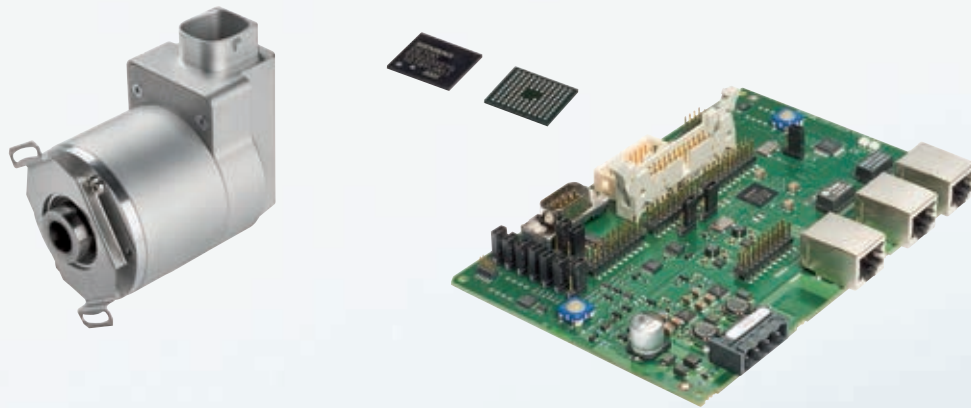


SIEMENS



DRIVE-CLiQ

The open encoder interface for the SINAMICS drives family

siemens.com/sinamics/drive-cliq

Brochure

Edition
July
2014

Answers for industry.

SINAMICS S120

The universal drive system

SINAMICS S120 – The universal drive system
for Motion Control applications

Within the SINAMICS drive family, SINAMICS S120 is the drive system of Siemens AG for Motion Control applications in machine and plant construction.

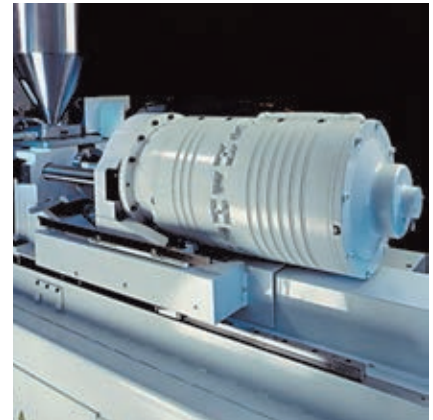
Due to its broad output range, its performance and dynamics, its ability to drive synchronous as well as asynchronous motors in the different control modes, not to mention the facility for combining the different versions and components, SINAMICS S120 has become the leading drive system for Motion Control applications worldwide.

SINAMICS S120 is being used in a wide range of different types of machines and plants, e.g. in:

- Machine tools
- Packaging machines
- Printing machines
- Paper, foil production machines (converting applications)
- Plastics processing machines
- Metal forming technology
- Machines for manufacturing and processing wood, glass, ceramics and stone
- Textile machines
- Handling units

A core component of the SINAMICS S120 drive system and further drives of the SINAMICS family is the DRIVE-CLiQ system interface.

This innovative, high-performance interface supports simple data communication among the converter components, as well as IT integration of motors and direct rotary and linear encoder systems in the drive system. DRIVE-CLiQ is an open interface and supports the connection of encoders and measuring systems from any manufacturer.



Ceramics industry









Packaging industry



Machine tool

SINAMICS S120 – Formats for Virtually Any Application

Modular drive system for demanding single-axis and multi-axis applications

Devices for single-axis applications		Devices for multi-axis applications			
Blocksize	Chassis	Booksize Compact	Booksize	Chassis	Cabinet Modules
					
0.12 – 90 kW	110 – 250 kW	0.9 – 9.7 kW	1.6 – 107 kW	75 – 5700 kW	1.6 – 4500 kW

SINAMICS S120 highlights

- Modular, high-performance drive system for Motion Control applications with innovative, future-oriented system architecture
- Established in many sectors worldwide in machines and plants of all types
 - For production machines and cranes in combination with the Motion Control system SIMOTION or the industrial automation system SIMATIC
 - Machine tools in combination with the SINUMERIK computerized numerical control
- Support for synchronous and asynchronous motors
- Broad performance spectrum from 0.12 to 5700 kW
- Drive-integrated functions, such as positioning functions
- Integrated safety functions
- Different drive variants for single-axis and multi-axis applications
- Drive variants can be freely combined



Handling application



Crane application



Glass industry

DRIVE-CLiQ

The innovative encoder interface

DRIVE-CLiQ – The innovative system interface of the SINAMICS drive system

In the SINAMICS S120 drive system, the system components required for an application solution are connected together through the high-performance interface DRIVE-CLiQ to form a drive network.

Optimum performance

With a transmission rate of 100 Mbits/s DRIVE-CLiQ has the performance required for even the most demanding closed-loop control tasks.

Auto-configuring with electronic rating plate

With DRIVE-CLiQ, the drive system can be configured automatically during commissioning. By reading the specific data from the electronic rating plates of the drive components, error-free parameterization of the drive configuration and rapid commissioning are assured.

Fast diagnostics in the event of a fault

Status alarms can be transferred via DRIVE-CLiQ to the drive components for evaluation in a higher-level controller. This supports fast diagnostics.

Open encoder interface

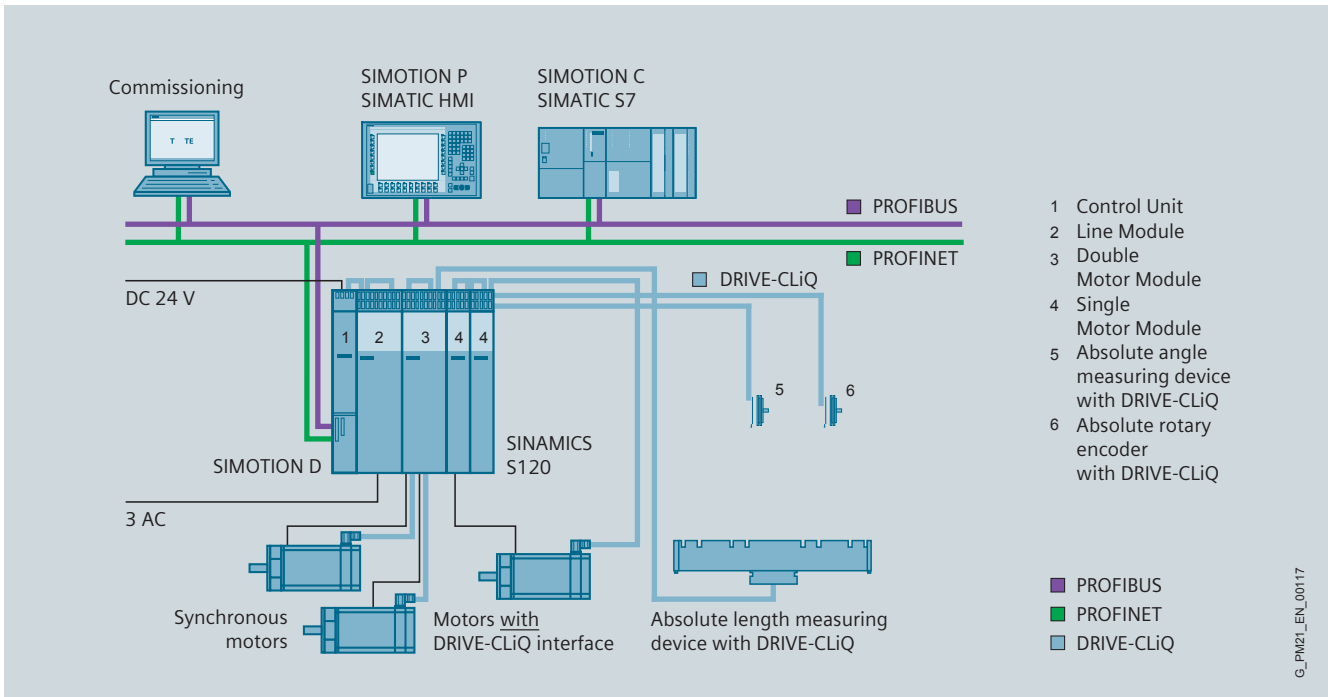
DRIVE-CLiQ is an open encoder interface. This enables users to select the measuring system that is perfectly tailored to their application. Encoders that use new measuring techniques (such as magnetic/inductive systems, magnetostrictive sensors, lasers) can also be connected through DRIVE-CLiQ. This means that measuring systems can be integrated into the SINAMICS drive system that are tailored to the application in terms of price and function.

The DRIVE-CLiQ interface is hub-capable

Only one data cable needs to be taken to the control cabinet from a hub positioned at shaft level to which the data cables of up to five measuring systems can be connected – a considerable advantage particularly for cable carriers. This cuts down not only on cable material, but above all reduces installation time and simplifies the entire cabling of machine modules prior to their installation in the machine or plant.



Encoder with DRIVE-CLiQ interface



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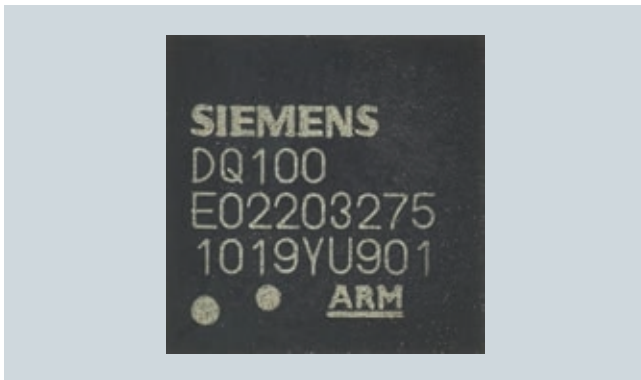
Configuration diagram for SINAMICS S120 Booksize network with SIMOTION/SIMATIC

DRIVE-CLiQ highlights

- Powerful system interface for the SINAMICS drive system
- Connection of devices from various manufacturers
- Integrated safety functions are supported (SINAMICS Safety Integrated)
- Automatic configuration through electronic rating plates
- Easy, uniform cabling for all encoder types
- Compact connection technology in cable carrier
- Low configuration overhead
- Quick and easy diagnosis of the measuring system

DRIVE-CLiQ Encoder Interface

Quick and easy integration



Interface ASIC, DQ100

DRIVE-CLiQ for manufacturers of measuring systems

Encoder manufacturers have the option of offering linear or rotary encoders with DRIVE-CLiQ interface. For implementing DRIVE-CLiQ, Siemens supports you with:

- Interface ASIC DQ100
- Development Kit for development and testing
- Driver software and documentation

DRIVE-CLiQ ASIC DQ100

The interface ASIC DQ100 contains the DRIVE-CLiQ functionality. Through integration in the encoder electronics, the encoder has direct access to the DRIVE-CLiQ system interface. The circuits can be ordered in batch sizes of 60, 240 and 1200 items.

DRIVE-CLiQ Development Kit

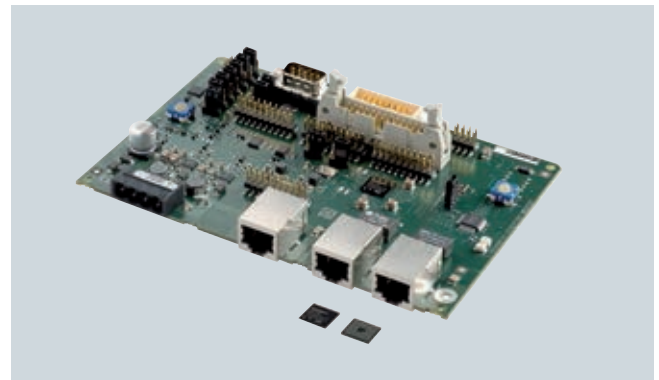
The DRIVE-CLiQ Development Kit is used to develop DRIVE-CLiQ components. It comprises a DQ100 evaluation board, driver software, an FPGA board emulating an encoder and documentation.

Main features of the DQ100 Evaluation Board

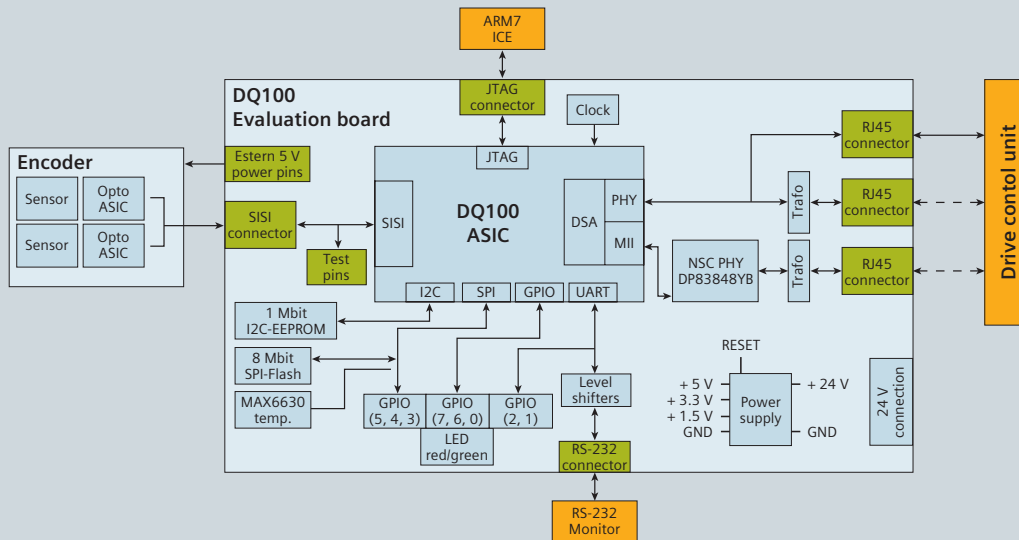
DRIVE-CLiQ interface software can be developed before completion of the target hardware using the DQ100 Evaluation Board.

Support and certification

Siemens Support Center supports encoder manufacturers - with integration of the DRIVE-CLiQ encoder interface and will perform certification of the DRIVE-CLiQ measuring system.



Evaluation Board



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DQ100 Evaluation Board

Basic Functional Components
DQ100 ASIC
ARM 7 [™] based system (internal RAM and ROM)
50 MHz clock
Housing 113-Pin Plastic FBGA (10 mm x 10 mm)
Power Supply 3.3 V; 1.5 V
Basic function:
– Process encoder data
– Conversion of encoder data to the DRIVE-CLiQ protocol
Supported types of encoders:
– Absolute rotary encoders both singleturn and multiturn
– Absolute linear encoders
i2C Memory
1 Mbit (8 x 128 kBit) EEPROM for configuration data, electronic name-plate and application code
Clock frequencies of 385 kHz and 100 kHz supported
DRIVE-CLiQ interface
Available electrical connectors RJ45 and M12
The DQ100 Evaluation Board contains 3 variations of DQ interface (reflected via jumpers and/or 0-ohm-resistors)
– Internal PHY
– Internal PHY with external transformer
– External PHY (DP83848YB) with external transformer
Use of transformer for internal PHY can be configured via resistors
Possibility of supplying power to the board via DQ cable from drive control unit (24 V DC)
UART (Universal Asynchronous Receiver Transmitter)
RS-232 interface with DB9M connector
Connection via null modem cable to external PC
Used for diagnostic and service purposes with DQ100 monitor commands
SPI (Serial Peripheral Interface, optional)
DQ100 Evaluation Board supports connection e. g. of temperatur sensors or flash memories
Power Supply
Power supply can be realized by 2 possibilities:
– External 24V power supply (e. g. SITOP) or via DRIVE-CLiQ cable from drive control unit
The test board can supply 5 V nominal voltage for encoder purposes.

* Processor kernel of DQ100

There's more to it

www.siemens.com/ids

Discover in detail how
Integrated Drive Systems
boost your competitive
edge and improve
your time to profit.

Integrated
Drive Systems
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mobile site!



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