

SD6 Drive Controller



Maximum dynamics and
precision for CODESYS
controlled axes



Ready for anything with 32-bit Dual-Core processor



Precise precision control of servo axes with EnDat® 2.2 encoders

With the speed feedback via EnDat® 2.2 encoders, 33 million positions per revolution can be determined.

The 32-bit Dual-Core processor on the SD6 drive controller processes the encoder data with maximum accuracy and speed. With its high computing capacity, the SD6 drive controller can also be used with future encoder systems with higher resolution.

A 32-bit format is available for the reference value/actual value interface. So positions can be represented with high precision and a large position range.

SPEED | FLEXIBILITY | DESIGN

Specially for motion control solutions

The 32-bit Dual-Core control performance gives a new dimension to motion precision and smoothness

Position, speed and torque control of the servo axes are calculated at a cycle time of 62.5 μ s (16 kHz).

This allows extremely high dynamics and precision of the drives due to very short settling times for fast reference values and load changes.

The new SD6 drive controller offers the possibility of a significant and impressive increase in precision and productivity in automation engineering and tooling machines despite the ever-increasing complexity of the functions.

With the high performance SD6 drive controller, the constant customer demands for faster cycle times and an increase in output can be convincingly and reliably met.

The new STOBER 6th generation device

The completely redesigned STOBER 6th generation device starts with the SD6 drive controller and MC6 motion controller.

Based on a combination of the two devices, the drive controller is operated in Controller Based Mode (CBM).

EtherCAT[®] and CANopen[®] device communication

The STOBER CBM application is based on the internationally standardized device profile CiA 402 for electric drives and motion control.

The SD6 drive is controlled by the CiA 402 compliant control words, status words, reference values and actual values.

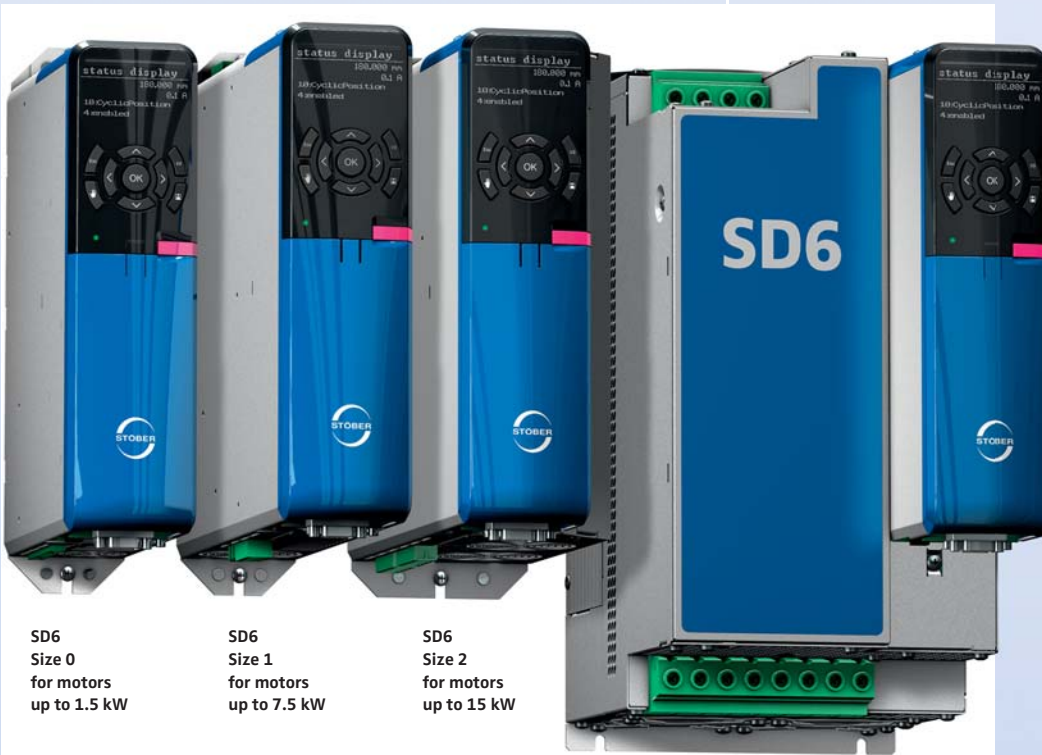
The SD6 drive controller operating modes

- **Interpolated position mode (CANopen[®])**
Cyclic position input by the motion controller – the drive follows in position control
- **Cyclic synchronous position mode (EtherCAT[®])**
Cyclic position input by the motion controller – the drive follows in position control
- **Cyclic synchronous velocity mode (EtherCAT[®])**
Cyclic speed input by the motion controller – the drive follows in speed control
- **Cyclic synchronous torque mode (EtherCAT[®])**
Cyclic torque input by the motion controller – the drive follows in torque control
- **Type/STOBER specific mode**
Control-independent travel of the drive – e.g. for set up functions and emergency mode
- **Homing mode**
Control-independent referencing by the drive – the drive calculates the necessary travel profiles independently



6th generation device

For drive axes from 0.37 to 50 kW



SD6
Size 0
for motors
up to 1.5 kW

SD6
Size 1
for motors
up to 7.5 kW

SD6
Size 2
for motors
up to 15 kW

SD6
Size 3
for motors
up to 50 kW

New look design

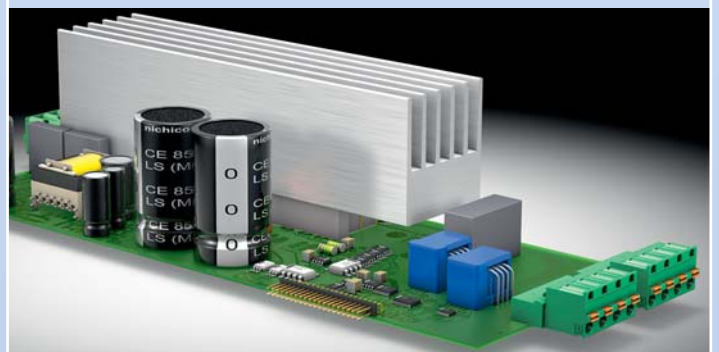
The dark front glazing with the multiline text and graphic display, operation by control pad and the striking Softline housing are features of the quality design of the new SD6 series.

EMC protection

The sheet steel housing design is part of the STOBER EMC strategy to shield against electromagnetic interference. This construction increases RFI immunity and reduces emitted interference.

Cabinet installation

With a housing depth of 194 mm respectively 284 mm, sizes 0, 1 and 2 are also suitable for installation in compact cabinets 300 mm deep.



G6 power board

Modular flexibility and options

The SD6 drive controller stands out for its proven board architecture and its universal options.

So every single system axis in the configuration can have the best design.

A control for a 24V holding brake is integrated ($\leq 2.5\text{ A}$)

A non-wearing, fully electronic interface is provided as standard for the *Safe Torque Off (STO)* safety function (response time $< 10\text{ ms}$).

A technically innovative solution allows the STO safety function to work without interruptive system tests and their documentation. In practice this means impressively increased availability.

On multi-axis applications with SD6 drive controllers, it is possible simply to loop through the STO safety function.

Functional safety data are provided for standard market calculation tools for system safety (e.g. Sistema, Pascal).

The safety relevant functions were developed jointly with Pilz GmbH & Co. KG.



Safety board connector (developed jointly with Pilz GmbH & Co. KG)



The connections for motor, DC link, braking resistor and holding brake are located on the underside of the device



The quick mains or 24V connection is made from above through plug-in terminal strips



SD6 size 0 – housing cover removed to show terminal boards Terminal board X16 (left), terminal board IO6 and RI6 in preparation



EtherCAT® connection for motion control operation



Paramodul with micro SD card for storage of all device data

Designed for multiaxis operation

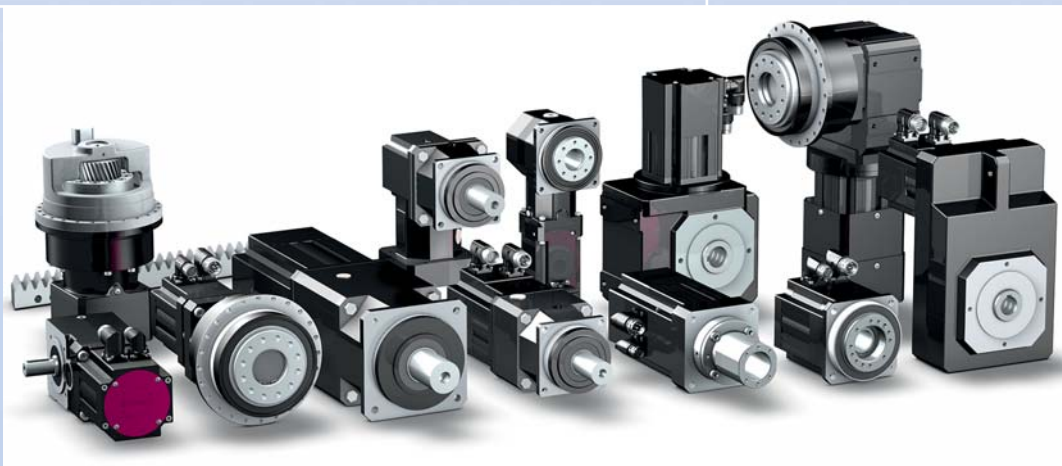


Drive controller in multiaxis operation, controlled by the STOBER MC6 motion controller via EtherCAT®

High performance – for complex motion profiles of the drive axes

In multiaxis operation every geared motor has its task and conditions. Multiaxis applications with high dynamics can only be achieved if the drive controllers are capable of guaranteeing precision and timing in all circumstances.

The high performance SD6 drive controller is ideal for these applications.



A selection of the servo drive product range from STOBER

... perfectly coordinated with synchronous servo motors from STOBER

With this extensive hardware range, virtually all requirements in machine manufacture and automation can be met.

Common DC link configuration for more energy efficiency

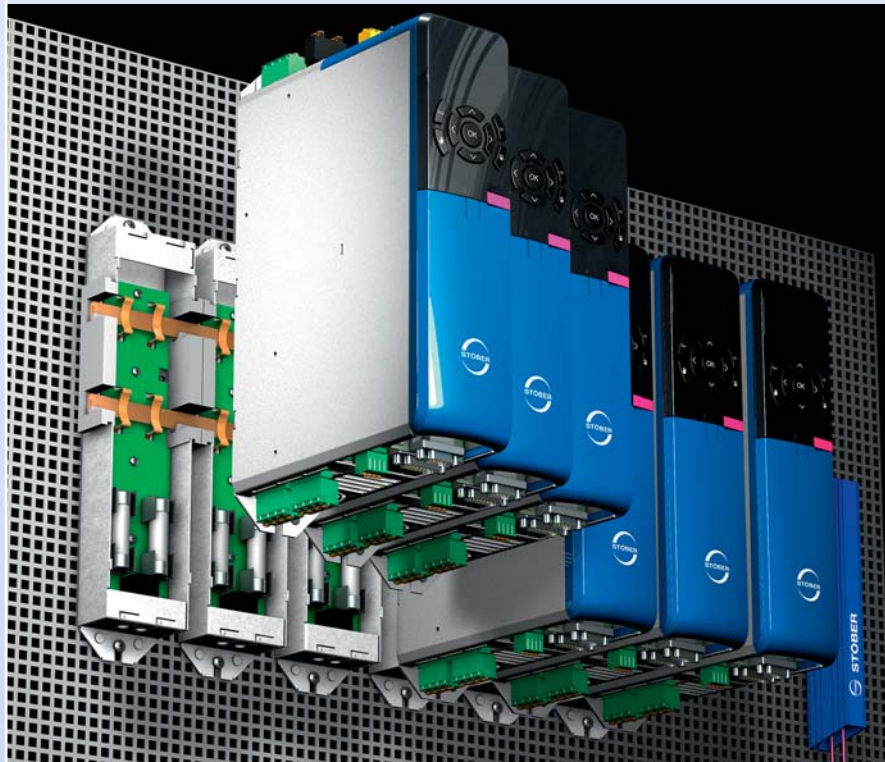
Options for energy use of a DC link connection

All the SD6 drive controller series have a DC link connection facility.

With this technology the regenerative energy from one servo drive can be absorbed and used by another motoring servo drive on the same DC link line.

Regenerative energy occurs when a load drives the motor and energy is returned to the drive controller.

If operating conditions change frequently or regularly from motoring to regenerative mode, it can make sense to feed the surplus energy generated to one or more drive controllers or servo drives. This is done through the DC link connection referred to.



Submounted G6 DC link with concealed busbar for DC link connection, with an added brake resistor

Quick DC Link

The *Quick DC Link* rear-mounted module was developed to offer a secure and efficient bus connection for a common DC link configuration. The contact between the SD6 drive controllers is made by standard busbars (5 x 12). They are installed without tools by quick-fix clamps. The *Quick DC Link* modules come with an integral fuse.

Safe and reliable through motion control

Typical uses can be found in winding technology, storage and retrieval units, conveyor and handling systems and installations with vertical axes.

A common DC link configuration can also be a consideration if several drives with braking resistors are used or planned in an installation.

For optimized use of the 'self-generated' energy, it is necessary to coordinate the drive sequences and motion profiles and control them via the MC6 motion controller.

Software, solutions and user seminars

DriveControlSuite

The DriveControlSuite commissioning software version 6 has all the functions for efficient use of drive controllers in multiaxis applications.

Commissioning is made easy, for example by a multiaxis oscilloscope.

Integrated bus (IGB)

The IGB network makes real time control of a variety of communication and diagnosis concepts between several drive controllers and interfaces possible.

This interface is ideal for direct connection between PC and drive controller.

CODESYS – the software for multiaxis operation

CODESYS – from 3S-Smart Software Solutions – is a hardware independent programming software or a complete programming system for the international standard PLC languages according to IEC 61131-3.

The centralization of all the axis parameters in one program operation makes it easier to program complex multiaxis applications. Examples of these are path travel, CNC and robotic functions.

Due to its wide popularity, this software tool represents the market standard for hardware independent development systems. Many users, particularly in the automation industry, are perfectly familiar with CODESYS.

The new MC6 motion controller from STOBBER (see separate brochure) is already equipped with the new CODESYS V3 version.

Complete solutions in combination with the MC6 motion controller from STOBBER

With the development of the new MC6 motion controller and its integration in the STOBBER product portfolio, slim, user friendly engineering solutions can be offered for drive engineering systems from a single source.

Using the MC6 motion controller in combination with SD6 drive controllers makes programming easier in many cases. This also applies to complex functions with high timing and precision specifications.

Added to this is STOBBER's experience in optimum design of each individual axis.

Commissioning and program maintenance are carried out centrally on the motion controller.

Application support and tailor-made services

STOBBER offers you support and services specially matched to your requirements.

You can also make use of the STOBBER technology support for troubleshooting or optimization of an existing system.

With the design and programming of a *Tailor Made Application* by STOBBER, you are given uncompromising, optimized solutions as a complete package ready to run.

Integrated bus interface



Commissioning & parameterization

User seminars for CODESYS and DriveControlSuite

STOBER offers a multistage program of seminars which focuses mainly on application programming of the MC6 motion controller and SD6 drive controller.

The courses take place at the STOBER seminar centre but can also be held locally for specific projects.

After attending the basic and advanced courses, you will be able to utilise the potential of the MC6 motion controller to the full and carry out commissioning efficiently.

Further information can be found in the *MC6 Motion Controller* brochure and on the website www.stober.com (Services).



Additional fine-tuning of parameter settings directly on the SD6 drive controller

Flexible handling as required

For system configuration and parameterization the SD6 drive controller can be addressed directly via the DriveControlSuite device software.

And finally, the display in combination with the control pad, allows for fine-tuning of settings directly on the device.



Central commissioning of a CODESYS multiaxis application

Customer benefits and facts

High performance equipment for challenging applications

- Dual-Core RISC processor (200 MHz) with floating point unit 32-bit current, speed and position controllers 62.5 μ s
- Power stage for 250 % accelerating current
- Thermistor motor protection by PTC or KTY
- Control system with maximum EnDat[®] 2.2 encoder resolution (25 bits per turn)

Easy to use

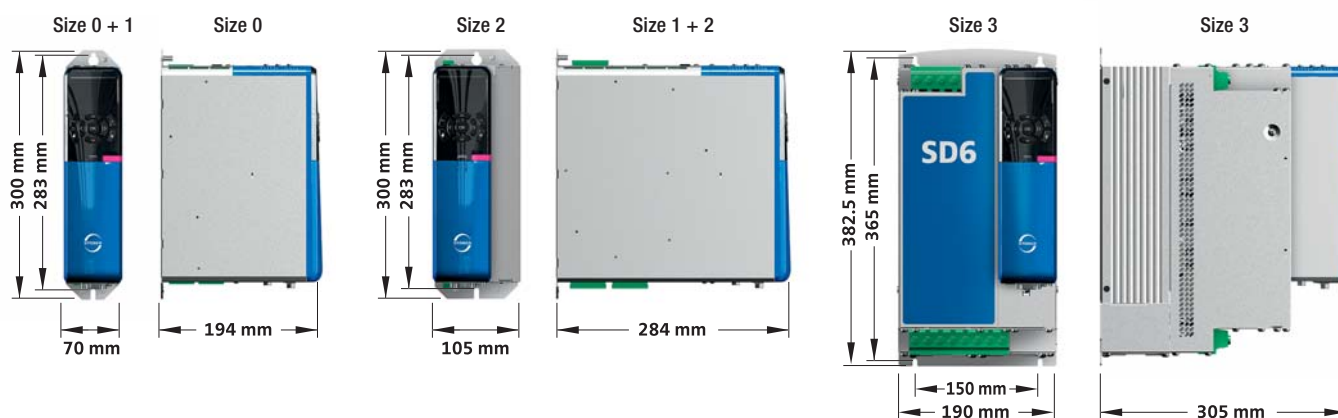
– clear added value for total cost considerations

- **Ethernet-based interface**
For programming and parameterization – and for the IGB network for communication with multi-axis systems and remote maintenance via the internet.
- **Display and keypad with new one touch save button**
Illuminated keypad and graphics compatible display (128 x 64 characters).
- **Reference value input in user units**
Guarantees easy and transparent use.
- **Live firmware update**
- **Windows software**
DriveControlSuite
- **Paramodul plug-in memory module**
With integrated microSD card (suitable for industrial use). Ideal medium for storage of additional project data and documentation. Can be used for direct processing on the PC.
- **Easy to install**
All terminals are the spring loaded plug-in type. Supply and motor cable connections are in separate places. Easily accessible EMC plate for simple shield connection of the motor cable.

Adaptable to many different drive tasks

- **Flexible control mode**
Adaptable to the operation of synchronous servo motors and to asynchronous motors in the operating modes (V/f, sensorless VC, VC).
- **Encoder interfaces**
 - Absolute encoders EnDat[®] 2.1 or 2.2 with electronic name plate and SSI
 - Incremental encoders (HTL, TTL)
 - Resolvers
- **Fieldbus modules**
 - EtherCAT[®] (EC6)
 - CANopen[®] (CA6)
 - PROFIBUS/PROFINET (under preparation)
- **I/O terminal modules**
Terminal board XI6 (IO6 and RI6 in preparation)
- **Braking resistors**
UL compliant, available as submounted modules or for separate cabinet installation.
 - Ratings from 40 W to 8000 W
 - Enclosure up to IP54

Dimensions



Safety integrated (ST6)

● Competence

Cooperation with PILZ GmbH & Co. KG, the industry leader in safety engineering.

● STO

Non-wearing electronic safety function.

The STO safety function ensures that no torque-generating energy is supplied to the motor and the drive is reliably torque-free.

This function forms the basis for many other safety functions.

- Response time < 10 ms

TÜV certified in accordance with:

- SIL3 (HF1)
According to EN 61800-5-2
- PLe (cat. 4)
According to EN ISO 13849
PLe (cat. 4)
Allows use of the SD6 drive controller in challenging safety-related applications

D link connection with Quick DC Link

More energy efficient

If the potential exists for reciprocal use of braking energy, the energy efficiency can be increased by a D link coupling.

- Simple D link connection with Quick DC Link.
- Can reduce energy consumption in multi-axis applications.
- No additional control cabinet space required due to the rear-mounted module design
- All the SD6 drive controller sizes can be interconnected via the Quick DC Link.
- Every Quick DC Link module is separately fused.

Conformity

CE compliant

All SD6 drive controllers comply with the EMC Directives and meet the criteria of the Low Voltage Directives. The units come with an effective system package as standard – including an integrated EMC filter and the high end galvanized sheet steel housing. Levels and terms are defined to IEC 1131. All SD6 drive controllers have the CE mark.

UL compliant

The UL and cUL (“Canada UL”) listed SD6 drive controllers meet the requirements of standards UL 508C and UL 840.

Technical data

Size	Type	Recommended motor power	Input voltage	Rated current I_N	Maximum current I_{max}	Switching frequency	Overvoltage limit	Braking resistor $R_{Br min}$	Braking resistor $P_{Br max}$
0	SD6 A02	0.75 kW	(L1-N) 1 x 230 V +20%/-40%, 50/60 Hz	3.0 A	7.5 A	8 kHz	440 V	100 Ohm	1.8 kW
	SD6 A04	0.75 kW	(L1-L3) 3 x 400 V, +32%/-50%, 50 Hz	1.7 A	4.2 A	8 kHz	830 V	100 Ohm	6.4 kW
	SD6 A06	1.50 kW	(L1-L3) 3 x 480 V, +10%/-58%, 60 Hz	3.4 A	8.5 A				
1	SD6 A14	4.00 kW	(L1-L3) 3 x 400 V, +32%/-50%, 50 Hz	6.0 A	15.0 A	8 kHz	830 V	47 Ohm	6.4 kW
	SD6 A16	7.50 kW	(L1-L3) 3 x 480 V, +10%/-58%, 60 Hz	10.0 A	25.0 A				13.6 kW
2	SD6 A24	11.00 kW	(L1-L3) 3 x 400 V, +32%/-50%, 50 Hz	14.0 A	35.0 A	8 kHz	830 V	22 Ohm	29.1 kW
	SD6 A26	15.00 kW	(L1-L3) 3 x 480 V, +10%/-58%, 60 Hz	20.0 A	50.0 A				
3	SD6 A34	22.00 kW	(L1-L3) 3 x 400 V, +32%/-50%, 50 Hz	30.0 A	75.0 A	8 kHz	830 V	15 Ohm	42.0 kW
	SD6 A36	37.00 kW	(L1-L3) 3 x 480 V, +10%/-58%, 60 Hz	50.0 A	125.0 A				
	SD6 A38	50.00 kW		72.0 A	160.0 A				



STOBER offers consistent solutions

As a system supplier STOBER has a complete product range for digital drive technology. The MC6 motion controller uses the CODESYS programming software to keep up with the trend towards open systems in the world of automation.

In combination with digital servo axes, STOBER solutions can be used for small or more extensive drive applications.

Note on the design of axes and drives

For optimum axis design, it makes sense to focus primarily on the gear units or geared motors. A useful aid is the design software SERVSoft®.

For an overall approach, use the specific expertise of the STOBER application consultants.

Contact and advice:
applications@stoeber.de

Service

The STOBER service system comprises 38 expert partners in Germany and more than 80 companies in the STOBER SERVICE NETWORK worldwide.

This service concept guarantees local expertise and availability when needed.

In general, the service specialists can be reached at any time via a 24/7 service hotline.

When necessary, a problem can be addressed immediately.

24/7 service hotline
+49 180 5 786323

STOBER DRIVES LTD.
CANNOCK WS12 2HA
UNITED KINGDOM
sales@stober.co.uk

STOBER DRIVES, INC.
MAYSVILLE, KY 41056
USA
sales@stober.com

STÖBER ANTRIEBSTECHNIK GmbH
4663 LAAKIRCHEN
AUSTRIA
sales@stoeber.at

STOBER CHINA
BEIJING 100004
CHINA
sales@stoeber.cn

STOBER S.a.r.l.
69300 CALUIRE ET CUIRE
FRANCE
sales@stober.fr

STÖBER TRASMISSIONI S.r.l.
20017 RHO (MI)
ITALY
sales@stober.it

STOBER Japan K. K.
TOKYO
JAPAN
sales@stober.co.jp

STOBER Singapore Pte. Ltd.
SINGAPORE 787494
SINGAPORE
sales@stober.sg

STÖBER Schweiz AG
5453 REMETSCHWIL
SWITZERLAND
sales@stoeber.ch



STÖBER ANTRIEBSTECHNIK GmbH + Co. KG

Kieselbronner Str. 12
75177 PFORZHEIM
GERMANY
Phone +49 7231 582-0
Fax +49 7231 582-1000
sales@stoeber.de
www.stoeber.de

