

## SERVOSTAR 400 (S400)

### Quickstart Guide

Version 12.2014



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.

## Install Setup Software

On the start screen you find a link to the setup software:

***Install Setup Software SERVOSTAR S400/S600 Release \_\_. \_\_ Build \_\_***

Click it and follow the instructions from here.

## Documents

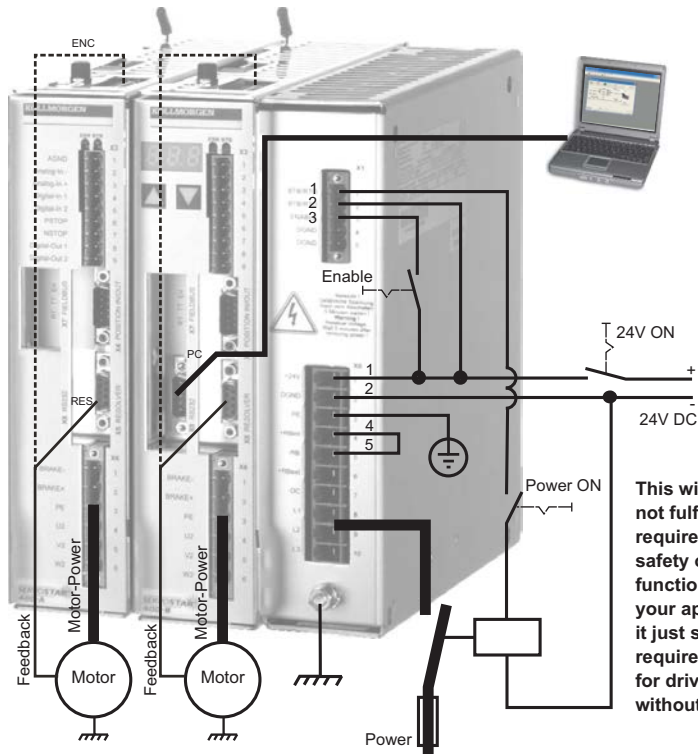
You need Acrobat Reader to read the PDFs (installation link on every screen).

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



## Mechanical and Electrical Installation of the Servo Amplifier



1. Unpack servo amplifier and accessories
2. Keep the instructions manual ready (print if necessary)
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 next page)

## Minimum Wiring for Drive Operation



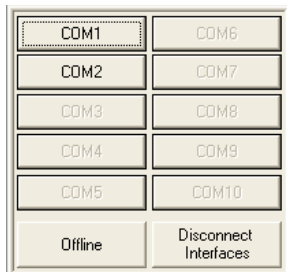
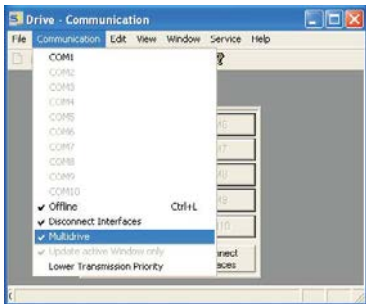
## Connect

- 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 Drive.exe icon on your Windows desktop to start the software.



"Multidrive" must be activated in the menu "Communication"!

You can work offline or online with Drive.exe. We work online now. Select the interface where the servo amplifier is connected to.

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

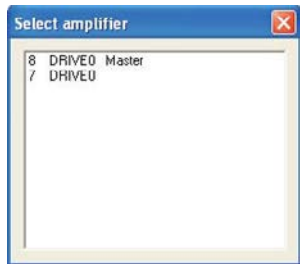


- wrong interface chosen
- wrong connector chosen at the servo amplifier
- interface is used by another software
- 24 V auxiliary voltage for the servo amplifier not working
- interface cable broken or wrong wiring

Frequent causes:

Click OK to remove the error message. Detect and remove the error source. Restart the software.

If communication works, the drive selection screen appears:



The master and axis modules, recognized in the system, with its station address and name are listed. The master module is separately characterized.

Doubleclick on the amplifier, which you want to work with.

You can select additional other axis modules later to show them in parallel at the screen and parameterize them (Multidrive function).

Now parameters are transmitted from the servoamplifier to the computer. Then you see the start screen.

**Make sure, that the amplifier is disabled (Input HW-Enable connector X1 pin 3 must be 0 V or open)!**

# 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 ? / Online HTML Help	Starts Online Help with table of contents.

## Tool Bar



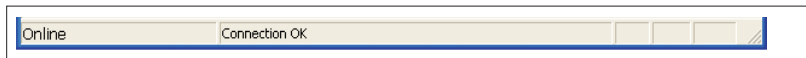
	Save to EEPROM, required if you changed parameters.
--	--

	Reset (coldstart), required if you changed important configuration parameters.
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<p>OPMODE</p> <p>0: Digital Speed</p>	Operation Mode, use Digital Velocity mode for drive testing.
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<p>SW</p> <p>Disable (F12)    Enable (Shift+F12)</p>	Disable and Enable of the amplifier's output stage via software.
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## Status Bar



## Basic Setup

On the start screen click "**Basic Setup**" button.

The screenshot shows a software configuration window titled "Basic Setup 8 / FB 8 'DRIVE0'". The window is divided into several sections:

- PC Software:** A text field containing "V5.53 KS283".
- Power Supply:**
  - Regen Resistor:** A dropdown menu set to "Internal".
  - max. Regen Power:** A text field with "80" and a unit "W".
  - max. Mains Voltage:** A text field with "230 V" and a dropdown menu.
  - Mains Phase missing:** A dropdown menu set to "No Message".
- Amplifier Hardware:** A text field containing "Drive 3A, Hardware Version 10.04".
- Firmware:** A text field containing "V5.76 DRIVE Rev create.d Jun 06 12:00:16 2003".
- Serial Number, Address, Field Bus Address, Baud Rate, CAN Bus:** A table with the following values:

Serial Number	Address	Field Bus Address	Baud Rate	CAN Bus
800203438	8	0	500 kBaud	
- Run Time, Name, Auto Enable, Ext. w/D:** A table with the following values:

Run Time	Name	Auto Enable	Ext. w/D
68:34 h	DRIVE0	On	100
- Units:**
  - Acceleration:** A dropdown menu set to "ms->VLIM / VCMD".
  - Velocity:** A dropdown menu set to "Compatibility mode".
  - Position:** A dropdown menu set to "incr.".

At the bottom of the window are three buttons: "OK", "Cancel", and "Apply". A mouse cursor is pointing at the "OK" button.

**Regen Resistor:** Change only if you use an external regen resistor. Most applications don't need an external regen resistor

**Max. Mains Voltage:** Select the nominal mains AC voltage

**Mains Phase Missing:** 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.

**Units: Acceleration, Velocity, Position**

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

**Address:** Adjust for master amplifier only (= highest address of the drive system, see instructions manual: "Setup/Multi-Axis Systems")

**Leave all other fields unchanged. Click OK.**

## Motor (synchronous)

On the start screen click "**Motor**" button.

Motor 8 / FB 8 "DRIVE0"

Motor Type: Synchronous Motor Motor Unit: rpm

$I_0$ : 1 A No. of Poles: 6

$I_0$  max: 4.5 A L: 61 mH

Max Speed (n max): 6000 rpm

Number - Name: [ ] Holding Brake: without

Current Advance [° elect.]: 0

Limit Phi [° elect.]: 20

Start Phi [rpm]: 1500

Buttons: OK, Cancel, Apply, Load Data from Disk

**Press function key F12 (Software Disable).**

**Motor Type:** Select Synchronous Motor. If you use a linear motor or an induction motor, please contact our support department.

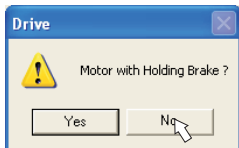
**Number-Name:** Click the list to start uploading the motor parameter table, which is stored in the servo amplifier. Search and select the connected motor. If your motor is not listed, please contact our support department.

**Leave all other fields unchanged.**

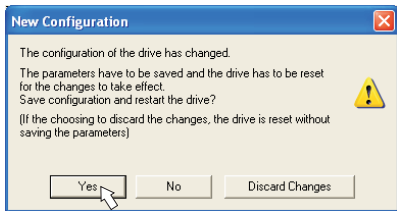
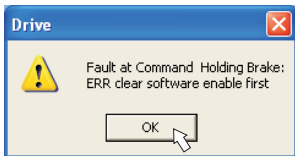
Click **OK**.



If your motor has a built-in brake, click "Yes", otherwise "No".



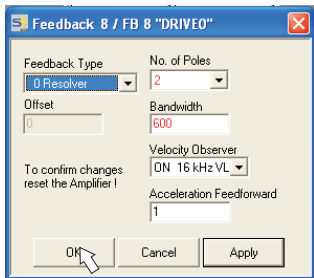
If Software Enable is active, a warning appears. You can proceed, but after the amplifier is restarted, you must check whether the holding brake configuration is correct. Click OK.



Parameters are uploaded to the amplifier's RAM now (takes some seconds). When this is done, you have to accept the changed configuration with "Yes" or to discard the changes in the appearing screen. If you click "Yes", the parameters are saved in the EEPROM and the amplifier makes a coldstart (reset). This takes some seconds.

# Feedback

On the start screen, click **"Feedback"** button.



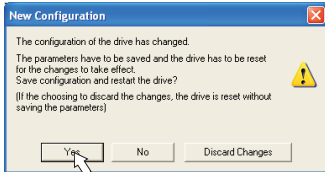
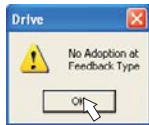
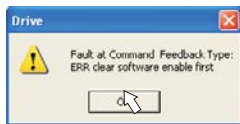
**Press F12 (disable) before changing feedback parameters.**

## Feedback Type:

Select the feedback type used.

**Leave all other fields unchanged.**

If Software Enable is active, a warning appears. The configuration change cannot be performed. Click OK on the warnings, press F12 (SW disable) and start the Feedback procedure again.



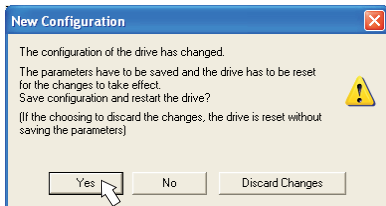
If everything was ok, the same procedure (parameter upload) that has been described for the motor selection starts.

If you click "Yes", the parameters are saved in the EEPROM and the amplifier makes a coldstart (reset). This takes some seconds.

## Save Parameters and Restart


You are going to finish setup and you have changed several basic parameters. Depending on the parameters you changed, two possible reactions can occur:

### 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). For example, this happens after motor or feedback selection.

### Other parameters changed


No warning appears. Parameters are saved in the volatile RAM only. 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.

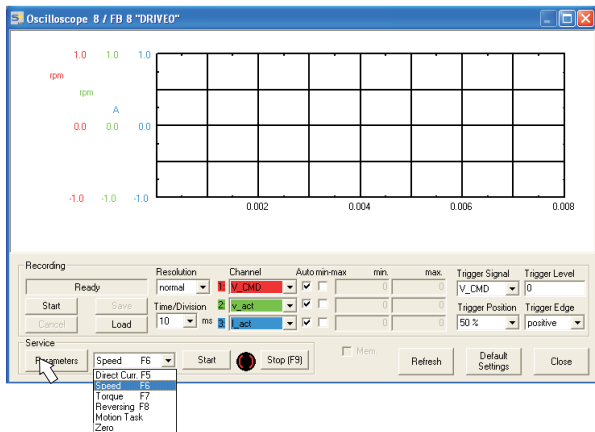
### Reset the amplifier

You can reset the amplifier manually (e.g. in case of an error). Click the icon 

## Jogging the Motor (Speed Control)

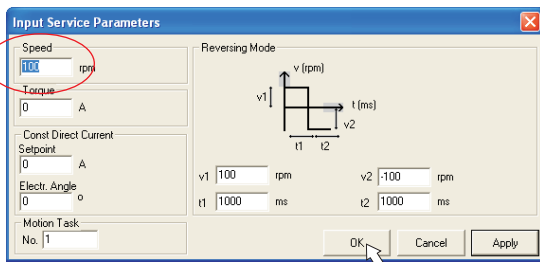
Be aware that the actual position of the load permits the subsequent moving operations. The axis could move to the hardware limit-switch or the mechanical stop. Make sure that a jerk or a fast acceleration of the load cannot cause any damage.

- Switch on the power supply for the drive.
- **Hardware-Enable:** +24 VDC to Enable [connector X1 pin 3].
- **Software-Enable:** Click the "Enable" button Enable (Shift+F12) on the start screen or use key combination Shift+F12. Now, the front display shows an E and the current rating (e.g. **8.8.8** for Enable, 3 amps)
- Click the icon "Oscilloscope"  :

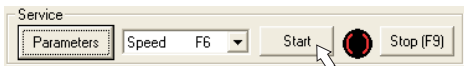


- Select Service-Mode "Speed F6", then click "Parameter" button

Parameter



- Enter a safe speed. The sign defines the direction of movement.  
**Observe the "safe reduced speed" requirements for your application!**
- Click OK.
- Start the service function ("Start" button or press F6).  
Click OK on the warning notice.



The opmode is switched to "0" and the output stage is enabled automatically. The symbol's color changes to green as long as the function is active.

- **The function is active until you click the "Stop" button or press F9.**
- The output stage can be disabled by pressing function key F12.

## Status

Actual warnings and errors are listed on the **Status** screen, which can be accessed on the start screen by clicking the "Status" button. This button monitors the current status of the amplifier and can appear with different text.

The screenshot displays two windows from the 'DRIVIO' software. The left window, titled 'Amplifier B / FB B "DRIVIO"', shows a block diagram of the drive system. It includes inputs for 'Analog I/O' and 'Digital I/O', a 'R00/SSU/E' encoder, and a 'R00' input. The diagram shows 'Torque' and 'Position' signals going to the 'OPMODE' block, which outputs 'Current' to the 'Motor'. 'Speed' and 'Feedback' signals are also shown. A 'Resolver' is connected to the 'Motor' and outputs 'Feedback'. The motor is labeled 'DELTAHD130'. At the bottom left, there is a 'Status' button with a mouse cursor pointing to it. The right window, titled 'Drive Status B / FB B "DRIVIO"', shows the status screen. It has a 'Run Time' of 4518:39. Below that is a 'Fault History' table with columns for 'Fault', 'H:MIN', and 'Fault Frequency'. The table lists several faults, including 'F04 Feedback Loss', 'F01 Heat Sink Temp.', 'F03 Following Error', 'F04 Feedback Loss', 'F16 Mains ETB/RT0', 'F05 Undervoltage Cond.', 'F06 Motor Temperature', 'F08 Overspeed Condition', 'F11 Brake', 'F05 Undervoltage Cond.', 'F16 Mains BTB/RT0', 'F19 Mains Phase', and 'F25 Communication Error'. Below the table are 'Actual Errors' and 'Actual Warnings' sections, both showing 'No'. There are 'Reset' and 'Cancel' buttons at the bottom right.

Fault	H:MIN	Fault Frequency
F04 Feedback Loss	4518:29	F01 Heat Sink Temp. 1
F04 Feedback Loss	4517:30	F03 Following Error 1
F04 Feedback Loss	4517:30	F04 Feedback Loss 91
F16 Mains ETB/RT0	4517:30	F05 Undervoltage Cond. 24
F05 Undervoltage Cond.	4517:30	F06 Motor Temperature 61
F04 Feedback Loss	4517:30	F08 Overspeed Condition 6
F16 Mains ETB/RT0	4517:30	F11 Brake 7
F05 Undervoltage Cond.	4517:30	F16 Mains BTB/RT0 37
F04 Feedback Loss	4517:30	F19 Mains Phase 1
F04 Feedback Loss	4517:37	F25 Communication Error 3

The Reset button can be used to clear some actual error messages. A description of errors/warnings can be found in the online help.

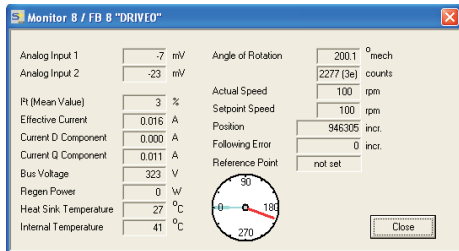
Now you have setup and tested the basic functions of the drive successfully.

## Additional Setup Parameters

Observe the safety instructions in the manuals when you change additional parameters.

Detailed information on all setup functions can be found in the Online Help system and the integrated command reference.

# Monitor



Click the icon "Monitor"



The Monitor screen shows all important electrical and mechanical actual values.

## Documents

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

Depending on the installed fieldbus interface, you need one of these documents:

- PROFIBUS DP communication profile
- SERCOS communication profile
- EtherCAT communication profile

You need Acrobat Reader to read the PDFs, an installation link is on every screen of the product CD-ROM.

**Technical changes which improve the performance of the equipment may be made without prior notice!**

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