore be used directly without additional configuring. F-DI 0 is provided with a jumper on delivery so that the drive can also be moved without wiring an emergency stop control device.

The Safety Integrated function is implemented electronically and therefore offers short response times in comparison to solutions with externally implemented monitoring functions.

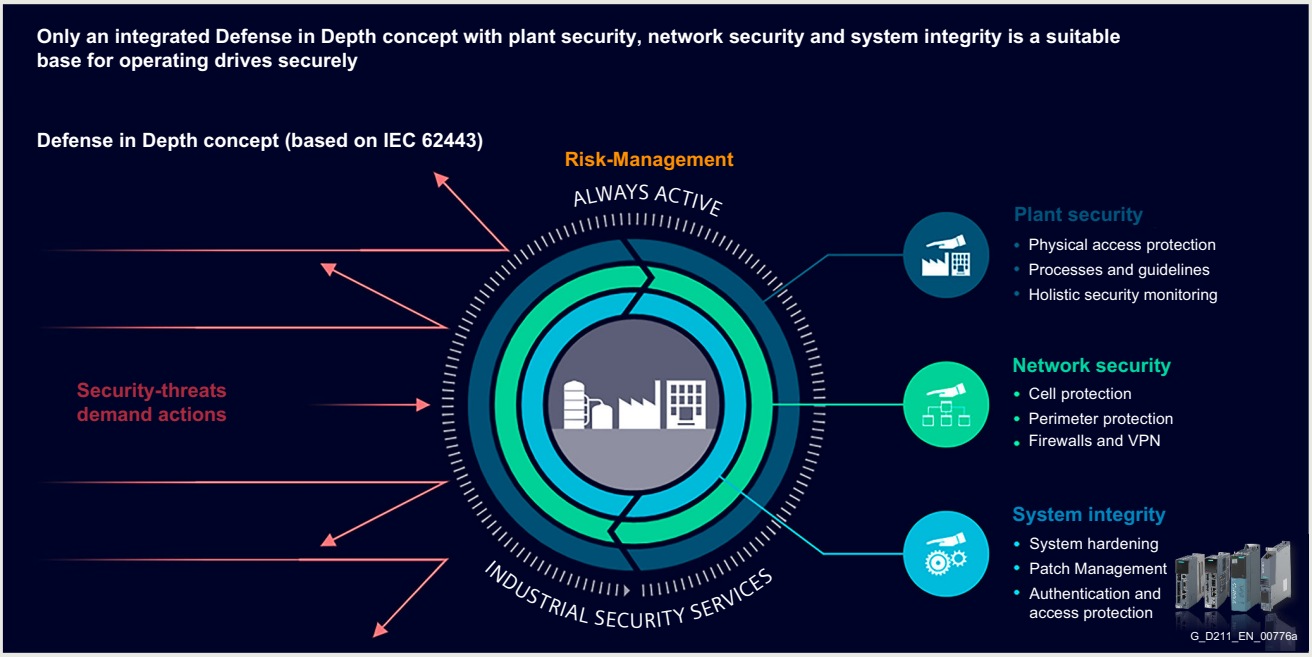
Function

Function	Control	Underlying Function	Reaction to limit overshoot	Encoder required	License required
STO	• F-DI	–	–	No	No
SS1 time-controlled	• F-DI	Following expiry of the parameterized delay time	–	No	No

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Overview

SINAMICS Security Integrated



The increasing digitalization and networking of industrial plants (IT/OT convergence) raises the risk of cyber attacks. Therefore, infrastructures must be protected end-to-end – from the corporate IT level down to the field level.
SINAMICS converters are used at the field level. For use in next-generation security and network architectures, they already have the necessary security functions integrated.

Risk Management and Defense-in-Depth

The foundation for a secure machine or plant is a continuous risk management process. This process follows a clear structure: First, potential risks are identified and analyzed. Then, appropriate measures to mitigate these risks are defined and implemented. A final security audit ensures that the risks have been effectively reduced or eliminated.

A key component of these measures is the Defense-in-Depth concept. This multi-layered security approach consists of several coordinated protection levels that work together to provide comprehensive protection against cyber attacks.

Plant security

Unauthorized persons may be able to enter the production site/building and damage or alter production equipment as a result of vulnerabilities in a company's physical security. Confidential information can also be lost. Company locations and critical production units must therefore be protected using suitable measures.

Network security through cell protection

One of the things that the Defense in Depth concept provides is that production plants are segmented into secured cells. The cells contain automation and drive products such as SINAMICS frequency converters. Communication with the individual cells is protected by so-called cell protection, e.g. SCALANCE S products, which by default does not allow communication in and out of the cell. For communication across cell boundaries, a risk analysis must be carried out. It must only be done for dedicated protocols to dedicated devices.

Patch management

Siemens offers a targeted hotfix/patch management system and communicates security vulnerabilities and patches via Siemens ProductCERT. Customers can be automatically informed when new advisories are available for the products they use. Standardized interfaces are also available for automatically interfacing with customer-specific tools.

Security Integrated functions

SINAMICS frequency converters of the next generation (from firmware V6.1) have Security Integrated functions as standard.

Secure default settings

The converters are delivered from the factory with security functions activated, yet in such a way that allows for a user-friendly first commissioning. When configuring the converter in TIA Portal or via the SINAMICS web server, the user is automatically guided through a security wizard to adjust the most important security settings. Among other things, this determines whether the converter should be protected by user administration and access control.

User management and access control

This function makes it possible to create various users and protect their access to the converter with passwords. Each user is assigned one or more roles. Various rights can be assigned to each role. There are various rights, both for offline configuration as well as for online access to the device. In this way, it is possible to set which users have full access to the device's settings and which users only receive limited rights. For example, you could create users who only have read access for diagnostic purposes or users who have write access to the device settings but no rights to change the safety configuration.

TIA Portal provides cross-device user administration.
Users and rights can be configured in the TIA Portal at a central location in the project across devices for SINAMICS converters, SIMATIC HMI Panels, SIMATIC PLCs, and for the TIA Portal project engineering. This means that settings for users and rights can be made and changed consistently and rapidly for multiple devices.

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Overview (continued)

Protected communication with engineering systems (SINAMICS Startdrive and SINAMICS web server)

The converters enable TLS-based communication between the converter and the TIA Portal (secure S7 protocol Startdrive) and to web clients (https protocol).

Protected communication for integration into digitization use cases

For integration into digitalization use cases, the converters support OPC UA communication. For more information, see the "Connectivity functions" section.

Firmware integrity and authenticity

The Siemens-provided firmware of the converters is equipped with integrity and authenticity protection and is signed by Siemens. Through this, the converter can detect when installing a new firmware, whether it has been tampered with by a third party and whether it comes from a trusted source.

Firmware updates can be carried out via memory card, TIA Portal and web clients.

Backup and restore

The configuration of the converters can be backed up and restored remotely via the SINAMICS web server, SINAMICS Startdrive or locally via the SD card. Creating a backup after changes is an important step of a comprehensive security concept. This means that the converter can be quickly restored to a known state in the event of a cyber attack.

Restoring the backup file can also be used to provide the new converter with the desired configuration when replacing a existing converter.

Protection of data in backup files

Passwords are stored in backup files not in plain text, but as a hash value or key. In addition, the data for user management and access control can be stored in encrypted form via the "driva data encryption" feature.
In addition, the backup files have integrity protection and optionally authenticity protection. The authenticity protection detects tampering and can prevent backup files from being imported from untrusted sources.

Session handling

The converters feature session handling. A session starts as soon as a user logs in to the device and ends when the user logs out manually or after a preset period of inactivity. Session handling ensures that each user only receives the access rights that are assigned to him, even if multiple users with different rights are connected to the device at the same time.

Logging of security events

Security-relevant events can be logged locally (from V6.7) as well as sent to a syslog server (from V6.4).

Physical access protection

Access to the SINAMICS SDI (Smart Drive Interface) and SD card slot of the SINAMICS G210X/G220 degree of protection IP55 drives can optionally be locked with a padlock. This prevents configurations from being changed directly on the device by unauthorized persons

Certified Security

Life cycle for safe product development

The development of the SINAMICS converters meets the requirements of IEC 62443-4-1:2018.

Integrated Security Features

The integrated security features are certified by UL Solutions according to IEC 62443-4-2 Security Level Capability 2 (SL-C 2).

Security documentation

The configuration manual SINAMICS Industrial Cybersecurity provides comprehensive documentation of security basics and security functions of the drives:
https://support.industry.siemens.com/cs/ww/en/view/109999221

Further information is available on the internet at:
www.siemens.com/sinamics-cybersecurity

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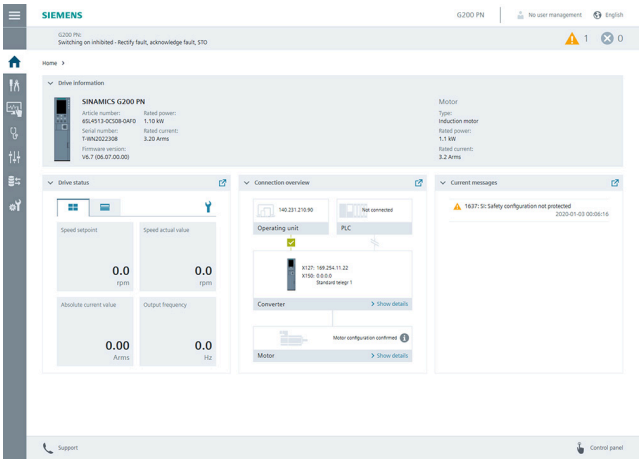
Overview

Web server for efficient commissioning, diagnostics, maintenance and operator control and monitoring, any time, from anywhere

Thanks to the web server, the SINAMICS G200 drive system offers efficient commissioning, diagnostics, maintenance options as well as operation and monitoring functions. The user is supported by a help function and additional links to specific product information, downloads, FAQs and manuals.
The web server provides access to a multi-faceted range of new options for commissioning or parameter assignment, drive diagnostics, remote maintenance as well as operator control and monitoring for any networked PC with a web browser or for tablets and smartphones (wired connection or wireless connection via a separate WLAN access point, such as SINAMICS Smart Adapter).
The following provides an insight into the functionality offered.

The start screen offers a quick overview of the state of the drive

- Drive type, connected motor as well as the article number and installed firmware
- Important drive parameters show the operating state (can be configured)
- The connection overview provides information about the status of the connections (operating unit - converter - motor)
- Overview of all pending faults and warning messages

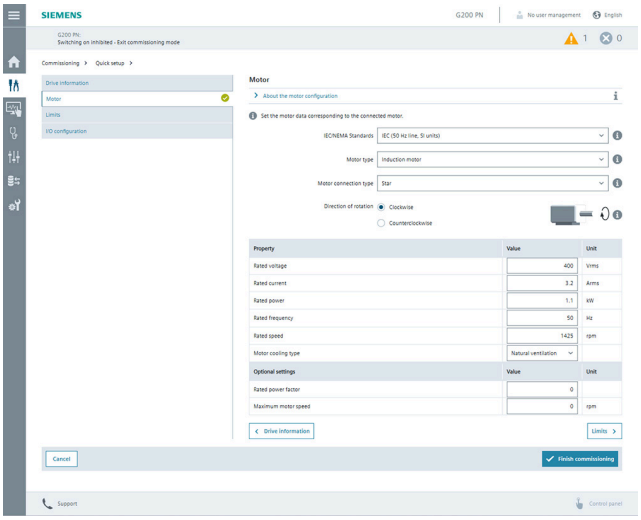


Start screen of the web server integrated into SINAMICS G200

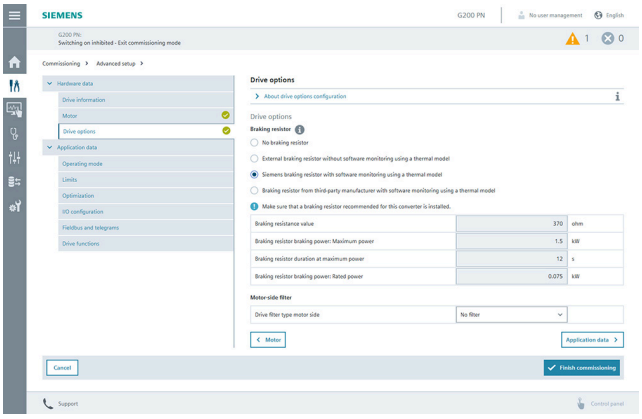
Commissioning

- In the quick setup, the most important drive characteristics are defined, e.g. motor data, limit values and the configuration of the inputs and outputs. If a motor-side filter is installed, the advanced setup has to be used.
- In the advanced setup, drive options and functions are defined to suit your application. The advanced setup includes all the settings of the quick setup as well as additional options and functions.
- Safety Integrated commissioning guides you through the commissioning of the Safety Integrated functions of the converter.

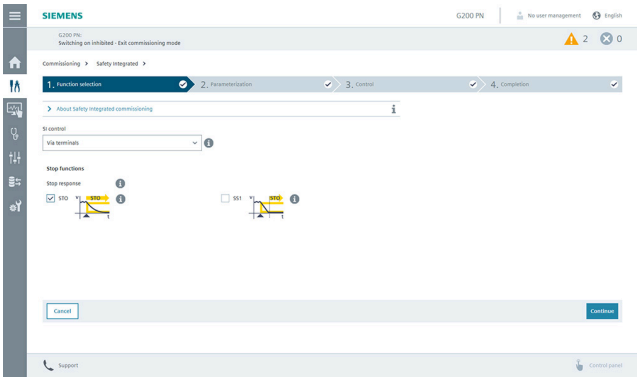
Overview (continued)



Quick setup with open dialog showing the set motor data



Advanced setup with open dialog for the line/drive options



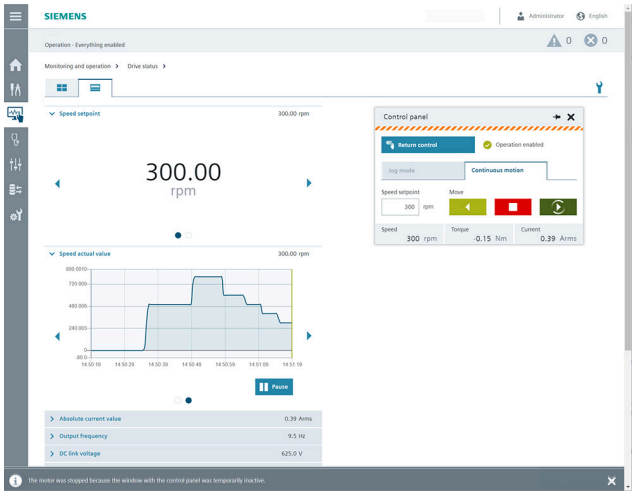
Safety Integrated assistant

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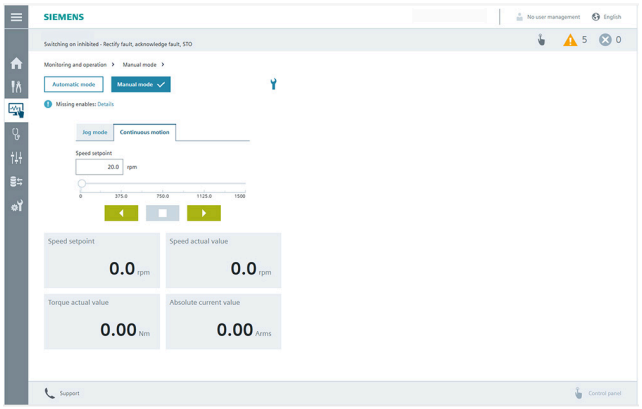
Overview (continued)

Operator control and monitoring

- Configurable drive status with value or trend display
- Status of the inputs and outputs
- Drive traversing via the control panel, which can be freely positioned on the screen
- Switch smoothly between Automatic and Manual mode via the Manual operation



Operator control and monitoring of the drive with the help of the drive status and control panel

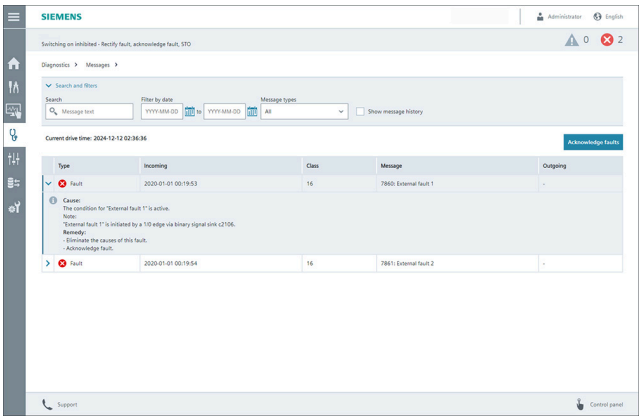


Switch smoothly between Automatic and Manual mode via the Manual operation

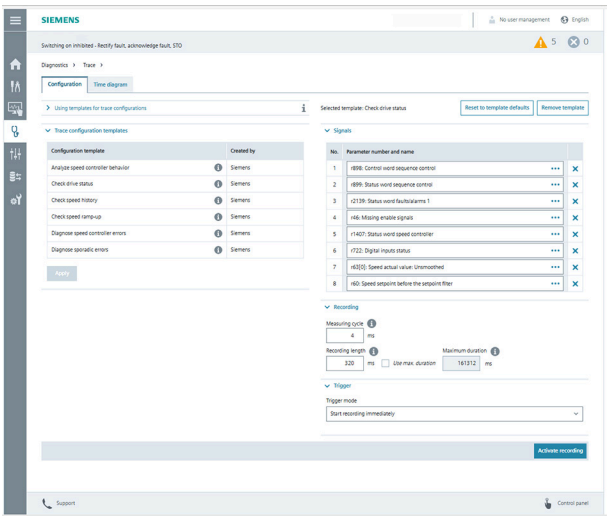
Diagnostics

- Evaluation of warnings and fault messages
- Evaluation of system events (diagnostic buffer)
- Analysis of the safety status
- Connection overview, diagnostics of the drive communication and control and status words
- Trace: Data logging and visualization for in-depth analysis

Overview (continued)



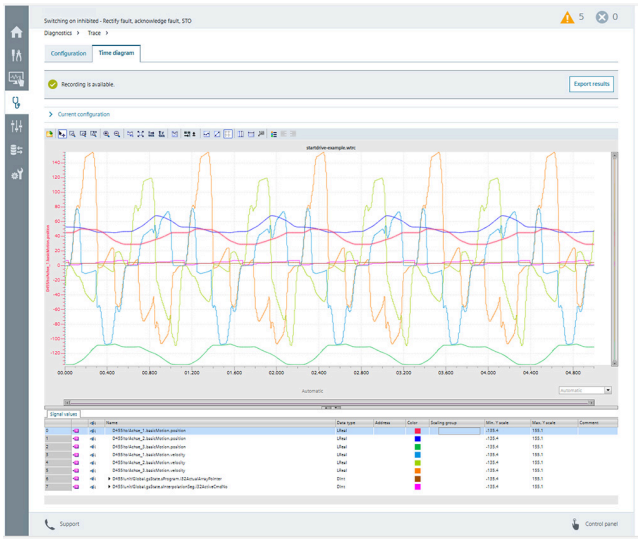
Alarm view with convenient search and filter functions



Trace configuration to apply trace templates and set recording conditions

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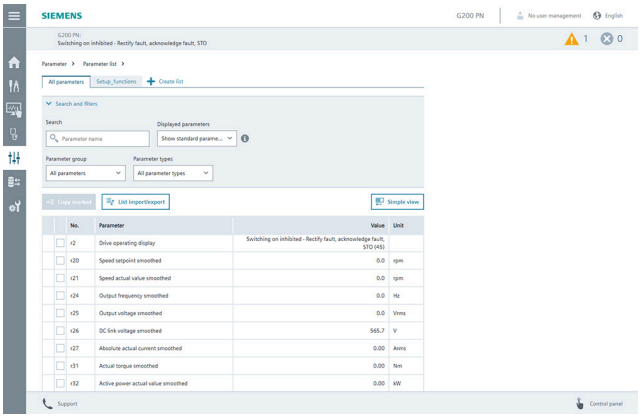
Overview (continued)



Trace time diagram to check the measurements result

Service and maintenance functions

- Monitor and adjust drive parameters
- Convenient creation and management of signal interconnections
- Create, import and export user-specific parameter lists
- Backup and restore the drive configuration
- Perform firmware update, also via the network
- Manage software licenses
- Configure basic settings for the drive and web server (e.g. date and time of the drive)
- Configure and manage user accounts and access controls (UMAC)

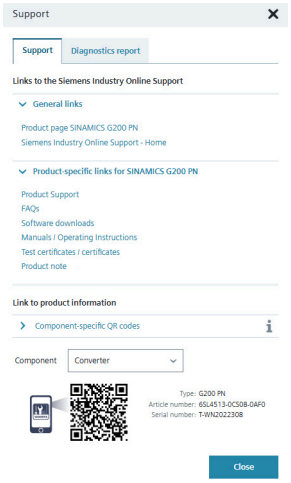


Parameter list for quick access to drive parameters, also via user-defined parameter lists

Overview (continued)

Support

- Operator support with comprehensive information about the drive and user interface
- Easy access to product information such as FAQs, software downloads, manuals and certificates
- When storing the html documentation on the drive memory card, the user manual can be accessed in a context-sensitive manner from the user interface
- The diagnostics report supports the support with basic information on the current status of the converter, e.g. in the event of a malfunction or error. The diagnostics report always contains the drive, motor and encoder data and, optionally, an overview of the errors and messages that have occurred.



Support dialog for quick access to product-specific information

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Benefits

Simple and fast commissioning

- Installation of additional commissioning software is not required. Tools required for the commissioning are ready to use via the integrated web server.
- Standard pages to set thresholds and onboard inputs
- Guided parameterization of Safety Integrated functions
- Extensive online help with context-sensitive access to the Operating Instructions (memory card required)

Shorter machine downtimes

- Quick overview of the current configuration and the state of the drive
- Efficient diagnostics and maintenance
- Understandable diagnostic information and messages, including the causes of issues and possible remedies, are displayed in plain text in multiple languages
- Context-sensitive help with optional access to the web-based device documentation provides quick help with questions about drive functions

Convenient service and maintenance functions

- Quick backup and restoration of the drive data
- Convenient firmware update, also via the network
- Convenient access to drive parameters and their signal interconnections
- User-defined parameter lists that focus on what matters
- Easy and efficient handling of the parameter list by using search functions and filters (e.g. parameter groups, parameter types)
- Easy exchange with operating personnel by importing/exporting user-defined parameter lists.
- User-defined parameter lists can be exchanged between the SINAMICS Startdrive and the web server.
- The generation and dispatch of a diagnostics report supports communication with service personnel or machine builders.

Direct language selection

- English, French, German, Italian, Spanish, Chinese Simplified

Accessibility

- Via all LAN or PROFINET interfaces
- Use of mobile devices (e.g. notebooks/tablets and smartphones) via WLAN e.g. with SINAMICS Smart Adapter or a separate access point
- Access to the web server via PCs/notebooks, SIMATIC HMI (> 10”), smartphones/tablets with a Chromium-based internet browser or Safari

Access security

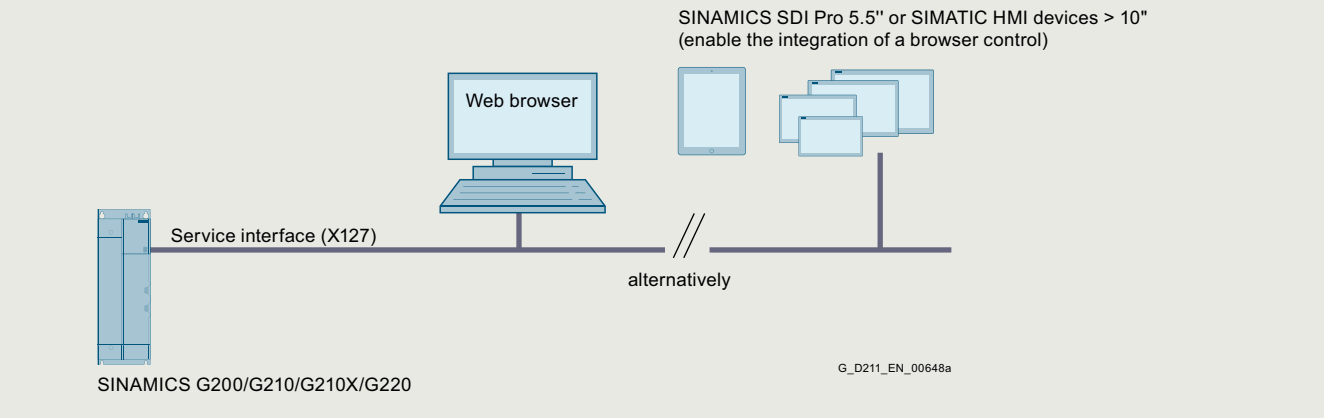
- Protection against unauthorized access to the drive functions and data
- Convenient user administration that supports a roles concept
- Easy set-up and management of user accounts

Application

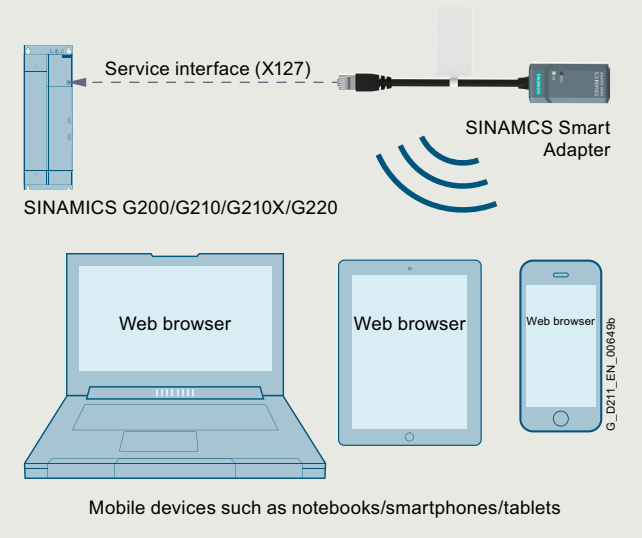
The web server is ideal for applications not requiring any special commissioning software or version dependencies. Commissioning, diagnostics and maintenance as well as operator control and monitoring are possible both locally and remotely, provided appropriate security measures are applied.

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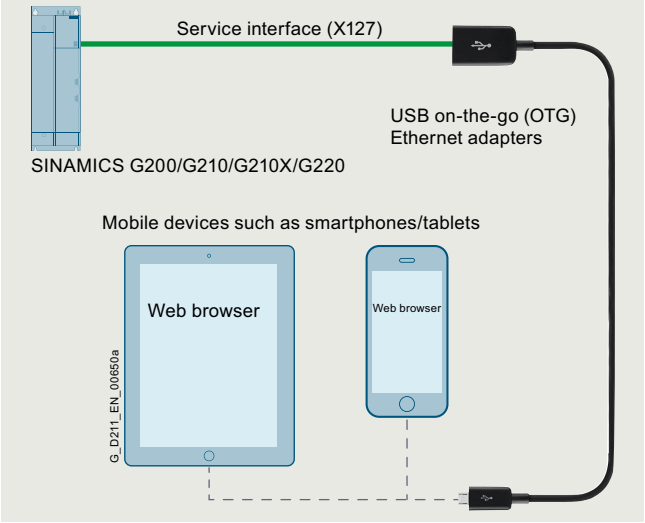
Integration



Integration of the SINAMICS web server based on the example of a SINAMICS G200/G210/G210X/G220 and the service interface (X127)



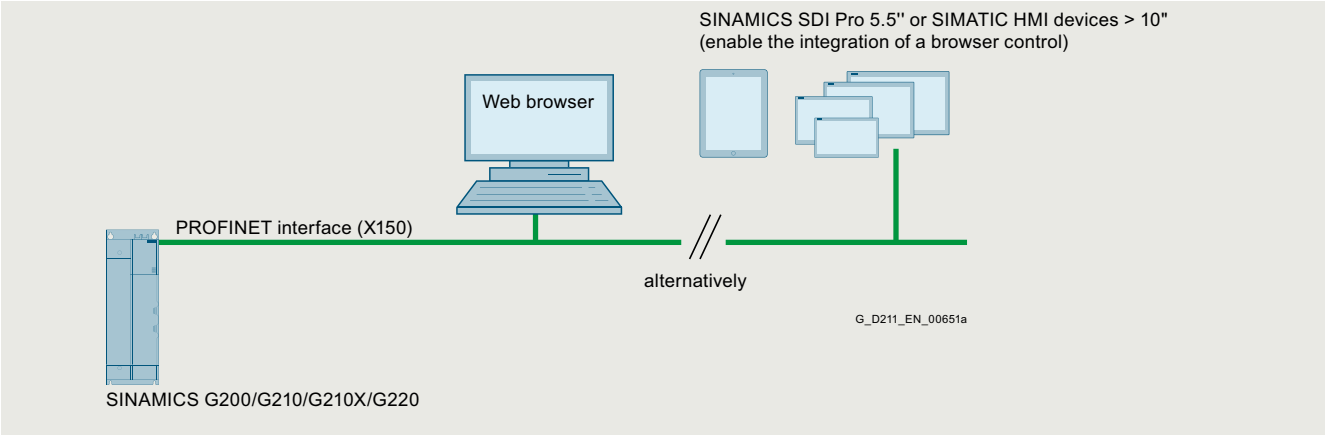
Wireless access to the web server via the service interface (X127) of the SINAMICS G200/G210/G210X/G220 with the help of the SINAMICS Smart Adapter



Access to the web server via the service interface (X127) of the SINAMICS G200/G210/G210X/G220 with the help of a USB on-the-go (OTG) Ethernet adapter

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Integration (continued)



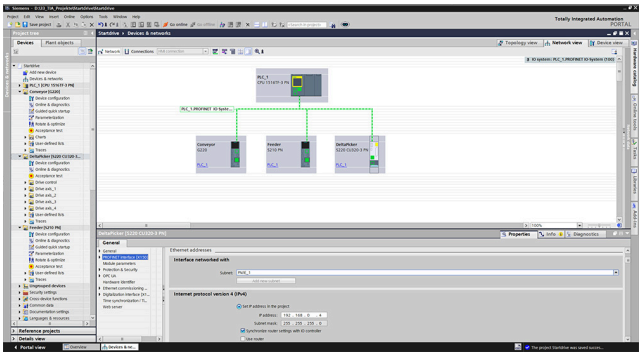
Integration of the SINAMICS web server based on the example of a SINAMICS G200/G210/G210X/G220 and the PROFINET interface (X150) as connected web client (e.g. PC, SIMATIC HMI etc.)

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Overview

SINAMICS Startdrive is integrated in the TIA Portal and is a tool for the configuration, commissioning and diagnostics of the SINAMICS family of converters.

The SINAMICS Startdrive commissioning tool has been optimized with regard to user friendliness and consistent use of the TIA Portal benefits of a common working environment for PLC, HMI and drives. Time-saving and guided step-by-step commissioning with maximum flexibility is complemented by user-friendly graphic function views for all drive functions, including functional safety (Safety Integrated) and drive-based technology functions (e.g. EPOS). The automatic message display, the powerful real-time trace and the context-sensitive online help make converter diagnostics very easy.



The software packages based on the TIA Portal are harmonized with each other and offer important benefits, the main advantage being a shared project storage. The TIA Portal enables simple integration of SINAMICS converters in your automation solution. Thanks to the standardization of operator actions and the integration in general TIA Portal operating concepts (e.g. UMAC, Openness) as well as standard TIA Portal functions (e.g. Undo/Redo), familiarization is easy both for drive experts as well as SIMATIC users. Special focus is placed on the interaction between SIMATIC and SINAMICS, especially when connecting the SINAMICS drives to SIMATIC technology objects.

Integration

Supported frequency converters

SINAMICS Startdrive Basic enables complete commissioning, diagnostics, parameterization, optimization and connection to the PLC for the following SINAMICS converters integrated in SINAMICS Startdrive:

- SINAMICS G120, G120C, G120D, G120P
- SINAMICS G115D
- SINAMICS G130, G150
- SINAMICSG200 [1)]
- SINAMICSG210, G210C, G210X [1)]
- SINAMICS G220
- SINAMICS S120, S150
- SINAMICS S200
- SINAMICSS200 Spindle [1)]
- SINAMICS S210 (6SL3...) and innovated SINAMICS S210 (6SL5...)
- SINAMICS S220
- SINAMICS MV

1) As of SINAMICS Startdrive V21 Update 1.

SINAMICS Startdrive Advanced

With SINAMICS Startdrive Advanced (available as of V15) you benefit from powerful engineering functions that save you considerable time and ultimately costs.

- Safety acceptance test:
  - Guided acceptance test wizard for all drive-based Safety Integrated functions
  - Automatic and safety function-specific generation of traces to analyze the machine behavior
  - Generation of an acceptance report as Excel file (xlsx format, can also be used with OpenOffice)
- Improved optimization options in the drive: Extended measuring functions (available for CU320-2 PN/DP and CU310-2 PN as of V5.2 SP3 and all devices from V6.x), long-term trace (available for CU320-2 PN/DP and CU310-2 PN from V5.2 SP3)
- Export of backup files from the Startdrive project
- Import of backup files into the Startdrive project
- Also contains all Startdrive Basic functions
- Only license key required, no additional installation

New in V21

Startdrive Basic V21

- Comparison of drive parameters for up to 5 drives
- Offline firmware upgrade as a mass operation
- Download in the background
- Integration of the drive version V6.6 for SINAMICS G220, S220, G200 Basic
- Integration of the drive version V6.7 for SINAMICS G200, G210, G210C, G210X, G220, S200, S200 Spindle, S220
- Support of the virtual motor encoder for encoderless positioning on SINAMICS G210, G220 and S220

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Integration (continued)

Startdrive Advanced V21

- Import of backup files as station upload to the Startdrive project (from V21 Update 1)

Installation versions

SINAMICS Startdrive can only be installed as an option package for SIMATIC STEP 7. However, a SIMATIC STEP 7 license is not required to run SINAMICS Startdrive.

System requirements

The following table shows the recommended hardware and system equipment for the operation of SINAMICS Startdrive.

Hardware	Recommendation
Computer	As of SIMATIC FIELD PG M6 Comfort (or comparable PC)
Processor	Intel Core i5-8400H (2.5 ... 4.2 GHz; 4 cores + hyper-threading; 8 MB Smart Cache)
RAM	16 GB or more (32 GB for large projects)
Hard disk	SSD with at least 50 GB available memory
Screen resolution	15.6" Full HD display (1920 × 1080 or larger)
Operating systems	• **Microsoft Windows 10 (64 bit)** - Windows 10 Enterprise 21H2 • **Microsoft Windows 11 (64 bit)** - Windows 11 Home Version 24H2 - Windows 11 Professional Version 24H2 - Windows 11 Enterprise 24H2, 23H2 • **Microsoft Windows Server (64 bit)** - Windows Server 2022 Standard (full installation) - Windows Server 2025 Standard (full installation)

Compatibility with other products

- SINAMICS Startdrive V21 operates with STEP 7 and WinCC V21 in one framework
- SINAMICS Startdrive V21 can be installed on the same computer in parallel with other versions of SINAMICS Startdrive V12 to V20
- SINAMICS Startdrive can be installed on the same computer as SINAMICS MICROMASTER STARTER

Supported virtualization platforms

SINAMICS Startdrive can be installed in a virtual machine. For this purpose, one of the following virtualization platforms in the specified version or a newer version can be used:

- VMware vSphere Hypervisor (ESXi) 8.0 or higher
- VMware Workstation 17.0 or higher
- VMware Player 17.0 or higher
- Microsoft Hyper-V Server 2019 or higher

Supported safety programs

The following safety programs have been tested with SINAMICS Startdrive V21:

Integration (continued)

- Virus scanners:
  - Symantec Endpoint Protection 14.3 RU8
  - Trend Micro Apex One
  - McAfee Endpoint Security (ENS) 10.7
  - Microsoft Defender
  - Qihoo 360 (Safe Guard and Virus Scanner)
  - Crowdstrike Falcon Go (Falcon Prevent and Falcon Device Control)
- Encryption software:
  - Microsoft Bitlocker
- Host-based Intrusion Detection System
  - McAfee Application Control 8.4 (Trellix)

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Selection and ordering data

Description	Article No.
SINAMICS Startdrive Basic V21 commissioning tool Single license and certificate of license English, French, German, Italian, Spanish, Chinese Simplified	
• Software download (email address required for delivery)	**6SL3072-4MA02-0XG0**
SINAMICS Startdrive Advanced V21 commissioning tool License key (floating license) English, French, German, Italian, Spanish, Chinese Simplified	
• On USB flash drive	**6SL3072-4MA02-0XA5**
• Software download incl. license key (email address required for delivery)	**6SL3072-4MA02-0XG5**
Upgrade SINAMICS Startdrive Advanced V15 ... V20 to V21	
• On USB flash drive	**6SL3072-4MA02-0XE5**
• Software download incl. license key (email address required for delivery)	**6SL3072-4MA02-0XK5**

Description	Article No.
Software Update Service with SINAMICS Startdrive Advanced in the TIA Portal Delivery is performed according to the number of ordered SUS products (e.g. 10 upgrade license keys (floating license) with 10 USB flash drives, etc.)	
• On USB flash drive	**6SL3072-4AA02-0XL8**
• Software download incl. license key (email address required for delivery)	**6SL3072-4AA02-0XY8**

Note:

SINAMICS DCC can be installed in addition to the SINAMICS Startdrive commissioning tool. This allows the device functionality in the SINAMICS drive system to be expanded with dedicated technological functions as required.

Further information on SINAMICS DCC can be found in the section "SINAMICS DCC (Drive Control Chart) in the TIA Portal" and the section "Drive Control Chart (DCC)" in the Technology Functions section for the SINAMICS Drive Software for the next generation of SINAMICS frequency converters (from firmware V6.4).

Accessories

Depending on the version of the Control Unit (CU), the Control Unit of the drive unit can communicate with the programming device (PG) or PC via PROFIBUS or PROFINET / Ethernet or via a serial interface. The following accessories are available for the particular drive system as listed in the following table.

Description		Recommended accessories For communication between the drive unit and the programming device or PC Article No.
SINAMICS frequency converters of the next generation (from firmware V6.1)		
• Wi-Fi	**SINAMICS Smart Adapter** Wi-Fi solution for the next generation of SINAMICS frequency converters of the next generation (from firmware V6.1)	**6SL4950-0AJ00-0AA0**
SINAMICS G120C		
• USB	**PC converter connection kit 2** Mini USB interface cable for communication with a PC, 3 m (9.84 ft)	**6SL3255-0AA00-2CA0**
SINAMICS G120		
• USB	**PC converter connection kit 2** Mini USB interface cable for communication with a PC, 3 m (9.84 ft)	**6SL3255-0AA00-2CA0**
• PROFINET / Ethernet	Standard CAT5 Ethernet cable or PROFINET cable	–
SINAMICS G115D		
• USB	**PC converter connection kit 2** Mini USB interface cable for communication with a PC, 3 m (9.84 ft)	**6SL3255-0AA00-2CA0**
• PROFINET / Ethernet	Connection to the PROFINET system in the plant	See supplementary products [1]
SINAMICS G120D		
• USB	**PC converter connection kit 2** Mini USB interface cable for communication with a PC, 3 m (9.84 ft)	**6SL3255-0AA00-2CA0**
• PROFIBUS	Connection to the PROFIBUS system in the plant	See supplementary products [1]
• PROFINET / Ethernet	Connection to the PROFINET system in the plant	See supplementary products [1]

[1] An overview of all the supplementary products (e.g. cables and connectors) that are available for the distributed drives family can be found at the following link: http://www.siemens.com/distributeddrives-supplementaryproducts

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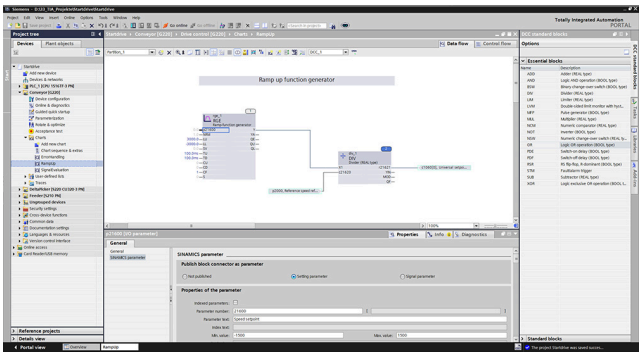
More information

The SINAMICS Startdrive Basic commissioning tool is available free on the internet at
www.siemens.com/startdrive

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Overview

SINAMICS DCC (Drive Control Chart) is a technological expansion for the SINAMICS drive systems. This allows the device functions of the converter systems to be expanded individually and flexibly with freely available closed-loop control, arithmetic and logic blocks and thus opens up a new dimension of adaptation capabilities for the specific functions of the machine for the user. The user-friendly configuration tool in the TIA Portal enables simple, graphic configuration of these blocks and integrates them in the drive unit. SINAMICS DCC is available as an option for SINAMICS Startdrive Basic and Advanced in the TIA Portal.



With the integration into the TIA Portal, the focus is on simple usability. For this reason, closed loop control and open loop control functions can be graphically interconnected in just a few steps via drag and drop.

The SINAMICS DCC installation contains a comprehensive standard block library. Furthermore, additional libraries can be installed as DCB Extension to expand the range of functions of the blocks. The diagnostics functions allow the program behavior to be verified and, in the case of a fault, the cause to be identified.

Via the Siemens application support, a range of example applications (winder, synchronous operation, cross-cutter, etc.) are available for download on the basis of SINAMICS DCC and can be used as a ready-to-use solution or be individually adapted or expanded.
www.siemens.com/sinamics-applications

Supported frequency converters

With SINAMICS DCC, you can flexibly and individually extend the following devices:

- SINAMICS G220 (as of drive version V6.4)
- SINAMICS G210, G210C, G210X (as of drive version V6.7) [1)]
- SINAMICS G200(as of drive version V6.7) [1)]
- SINAMICS G200 Basic (as of drive version V6.6)
- SINAMICS G130, G150
- SINAMICS S120, S150
- SINAMICS MV
- SINAMICS S120 integrated in SIMATIC Drive Controller
- SINAMICS S220 (as of drive version V6.6)

1) As of SINAMICS DCC V21 Update 1.

Overview (continued)

New in V21

- Support of SINAMICS DCC with SINAMICS G220, G200 Basic and S220 from drive version V6.6
- Support of indexed DCC parameter from drive version V6.6
- Extension of user-specific SINAMICS DCC from drive version V6.6
- Support of SINAMICS DCC with SINAMICS G210, G210X and G200 from drive version V6.7

Licenses

With the support of SINAMICS DCC for SINAMICS G220 and S220 drive units, licensing becomes even easier and more flexible. While the SINAMICS DCC Combo engineering licenses are still required for the drive units with drive version V5.x (e.g. SINAMICS S120), SINAMICS DCC Engineering licenses are no longer required for the SINAMICS devices as of V6.x. Instead, the licensing depends on the scope of the SINAMICS DCC application.

For simple SINAMICS DCC applications with up to 20 modules, the SINAMICS DCC application can be used free of charge! For more extensive SINAMICS DCC applications, scalable SINAMICS Drive licenses are available, which are precisely tailored to the required needs.

In order to be able to project SINAMICS DCC with the V6.x drive version, the SINAMICS DCC V21 Basic product variant is required.

In the case of using SINAMICS DCC with the V5.x drive version, the SINAMICS DCC V21 Combo Floating License is required, which is offered in the product of the same name. The floating license allows the use of software on any number of computers. This allows one user per license to use the software independently of the computer being used or a specific workstation. The number of existing licenses determines the number of computers on which the software can be used simultaneously.

- Existing SINAMICS DCC combo licenses V15 ... V20 can be upgraded to V21. This requires an upgrade license.
- The combo license allows parallel use of SINAMICS DCC V3.3/V3.4/V3.5/V3.6/3.7 and SINAMICS DCC V21 if both tools are installed on the same PC.

Installation versions

SINAMICS DCC is an option package for SINAMICS Startdrive Basic and Advanced.

System requirements

The SINAMICS DCC V21 option package has the same system requirements and supports the same virtualization platforms and safety programs as SINAMICS Startdrive V21.

Compatibility with other products

- SINAMICS DCC V21 operates with Startdrive, STEP 7 and WinCC in one framework
- SINAMICS DCC V21 can be installed on a computer in parallel with SINAMICS MICROMASTER STARTER with SINAMICS DCC

Supported languages

- Standard installation: English, German, Chinese (simplified)
- Language packages: French, Italian, Spanish

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Selection and ordering data

SINAMICS DCC in the TIA Portal, consisting of the graphical configuration tool and the standard library, is the continuation of SINAMICS DCC in the STARTER.

For drive versions V5.x. no runtime license is required for the standard library included in the scope of supply.

Description	Article No.
SINAMICS DCC V21 Basic Single License as an option package for SINAMICS Startdrive Basic or Advanced V21 for SINAMICS drives as of drive version V6.6 German, English, French, Italian, Spanish, Chinese Simplified	
• Software download (email address required for delivery)	**6SL3070-4MA01-0XG0**
SINAMICS DCC V21 for TIA Portal incl. Floating as an option package for SINAMICS Startdrive Basic or Advanced V21 Combo license key (floating license) German, English, French, Italian, Spanish, Chinese Simplified	
• On USB flash drive	**6SL3070-4MA01-0XA5**
• Software download incl. license key (email address required for delivery)	**6SL3070-4MA01-0XG5**
Upgrade SINAMICS DCC V15.1 ... V20 to V21	
• On USB flash drive	**6SL3070-4MA01-0XE5**
• Software download incl. license key (email address required for delivery)	**6SL3070-4MA01-0XK5**
Software Update Service with SINAMICS DCCin the TIA Portal [1] Delivery is performed according to the number of ordered SUS products (e.g. 10 upgrade license keys with 10 USB flash drives, etc.)	
• On USB flash drive	**6SL3070-4AA01-0XL8**
• Software download incl. license key (email address required for delivery)	**6SL3070-4AA01-0XY8**

[1] See Software Update Service section.

DCB Extension

With DCB Extension, additional libraries can be added as specifically programmed blocks to the standard block library at SINAMICS S120/S150/S220/G130/G150/G210/G210X/G220/MV drive systems and SIMATIC Drive Controller. As a result, complex tasks can be implemented in the drive and the internal know-how protection can be increased as a Black Box. These blocks or libraries are programmed with the separate SINAMICS DCB Studio development tool in the C/C++ high-level language and can be used as a DCB Extension library for SINAMICS DCC. A SINAMICS Drive software option license is required to use these blocks from the DCB extension libraries. The selection of the required license depends on the drive system running firmware V5.x and V6.x.

SINAMICS DCB Studio

Development tool for programming blocks that can be imported as an additional library (DCB Extension) for SINAMICS DCC in the TIA Portal (upon request).

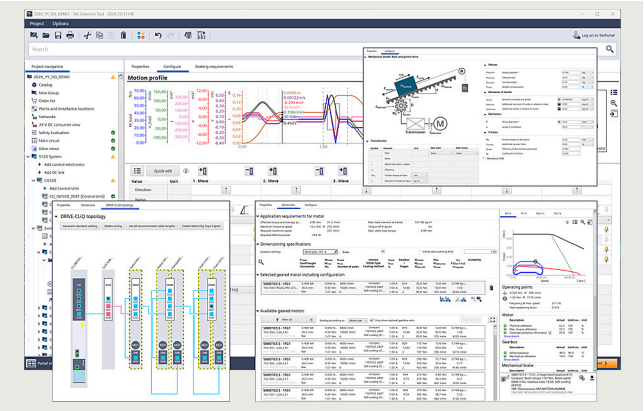
More information

TIA Portal highlights
www.siemens.com/tiaportal

The SINAMICS DCC option package as trial version is available free on the internet at
www.siemens.com/startdrive

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Overview



Selection guide and configurator for automation technology

Error-free configuration without expert knowledge through intelligent configurators and selection wizards. Desktop and cloud versions enable cross-team collaboration with maximum flexibility.

There are two versions of TIA Selection Tool:

- Desktop version: for downloading and executing on Microsoft Windows PCs (from Microsoft Windows 10)
- Cloud version: for running in the cloud and launching directly out of the browser (we recommend Google Chrome, Mozilla Firefox and Microsoft Edge)

Projects stored in the cloud can be edited with both tools. This makes it possible to work on-the-go using a tablet, at home on a PC – and vice versa, or together with colleagues and customers.

To use the full functionality, we recommended setting up a SiePortal account for both cases. This gives you access to prices and enables you to save your projects to our cloud.

Drive system dimensioning with SIZER integrated in TIA Selection Tool (desktop version)

SIZER provides support in the technical design of the hardware and firmware components required for a drive task. This includes the project planning of the complete drive system and enables the handling of simple individual drives to complex multi-axis applications.

The following drives and controls can be configured using the engineering tool:

- SIMOTICS motors, including servo geared motors
- SINAMICS low-voltage drive systems, including extra low-voltage drives
- SINUMERIK CNC
- SIMATIC controller
- MOTION-CONNECT connection systems
- Partner products in the field of low-voltage motors and connection systems

In addition, the integration into the TIA Selection Tool offers the selection and configuration of many other components of automation technology, thus allowing complete project planning in one tool.

SIZER supports all of the engineering steps in one workflow:

Overview (continued)

- Configuring the power supply
- Defining loads by means of mechanical systems and traversing profiles, load cycle imports or load characteristic curves
- Designing the motor and gearbox, including calculation of mechanical transmission elements
- Configuring of the drive components
- Compiling the necessary accessories
- Selecting the line-side and motor-side power options, e.g. cables, filters, and reactors

When designing SIZER, particular importance was placed on user-friendliness and a holistic, function-oriented approach to the drive application. It is easy to switch between the individual steps of the dimensioning and thus change previously made selections without discarding other inputs. Status information and messages are continuously updated and keeps you continually informed about the progress of the configuration process.

The projected drive configurations, including all inputs, are saved in projects and can be fully reloaded. The results of the engineering can be exported to project documentation.

The configuration process produces the following results:

- Parts list of the required components (export to Microsoft Excel, use of the Microsoft Excel data sheet for import into SAP)
- Technical specifications of the system
- Characteristic curves and load curves
- Arrangement of the drive and control components and dimensional drawings of the motors and converters (using separate download links)

More information

The download of the current desktop version of the TIA Selection Tool with integrated drive dimensioning as well as further information on the TIA Selection Tool can be found at www.siemens.com/tia-selection-tool

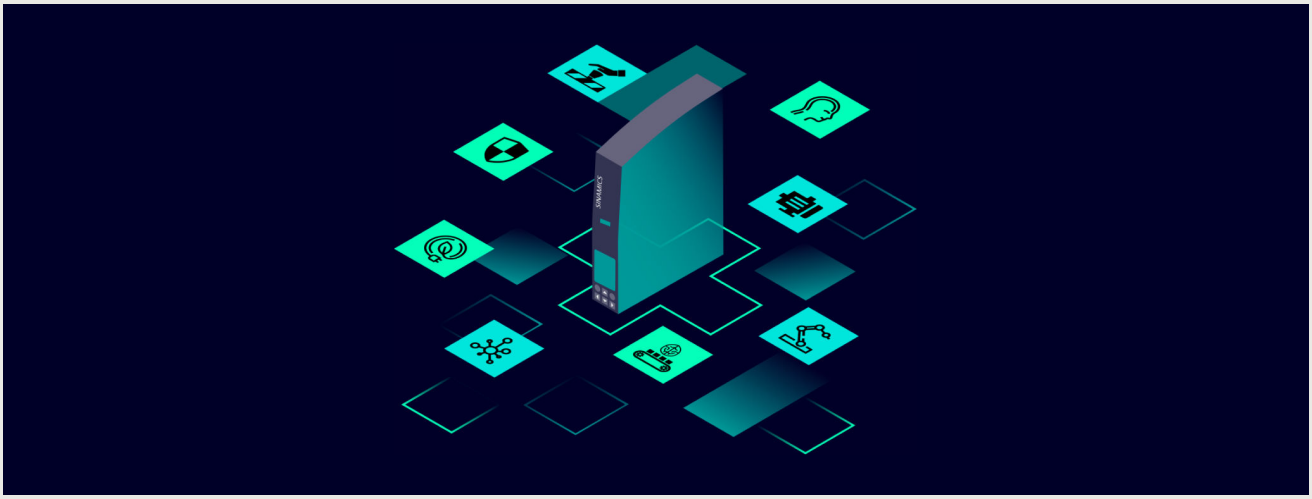
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3/2 Introduction

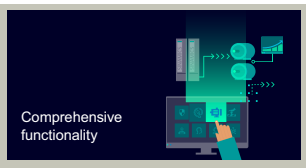
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Overview

SINAMICS Drive Software – The right function for every application



SINAMICS Drive Software ensures that our SINAMICS frequency converters of the next generation (from firmware V6.1) operate smoothly and reliably. It offers comprehensive functionality, is easily expandable and enables the greatest possible flexibility for a wide range of applications.



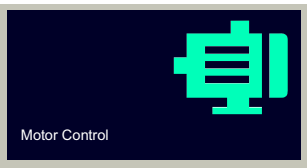
Comprehensive functionality
The software enables highly accurate and dynamic control of different types of motors.
Integrated functions help to reduce energy consumption. The software protects the converter against overload and ensures high availability.
Furthermore, positioning tasks as well as logic and technology functions can be taken over directly by the drive.
Integrated functions help to reduce energy consumption. The software protects the converter against overload and ensures high availability.
Furthermore, positioning tasks as well as logic and technology functions can be taken over directly by the drive.



Easily expandable
Most of the SINAMICS Drive Software functionality is already included in the basic scope of our frequency converters.
However, the scope of performance can be further increased via additional SINAMICS Drive Software options.
These options allow the use of special added value or expansion functions.
For example, the SINAMICS Safety Integrated Extended option provides additional safety functions compared to the basic version.



Greatest flexibility
The additional SINAMICS Drive Software options can easily be ordered together with the SINAMICS frequency converter.
You do not know which options you need at the beginning?
No problem, besides options that can be ordered directly at the time of purchase, some options can also be ordered later.
Before purchasing, you can test the SINAMICS Drive Software options free of charge for a limited time (trial license concept).



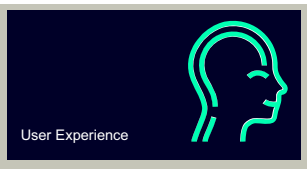
Motor Control Functions
Basic – but most important!
From standard pump and fan applications to high-end drives with complex multi-axis servo applications:
Motor control with SINAMICS drives is always perfect.
A wide variety of motor technologies and performance levels with optimal settings for all applications can be controlled. Just the perfect control for your task!
Information on ordering see SiePortal.



Technology Functions
The SINAMICS drives' range of applications is significantly expanded by the Technology Functions.
From logic to positioning and more – everything on board!
Information on ordering see SiePortal.

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Overview (continued)



User Experience
An excellent user experience is given throughout the whole engineering chain as well as throughout the whole drives portfolio due to consistent Ethernet-based interfaces, communication protocols (wired or wireless) as well as up to date browser technologies.
All of the converter functions have been designed so that they can be handled in the same way from an engineering perspective, irrespective of the selected drive type.
Knowledge gained can therefore be reused easily and efficiently.
www.siemens.com/engineering-tools
Information on ordering see SiePortal.



Safety Integrated Functions
SINAMICS drives offer comprehensive and integrated safety functions.
These act significantly faster than conventional designs.
As a consequence, Safety Integrated further increases the safety of a machine.
www.siemens.com/safety-drives
Information on ordering see SiePortal.



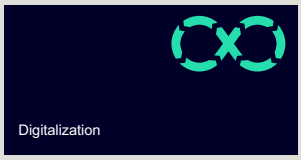
Security Integrated Functions
The Security Integrated Functions for SINAMICS converters of the next generation (from firmware V6.1) increase protection against cyber attacks.
www.siemens.com/industrial-cybersecurity
Information on ordering see SiePortal.



Energy Efficiency and Grid Capability Functions
Energy is valuable and should be used as efficiently as possible.
SINAMICS drives offer integrated functions for energy efficiency and naturally also support PROFIenergy.
www.siemens.com/drives-energy-efficiency
Information on ordering see SiePortal.



Connectivity Functions
Consistent openness today and tomorrow.
SINAMICS offers a comprehensive range of communication options for engineering, exchanging data between drives – and naturally for exchanging data with higher level automation systems.
www.siemens.com/profinet
Information on ordering see SiePortal.



Digital Drivetrain
Getting started in drive technology digitalization is very easy. We offer suitable digitalization solutions for low-voltage motors and low-voltage converters for every phase in the life cycle of a machine or plant. Our portfolio extends from the digital to the real drive train. Thanks to continuous integration, it is possible to start today in one area with little effort – and use the information acquired elsewhere tomorrow.
www.siemens.com/digital-drives
Information on ordering see SiePortal.

More information

Further information about SINAMICS Drive Software is available on the internet at:
www.siemens.com/sinamics-drive-software
For more information on ordering and configuration, see catalog D 99 and SiePortal at:
www.siemens.com/d99
www.siemens.com/sinamics-drive-software/sieportal

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4/2	Applications
4/3	Drives Options Partner
4/4	Documentation

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Overview



Our understanding of an application is the customer-specific solution of an automation task based on standard hardware and software components. In this respect, industry knowledge and technological expertise are just as important as expert knowledge about how our products and systems work. We are setting ourselves this challenge with more than 280 application engineers in 20 countries.

Application Centers

We currently have Application Centers in:

- Germany:
  Head Office in Erlangen and in other German regions, e.g. in Munich, Nuremberg, Stuttgart, Mannheim, Frankfurt, Chemnitz, Cologne, Bielefeld, Bremen, Hanover, Hamburg
- Belgium: Brussels
- Brazil: Sao Paulo
- China: Beijing and 12 regions
- Denmark: Ballerup
- France: Paris
- Great Britain: Manchester
- India: Mumbai
- Italy: Bologna, Milan
- Japan: Tokyo, Osaka
- The Netherlands: The Hague
- Austria: Vienna
- Poland: Warsaw
- Sweden: Göteborg
- Switzerland: Zurich, Lausanne
- Spain: Madrid
- South Korea: Seoul
- Taiwan: Taipei
- Turkey: Istanbul
- USA: Atlanta

These Application Centers specialize in the use of SIMATIC/SINAMICS. You therefore can rely on automation and drive specialists for implementing successful applications. By involving your personnel at an early stage in the process, we can provide a solid basis for rapid knowledge transfer, maintenance and further development of your automation solution.

Overview (continued)

Advice on applications and implementation

We offer a variety of consultation services to help you find the optimum solution for the SIMATIC/SINAMICS application you want to implement:

The quotation phase includes

- clarification of technical questions,
- discussion of machine concepts and customer-specific solutions,
- selection of suitable technology and
- suggestions for implementation.

A technical feasibility study is also performed at the outset. In this way, difficult points of the application can be identified and solved early on. We can also configure and implement your application as a complete solution from a single source.

A large number of proven standard applications are available for use during the implementation phase. This saves engineering costs.

The system can be commissioned by experienced, competent personnel, if required. This saves time and trouble.

If servicing is required, we can support you on site or remotely. For more information about servicing, please see the section "Industry Services".

On-site application training

Training for the implemented applications can also be organized and carried out on site. This training for machine manufacturers and their customers does not deal with individual products, but the entire hardware and software system (for example, automation, drives and visualization).

From an initial concept to successful installation and commissioning: We provide complete support for SIMATIC/SINAMICS! Contact your Siemens representative.

You can find more information at

www.siemens.com/machinebuilding

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Overview

Siemens Product Partners for Drives Options

Individual options for our drives

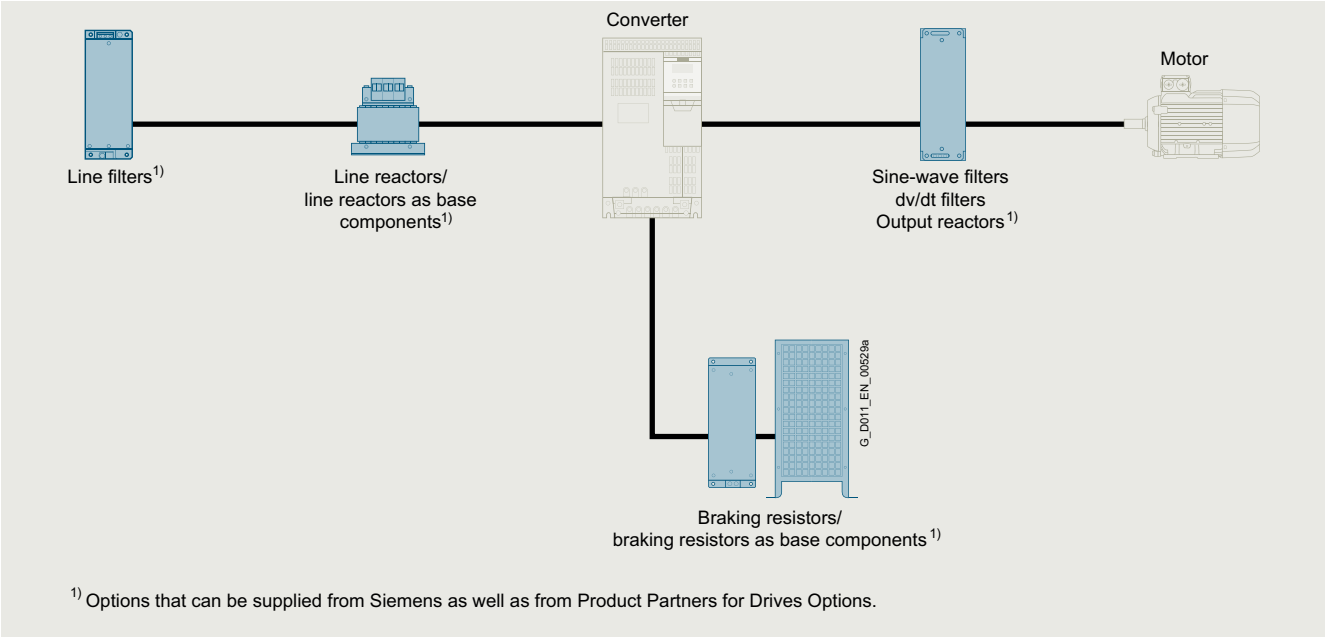
In order to meet as many customer requirements as possible in the field of drive technology, in addition to its own products, Siemens also relies on the individual and complementary services of selected partners.

We are increasingly focusing on the standard drive options, and our Siemens Product Partners for Drives Options supplement our drives with individual drive options.

This gives Siemens a unique flexibility to meet all application requirements. Naturally, we support our Siemens Product Partners for Drives Options in tailoring their options perfectly to our drives.

For you as our customer, there are multiple benefits:

- The Siemens Product Partners for Drives Options meet the same high standards of quality and performance that we place on our own products
- Drive options can be adapted to individual requirements/designs
- The Siemens Product Partners for Drives Options know our Siemens converter portfolio and can advise you individually and quickly



Schematic circuit diagram

More information

More information is available on the internet at
www.siemens.com/drives-options-partner

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Overview

A high-quality programmable control or drive system can be used to maximum effect only if the user is aware of the performance of the products used as a result of intensive training and good technical documentation.

This is becoming more important due to the shorter innovation cycles of modern automation products and the convergence of electronics and mechanical engineering.

A comprehensive range of documentation is available which includes a Getting Started guide, operating instructions, installation manuals and a list manual.

In addition to technical information for SINUMERIK, SINAMICS and SIMOTICS, the documentation is available for downloading as a PDF file from the internet:

- SINUMERIK
  https://support.industry.siemens.com/cs/document/109766201
- SINAMICS
  https://support.industry.siemens.com/cs/document/109807358
- SIMOTICS
  https://support.industry.siemens.com/cs/document/109813641

Application

Explanations of the manuals:

- **Operating Instructions**
  contain all the information needed to install the device and make electrical connections, information about commissioning and a description of the converter functions.
  Phases of use: Control cabinet construction, commissioning, operation, maintenance and servicing.
- **Hardware Installation Manual**
  contains all relevant information about the intended use of the components of a system (technical specifications, interfaces, dimensional drawings, characteristics, or possible applications), information about installation and electrical connections and information about maintenance and servicing.
  Phases of use: Control cabinet configuration/construction, maintenance and servicing.
- **Operating and Installation Instructions** (for converter and accessories)
  contain all relevant information about the intended use of the components, such as technical specifications, interfaces, dimensional drawings, characteristics, or possible applications.
  Phases of use: Control cabinet configuration/construction.
- **Manual/Configuration Manual**
  contains all necessary information about the intended use of the components of a system, e.g. technical specifications, interfaces, dimensional drawings, characteristics, or possible applications.
  Phases of use: Cabinet configuration/setup, circuit diagram configuration/drawing.
- **Commissioning Manual**
  contains all information relevant to commissioning after installation and wiring. It also contains all safety and warning notices relevant to commissioning in addition to overview drawings.
  Phases of use: Commissioning of components that have already been connected, configuration of system functions.
- **List Manual**
  contains all parameters, function diagrams, and faults/alarms for the product/system as well as their meanings and setting options. It contains parameter data and fault/alarm descriptions with functional correlations.
  Phases of use: Commissioning of components that have already been connected, configuration of system functions, fault cause/diagnosis.
- **Getting Started**
  provides information about getting started for the first-time user as well as references to additional information. It contains information about the basic steps to be taken during commissioning. The information in the other documentation should be carefully observed for all of the other work required.
  Phases of use: Commissioning of components that have already been connected.
- **Function Manual Drive Functions**
  contains all the relevant information about individual drive functions: Description, commissioning and integration in the drive system.
  Phases of use: Commissioning of components that have already been connected, configuration of system functions.

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Appendix

5



5/2	SITRAIN
5/5	Partners
5/6	Digital Enterprise Services
5/7	Certificates of suitability (approvals)
5/9	Information on software licensing
5/11	Conditions of sale and delivery

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Overview



Lern the way you like it – with SITRAIN

SITRAIN provides comprehensive technical knowledge for a wide range of industries and applications. Its offering is consistently aligned with the needs of learners and the requirements of innovative companies. Benefit from modern learning methods, personalized support, and practical knowledge that sustainably enhances your daily work and professional development. SITRAIN stands for successful, flexible, and continuous learning.

Education and training directly from the manufacturer

SITRAIN offers high-quality training covering Siemens' industrial product and solution portfolio and has more than 30 years of experience in technical training. Discover the wide range of opportunities to expand your expertise and find the course that perfectly fits your needs.



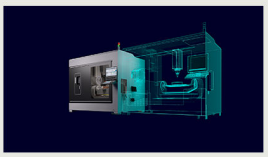
Industrial Automation Systems SIMATIC

Training available for:
SIMATIC S7-1200/S7-1500. TIA Portal,
SIMATIC S7-300/400



Drive Technology

Training available for:
SINAMICS S120, S210,
SINAMICS G120, G220,
SINAMICS G130/G150/S150,
SINAMICS G180,
SINAMICS DCM



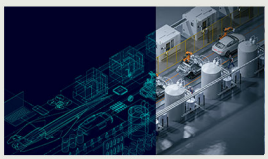
SINUMERIK CNC automation system

Training available for:
SINUMERIK 840D,
SINUMERIK 840D sl and
SINUMERIK ONE



Process Control Systems

Training available for:
SIMATIC PCS 7,
SIMATIC PCS neo



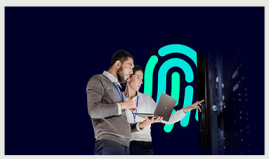
Digital Enterprise

Training available for:
Openness, SIMIT, OPC UA, Industrial Edge,
virtual commissioning



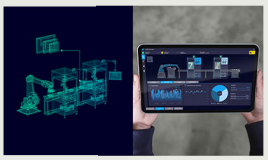
Industrial Communications

Training available for:
OPC UA, PROFINET, SCALANCE, RUGGEDOM, Industrial Ethernet, Remote Communication



Cybersecurity

Training available for:
Industrial security for factory and process automation,
SINEC Security Software Suite and IT/OT security for industrial networks



Operator Control and Monitoring Systems

Training available for:
SIMATIC WinCC Unified in TIA Portal, SIMATIC WinCC in TIA Portal, SIMATIC WinCC V8



Motion Control

Training available for:
SIMATIC Motion Control and SIMOTION



Smart Infrastructure

Training available for
SIRIUS, SENTRON, SIVACON, ALPHA, SIMOCODE and circuit breakers



Process Analytics & Instrumentation

Training is available for process analytics and instrumentation and explosion protection



Additional training offer

Battery manufacturing, SIMOVE with automated guided vehicles (AGV), cranes, guidelines and standards for control cabinets

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Overview (continued)

Different learning formats and methods for maximum learning success

With SITRAIN trainings, you can shape your further education according to your individual preferences and the demands of your professional routine. You have the option to choose between online training and classroom courses – depending on which format suits you best.

In addition, you decide whether to complete your training flexibly on demand or attend scheduled sessions.

Whether with a learning consultant, as part of a team, or through self-paced learning – SITRAIN offers maximum flexibility and tailored options for your learning process.

Discover our three learning formats:

Learning Event



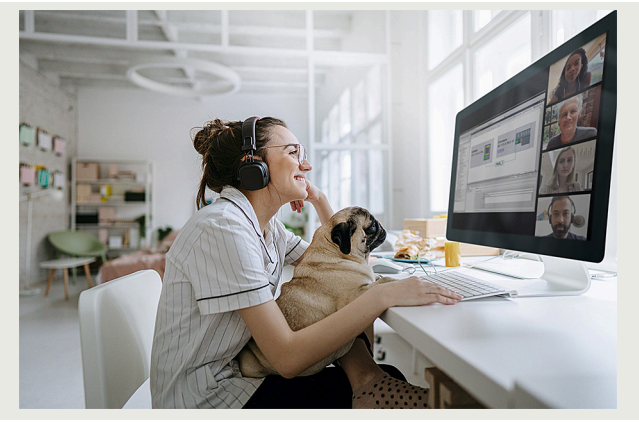
SITRAIN Learning Events are the perfect choice to achieve a defined learning goal in the shortest possible time. You learn in a protected learning environment outside of the daily work routine under the guidance of a learning consultant – virtually, in the training center, or at your company.

Learning Membership I SITRAIN access



SITRAIN access is a digital learning platform where knowledge is delivered through modular content such as tutorials, presentations, exercises, and tests. Learners benefit from a growing course offering as well as the Siemens Virtual Lab, where they can deepen their knowledge in a practical way – without the need for installation. Learn anywhere, anytime, flexibly and online.

Learning Journey



The Learning Journey is the perfect combination of virtual live sessions with a learning consultant and self-learning modules for sustainable learning success. The modular approach enables an easy integration of learning into your daily work. This also includes access to the digital learning platform, SITRAIN access, for one year.

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Overview (continued)

Live
Learn together with others, simultaneously and guided by a learning consultant. Online, in the SITRAIN training center or at your company.

Self-reliant
Expand your knowledge self-determined with industry learning and work on your learning units at your own pace and according to your own schedule.

On demand
Get the knowledge you need, exactly when you need it. Be it to answer a current question or to work on a special topic.

Individual
Talk directly with the learning consultant, clarify detailed questions and get personal coaching for transferring the learned topics to your own application.

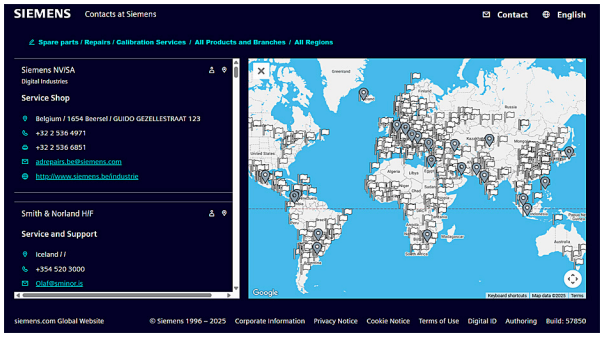


More information
https://www.siemens.com/sitrain
Course booking
https://sitrain.siemens.com
Training cases
https://www.siemens.com/sitrain-catalog-training-cases

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Overview

Partners at Siemens



At your service locally, around the globe for consulting, sales, training, service, support, spare parts on the entire portfolio of Siemens.

Your partner can be found in our Personal Contacts Database at: www.siemens.com/automation-contact

You start by selecting the required competence, products and branches, a country and a city or by a location search or free text search.

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Overview



At Digital Enterprise Services, we provide you with comprehensive services throughout the entire lifecycle. From a fully digital factory to a reliable spare parts supply and quick support in the event of outages, we work with our partners to ensure your plant operates optimally – improving availability, productivity, and efficiency.

Our services take industry to the next level and give you a competitive edge:

- **Industrial Digitalization Services:**
  Accelerate your digital transformation with our Digitalization Services. Our scalable offerings combine the real and digital worlds by delivering value through IT/OT solutions, improved Overall Equipment Effectiveness (OEE), advanced AI, predictive maintenance and robust cybersecurity while keeping you ahead of competition.
- **Industrial Sustainability Services:**
  From carbon reduction to lifecycle extension and higher plant availability, we help you save resources, extend product lifetimes, and reduce costs – securing long-term competitiveness. Advance your sustainability across key impact areas through optimization and lifetime extension services, covering Circular Spares and Repairs, Energy Efficiency Services as well as Retrofit and Modernization Services.
- **Industrial Lifecycle and Training Services:**
  Our tailored Lifecycle Services deliver expert maintenance and support worldwide, enhancing the availability and performance of your industrial assets throughout their lifecycle – from individual machines and systems to entire plants or factories. In addition, our flexible and future-oriented training offerings for all industries and applications empower you to get the most out of your investments.

For more information, please visit us at
Industrial Digitalization Services
Industrial Sustainability Services
Industrial Lifecycle and Training Services

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Overview

Many of the products in this Catalog fulfill requirements, e.g. for UL, CSA or FM and are labeled with the corresponding approval designation.

All of the certificates of suitability, approvals, certificates, declarations of conformity, test certificates, e.g. CE, UL, Safety Integrated etc. have been performed with the associated system components as they are described in the Catalogs and Configuration Manuals.

The certificates are only valid if the products are used with the described system components, are installed according to the Installation Guidelines and used for their intended purpose.

In other cases, the vendor of these products is responsible for arranging for the issue of new certificates.

Test code	Tested by	Device series/ Component	Test standard	Product category/ File-No.
UL: Underwriters Laboratories **Independent public testing body in North America**				
	UL according to UL standard	SINUMERIK	Standard UL 508, CSA C22.2 No. 142	NRAQ/7.E164110 NRAQ/7.E217227
		SIMOTION	Standard UL 508, CSA C22.2 No. 142	NRAQ/7.E164110
	UL according to CSA standard	SINAMICS	Standard UL 508, 508C, 61800-5-1 CSA C22.2 No. 142, 274	NRAQ/7.E164110, NMMS/2/7/8.E192450, NMMS/2/7/8.E203250, NMMS/7.E214113, NMMS/7.E253831 NMMS/2/7/8.E121068 NMMS/7.E355661 NMMS/7.E323473
	UL according to UL and CSA standards	SIMODRIVE	Standard UL 508C, CSA C22.2 No. 274	NMMS/2/7/8.E192450 NMMS/7.E214113
		SIMOTICS	Standard UL 1004-1, 1004-6, 1004-8, CSA C22.2 No. 100	PRGY2/8.E227215 PRHZ2/8.E93429 PRHJ2/8.E342747 PRGY2/8.E253922 PRHZ2/8.E342746
	UL according to UL standard	Line/motor reactors	Standard UL 508, 506, 5085-1, 5085-2, 1561, CSA C22.2 No. 14, 47, 66.1-06, 66.2-06	XQNX2/8.E257859 NMTR2/8.E219022 NMMS2/8.E333628 XPTQ2/8.E257852 XPTQ2/8.E103521 NMMS2/8.E224872 XPTQ2/8.E354316 XPTQ2/8.E198309 XQNX2/8.E475972
	UL according to CSA standard	Line filters, dv/dt filters, sine-wave filters	UL 1283, CSA C22.2 No. 8	FOKY2/8.E70122
		Resistors	UL 508, 508C, CSA C22.2 No. 14, 274	NMTR2/8.E224314 NMMS2/8.E192450 NMTR2/8.E221095 NMTR2/8.E226619
	UL according to UL and CSA standards			
TUV: TUV Rheinland of North America Inc. **Independent public testing body in North America, Nationally Recognized Testing Laboratory (NRTL)** **TÜV: TÜV SÜD Product Service** **Independent public testing body in Germany, Nationally Recognized Testing Laboratory (NRTL) for North America**				
	TUV according to UL and CSA standards	SINAMICS	NRTL listing according to standard UL 508C	U7V 12 06 20078 013 U7 11 04 20078 009 U7 11 04 20078 010 U7 11 04 20078 011
		SIMOTION	NRTL listing according to standard UL 508	U7V 13 03 20078 01
		SIMODRIVE	NRTL listing according to standard UL 508C, CSA C22.2. No. 14	CU 72090702
		Motion Control Encoder	NRTL listing according to UL 61010-1 CSA C22.2 No. 61010-1	U8V 10 06 20196 024

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Overview (continued)

Test code	Tested by	Device series/ Component	Test standard	Product category/ File-No.
CSA: Canadian Standards Association Independent public testing body in Canada				
	CSA according to CSA standard	SINUMERIK	Standard CSA C22.2 No. 142	2252-01 : LR 102527
FMRC: Factory Mutual Research Corporation Independent public testing body in North America				
	FM according to FM standard	SINUMERIK	Standard FMRC 3600, FMRC 3611, FMRC 3810, ANSI/ISA S82.02.1	–
EAC: Independent public testing body within the Eurasian Conformity Area				
	EAC in accordance with the EAC Directive	SINAMICS SINUMERIK SIMOTION	Standard IEC 61800-5-1/-2, IEC 61800-3	–
RCM: Australian Communications and Media Authority Independent public testing body in Australia				
	RCM according to EMC standard	SINAMICS SINUMERIK SIMOTION	Standard IEC AS 61800-3, EN 61800-3	–
KC: National Radio Research Agency Independent public testing body in South Korea				
	KC according to EMC standard	SINAMICS SINUMERIK SIMOTION	Standard KN 11	–
BIA Federal Institute for Occupational Safety				
–	Functional safety	SINAMICS SINUMERIK SIMOTION	Standard EN 61800-5-2	–
TÜV SÜD Rail				
–	Functional safety	SINAMICS SINUMERIK SIMOTION	Standard EN 61800-5-2	–

More information about certificates can be found online at:
https://support.industry.siemens.com/cs/ww/en/ps/cert

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Overview

Software types

Every software subject to a license is assigned to a type.
The following software types are defined:

- Engineering software
- Runtime software

Engineering software

This includes all software products for creating (engineering) user software, e.g. for configuring, programming, parameterizing, testing, commissioning, or servicing. Data generated with Engineering software or executable programs can be duplicated for your own use or for use by third parties free-of-charge.

Runtime software

This includes all software products required for plant/machine operation, e.g. operating system, basic system, system expansions, drivers, etc.
The duplication of the Runtime software or executable programs created with the Runtime software for your own use or for use by third parties is subject to a charge. You can find information about license fees according to use in the ordering data (e.g. in the catalog). Examples of categories of use include per CPU, per installation, per channel, per instance, per axis, per control loop, per variable, etc.
Information about extended rights of use for parameterization/configuration tools supplied as integral components of the scope of delivery of the Runtime software can be found in the accompanying readme files.

License types

Siemens Digital Industries and Smart Infrastructure offers different types of licenses for software:

- Floating license
- Single license
- Rental license
- Rental floating license
- Trial license
- Demo license
- Demo floating license

Floating license

The software may be installed by the licensee for internal use on any number of devices. Only the concurrent user is licensed. The concurrent user is the person using the program. Use begins when the software is started. One license is required for each concurrent user.

Single license

Unlike the floating license, only one installation of the software is permitted per license. The type of use licensed is specified in the ordering data and in the Certificate of License (CoL). Types of use include, for example, per instance, per axis, per channel, etc.
One single license is required for each type of use defined.

Rental license

The rental license supports the "sporadic use" of Engineering software. Once the license key has been installed, the software can be used for a defined time (the operating hours do not have to be consecutive). One license is required for each installation of the software.

Rental floating license

The rental floating license corresponds to the rental license; however, a license is not required for each installation of the software. Instead, one license per object (e.g. user or device) is required.

Overview (continued)

Trial license

A trial license supports "short-term use" of the software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license.

Demo license

A demo license supports "sporadic use" of the Engineering software in a non-productive context, e.g. for testing and evaluation purposes. It can be transferred to another license. Once the license key has been installed, the software can be used for a defined time (the operating hours do not have to be consecutive).
One license is required for each installation of the software.

Demo floating license

The demo floating license corresponds to the demo license; however, a license is not required for each installation of the software. Instead, one license per object (e.g. user or device) is required.

Certificate of License (CoL)

The CoL is the licensee's proof that the use of the software has been licensed by Siemens. A CoL is required for every type of use and must be kept in a safe place.

Downgrading

The licensee is permitted to use the software or an earlier version/release of the software, provided that the licensee owns such a version/release and its use is technically feasible.

Available versions

Software is constantly being updated. The delivery versions

- PowerPack
- Upgrade

can be used to access these updates.

Existing bug fixes are supplied with the ServicePack delivery version.

PowerPack

PowerPacks are conversion packages used to upgrade to more powerful software.

The licensee receives a new license agreement and Certificate of License (CoL) with the PowerPack. This CoL, together with the CoL for the original product, proves that the new software is licensed.
A separate PowerPack must be purchased for each original license of the software to be replaced.

Upgrade

An upgrade allows a newer, available version of the software to be used under the condition that a license for a previous version has already been acquired. The licensee receives a new license agreement and CoL with the upgrade. This CoL, together with the CoL for the previous version, proves that the new software is licensed.
A separate upgrade must be purchased for each original license of the software to be upgraded.

ServicePack

ServicePacks are used to debug existing products. ServicePacks may be duplicated for use as prescribed according to the number of existing original licenses.

License key

Siemens Digital Industries and Smart Infrastructure offers software products with and without license keys.
The license key serves as an electronic license stamp and is also the "switch" for activating the software (floating license, floating license, etc.)
The complete installation of software products requiring license keys includes the program to be licensed (the software) and the license key (which represents the license).

Software Update Service (SUS)

Within the framework of the SUS contract, you are provided with all software updates for the relevant product at no cost over a period of

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Overview (continued)

one year from the date of invoice. The contract is automatically extended by a further year unless canceled three months before expiration.

The prerequisite for agreeing to an SUS is the presence of the current version of the relevant software.

You can download information on license conditions under this link.

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Overview

1. General Provisions

1.1 Scope

The purchase of hardware, software, cloud services and other services (collectively "Offerings") through this catalog from Siemens Aktiengesellschaft ("Siemens") is subject to the following General Terms and Conditions for the sale of Siemens Offerings ("Catalog T&C"). These Catalog T&C apply only for orders placed with Siemens in Germany. Customer means the entity that places an order via Siemens.

1.2 Order Process

If Customer writes something in the "free choice text" (F), it is solely for Customer's internal order processing and is not reviewed or taken into consideration by Siemens and will not be legally binding.

1.3 Formation of contract

Any information provided in this catalog or in SiePortal does not constitute a binding offer and may contain errors. In particular, illustrations contained in the Offering descriptions, or in Siemens' catalogs are not binding. Any data, statement to dimensions and weights in our Offering descriptions and catalogs are subject to change without prior notice and become only binding upon contract conclusion.

An individual contract between Siemens and Customer is established when Siemens expressly accepts an order from Customer electronically or in another form, or if such acceptance does not occur, when Siemens fulfills Customer's order through delivery or performance. When the order is placed in SiePortal Siemens will send Customer an electronic confirmation of the receipt of the order, which, however, does not constitute an acceptance of the order. Neither is the Customer obligated to place an order, nor is Siemens obligated to accept any orders placed by Customer.

1.4 Additional Terms

Subordinately to these Catalog T&C, the specific terms and conditions in the text of the product description (if available) apply. If the text of the product description says that the specific terms and conditions mentioned there apply exclusively, only those specific terms and conditions apply. If the text of the product description does not contain any specific terms and conditions or if the specific terms and conditions mentioned there do not apply exclusively, the following terms and conditions apply subordinately in the version valid at the time of contract conclusion:

1.4.1 Hardware

- a. "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry ("Grüne Lieferbedingungen"-GL) "[1] and
- b. the Siemens "Terms on Export Control and Electronically Order Processing "[1]

If the hardware contains open-source software those terms prevail over the GL, we will provide a notification with the hardware specifying the applicable terms. The same applies with respect to any third-party software components in the hardware.

1.4.2 Other Offerings than hardware

- a. for software on premise including any associated maintenance and support services:
  the "General Software and Cloud Supplemental Terms (AGB Germany) "[2] and the
  "Specific Supplemental Terms for on-premises Software of Infrastructure & Industry Business[2];
- b. for cloud services:
  the "General Software and Cloud Supplemental Terms (AGB Germany) "[2] and the cloud services product specific terms stated in the product description;
- c. for services:
  the "Services Supplemental Terms (AGB Germany) "[2]; and

Overview (continued)

- d. generally for all Offerings under a. - c.:
  "Base Terms Germany (AGB Germany) "[2].

1.5 Customers with master or frame agreement

To the extent Offerings purchased are covered by an existing master or frame agreement, the terms and conditions of that agreement shall apply instead of these Catalog T&C.

1.6 Payment agreement and data sharing

If Customer can select and selects that a payment agreement shall apply to the order, upon conclusion of the order the payment agreement will apply and prevail over these Catalog T&C.

For the assessment of financing options, Siemens shares information and data in relation to Customer's company obtained within the scope of its business relationship with its affiliates (as defined in the Base Terms Germany (AGB Germany)).

2. Prices, payment terms and price escalation

2.1 Prices

The prices are in € (Euro), EXW INCOTERMS®2020, exclusive packaging.

2.2 Taxes

All prices and expenses stated in the order are exclusive of any taxes, duties, tariffs and any other charges ("Tax"). Customer will pay or refund Siemens for any applicable Tax imposed by any government authority for Customer's use or receipt of the Offerings.

If Customer is exempt from value-added or sales tax, or similar taxes, it must provide a valid, timely, and executed exemption certificate, direct pay permit, or other such government-approved documentation.

If Customer is required by law to deduct or withhold Tax, Customer will increase the amount it pays to Siemens so that Siemens still receives the amount originally invoiced. Customer will promptly provide all tax receipts confirming it has paid Tax or has withheld Tax.

2.3 Price escalation

2.3.1 Price escalation for metal surcharges

To account for fluctuations commodity prices (silver, copper, aluminum, lead, gold, dysprosium and/or neodymium), surcharges will apply to Offerings containing these metals. Surcharges are calculated daily using the Offering's Metal Factor, which defines the applicable commodity and pricing methods. . Details are provided in the exhibit "Metal surcharges "[3]. The surcharges calculated by using these pricing methods will be added to the Offering's price.

If applicable, the Metal Factor is shown with the Offering's price information or listed on SiePortal (https://sieportal.siemens.com).

2.3.2 General price escalation

If, between ordering and delivery, there are any new or modified taxes, duties, tariffs, or equivalent measures that are directly or indirectly applicable to Siemens' offering, including any hardware, software, or service components contained therein, or a price increase of more than 20% for relevant commodities (e.g. electronic components, semiconductors) applies, Siemens reserves the right to adjust the price accordingly.

2.4 Price Changes

Prices stated in the SiePortal or in Siemens' catalogs are subject to change without prior notice.

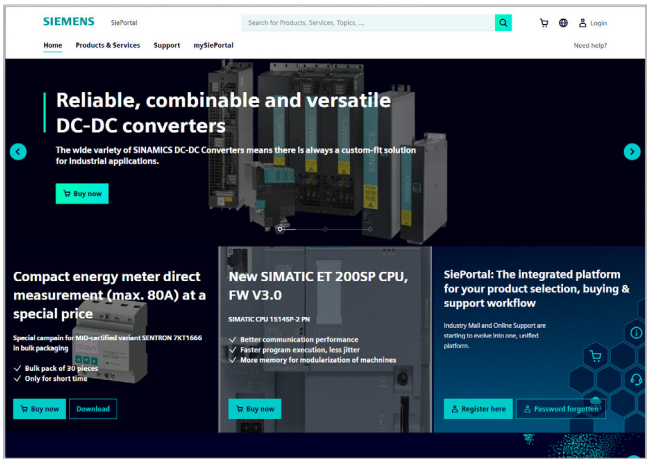
3. Units of measurement and weight

The dimensions and weight of all Offerings are given in meters and kilograms. If the dimensions or weight of the Offerings are specified in other units of measurement, such as inches or pounds, this indicates that these Offerings are intended for export.

[1] Download under www.siemens.com/sts-base-terms-deu
[2] Download under www.siemens.com/sts-st-deu
[3] Download under this link

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Easy product selection and ordering with SiePortal

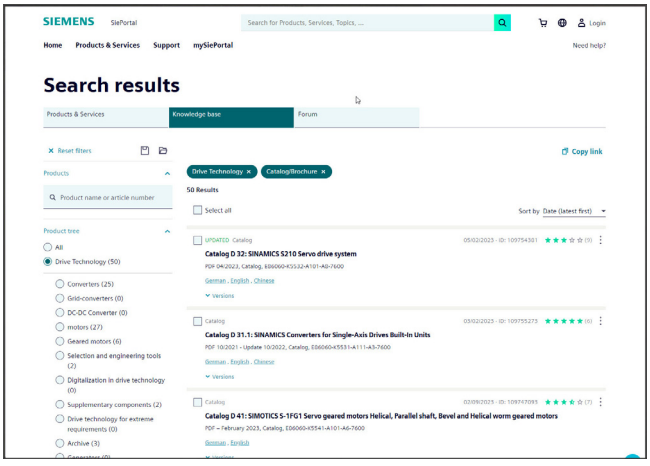
SiePortal > Products & Services

The internet ordering platform of Siemens AG is located in SiePortal. It provides you with online access to a comprehensive product spectrum that is presented in an informative, well-organized way.

Powerful search functions help you select the required products, while configurators enable you to configure complex product and system components quickly and easily. CAx data are also available for you to use.

Data transfer allows the entire procedure, from selection through ordering to tracking and tracing, to be carried out online. Availability checks, individual customer discounting, and quotation preparation are also possible.

https://sieportal.siemens.com



Downloading catalogs

SiePortal > Support > Knowledge base

You can download catalogs and brochures in PDF format from Siemens Industry Online Support without having to register.

The filter box makes it possible to perform targeted searches.

https://sieportal.siemens.com

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Cybersecurity information

Siemens provides products and solutions with industrial cybersecurity functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial cybersecurity concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial cybersecurity measures that may be implemented, please visit **www.siemens.com/cybersecurity-industry**

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Cybersecurity RSS Feed under **www.siemens.com/cert**

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SINAMICS G200 standard converters::
www.siemens.com/sinamics-g200

SIMOTICS motors for industry:
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