SERVO**STAR**® S300

Quickstart Guide

Version 09.2011
Valid for hardware revision 04.00

Keep all manuals as a
product component during
the life span of the product.
Pass all manuals to future
users/owners of the product.

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Preparation

The CD-ROM delivered with the servo amplifier contains all the manuals in PDF format and the setup software. Insert the CD-ROM into your PC.

Autostart function activated: A window with the start screen opens.

Autostart function deactivated: Click START (task bar), then on Run. Enter x:\index.htm or x:\autorun.exe (x = CD drive letter). Click OK. The start screen opens.

Documents

You need Acrobat Reader to read the PDFs (installation link on every screen).

European CD-ROM: Select the language version on the start screen of the CD-ROM. Click "Servo Amplifiers" in the column "Technical Manuals". A table with links to all manuals appears.

North American CD-ROM: Click on any manual title automatically brings up the document.

You need access to these documents (located on the product CD-ROM, you can download the latest editions from our website):

● Instructions Manual (Assembly, Installation, Setup)
● CANopen communication profile
● Accessories manual

Depending on the installed expansion card, you need one of these documents:
● PROFIBUS DP communication profile
● DeviceNet communication profile
● SERCOS communication profile
● EtherCAT communication profile

UL Markings

This servo amplifier is listed under UL file number **E217428**.

● Use 60°C / 75°C copper wire only.
● Use Class 1 wire only or equivalent.
● Tightening torque for field wiring terminals:

Connector	Tightening torque
X0, X8, X9	0,5 to 0,6 Nm
Grounding bolt	3,5 Nm

● Use in a pollution degree 2 environment only.
● Suitable for use on a circuit capable of delivering not more than 42kA rms symmetrical amperes for a maximum voltage of 480 V.

Install Setup Software

European CD-ROM: On the start screen you find a link to the setup software:
> ***Install Setup Software S300/S700 Release _.__ Build __***
> Click it and follow the instructions from here.

North American CD-ROM: Click the product name, then select ***Install Software***
> from the next screen. Follow the instructions from here.

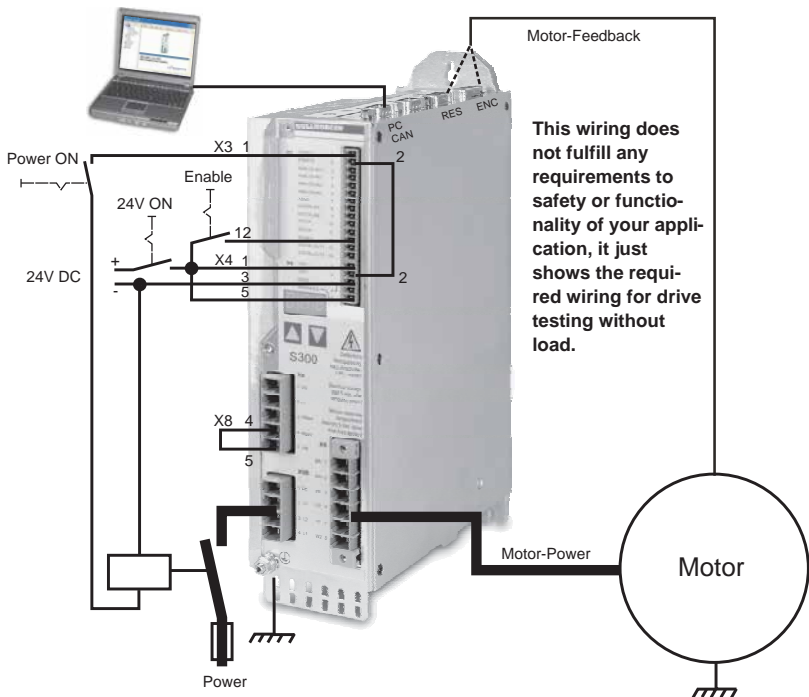**Mechanical and Electrical Installation of the Servo Amplifier**

1. Unpack servo amplifier and accessories
2. Keep the Instructions Manual ready (print if necessary), check HW-Revision
3. **Observe safety instructions in the manuals**
4. Mount the servo amplifier as described in the Instructions Manual
5. Wire the servo amplifier as described in the Instructions Manual or apply the minimum wiring for drive test (see page 5).

The servo amplifiers must **only** be operated in a closed control cabinet, taking into account the ambient conditions defined in the Instructions Manual. Ventilation or cooling may be necessary to keep the temperature within the cabinet below 40°C.

Servo amplifiers in the S300 series (overvoltage category III acc. to EN 61800-5-1) can be supplied from 3-phase grounded (earthed) industrial supply networks (TN-system, TT-system with grounded neutral point, no more than 42kA symmetrical rated current at $110_{-10\%}...230V^{+10\%}$ or $208_{-10\%}...480V^{+10\%}$ depending on the amplifier type).

Periodic overvoltage between phases (L1, L2, L3) and the housing of the servo amplifier must not exceed 1000V crest. In accordance with IEC 61800, voltage spikes (< 50µs) between phases must not exceed 1000V. Voltage spikes (< 50µs) between a phase and the housing must not exceed 2000V.

Minimum Wiring for Drive Operation

Motor-Feedback

This wiring does not fulfill any requirements to safety or functionality of your application, it just shows the required wiring for drive testing without load.

Power ON

Enable

24V ON

24V DC

X3 1
2

12

X4 1
3
5

X8 4
5

Power

Motor-Power

Motor

PC CAN   RES   ENC

S300

Connect

● Connect the interface cable to a serial interface on your PC and to the serial interface X6 of the servo amplifier. USB to serial converter can be used optionally.
● Switch on the 24 V logic power supply for the servo amplifier.
● Wait about 30 seconds, until the front display of the servo amplifier displays the current rating (e.g. 🔢🔢🔢 for 3 amps). If the mains power supply voltage is switched on, too, a leading P is displayed (e.g. 🔢🔢🔢 for Power, 3 amps).

If a fault code (🔢🔢🔢) or a warning (🔢🔢🔢) or a status message ("." or "_" or "E" or "S") appears in the display, you will find the description and hints for trouble shooting in the Instructions Manual. If there is fault, fix the problem.

Double-Click the DriveGUI.exe icon on your Windows desktop to start the software.
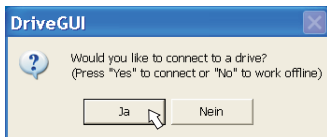
You can work offline or online with DriveGUI.exe.
Work ONLINE now.
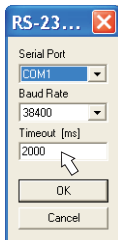
If the communication is started for the first time, you have to setup the communication parameters.
Choose the communication system and the interface, where the servo amplifier is connected to.
Click OK.

The software tries to communicate with the drive and to upload the parameters. If it's not successful, you receive this error message:

Frequent causes:
- wrong interface chosen
- wrong connector chosen at the servo amplifier
- interface is used by another software
- 24 V auxiliary voltage for the servo amplifier not working
- interface cable broken or wrong wiring

Click OK to remove the error message. The software starts in the offline mode now, that requires the manual selection of the amplifier's type. Quit this selection by closing the window.
Fix the communication problem. Restart the software in Online mode.
If communication works, you see the start screen.

Make sure, that the amplifier is disabled (Input Enable connector X3 pin 12 must be 0 V or open)!

Select "**Setup Wizard**" in the navigation frame.

Important Screen Elements

Help Function

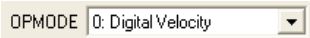The Online-Help gives detailed information to all parameters the servo amplifier can work with.

Key F1	Starts Online Help for the actual screen page.
Menu bar Help	Starts Online Help with the first page.
	Context Help. Click the help symbol first. Then click the function for which you need help.

Tool Bar

	Save to EEPROM, required if you changed parameters.

	Reset, required if you changed important configuration parameters.

	Operation Mode, use Digital Velocity mode for drive testing.

Status Bar

The status bar shows a green Online symbol, indicating that the communication works.

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Setup Wizard

The Setup Wizard leads you through the necessary steps for configuring your servo amplifier. Depending on the selected application, only the active screen pages are necessary.

For a quick setup select the setup type "Quick Motor/Drive Setup".

Start the Wizard.

Basic Setup

Mains voltage: Select the nominal mains AC voltage

Response to Loss of Input Phase: Select Single-Phase or Three-Phase operation. With three-phase operation you can select either warning "n05" or error "F19" in case of phase loss. The setting "F19" disables the output stage, "n05" is just a message.

Name: You can enter a name for the servo amplifier (up to 8 characters). This simplifies the drive identification in the system.

Set Software Enable on Bootup: Don't select this option for the quick test.

Click NEXT.

Units/Mechanical

The user units for all input fields in the setup software can be preselected here.

Position, Velocity, Acceleration

Select usable units for your application referring to the moved load.

Mechanical Conversion

The relationship between motor shaft revolution (pole pair pitch with linear motors) and motion distance of the load is specified here. Gear ratio can be calculated here as well. Detailed information can be found in the online help. Use the calculation tool based on sample applications for calculating the resolution value (press "**Calculate PGEARI/PGEARO...**" button). Select the application and enter the required values. Click "Calculate Conversion Factors..." button. Resolution is calculated now.

Click NEXT.

Motor (rotary) / Feedback - **linear motor see next page**

Simplified setting of the motor related parameters.

Feedback: Select the feedback type used in the motor.

> **Attention: Resolver is fixed to 2 pole in the Quick Motor/Drive Setup.**
>
> Change "pole n°" on feedback screen in Complete Setup later, if required.

Motor type: Click the button "**Select from Database...**". Open the database file (mdb_ _ _.csv) and select the used motor. Special motors must be defined in the "Complete Setup".

Brake: If the amplifier shall control a brake, change the Brake parameter to "With"

Calculated quick tuning: If you know the load-to-motor inertia ratio (0 is for no load), enter this number here and select the desired servo performance. If you don't know the inertia ratio, select "Do not tune". **Click FINISH.**

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Motor (linear) / Feedback **- rotary motor see previous page**

Simplified setting of the motor related parameters.

Feedback: Select the feedback system used.

Motor type: Click the button "**Select from Database...**". Open the database file (mdb_ _ _.csv) and select the used motor out of the list. Special motors must be defined in the "Complete Setup".

Encoder Lines (appears with Feedback Type Sine Encoder):
Click "Calculate" and fill in the Encoder signal period.

**Brake:** If the motor has a built-in brake, change the Brake parameter to "With"

Calculated quick tuning: If you know the load-to-motor inertia ratio (0 is for no load), enter this number here and select the desired servo performance. If you don't know the inertia ratio, select "Do not tune". **Click FINISH.**

Save Parameters and Restart

You are going to finish the Setup Wizard and you have changed several basic parameters. Depending on the parameters you changed, two possible reactions will occure now:

Configuration parameters changed

A warning appears, that you have to restart the amplifier, this is called "coldstart".
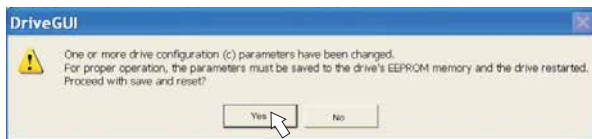
Click "YES". The parameters are saved to the amplifier's EEPROM automatically and a reset command restarts the amplifier (takes a few seconds).
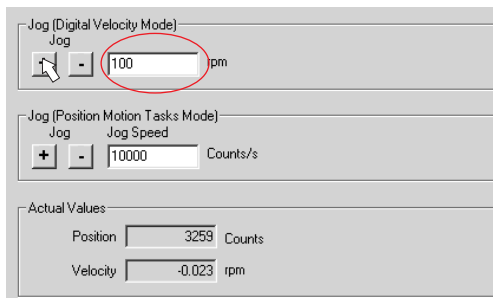
Other parameters changed

No warning appears. Save the parameters to the EEPROM of the servo amplifier manually by clicking the symbol in the tool bar. A coldstart of the amplifier is not necessary.

Select the screen "**Motion Service**" in the navigation frame.

Motion Service (Jog Mode)

Be aware that the actual position of the load permits the subsequent moving operations. The axis could move to the hardware limit-switch or the mechanical stop. Make sure that a jerk or a fast acceleration of the load cannot cause any damage.

- Switch on the power supply for the drive.
- **STO-Enable:** Apply +24 V to the input STO-Enable [X4/5]
- **Hardware-Enable:** Apply +24 V to the input Enable [X3/12]. If STO-Enable is missed or the sequence was wrong, the front display shows $\boxed{8}\boxed{5}\boxed{8}$.
- **Software-Enable:** Click the symbol EN in the tool bar. Now, the front display shows an E and the current rating (e.g. $\boxed{8}\boxed{8}\boxed{8}$ for Enable, 3amps). Click the symbol DIS to switch off the output stage (disable).

Jog (Digital Velocity Mode)	
Jog	
[cursor] -	100 rpm

Jog (Position Motion Tasks Mode)		
Jog	Jog Speed	
+ -	10000	Counts/s

Actual Values		
Position	3259	Counts
Velocity	-0.023	rpm

Jog (Digital Velocity Mode): You can move the drive with constant speed. Enter a safe speed.

Observe the "safe reduced speed" requirements for your application!

The drive moves with the preset speed when the + or – button is pressed. It stops when the button is released.

Actual errors and warnings are listed on the screen **Status**. A description of errors/warnings can be found in the online help.

Now you have setup and tested the basic functions of the drive successfully.

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