



# Digital Servo amplifier S700



*Helping you build a better machine, faster.*

# Safety First!

The challenges faced by today's mechanical and process engineers include an increasing demand for a broader range of products and services, higher productivity, as well as increased supply availability and reliability. With its new S700 servo amplifier, Danaher Motion is now able to offer a product that is definitely up to these challenges. The S700, which is based on the SERVOSTAR 300 architecture and features the same kind of processor, is a fully digital servo amplifier that is ideal for complex drive tasks. You also have the option of using an MMC memory card, which enables parameter records and firmware to be backed up and copied extremely quickly and easily in the field.

In light of the fact that a growing number of engineers are moving towards Ethernet based communications such as EtherCAT and SynqNet, Danaher Motion has geared the S700 to the future by integrated an Ethernet connection into the new drive. The S700's onboard interface means that customers no longer have to rely on additional expansion cards for this kind of compatibility.

The S700 integrates a Safe Torque Off function. A digital input disables the amplifier's power output stage, thereby implementing the Safe Torque Off function (safe stop). Advanced safety functions such as "Safely Limited Speed" and "Safe Stop 2" are implemented by means of a safety expansion card.



## The advantages for you

### • Increased productivity

- High-speed current, speed and position control results in higher machine cycle rates
- Safety functions to IEC 61800 increase machine availability

### • Fewer types need to be stocked

- Multi-interface facilitates connection to all standard controllers
- Multi-feedback feature compatible with all common feedback systems

### • Smaller switchgear cabinets

- Soft PLC and motion control on board
- Integrated power supply and brake resistor

### • Faster startup

- MMC memory card for parameter & firmware updates
- All connections via connectors
- Autotuning

### • Lower system costs

- Ethernet on board means real time fieldbusses like EtherCat without additional hardware
- Soft PLC and motion control on board
- A single device for all application variants
- Flexible interfaces make configuration easy

## Applications

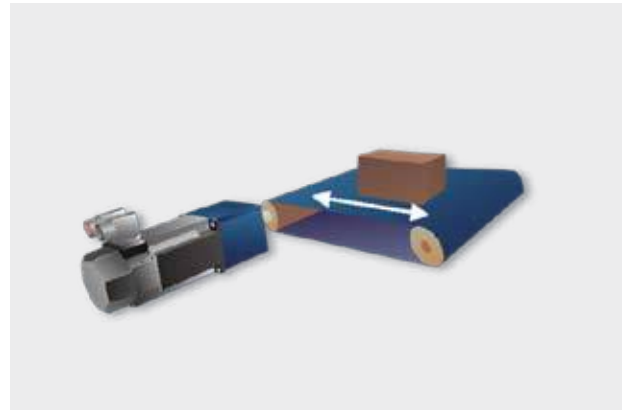
With its new S700 servo amplifier, Danaher Motion is able to meet the user demand for a high level of safety, flexible integration and faster throughput times.

Within this context, the versatile communication strategy, user-friendly interface and machine safety concepts all have an important part to play. The optimized control

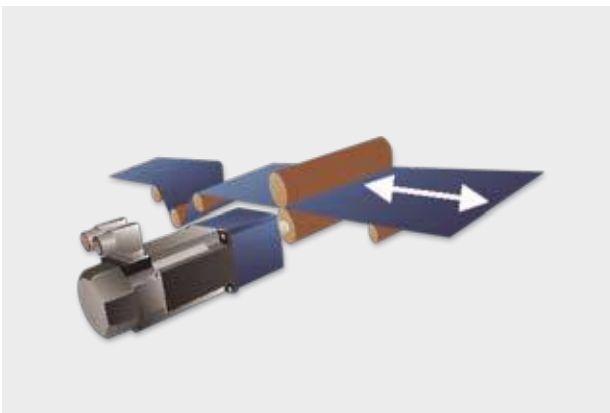
response results in improved performance and dynamics. The S700 is the perfect choice for an extremely wide range of automation environments including, for example, semiconductor production, packaging industry, medical engineering, woodworking, and plastics processing applications.



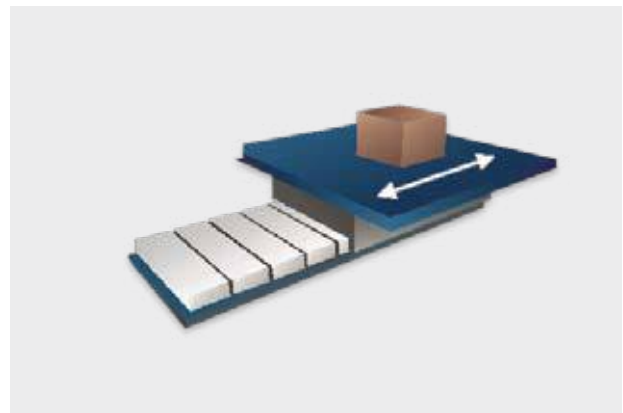
Belt drive



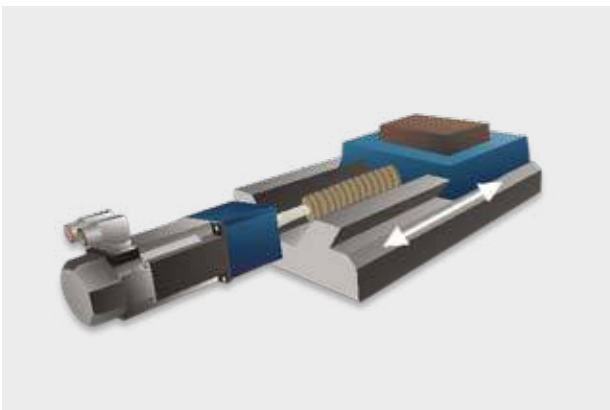
Conveyor belt



Endless conveyor



Direct drive: linear



Spindle drive



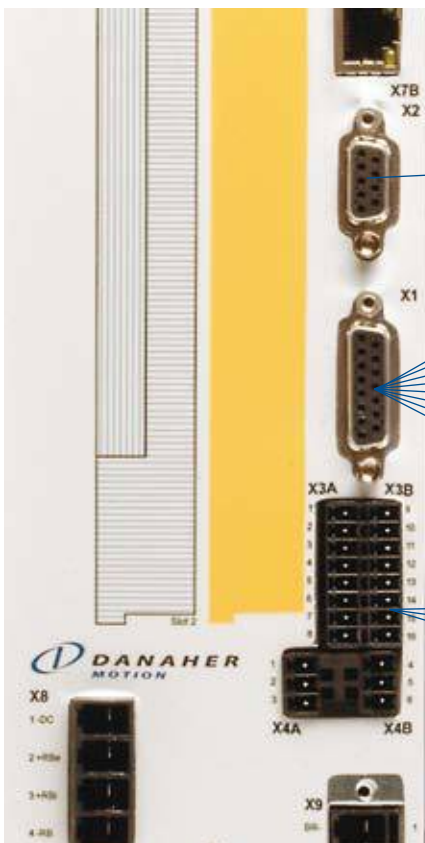
Disk

# Technical Data

Rated data	DIM	S701	S703	S706	S712	S724
Rated line voltage	V~	3 x 208 V <sub>-10%</sub> ... 3 x 480 V <sub>+10%</sub> , 50/60 Hz				
Rated line power for S1 operation	kVA	1.1	2.2	4.5	9	18
Auxiliary supply	V=	24				
Rated DC-link voltage	V=	290-675				
Rated output current (rms value)						
- At 3 x 208 V	Arms	2.5	5	6	12	24
- At 3 x 230 V	Arms	2	4	6	12	24
- At 3 x 400 V	Arms	1.5	3	6	12	24
- At 3 x 480 V	Arms	1.5	3	6	12	24
Peak output current (rms value)	Arms	4.5	9	18	24	48
<b>Dimensions</b>						
Height	mm	345				348
Width	mm	70				100
Depth	mm	243				243

## Multi-feedback

The S700 can read data from a wide range of feedback systems and evaluate up to three of them in parallel. This feature ensures a high level of flexibility where integration of the S700 into different applications is concerned. Control without a feedback system is also supported, e.g. in the case of asynchronous motors.



- 2 to 36-pin resolvers
- SinCos encoder with BISS
- SinCos encoder with ENDAT 2.1
- SinCos encoder with HIPERFACE
- SinCos encoder without data track
- SinCos encoder + Hall-effect sensor
- Hall-effect sensor
- Incremental encoder (AquadB) 5 V
- Incremental encoder (AquadB) 5 V + Hall-effect sensor
- Incremental encoder (AquadB) 24 V
- Incremental encoder (AquadB) 24 V + Hall-effect sensor
- Pulse/direction 24 V

**Optional**  
 SSI absolute encoder  
 Pulse/direction 5 V

## Multi-interface

The S700 really stands out on account of the high level of flexibility that it offers when integrated into network environments. Virtually all of the most popular fieldbus connections can be accommodated, thereby enabling the servo amplifier to communicate with any standard controller.

### Standard

#### RS232

- Standard interface that enables connection to a PC for startup and optimization purposes



- CAN standard ISO 11898 (high-speed communication)
- Max. transmission speed of 1 Mbit/s
- Supports CANopen standards DS301, DSP402

#### Ethernet:



- The firmware can be selected to set the EtherCat protocol for the Ethernet interface

#### SynQNet

- The firmware can be selected to set the in-house SynQNet system bus for the Ethernet interface

### Optional



- SERCOS standard to IEC 61491
- Noise-resistant optical fiber
- Choice of baud rate settings: 2, 4, 8 and 16 Mbaud



- PROFIBUS DP to EN 50170
- Baud rates from 187.5 kbaud to 12 Mbaud
- Support for the PROFIDRIVE drive profile

#### DeviceNet™

- CAN standard ISO 11898 (high-speed comm.)
- Max. transmission speed of 500 kbit/s

#### I/O expansion

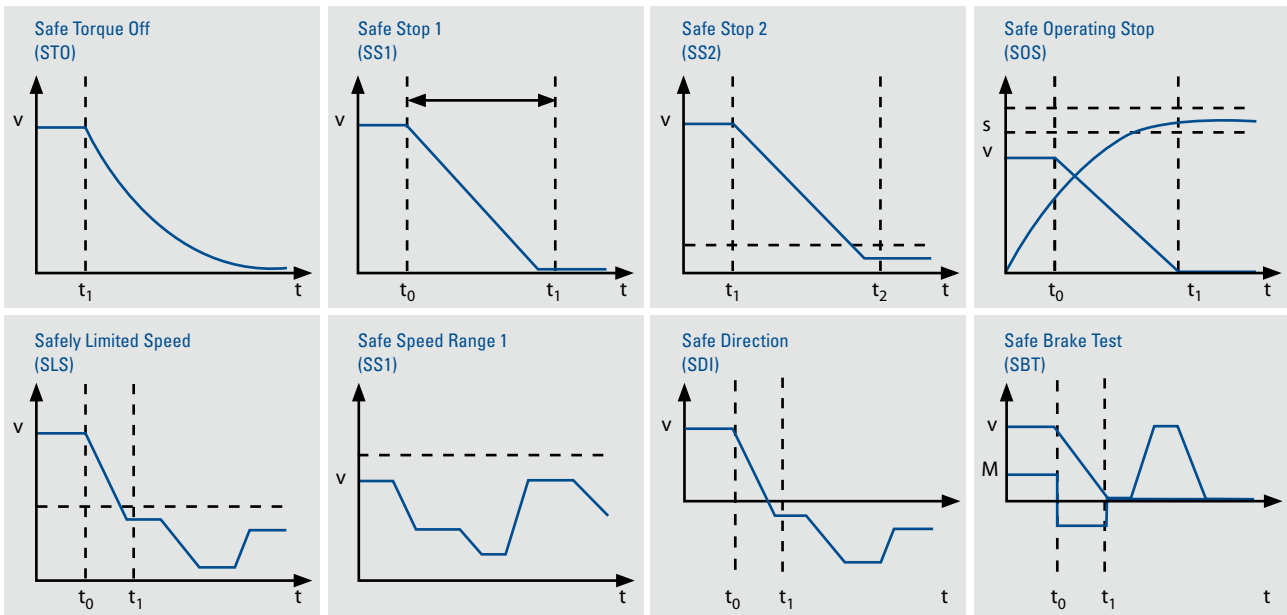
- In the case of straightforward automation tasks, the I/O expansion card provides an extremely cost-effective way of implementing servo motor positioning control
- 14 additional digital inputs enable selection and launch of the motion tasks stored in the S700's process block memory
- 8 digital outputs communicate the drive status to the higher-level control system



# Safety

Safe Torque Off (STO) is integrated as standard. The drive for ever-greater productivity means that safe intervention has to be ensured even when the motor remains switched on (in order to hold a load or slow down machinery, for example). That is why the S700 has been equipped with a

slot for a safety expansion card, which supports advanced safety functions, such as Safely Limited Speed and Safe Stop 2.



# Autotuning

The Autotuning function is split into 3 levels in the startup software, depending upon the extent of manual intervention required. At the highest automation level, all relevant control parameters and filters are calculated automatically. The entire process is performed under load with the built-in motor. Undesirable characteristics of the

system mechanics are detected and corrected by means of strategic filtering and feed forward.

From the point of view of dynamics, rigidity and smooth operation, experience has shown that this approach produces results that are approximately 20% better than with any other optimization method.

# Cogging torque suppression

The servo motors produced by many manufacturers manifest a noticeably high cogging torque as a result of how the permanent magnets are arranged. The S700 offers a function for suppressing cogging torque within defined traverse distances. This function has been specifically

designed for applications with the toughest synchronism requirements. Even linear motors can be operated at extremely low speeds with a high degree of synchronous accuracy.



## Soft PLC and Motion Control

Danaher Motion Suite (DMS) is a fully integrated system platform, which you can use to execute the key drive system functions directly on the S700: PLC and motion control. The soft PLC meets the requirements of IEC 61131-3 and supports all 5 languages (SFC, FBD, LD, ST, and IL). The motion controller's graphical programming language is highly intuitive. There are numerous libraries containing

IEC 61131-3 function blocks. DMS enables you to create a complete machine model at lightning speed. Complete drive solutions such as synchronized multi-axis systems can be programmed and set up quickly.

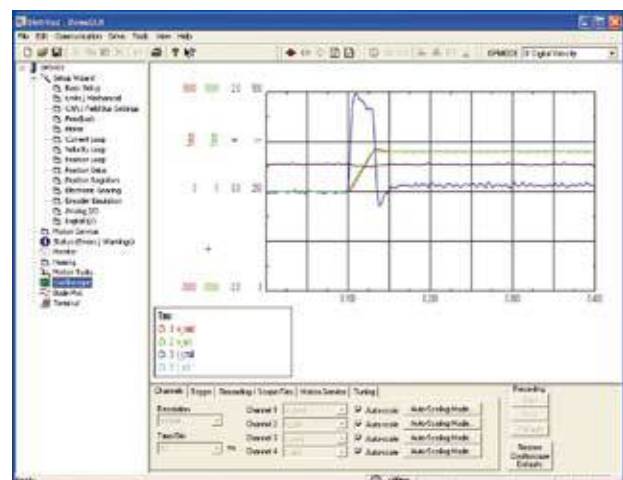


For additional information, please request a copy of the Danaher Motion Suite flyer.

## DriveGUI setup software

To facilitate initial setup of the S700, we provide graphics-based Windows® software that offers access to all S700 parameters and functions.

All S700 interfaces can be configured, any connected devices (e.g. motor type, feedback system, fieldbus) can be selected and the Autotuning functions can be launched. A four-channel oscilloscope and Bode plot ensure optimum display of the Autotuning results. Specialists are able to address all existing parameters via an integrated terminal window. Thanks to the Bode plot function, resonant frequencies of the machinery can be suppressed. This makes for quieter operation and optimizes the production process.



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