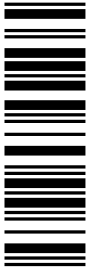


L-force *Runtime Software*



Software Manual

9400



Technology application "table positioning"

Lenze

Overview of the technical documentation for Servo Drives 9400

Project planning, selecting & ordering

- ☐ 9400 Hardware Manual
- ☒ Catalogue / electronic catalogue (DSC - Drive Solution Catalogue)

Mounting & wiring

- ☒ MA 9400 StateLine/HighLine
- ☒ MA for communication module
- ☒ MA for extension module
- ☒ MA for safety module
- ☒ MA for accessories
- ☒ MA for remote maintenance components

Parameter setting

- ☒ BA keypad
- ☐ SW for Lenze »Engineer« software
- ☐ SW for controller (9400 StateLine/HighLine)
- ☐ SW for regenerative power supply module
- ☐ KHB for communication module
- ☐ SW for extension module
- ☐ SW for safety module
- ☐ SW for Lenze technology application
- ☐ SW 9400 function library

← This documentation

Configuring

- ☐ SW for Lenze »Engineer« software
- ☐ SW for controller (9400 HighLine)
- ☐ KHB for communication module
- ☐ SW for extension module
- ☐ SW for safety module
- ☐ SW for Lenze technology application
- ☐ SW 9400 function library

← This documentation

Commissioning of the drive

- ☒ Commissioning guide
- ☐ SW for controller (9400 StateLine/HighLine)
- ☐ Remote Maintenance Manual

Networking

- ☐ KHB for communication medium used

Legend:

- ☒ Printed documentation
- ☐ Online documentation (PDF/Engineer online help)

Abbreviations used:

- BA Operating Instructions
- KHB Communication Manual
- MA Mounting Instructions
- SW Software Manual

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1 About this documentation

This documentation contains information about the technology application "Table positioning" for the Servo Drives 9400 series.



Note!

This documentation supplements the mounting instructions supplied with the controller, the hardware manual and the software manual for the controller.

The Mounting Instructions contain safety information which must be observed!

The information in this documentation applies to:

Technology application	Appl. ID	Required runtime software licence
Table positioning	100502101	Available in every license stage

The technology application can be used with the following controllers:

Product series	Type designation	From hardware version	From software version
9400 Servo Drives	E94AxHExxx	PD	1.35

Target group

This documentation is directed at qualified personnel according to IEC 364.

Document history

Version			Description
1.0	04/2007	TD05	First edition
1.1	10/2008	TD05	New subchapter " Parameterisable function blocks "
1.2	03/2010	TD05	Error corrections & supplements

1.1 Conventions used

This documentation uses the following conventions to distinguish between different types of information:

Type of information	Writing	Examples/notes
Numbers		
Decimal separator	Point	The decimal point is always used. Example: 1234.56
Text		
Program name	» «	The Lenze PC software »Engineer«...
Window pane	<i>Italics</i>	The <i>Message window</i> ... / the <i>Options</i> dialog box...
Control element	Bold	The OK button... / The Copy command... / The Properties tab... / The Name input field...
Sequence of menu commands		If the execution of a function requires several commands, the individual commands are separated by an arrow: Select File→Open to...
Keyboard command	< Bold >	Use < F1 > to open the Online Help. If a command requires a combination of keys, a "+" is placed between the key symbols: Use < Shift >+< ESC > to...
Program listings	Courier	<pre>IF var1 < var2 THEN a = a + 1 END IF</pre>
Keyword	Courier bold	
Hyperlink	<u>Underlined</u>	Optically highlighted reference to another topic. It is activated with a mouse click in this online documentation.
Symbols		
Page reference	( 6)	Optically highlighted reference to another page. It is activated with a mouse click in this online documentation.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1.2 Definition of notes used

The following signal words and symbols are used in this documentation to indicate dangers and important information:

Safety instructions

Layout of the safety instructions:



Danger!

(characterises the type and severity of danger)

Note

(describes the danger and suggests how to avoid the danger)

Pictograph	Signal word	Meaning
	Danger!	Danger of personal injury through dangerous electrical voltage Indicates an impending danger that may lead to death or severe personal injury if the corresponding measures are not taken.
	Danger!	Danger of personal injury through a general source of danger Indicates an impending danger that may lead to death or severe personal injury if the corresponding measures are not taken.
	Stop!	Danger of material damage Indicates a potential danger that may lead to material damage if the corresponding measures are not taken.

Application notes

Pictograph	Signal word	Meaning
	Note!	Important note for trouble-free operation
	Tip!	Useful tip for easy handling
		Reference to another document

2 Brief description

The technology application "table positioning" enables the drive to execute parameterisable travel profiles. The sequence is controlled by a superimposed control (e.g. PLC).



Note!

With the exception of the sequence table, the functionality of the table positioning is identical to the positioning sequence control.

Functions

- ▶ Control of the program flow via predefined ports
- ▶ Positioning in different positioning modes
 - Point-to-point positioning
 - Touch probe positioning (residual path positioning)
 - Profile chaining with velocity changeover (overchange)
- ▶ Homing in different homing modes
- ▶ Profile data management
 - Support of S profiles (jerk limitation)
 - Separate setting for acceleration and deceleration
 - "Teach" function
- ▶ Speed/acceleration override
- ▶ Following error monitoring
- ▶ Support of absolute value encoders
- ▶ Support of the basic drive functions "Manual jog" and "Quick stop"
- ▶ Monitoring of travel range limits with the basic drive function "Limiter"
- ▶ Optional control of a holding brake with the basic drive function "Brake control"

Application range

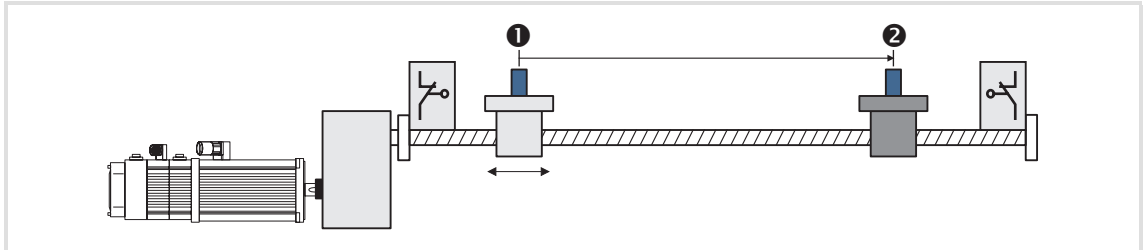
- ▶ Transport units
- ▶ Rotary tables
- ▶ Storage and retrieval units
- ▶ Feed drives
- ▶ Dosing machines
- ▶ Hoists

Required license/delivery

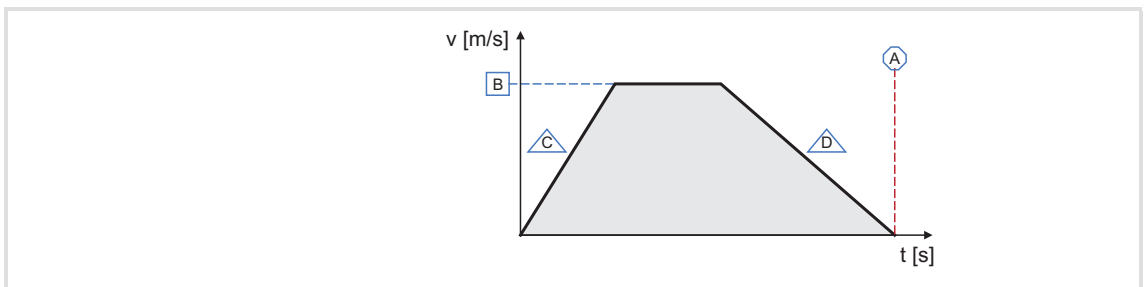
- ▶ Available in every license stage.
- ▶ The technology application can be selected in the »Engineer« application catalog.

3 Introduction

Positioning means to move a workpiece/tool or a piece of material from a starting position ❶ to a defined target ❷.



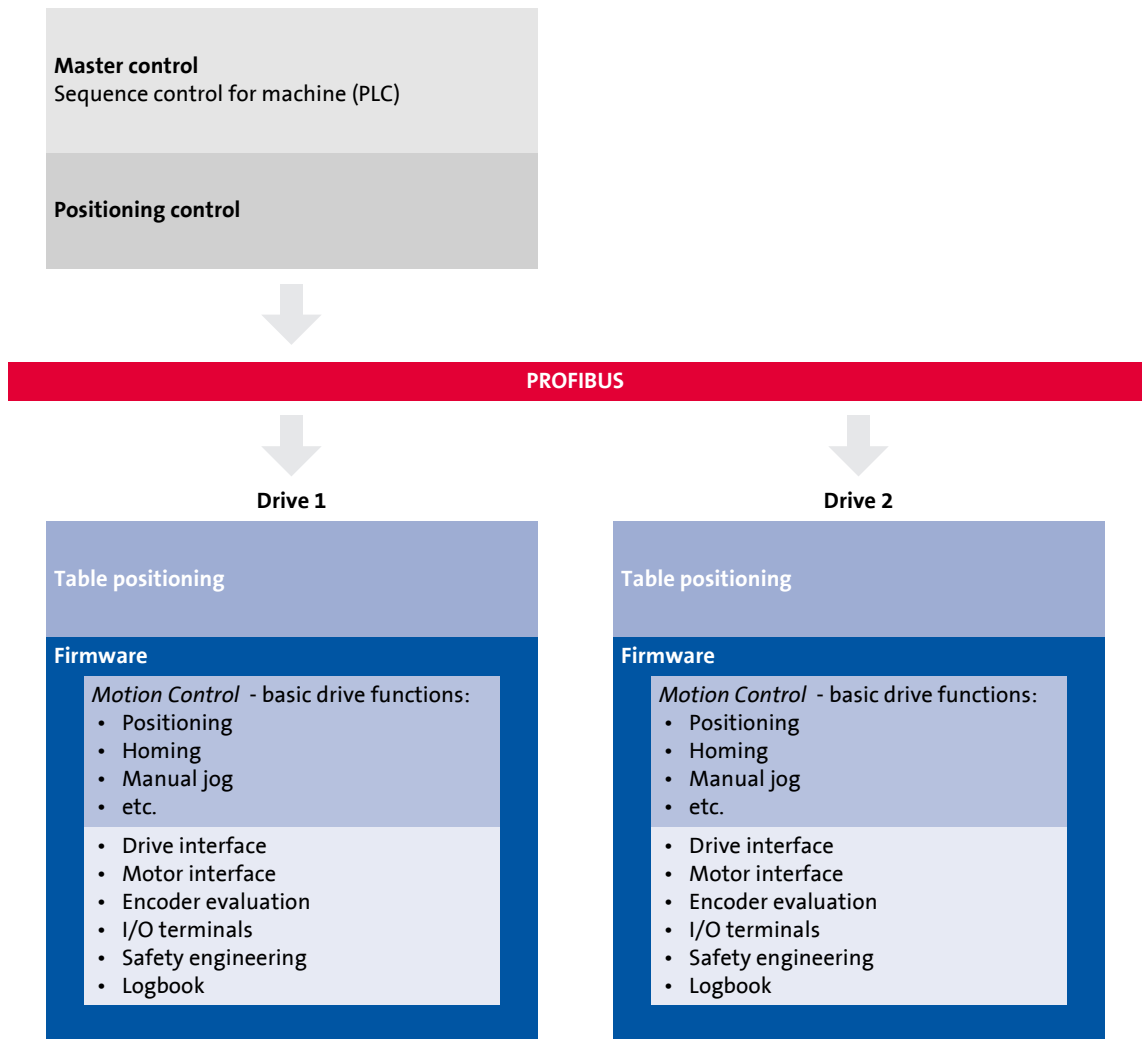
For this purpose a travel profile is to be provided in the controller, for which at least the following profile parameters are required:



Symbol	Profile parameters
❶	Position Target position or path distance to be traversed.
❷	Speed Maximum speed with which the target is to be approached.
❸	Acceleration Selection of the change in speed by which acceleration is to be carried out maximally.
❹	Deceleration Selection of the change in speed by means of which deceleration to standstill is to be maximally effected again.

- A positioning can consist of several profiles which are executed in a specified mode.

4 Application example



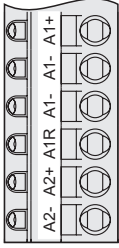
[4-1] Example: Table positioning with higher-level positioning control and networking via PROFIBUS

5.2 Assignment of the I/O terminals

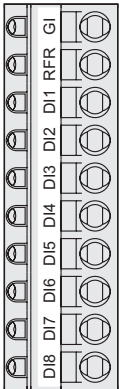
5.2.1 Setpoint and control signals

The following tables contain the Lenze assignment of the analog and digital inputs for the "Table positioning" technology application.

Analog inputs

Terminal X3	Signal (Lenze setting)
	AI1- AI1+ Selection for speed override ▶ Speed/acceleration override (37)
	AI2- AI2+ Selection for acceleration override ▶ Speed/acceleration override (37)

Digital inputs

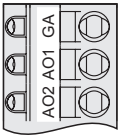
Terminal X5	Signal (Lenze setting)
	DI1 Quick stop - If DI1 is set to LOW level, the drive is decelerated to standstill within the deceleration time set for the quick stop function independent of the setpoint selection. - If the quick stop function is deactivated, the drive is led to the selected setpoint again via the set acceleration time. ▶ Quick stop (30)
	DI2 Connection of reference switch/touch probe sensor
	DI3 Connection of travel range limit switch positive/negative for basic function " Limiter ". (31)
	DI4 The inputs respond to the FALSE state (fail-safe).
	DI5 Reset error By means of a LOW-HIGH edge an existing error status can be reset if the cause of the fault is removed.
	DI6 -
	DI7 -
	DI8 -

5.2.2 Actual value and status signals

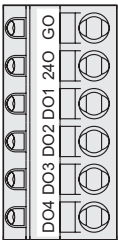
The following tables contain the Lenze assignment of the analog and digital outputs for the "Table positioning" technology application.

- The default signal configuration if required can be easily changed by parameterising the multiplexer parameters assigned.

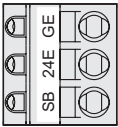
Analog outputs

Terminal X3	Signal (Lenze setting)	Signal configuration
	AO1 Motor speed • Scaling: $\pm 10\text{ V} \equiv$ motor reference speed (C00011)	C03110/1
	AO2 Motor torque (setpoint) • Scaling: $\pm 10\text{ V} \equiv$ Motor reference torque (C00057/2)	C03110/2

Digital outputs

Terminal X4	Signal (Lenze setting)	Signal configuration
	DO1 Status "Drive ready" • DC-bus voltage is available and no error has occurred.	C03100/1
	DO2 Status "Positioner active"	C03100/2
	DO3 Status "Limitation active" • At the moment a setpoint is limited or a software or hardware limit switch has been reached.	C03100/3
	DO4 Status "Error active acknowledgement is required" • A monitoring function with the error response "Error" or "Quick stop by trouble" has been activated and the controller is in the status "Error active" or "Quick stop by trouble active".	C03100/4

Statebus

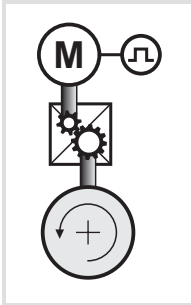
Terminal X2	Signal (Lenze setting)	Signal configuration
	SB Status "Error active acknowledgement is required" • A monitoring function with the error response "Error" or "Quick stop by trouble" has been activated and the controller is in the status "Error active" or "Quick stop by trouble active". • The state bus is put in the "error" status.	C03100/5

Display elements

User LED	Signal (Lenze setting)	Signal configuration
	Status "Positioning enabled"	C03100/6

5.3 Basic settings

5.3.1 Machine parameters



The machine parameters describe e.g. the motor end of the mechanics used.

The setting of the machine parameters in the »Engineer« is carried out on the **Application parameters** tab in the dialog level *Overview* → *Machine parameters*.



Tip!

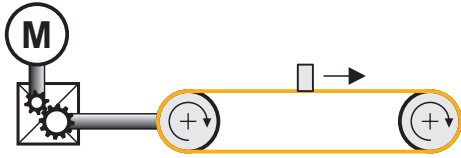
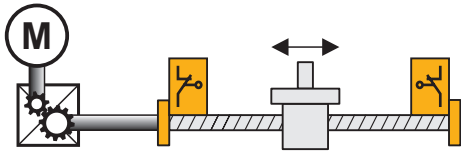
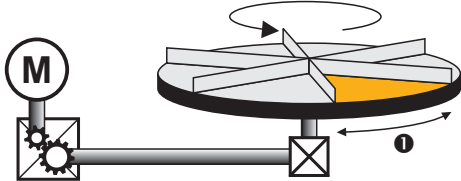
In the »Engineer« the most important machine parameters can be directly adapted to the machine on the **Application parameters** tab in the topmost *Overview* dialog level.

Short overview of machine parameters

Parameter		Lenze setting	
		Value	Unit
C00173	Mains voltage	400/415	V
C00174	Undervoltage (LU) threshold	285	V
C00600	Resp. to DC bus overvoltage	Trouble	
C02520	Gearbox factor numerator: Motor	1	
C02521	Gearbox factor denom: Motor	1	
C02527	Motor mounting direction	Motor rotating CW	
C02570	Position control structure	Phase control	
C02522	Gearbox factor num.: Pos. enc.	1	
C02523	Gearbox factor denom.: Pos. enc.	1	
C02529	Mounting direction of position encoder	Encoder rotating CW	
Description of the mechanics (load, tool)			
C02528	Traversing range	Limited	
C02524	Feed constant	360.0000	unit
C02525	Unit	°	
C02526	User-defined unit	°	
C02533	Time unit	s	
C00273/1	Motor moment of inertia	Motor-dependent	kg cm ²
C00273/2	Load moment of inertia	0.00	kg cm ²

5.3.2 Traversing range

By setting the traversing range the machine type/measuring system is set:

Traversing range	
Unlimited 	The drive can traverse optionally in both directions without reaching limitations. - Positioning here generally is effected in the positioning modes "Relative with/without TP" or "Speed with/without TP". - The positioning measuring system is reset to zero with every new positioning process. - By homing, the positioning measuring system receives a fixed reference point (zero point), so that also the positioning modes "Absolute with/without TP" can be used. Then also the software limit positions for limiting the traversing range are provided.
Limited 	After reaching the position limits, the drive must travel in the opposite direction again. - For positioning, the home position has to be known. By homing, the positioning measuring system receives a fixed reference point (zero point). - Basically, monitoring to the internally maximum usable value range ($\pm 2^{31}$ increments) takes place (software limit position monitoring of the internal value range). An overflow of the value range results in the loss of the home position. - Additionally parameterisable software limit positions can be activated on the user side for limiting the travel range.
Modulo 	The measuring system is repeated. - If the cycles ❶ set are exceeded a defined overflow occurs. The cycle typically corresponds to a rotation or tool distance in a rotative system. - For positioning, the home position has to be known. - Software limit positions are not effective. - Absolute targets can be approached by exceeding the measuring system limit, e.g. from 10° via 0° to 350°.

► Parameter setting: Tab **Application parameters** → dialog level *Overview*

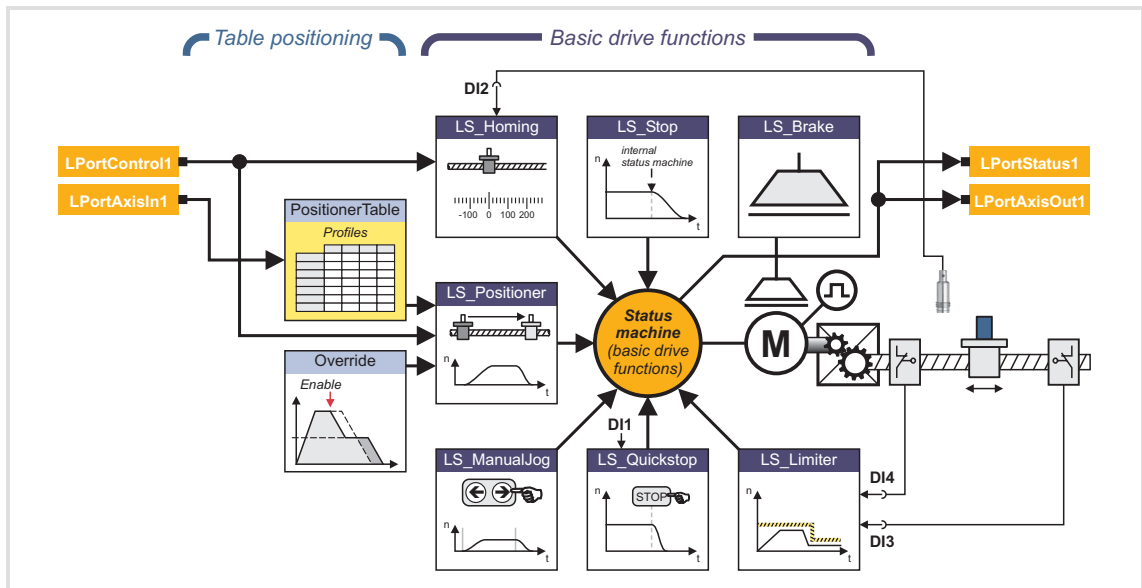
Parameter		Lenze setting	
		Value	Unit
C02528	Traversing range	Limited	
C02536	Cycle (only relevant for traversing range "Modulo")	360.0000	unit

5.3.3 Position control

In the dialog level *Overview* → *LS_Positioner* and the subordinate dialog levels, you can adapt the parameters for the position control, if necessary.

Parameter		Lenze setting	
		Value	Unit
C00254	Phase controller gain	20.00	1/s
C02553	Position controller gain	20.00	1/s
C02556	Position controller limitation	214748.3647	unit/s

5.4 Profile data management



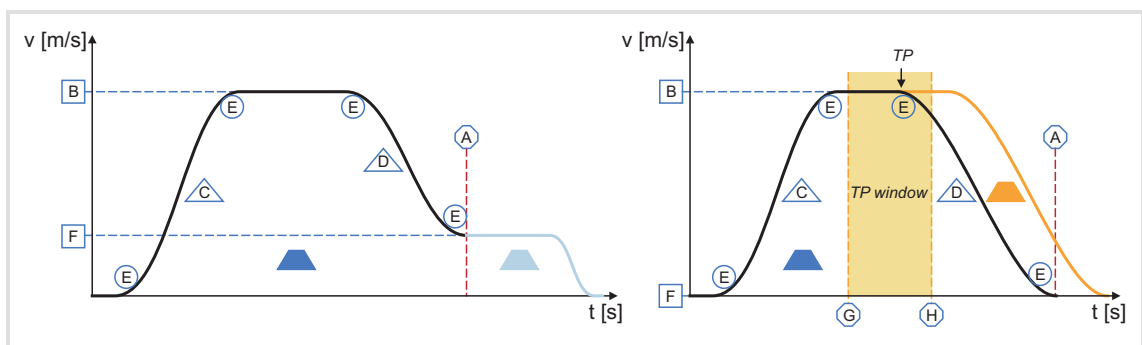
[5-2] Profile data management (schematic diagram)

The profile data management serves to file and manage up to 75 (travel) profiles.

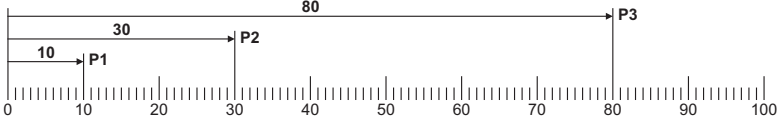
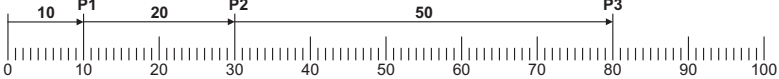
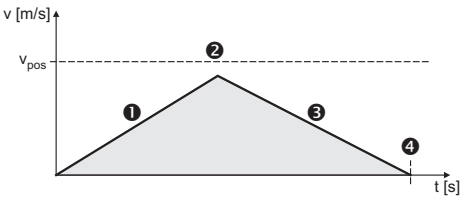
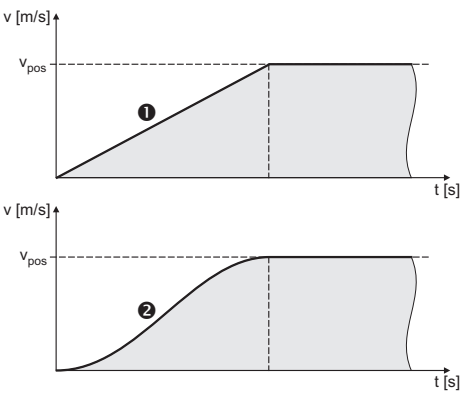
- ▶ A profile describes a motion request which can be converted by the basic drive function "Positioning" into a rotary motion.
- ▶ To execute a profile, 50 actions of type "Positioning" are available for the sequence table.
- ▶ The profile data management also enables the "teaching" of speed, acceleration/ deceleration and S-ramp times. ▶ ["Teach" function](#) (26)

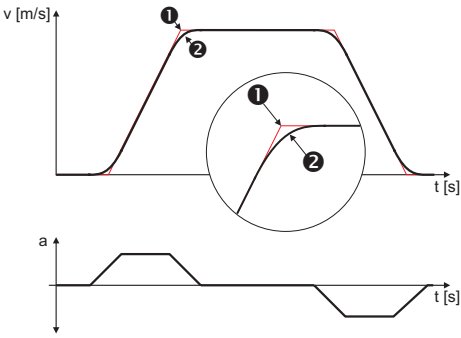
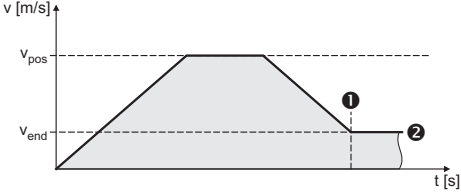
5.4.1 Profile parameters

A profile is described by the following profile parameters:



[5-3] Profile parameters

Symbol	Profile parameters
	(Standard) profile Profile data set (profile no. 1 ... 75) in which the profile data are stored.
	Mode Selection of the positioning mode. ▶ Positioning modes (22)
	Position Target position or path distance to be traversed. The position is either indicated as absolute or relative position. - An absolute position always specifies the distance to the zero position defined: $\text{absolute position} = \text{target position}$  - A relative position indicates the distance to the starting position (current position): $\text{Relative position} = \text{target position} - \text{starting position}$ 
	Speed Maximum speed with which the target is to be approached. Depending on the profile parameter position, acceleration and deceleration, it is possible that the drive may not reach the maximum speed. In this case, the graph would display a triangle instead of a trapezium.  1 Acceleration 2 Travelling speed (is not reached here) 3 Deceleration 4 Target position (or feed distance)
	Acceleration Selection of the change in speed by which acceleration is to be carried out maximally. - The following two acceleration types are distinguished: - Constant acceleration: the speed increases linearly. - Linearly increasing acceleration: The speed increases in S-shapes.  1 Constant acceleration 2 Linearly increasing acceleration
	Deceleration Selection of the change in speed by means of which deceleration to standstill is to be maximally effected again.

Symbol	Profile parameters
	S-ramp time When the S-ramp time is selected for a profile, it is executed with S-shaped ramps, e.g. acceleration and deceleration processes are started smoothly to reduce the jerk and thus prevent the drive components from damage. - The acceleration/deceleration specified in the profile are only reached after the defined S-ramp time has elapsed. - This type of acceleration/deceleration is required for e.g. sensitive machine parts with clearance. - The slower acceleration increase with the S profile prolongs the positioning time compared to the time optimal L profile.
	 1 without jerk limitation (L profile) 2 with jerk limitation (S profile)
	Final speed Selection of the speed by which the drive is to start the next profile after reaching the target position. "Velocity changeover" or "Overchange" can be implemented with a final speed that is non-zero, i.e. when the target position is reached, a second positioning process is started immediately without the drive being decelerated to standstill at the first target position:
	 1 Target position 2 Final speed (here unequal "0")
 	Start of TP window / End of TP window These profile parameters serve to restrict the range for a touch probe positioning (residual path positioning) in which touch probes are to be detected.
	Sequence profile with TP Profile data set (profile no. 1 ... 75) in which the profile data of the profile are stored which is to be executed after a touch probe has been detected. For the setting "0" no further profile connection by touch probe is effected.
	Sequence profile without TP Profile data set (profile no. 1 ... 75) in which the profile data of the profile is stored which is to be executed after the standard profile has been executed (profile chaining). - With the setting "0" no profile chaining is carried out. - The sequence profile defined in this profile parameter is executed even if no touch probe has been detected within the defined TP window.

5.4.2 Variable tables

To simplify parameter handling, the four most important physical sizes for profile parameters are stored in separate "variable tables".

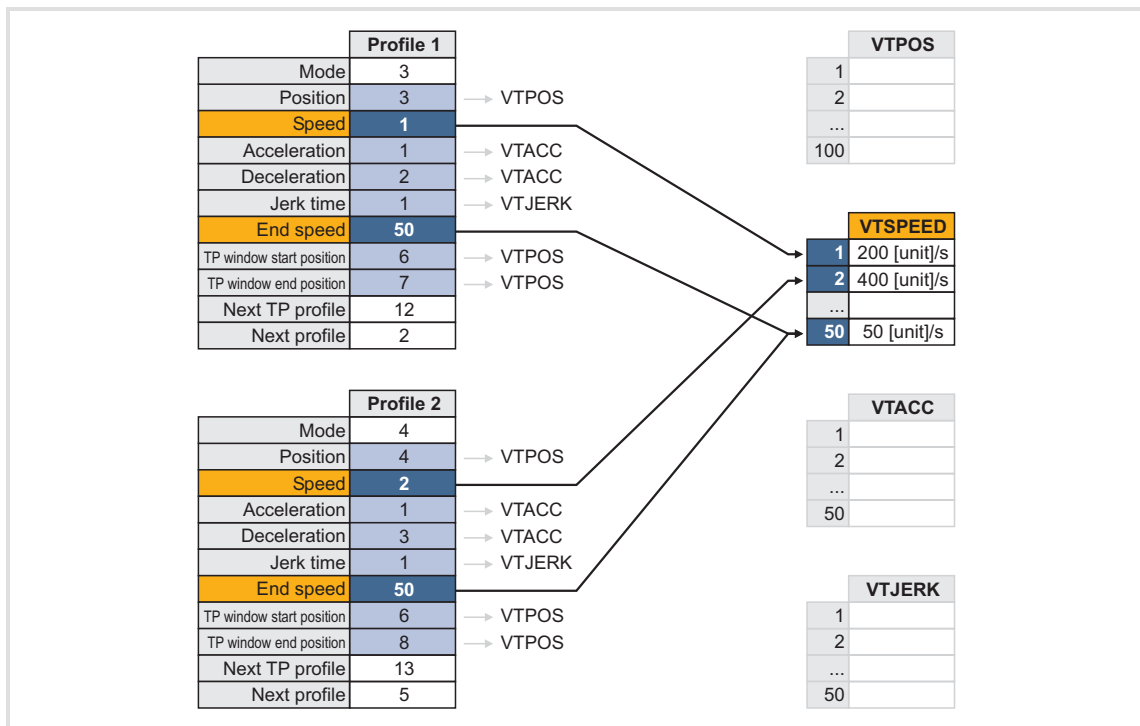
	VTPOS Positions	VTSPED Speeds	VTACC Acceleration/ deceleration	VTJERK S-ramp times
Unit	unit	unit/s	unit/s ²	s
Data format	DINT with four decimal positions			
Memory locations	75	50	50	50
Code	C04711/1...75	C04712/1...50	C04713/1...50	C04714/1...50
For profile parameters	Target position TP window starting position TP window end position	Speed Final speed	Acceleration Deceleration	S-ramp time



Note!

A value is assigned to a profile parameter by referring to a table position of the assigned variable table.

- Hence, not the value itself is entered into the profile parameter but the index of the table position which contains the value to be used.
- See the example in the illustration [\[5-4\]](#). (21)



[5-4] Principle: References to variable tables (here: References to VTSPED)

- In case of several references to the same table position, a change of the value in this table position affects several profiles at the same time. Thus, recurring profile parameters only need to be changed on one position.

- ▶ If e.g. in case of a profile linkage, several profiles are to be executed with the same speed, the corresponding profile parameters "speed" can all refer to the same table position.
- ▶ For an easier assignment and identification of the entered values, each table position can be optionally provided with a comment in the »Engineer«.

5.4.3 Positioning modes

Depending on the traversing range/application, you can select between different positioning modes which are described in the below table.



Note!

For absolute positioning, the home position must be known!

- If an absolute positioning process (positioning modes 1 ... 2 and 11 ... 16) is started although the home position is not known, an error message is indicated.
 - In this case a programming error has occurred and the program flow must be reset.
 - If the error only occurs in a sequence profile, the last valid deceleration is used to decelerate the drive to standstill.

The modulo positioning modes may involve reversing processes!

- If a modulo positioning process (positioning modes 11 ... 16) is started at an initial speed other than zero, the target position may be overtravelled and a reversing process may follow, depending on the selected deceleration / S-ramp time parameters. This would also cause e.g. counter-clockwise rotation in the "Absolute CW (modulo)" positioning mode.

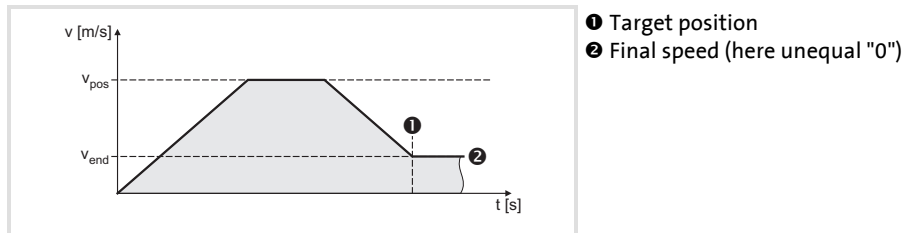
Positioning mode

1	Absolute The axis travels to an absolute position. • Reference for the absolute position is zero position. • The home position must be known. • The traversing range is limited: – to 214748.3647 [unit] – by the internal display area ($\pm 2^{31}$ increments) • Not possible with "modulo" traversing range.
2	Absolute TP Like mode 1, but with profile change when a touch probe is detected. ▶ Touch probe positioning. (📖 25)
5	Relative The axis is traversed by a distance. • Reference for the distance is the target position of the profile executed before. • The feed per positioning is limited: – to 214748.3647 [unit] – by the internal display area ($\pm 2^{31}$ increments)
6	Relative TP Like mode 5, but with profile change on touch probe detection. ▶ Touch probe positioning. (📖 25)

Positioning mode	
7	Speed Continuous constant travel. • Only possible with "unlimited" and "limited" traversing range • This mode does not approach a defined position, but follows the profile. • Acceleration and deceleration are based on profile values. • The traversing direction is defined by the sign of the traversing speed. • Stopped through break signal.
8	Speed TP Like mode 7, but with profile change on touch probe detection. ▶ Touch probe positioning. (📖 25)
11	Absolute CW The axis travels in CW direction to an absolute position. • Only possible with "Modulo" traversing range. • Reference for the absolute position is zero position. • In this direction the zero position of the axis can be overtravelled.
12	Absolute CW TP Like mode 11, but with profile change on touch probe detection. ▶ Touch probe positioning. (📖 25)
13	Absolute CCW The axis travels in CCW direction to an absolute position. • Only possible with "Modulo" traversing range. • Reference for the absolute position is zero position. • In this direction the zero position of the axis can be overtravelled.
14	Absolute CCW TP Like mode 13, but with profile change when a touch probe is detected. ▶ Touch probe positioning. (📖 25)
15	Absolute ShortestWay The axis travels to an absolute position in best time. • Only possible with "Modulo" traversing range. • Reference for the absolute position is zero position. • The rotary table positioning is basically an absolute positioning with target positions between 0 and 360 angular degree [°]. In this mode the zero point can also be overtravelled if this is the shortest way to the target position: The diagram shows a circular rotary table divided into six sectors by radial lines. The sectors are labeled with angles: 0° (top), 60° (top-right), 120° (right), 180° (bottom), 240° (bottom-left), and 300° (left). A blue arrow starts at the 0° position and points counter-clockwise towards the 300° position, indicating the shortest path to reach that target position.
16	Absolute ShortestWay TP Like mode 15, but with profile change on touch probe detection. ▶ Touch probe positioning. (📖 25)

5.4.4 Positioning with final speed

If a positioning process with a final speed other than zero is carried out, a velocity changeover / overchange can be realised, i.e. a second positioning process is started immediately once the target position is reached, and the drive does not come to a standstill at the first target position.



[5-5] The principle of velocity changeover / overchange

- ▶ Normally, the drive has reached the final speed when the target position is reached.
- ▶ The profile is run through which is defined via "Profile data sequence profile without TP".
- ▶ The final speed must not exceed the maximum profile speed.
 - The speed is internally limited to the profile speed.
 - This is the maximum value for the final speed if the profile speed is reduced via override. (This behaviour may add to the cases described in the note below.)
 - The speed limitation is not affected by subsequent increases in the override value.



Note!

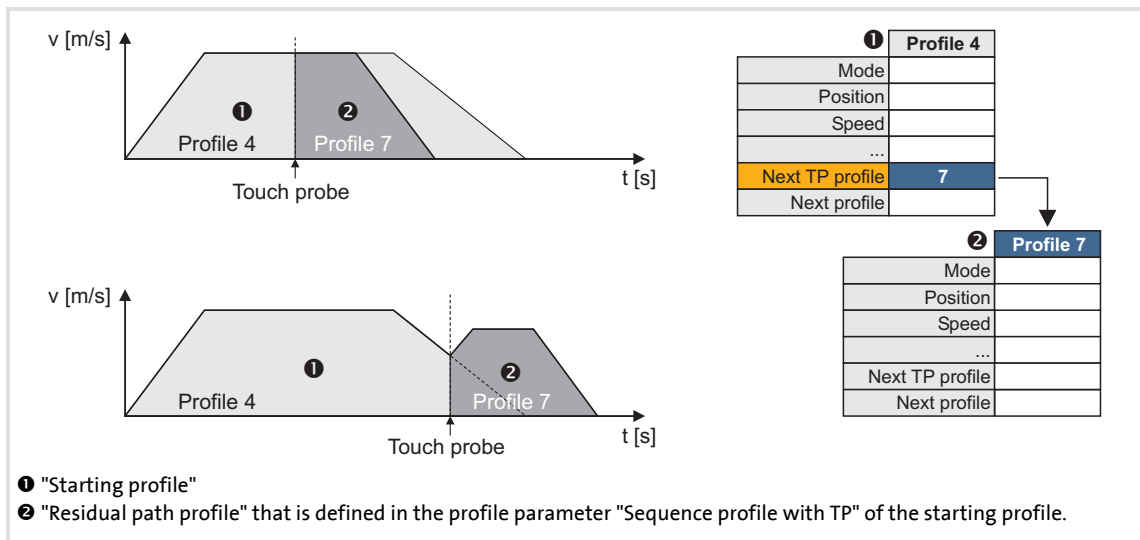
Positioning processes with final speeds other than zero do not permit reversing. In this case, the positioning process is aborted and an error is issued.

In the case of positioning processes with final speeds and if S-shaped ramps are used, a plausibility check as to whether the final speed can be reached is carried out when the profile is started. If the final speed cannot be reached, the positioning process is aborted and an error is issued. This is often the case if the positioning process has been paused and is then to be continued.

5.4.5 Touch probe positioning

In the touch probe positioning mode, the profile is first executed according to the [Profile parameters](#) set. If a touch probe is detected during the process, it is automatically changed to the profile specified in the profile parameter "Sequence profile with TP".

- ▶ Here the current actual position is stored at the time of the touch probe activation (by a touch probe sensor).
- ▶ In the following relative positioning process, the "residual path" to this stored position is travelled according to the increments.



[5-6] Examples for a "residual path positioning" after a touch probe is detected

- ▶ The profile parameters "TP window start" and "TP window end" the range in which touch probes are to be detected can be restricted.
 - If both profile parameters are "0", touch probe detection will be active over the whole profile/the whole traversing range.
- ▶ If no touch probe is detected and after the profile is executed, the positioning is continued with the profile defined in the profile parameter "Sequence profile without TP" (profile chaining).



Note!

If a profile is travelled with high speed and a touch probe positioning is started the residual path of which is shorter than the result from current speed and set deceleration ramp, the target position is "overtravelled".

- Normally a reversing movement occurs, i.e. the drive returns.
- If, for instance, a CCW rotation of the drive is forbidden by the safety module, the target cannot be approached since in this case the reversing movement is not permissible.

Further constellations are possible in connection with profile chaining in which an approach of the target position is impossible.

5.4.6 "Teach" function

The "Teach" function of the profile data management enables the teaching of positions, speeds, accelerations and S-ramp times.

The basic function "Manual jog" serves, for instance to approach the desired position manually and transmits it via "Teaching" to the variable table for positions.

- Parameter setting: Tab **Application parameters** → dialog level *Overview* → *L_PositionerTable*

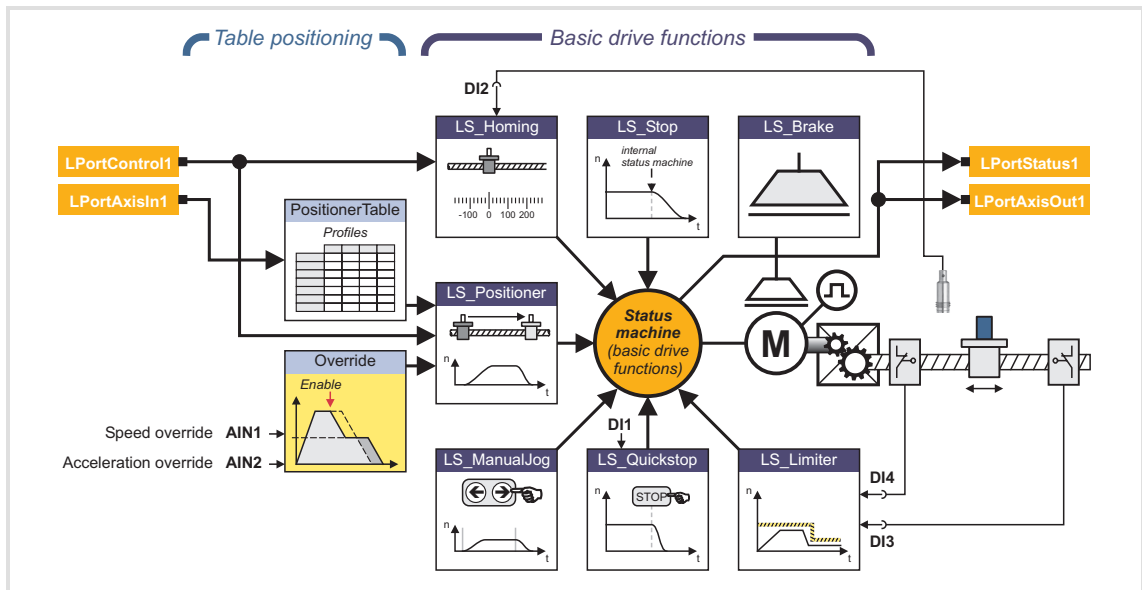
Control/setpoint inputs of the function		Signal configuration
Lenze setting	Control/setpoint input	(Multiplexer parameters)
FALSE	→ Teach position	C03020/1
C03016	→ Selection of table position for position	C03029/1
Zero position	→ Teach position	C03125/1
FALSE	→ Teach speed	C03020/2
C03017	→ Selection of table position for speed	C03029/2
Speed setpoint	→ Teach speed	C03024/1
FALSE	→ Teach acceleration	C03020/3
C03018	→ Selection of table position for acceleration	C03029/3
0	→ Teach acceleration	C03027
FALSE	→ Teach S-ramp time	C03020/4
C03019	→ Selection of table position for S-ramp time	C03029/4
0	→ Teach S-ramp time	C03028



Note!

After the function block editor is enabled the "Teach" function must be configured directly in the FB interconnection instead of via the parameters mentioned before!

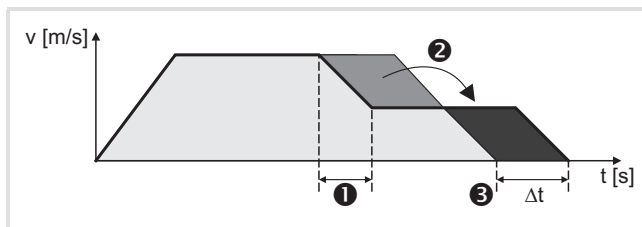
5.5 Speed/acceleration override



[5-7] Speed/acceleration override (schematic diagram)

"Override" is the change of profile parameters and their acceptance during the positioning process.

In this case, the travel profile is adapted accordingly to ensure that the defined target position is still exactly approached if, for example, the speed is changed during the positioning process ("speed override"):



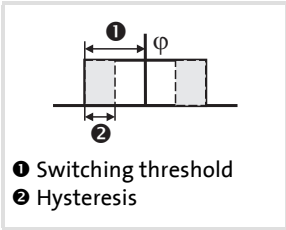
- ❶ The speed is reduced during the positioning process.
- ❷ To reach the defined position, the missing surface must be "attached" to the profile.
- ❸ When the speed is reduced the positioning process takes a longer time (Δt).

[5-8] Override (here: Speed override)

► Parameter setting: Tab **Application parameters** → dialog level **Overview** → **LS_Positioner**

Control/setpoint inputs of the function		Signal configuration (Multiplexer parameters)
Lenze setting	Control/setpoint input	
C03013	→ Activate override	C03185/5
AIN 1	→ Speed override	C03186/1
AIN 2	→ Acceleration override	C03186/2
+100 %	→ Deceleration override	C03186/3

5.6 Following error monitoring



In the Lenze setting a two-stage following error monitoring is active.
 If the parameterisable switching threshold 1 is exceeded, a warning appears. If the higher-set switching threshold 2 is exceeded, a "warning locked" appears.

[5-9] Following error monitoring

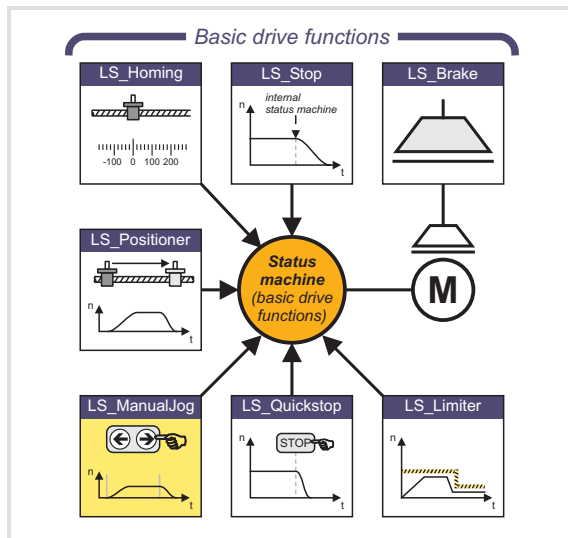
► Parameter setting: Tab **Application parameters** → dialog level *Overview* → *Following error*

Parameter		Lenze setting	
		Value	Unit
C03911	Switching threshold 1	100.0000	unit
C03914	Switching threshold 2	200.0000	unit
C03917	Hysteresis 1	0.0000	unit
C03920	Hysteresis 2	0.0000	unit
C05902/1	Error response - following error 1	Warning	
C05902/2	Error response - following error 2	Warning locked	

Control inputs of the function		Signal configuration (Multiplexer parameters)
Lenze setting	Control input	
TRUE	→ Activate following error limit 1	C03058/1
TRUE	→ Activate following error limit 2	C03058/2

5.7

Manual jog



[5-10] Basic function "Manual jog" (schematic diagram)

For the setting-up operation and "Teaching" of positions the basic function "Manual jog" is available.

Manual jog is controlled via parameters (e. g. via HMI).

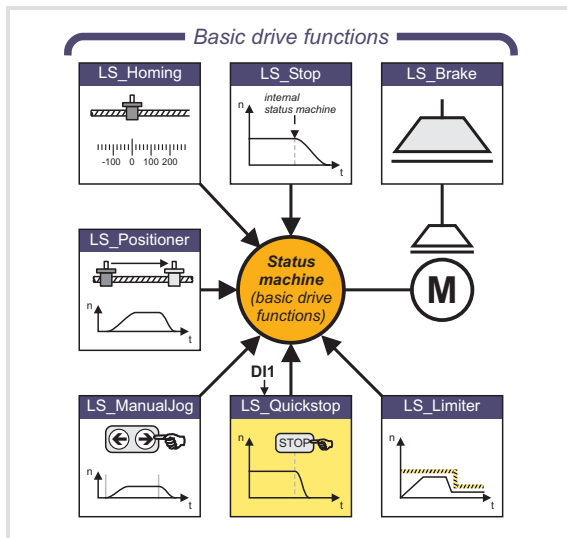
Manual jog can always be carried out if the sequence control is not active and no other basic function and no error status are active. The request of manual jog then is effected automatically with the travel commands.

► Parameter setting: Tab **Application parameters** → dialog level *Overview* → *Manual jog*

Parameter		Lenze setting	
		Value	Unit
C02620	Manual jog: Speed 1	360.0000	unit/s
C02621	Manual jog: Speed 2	720.0000	unit/s
C02622	Manual jog: Acceleration	360.0000	unit/s ²
C02623	Manual jog: Deceleration	1440.0000	unit/s ²
C02624	Manual jog: S-ramp time	0.100	s
C03007	Activate positive manual jog	FALSE	
C03008	Activate negative manual jog	FALSE	
C03009	Activate "Retract limit switch"	FALSE	

Control inputs of the function		Signal configuration
Lenze setting	Control input	(Multiplexer parameters)
Automatic activation	→ Request manual jog	C03155/1
C03007	→ Activate positive manual jog	C03155/2
C03008	→ Activate negative manual jog	C03155/3
FALSE	→ Activate 2. speed	C03155/4
C03009	→ Activate "Retract limit switch"	C03155/5
+100 %	→ Manual jog override	C03186/5

5.8 Quick stop



[5-11] Basic function "Quick stop" (schematic diagram)

The basic function "Quick stop" brakes the drive to standstill within the deceleration time set for the quick stop function after a corresponding request independent of the setpoint selection. The sequence control is interrupted.

If the quick stop is deactivated, the drive remains in standstill until the sequence control is started again and takes over the drive control.

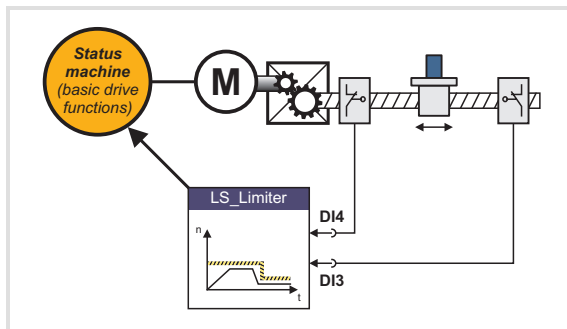
- The quick stop function can be activated as follows in the Lenze setting:
 - By setting the digital input DI1 to LOW level.
 - By a master control via the port *LPortControl*:
By setting bit 2 of the bit-coded control word 1.
- Parameter setting: Tab **Application parameters** → dialog level *Overview* → *All basic functions* → *Quick stop*

Parameter		Lenze setting	
		Value	Unit
C00105	Quick stop deceleration time	0.000	s
C00106	Quick stop S-ramp time	0.00	%
C00107	Reference for quick stop deceleration time	Motor reference speed (C00011)	

Control inputs of the function		Signal configuration (Multiplexer parameters)
Lenze setting	Control input	
DIGIN 1	→ Activate quick stop 1	C03135/1
Control word 1 bit 02	→ Activate quick stop 2	C03135/2
FALSE	→ Activate quick stop 3	C03135/3

5.9

Limiter



[5-12] Basic function "Limiter" (schematic diagram)

The basic function "Limiter" monitors the travel range limits via limit switches and parameterisable software limit positions and after an according request from the safety module can lead the drive into defined limit ranges. Furthermore higher-level limit values for travel profiles can be entered and activated.

- The software limit positions which can be set via parameters serve to limit the travel range by means of software and prevent that travel commands are executed which would cause an exit of the permissible travel range.
- Moreover, the travel range limits are monitored via limit switches via the digital inputs DI3 and DI4.

**Note!**

The digital inputs DI3 and DI4 are configured fail-safe in C00114/3 and C00114/4, i.e. a HIGH level is expected at both inputs in idle state.

- If the travel range limits should not be monitored (e.g. in case of a rotary axis), set the limit switch inputs of the basic function "Limiter" permanently to FALSE.

The parameterised limit values for travel profiles are not effective for the basic functions "speed follower", "torque follower", and "position follower"!

- For the exceeding of the limit values an error response can be set.

- Parameter setting: Tab **Application parameters** → dialog level *Overview* → *Limiter*

Parameter		Lenze setting	
		Value	Unit
Limit values			
C02707	Permissible direction of rotation	Positive and negative	
C02700	Software limit positions are active	Deactivated	
C02701/1	Positive software limit position	0.0000	unit
C02701/2	Negative software limit position	0.0000	unit
Only for homing, positioning and manual jog			
C02702	Limitations are active	Deactivated	
C02703	Max. speed	3600.0000	unit/s
C02705	Max. acceleration	3600.0000	unit/s ²
C02706	Min. S-ramp time	100	ms

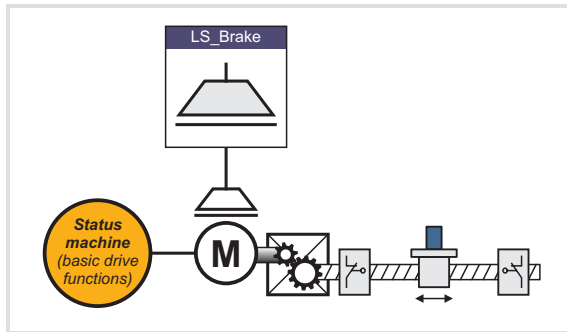
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Parameter setting & configuration

Limiter

Parameter		Lenze setting	
		Value	Unit
For manual jog only			
C02713	Max. manual jog distance	360.0000	unit
Limited speed 1 ... 4 (only for homing, positioning, and manual jog)			
C02708/1	Limited speed 1	3600.0000	unit/s
C02710/1	Delay lim. speed 1	0.0100	unit/s ²
C02711/1	S-ramp time lim. speed 1	100	ms
C02708/2	Limited speed 2	7200.0000	unit/s
C02710/2	Delay lim. speed 2	0.0100	unit/s ²
C02711/2	S-ramp time lim. speed 2	100	ms
C02708/3	Limited speed 3	14400.0000	unit/s
C02710/3	Delay lim. speed 3	0.0100	unit/s ²
C02711/3	S-ramp time lim. speed 3	100	ms
C02708/4	Limited speed 4	28800.0000	unit/s
C02710/4	Delay lim. speed 4	0.0100	unit/s ²
C02711/4	S-ramp time lim. speed 4	100	ms
Control inputs of the function		Signal configuration	
Lenze setting	Control input	(Multiplexer parameters)	
DIGIN 3	→ Positive limit switch	C03150/1	
DIGIN 4	→ Negative limit switch	C03150/2	

5.10 Brake control



[5-13] Basic function "Brake control" (schematic diagram)

The basic function "Brake control" serves to the wear free control and monitoring of a holding brake.

In the simplest case, an optionally available brake module is used.

Alternatively the holding brake can also be controlled and monitored via the digital inputs/outputs.

**Note!**

In the Lenze setting the brake control is switched off to reach a safe state after mains connection.

If the automatic operation (operating mode 2 or 12) is selected in C02580, the brake is controlled automatically, i.e. if the multi-purpose positioning or another basic function is activated which causes the drive to traverse, the brake is opened automatically and the operation is enabled.

► Parameter setting: Tab **Application parameters** → dialog level *Overview* → *Brake control*

Parameter		Lenze setting	
		Value	Unit
C02580	Operating mode of brake	Brake control off	
C02581	Brake activation threshold	50	rpm
C02582	Brake response to pulse inhibit	Activate the brake immediately	
C02583	Status input monitoring	Not active	
C02585	Brake control polarity	Not inverted	
C02586	Starting torque 1	0.00	Nm
C02587	Starting torque 2	0.00	Nm
C02588	Starting torque source	Starting torque 1/2	
C02589	Brake closing time	100	ms
C02590	Brake opening time	100	ms
C02591	Waiting time - status monitoring	100	ms
C02593	Waiting time - brake activation	0.000	s
C02594	Test torque	0.00	Nm
C02595	Permissible angle of rotation	5	°
C02596	Grinding speed	100	rpm
C02597	Acc./dec. time - grinding	1.000	s
C02598	Grinding ON time	0.5	s
C02599	Grinding OFF time	0.5	s

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Parameter setting & configuration

Brake control

Control/setpoint inputs of the function		Signal configuration
Lenze setting	Control/setpoint input	(Multiplexer parameters)
FALSE	→ Open brake (release)	C03165/1
FALSE	→ Activate starting torque 2	C03165/2
FALSE	→ Keep open brake at standstill	C03165/3
FALSE	→ Brake status signal	C03165/4
FALSE	→ Activate brake test	C03165/5
FALSE	→ Grind brake	C03165/6
0 %	→ Additional torque	C03166

5.11 Control of the program flow via predefined ports

For a sequence control by a higher-level control (e.g. PLC) the application is provided with predefined ports the signals of which are linked with the setpoint and control inputs of the application via multiplexer parameters.

Input port "LPortAxisIn1" for control and setpoint signals

Element variable/data type	Information/possible settings
nIn1 INT	Profile number (1 75) of the profile of the profile data management to be executed

Input port "LPortControl1" for control signals

The input port **LPortControl1** is intended for the connection with a master control.

Element variable/data type	Information/possible settings														
LPortControl1 WORD	Control word (bit coded) • Bits which are not listed are not assigned with a function.														
	<table> <tr> <td>Bit 3</td><td> Activate quick stop - The is decelerated to standstill within the deceleration time set for the quick stop function independent of the setpoint selection. - If the quick stop function is deactivated, the drive is led to the selected setpoint again via the set acceleration time. </td></tr> <tr> <td>Bit 7</td><td> Reset error - An existing error status is reset if the cause of the fault is removed. </td></tr> <tr> <td>Bit 11</td><td> Requesting control via the basic function "Positioning" - If no other basic function is active, the status changes to "Positioning" and positioning can be executed via the control inputs. - If bit 11 is reset, an active positioning is stopped, i.e. it is changed from the active function state "Positioning" to the basic function "Standstill" via the function state "Stopping". </td></tr> <tr> <td>Bit 12</td><td> Start positioning/restart - The profile with the profile number defined via <i>nIn2</i> is executed. - During an active positioning process, another profile can be defined via <i>nIn2</i> which is executed after restart (renewed state change of bit 12 from "0" to "1"). </td></tr> <tr> <td>Bit 13</td><td> Profile restart - Profile data is read in again considering the distances already covered. - The positioning process interrupted before is completed. </td></tr> <tr> <td>Bit 14</td><td> Profile reset - Profile data is read in again without considering the distances already covered. - The positioning process interrupted before is completed. </td></tr> <tr> <td>Bit 15</td><td> Request control via the basic function "Homing" and start reference search in the selected homing mode (C02640). </td></tr> </table>	Bit 3	Activate quick stop - The is decelerated to standstill within the deceleration time set for the quick stop function independent of the setpoint selection. - If the quick stop function is deactivated, the drive is led to the selected setpoint again via the set acceleration time.	Bit 7	Reset error An existing error status is reset if the cause of the fault is removed.	Bit 11	Requesting control via the basic function "Positioning" - If no other basic function is active, the status changes to "Positioning" and positioning can be executed via the control inputs. - If bit 11 is reset, an active positioning is stopped, i.e. it is changed from the active function state "Positioning" to the basic function "Standstill" via the function state "Stopping".	Bit 12	Start positioning/restart - The profile with the profile number defined via <i>nIn2</i> is executed. - During an active positioning process, another profile can be defined via <i>nIn2</i> which is executed after restart (renewed state change of bit 12 from "0" to "1").	Bit 13	Profile restart - Profile data is read in again considering the distances already covered. - The positioning process interrupted before is completed.	Bit 14	Profile reset - Profile data is read in again without considering the distances already covered. - The positioning process interrupted before is completed.	Bit 15	Request control via the basic function "Homing" and start reference search in the selected homing mode (C02640).
Bit 3	Activate quick stop - The is decelerated to standstill within the deceleration time set for the quick stop function independent of the setpoint selection. - If the quick stop function is deactivated, the drive is led to the selected setpoint again via the set acceleration time.														
Bit 7	Reset error An existing error status is reset if the cause of the fault is removed.														
Bit 11	Requesting control via the basic function "Positioning" - If no other basic function is active, the status changes to "Positioning" and positioning can be executed via the control inputs. - If bit 11 is reset, an active positioning is stopped, i.e. it is changed from the active function state "Positioning" to the basic function "Standstill" via the function state "Stopping".														
Bit 12	Start positioning/restart - The profile with the profile number defined via <i>nIn2</i> is executed. - During an active positioning process, another profile can be defined via <i>nIn2</i> which is executed after restart (renewed state change of bit 12 from "0" to "1").														
Bit 13	Profile restart - Profile data is read in again considering the distances already covered. - The positioning process interrupted before is completed.														
Bit 14	Profile reset - Profile data is read in again without considering the distances already covered. - The positioning process interrupted before is completed.														
Bit 15	Request control via the basic function "Homing" and start reference search in the selected homing mode (C02640).														

5.12 Signal configuration

5.12.1 Drive and motor interface

If required, the preset signal configuration of the control and setpoint inputs of the drive and motor interface can be easily reconfigured by parameterising the assigned multiplexer parameters.

Drive interface

Signal (Lenze setting)	Control input	Signal configuration
FALSE	→ Set controller inhibit	C03130/1
DIGIN 5	→ Reset error 1	C03130/2
Control word 1 bit 07	→ Reset error 2	C03130/3
FALSE	→ Reset error 3	C03130/4
FALSE	→ Set error	C03130/5
Control word 1 bit 00	→ Switch on drive	C03130/6

Motor interface

Signal (Lenze setting)	Setpoint input	Signal configuration
100 %	→ Load position controller adaptation	C03141/1
100 %	→ Motor position controller adaptation	C03141/2
100 %	→ Speed controller adaptation	C03141/3
100 %	→ Upper torque limit value	C03141/4
-100 %	→ Lower torque limit value	C03141/5
100 %	→ Flux setpoint	C03141/6
100 %	→ Mass inertia adaptation	C03141/7

5.12.2 Output ports

If required, the preset signal configuration of the output ports can be easily reconfigured by parameterising the assigned multiplexer parameters.

Output port "LPortAxisOut1"

The output port **LPortAxisOut1** is intended for the connection with a following axis.

Signal (Lenze setting)	Output port	Signal configuration
Axis status word		
- The bit assignment is identical to that of status word 1/2. - Application-specific signals can be supplemented.		
Drive ready	→ Axis status word bit 00	C03120/1
FALSE	→ Axis status word bit 01	C03120/2
Operation enabled	→ Axis status word bit 02	C03120/3
Error active	→ Axis status word bit 03	C03120/4
FALSE	→ Axis status word bit 04	C03120/5
Quick stop active	→ Axis status word bit 05	C03120/6
Drive is ready to start	→ Axis status word bit 06	C03120/7
Warning active	→ Axis status word bit 07	C03120/8
FALSE	→ Axis status word bit 08	C03120/9
FALSE	→ Axis status word bit 09	C03120/10
FALSE	→ Axis status word bit 10	C03120/11
Motor control in limitation	→ Axis status word bit 11	C03120/12
Positioning enabled	→ Axis status word bit 12	C03120/13
Positioning active	→ Axis status word bit 13	C03120/14
Positioning complete	→ Axis status word bit 14	C03120/15
Pos. status "Restart not possible"	→ Axis status word bit 15	C03120/16
Setpoints for horizontal communication		
Filtered torque setpoint	→ Axis-Port Out 1	C03124/1
	Scaling: $16384 \equiv 2^{14} \equiv 100\% \text{ motor reference torque (C00057/2)}$	
Motor speed	→ Axis port out 2	C03124/2
	Scaling: $1073741824 \equiv 2^{30} \equiv 100\% \text{ motor reference speed (C00011)}$	

Output port "LPortStatus1"

The output port **LPortStatus1** is intended for the connection with a higher-level control.

Signal (Lenze setting)	Output port	Signal configuration
Status word 1		
Drive ready	→ Status word 1 bit 00	C03121/1
FALSE	→ Status word 1 bit 01	C03121/2
Operation enabled	→ Status word 1 bit 02	C03121/3
Error active	→ Status word 1 bit 03	C03121/4
FALSE	→ Status word 1 bit 04	C03121/5
Quick stop active	→ Status word 1 bit 05	C03121/6
Drive is ready to start	→ Status word 1 bit 06	C03121/7
Warning active	→ Status word 1 bit 07	C03121/8
FALSE	→ Status word 1 bit 08	C03121/9
FALSE	→ Status word 1 bit 09	C03121/10
FALSE	→ Status word 1 bit 10	C03121/11
Motor control in limitation	→ Status word 1 bit 11	C03121/12
Positioning enabled	→ Status word 1 bit 12	C03121/13
Positioning active	→ Status word bit 13	C03121/14
Positioning complete	→ Status word 1 bit 14	C03121/15
Pos. status "Restart not possible"	→ Status word 1 bit 15	C03121/16

Output port "LPortStatus2"

Signal (Lenze setting)	Output port	Signal configuration
Status word 2		
FALSE	→ Status word 2 bit 00	C03122/1
FALSE	→ Status word 2 bit 01	C03122/2
FALSE	→ Status word 2 bit 02	C03122/3
FALSE	→ Status word 2 bit 03	C03122/4
FALSE	→ Status word 2 bit 04	C03122/5
FALSE	→ Status word 2 bit 05	C03122/6
FALSE	→ Status word 2 bit 06	C03122/7
FALSE	→ Status word 2 bit 07	C03122/8
FALSE	→ Status word 2 bit 08	C03122/9
FALSE	→ Status word 2 bit 09	C03122/10
FALSE	→ Status word 2 bit 10	C03122/11
FALSE	→ Status word 2 bit 11	C03122/12
FALSE	→ Status word 2 bit 12	C03122/13
FALSE	→ Status word 2 bit 13	C03122/14
FALSE	→ Status word 2 bit 14	C03122/15
FALSE	→ Status word 2 bit 15	C03122/16

5.13 Application error messages

For the output of application-specific error messages, the FB instances *ApplicationError1* and *ApplicationError2* of the function block **L_DevApplErr** are available in the network.

- Via the boolean inputs up to 16 different application error messages with parameterisable module ID, error ID and error response can be released by the application.

Error message		Error ID	Error response
FB instance "ApplicationError1"			
1	Following error limit 1	8001	Warning
2	Following error limit 2	8002	Warning locked
3	Positioner: Home position is not known	8003	Warning
4	Positioner: Cycle is not known	8004	Warning
5	Positioner: Wrong positioning mode	8005	Warning
6	Positioner: Invalid change of the positioning mode	8006	Warning
7	Positioner: Profile data is not plausible or faulty	8007	Warning
8	Positioner: Error in profile generation	8008	Warning
FB instance "ApplicationError2"			
1	Free error message 1	8011	Information
2	Free fault message 2	8012	Information
3	PositionerTable: Invalid axis data structure	8013	Warning
4	PositionerTable: Invalid profile no.	8014	Information
5	PositionerTable: Invalid table no.	8015	Warning
6	-	-	-
7	-	-	-
8	-	-	-

- Parameter setting: Tab **All parameters**

Parameter		Lenze setting
FB instance "ApplicationError1"		
C05900	Function block ID	999
C05901/1...8	Error ID 1 ... 8	See table above
C05902/1...8	Error response 1 ... 8	See table above
FB instance "ApplicationError2"		
C05903	Function block ID	998
C05904/1...8	Error ID 1 ... 8	See table above
C05905/1...8	Error response 1 ... 8	See table above

Reset of error message

In the Lenze setting the digital input DI5 for resetting (acknowledging) an error message is connected to the input *DI_bResetError1* of the drive interface.

5.14 Parameterisable function blocks

This subchapter lists all relevant parameterisable function blocks of the technology application and the corresponding parameters in alphabetical order.

5.14.1 ActualSpeedScaling

Is an instance of	Function
L_TbNormalize	Scaling of actual speed to a parameterisable reference variable

Parameter	Possible settings	Information
C04036	-2147483647 2147483647	Reference variable - Setting "0" is not possible. - Initialisation: 44739243

5.14.2 ApplicationError1

Is an instance of	Function
L_DevApplErr	Error handling ▶ Application error messages (39)

Parameter	Possible settings			Information
C05900	980		999	Module ID Initialisation: 999
C05901/1...8	0		65535	Error ID Initialisation: 8001 ... 8008
C05902/1...8				Error response
	0	None		
	1	Fault		
	2	Trouble		
	3	Quick stop by trouble		
	4	Warning locked		
	5	Warning		
	6	Information		

5.14.3 ApplicationError2

Is an instance of	Function			
L_DevApplErr	Error handling ▶ Application error messages (📖 39)			

Parameter	Possible settings			Information
C05903	980		999	Module ID Initialisation: 998
C05904/1...8	0		65535	Error ID Initialisation: 8011 ... 8018
C05905/1...8				Error response
	0	None		
	1	Fault		
	2	Trouble		
	3	Quick stop by trouble		
	4	Warning locked		
	5	Warning		
	6	Information		

5.14.4 FollowingErrorScaling

Is an instance of	Function		
L_TbNormalize	Scaling of the following error to a parameterisable reference variable		

Parameter	Possible settings			Information
C04035	-2147483647		2147483647	Reference variable • Setting "0" is not possible. • Initialisation: 65536

5.14.5 HysteresisFollowingError1

Is an instance of	Function		
L_SdSetPosition	Conversion of the following error hysteresis 1 selected in the real units of the machine via C03917 into a position in [increments]. ▶ Following error monitoring (📖 28)		

Parameter	Possible settings			Information
C03917	-214000.0000	unit	214000.0000	Position value • Initialisation: 0.0000 unit
C03918	String of digits			Position unit • Read only
C03919	-2147483647		2147483647	State • Read only

5.14.6 HysteresisFollowingError2

Is an instance of	Function
L_SdSetPosition	Conversion of the following error hysteresis 2 selected in the real units of the machine via C03920 into a position in [increments]. ▶ Following error monitoring (18)

Parameter	Possible settings	Information
C03920	-214000.0000 unit 214000.0000	Position value Initialisation: 0.0000 unit
C03921	String of digits	Position unit Read only
C03922	-2147483647 2147483647	State Read only

5.14.7 L_PosPositionerTable1

Is an instance of	Function
L_PosPositionerTable	▶ Profile data management (18)

Parameter	Possible settings	Information
C04700/1	071 The position applied at the input <i>dnPos_p</i> is saved to the VTPOS table position selected via the input <i>dwPosTableNumber</i>.	Teach position For execution via parameter channel.
C04700/2	071 The speed applied at the input <i>dnSpeed_s</i> is saved to the VTSPEED table position selected via the input <i>dwSpeedTableNumber</i>.	Teach speed For execution via parameter channel.
C04700/3	071 The acceleration/deceleration applied at the input <i>dnAcc_s</i> is saved to the VTACC table position selected via the input <i>dwAccTableNumber</i>.	Teach acceleration For execution via parameter channel.
C04700/4	071 The S-ramp time applied at the input <i>dwJerk</i> is saved to the VTJERK table position selected via the input <i>dwJerkTableNumber</i>.	Teach S-ramp time For execution via parameter channel.
C04701/1...75	-214748.3648 unit 214748.3648	VTPOS: variable positions For selecting the target positions and TP window start and end positions for the profiles.
C04702/1...50	-214748.3648 unit/s 214748.3648	VTSPEED: variable speeds For selecting the traversing and final speeds for the profiles.
C04703/1...50	-214748.3648 unit/s ² 214748.3648	VTACC: variable accelerations For selecting the accelerations and decelerations for the profiles.

Parameter	Possible settings			Information
C04704/1...50	-2147483.648	s	2147483.648	VTJERK: variable S-ramp times • For selecting the S-ramp times for the profiles.
C04705/1				DIS:bPosTeach
	0	FALSE		• Display of the input signal <i>bPosTeach</i> .
	1	TRUE		
C04705/2				DIS:bSpeedTeach
	0	FALSE		• Display of the input signal <i>bSpeedTeach</i> .
	1	TRUE		
C04705/3				DIS:bAccTeach
	0	FALSE		• Display of the input signal <i>bAccTeach</i> .
	1	TRUE		
C04705/4				DIS:bJerkTeach
	0	FALSE		• Display of the input signal <i>bJerkTeach</i> .
	1	TRUE		
C04706/1	0		100	DIS:VTPosNum • Display of the input signal <i>dwPosTableNumber</i> .
C04706/2	0		100	DIS:VTSpeedNum • Display of the input signal <i>dwSpeedTableNumber</i> .
C04706/3	0		100	DIS:VTAccNum • Display of the input signal <i>dwAccTableNumber</i> .
C04706/4	0		100	DIS:VTJerkNum • Display of the input signal <i>dwJerkTableNumber</i> .
C04706/5	0		100	DIS:ProfileNum • Display of the input signal <i>dwProfileNumber</i> .
C04707/1	-214748.3648	unit	214748.3648	DIS:dnTeachPos • Display of the input signal <i>dnPos_p</i> in the real unit of the machine.
C04707/2	-214748.3648	unit/s	214748.3648	DIS:dnTeachSpeed • Display of the input signal <i>dnSpeed_s</i> in the real unit of the machine.
C04707/1	-214748.3648	unit/s ²	214748.3648	DIS:dnTeachAcc • Display of the input signal <i>dnAcc_x</i> in the real unit of the machine.
C04707/1	-214748.3648	s	214748.3648	DIS:dnTeachJerk • Display of the input signal <i>dwJerk</i> in the real unit of the machine.
C04708	-2147483647		2147483647	State • Display of the bit-coded output signal <i>dnState</i> .

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Parameter setting & configuration

Parameterisable function blocks

Parameter	Possible settings	Information
C04710/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 Absolute	Positioning mode For absolute positioning, the home position must be known.
	2 Absolute TP	
	5 Relative	
	6 Relative TP	
	7 Speed	
	8 Speed TP	
	11 Absolute CW	
	12 Absolute CW TP	
	13 Absolute CCW	
	14 Absolute CCW TP	
	15 Absolute ShortestWay	
	16 Absolute ShortestWay TP	
C04711/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 VTPOS position 1 (C04701/1)	Position from VTPOS Reference to VTPOS table position for defining the profile parameter "position".
	2 VTPOS position 2 (C04701/2)	
		
	75 VTPOS position 75 (C04701/75)	
C04712/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 VTSPEED position 1 (C04702/1)	Speed from VTSPEED Reference to VTSPEED table position for defining the profile parameter "speed".
	2 VTSPEED position 2 (C04702/2)	
		
	50 VTSPEED position 50 (C04702/50)	
C04713/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 VTACC position 1 (C04703/1)	Acceleration from VTACC Reference to VTACC table position for defining the profile parameter "acceleration".
	2 VTACC position 2 (C04703/2)	
		
	50 VTACC position 50 (C04703/50)	
C04714/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 VTACC position 1 (C04703/1)	Deceleration from VTACC Reference to VTACC table position for defining the profile parameter "deceleration".
	2 VTACC position 2 (C04703/2)	
		
	50 VTACC position 50 (C04703/50)	
C04715/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 VTJERK position 1 (C04704/1)	S-ramp time from VTJERK Reference to VTJERK table position for defining the profile parameter "S-ramp time".
	2 VTJERK position 2 (C04704/2)	
		
	50 VTJERK position 50 (C04704/50)	
C04716/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	1 VTSPEED position 1 (C04702/1)	Final speed from VTSPEED - Reference to VTSPEED table position for defining the profile parameter "final speed". - An existing sequence profile is required.
	2 VTSPEED position 2 (C04702/2)	
		
	50 VTSPEED position 50 (C04702/50)	

Parameter	Possible settings		Information
C04717/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)			TP window start position from VTPOS - Reference to VTPOS table position for defining the profile parameter "TP window start position". - For the position value "0", the start position is the negative travel range limit.
	1	VTPOS position 1 (C04701/1)	
	2	VTPOS position 2 (C04701/2)	
	...	...	
	75	VTPOS position 75 (C04701/75)	
C04718/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)			TP window end position from VTPOS - Reference to VTPOS table position for defining the profile parameter "TP window end position". - For the position value "0", the end position is the positive travel range limit.
	1	VTPOS position 1 (C04701/1)	
	2	VTPOS position 2 (C04701/2)	
	...	...	
	75	VTPOS position 75 (C04701/75)	
C04719/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)			Sequence profile with TP Sequence profile for touch probe residual path positioning.
	1	Profile no. 1	
	...	...	
	75	Profile no. 75	
C04720/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)			Sequence profile without TP Sequence profile for profile linkage.
	0	No sequence profile (End of a profile linkage)	
	1	Profile no. 1	
	...	...	
	75	Profile no. 75	
C04721/1...75 (subcode 1 ... 75 ≡ profile no. 1 ... 75)	Value is bit-coded:		Touch probe configuration The touch probe channels to be used are selected by setting the corresponding bits to "1".
	Bit 0	TP channel 1, rising edge	Digital input 1
	Bit 1	TP channel 1, falling edge	
	Bit 2	TP channel 2, rising edge	Digital input 2
	Bit 3	TP channel 2, falling edge	
	Bit 4	TP channel 3, rising edge	Digital input 3
	Bit 5	TP channel 3, falling edge	
	Bit 6	TP channel 4, rising edge	Digital input 4
	Bit 7	TP channel 4, falling edge	
	Bit 8	TP channel 5, rising edge	Digital input 5
	Bit 9	TP channel 5, falling edge	
	Bit 10	TP channel 6, rising edge	Digital input 6
	Bit 11	TP channel 6, falling edge	
	Bit 12	TP channel 7, rising edge	Digital input 7
	Bit 13	TP channel 7, falling edge	
	Bit 14	TP channel 8, rising edge	Digital input 8
	Bit 15	TP channel 8, falling edge	
	Bit 16	TP channel 9	Motor encoder zero pulse
	Bit 18	TP channel 10	Load encoder zero pulse
	Bit 20	TP channel 11	DFIN zero pulse
	Bit 22	TP channel 12	DFOUT zero pulse

5.14.8 L_SdSwitchPoint1

Is an instance of	Function				
L_SdSwitchPoint	Position switch points (cams)				

Parameter	Possible settings				Information
C04395/1...8					State of switching range 1 ... 8 Read only
	0	Switch is off			
	1	Switch is on			
C04396	String of digits				Position unit Read only
C04397/1...8	-2147483648		unit	2147483648	Switch-on position switching range 1 ... 8
C04398/1...8	-2147483648		unit	2147483648	Switch-off position switching range 1 ... 8
C04399/1...8					Enable switching range 1 ... 8
	0	Switching range not enabled			
	1	Switching range enabled			

5.14.9 LimitFollowingError1

Is an instance of	Function		
L_SdSetPosition	Conversion of the following error switching threshold 1 selected in the real units of the machine via C03911 into a position in [increments]. ► Following error monitoring (📖 28)		

Parameter	Possible settings			Information
C03911	-214000.0000	unit	214000.0000	Position value • Initialisation: 100.0000 unit
C03912	String of digits			Position unit • Read only
C03913	-2147483647		2147483647	State • Read only

5.14.10 LimitFollowingError2

Is an instance of	Function		
L_SdSetPosition	Conversion of the following error switching threshold 2 selected in the real units of the machine via C03914 into a position in [increments]. ► Following error monitoring (📖 28)		

Parameter	Possible settings			Information
C03914	-214000.0000	unit	214000.0000	Position value • Initialisation: 200.0000 unit

Parameter	Possible settings			Information
C03915	String of digits			Position unit • Read only
C03916	-2147483647		2147483647	State • Read only

5.14.11 MonitFollowError1

Is an instance of	Function
L_LdMonitFollowError	► Following error monitoring (28)

Parameter	Possible settings			Information
C03960	-214748.3647	unit	214748.3647	Following error at the input Display of the input signal <i>dnFollowErrorIn_p</i> in the real unit of the machine.
C03961	String of digits			Position unit Read only
C03963				Following error out of tolerance Read only
	FALSE	Following error smaller than set switching threshold		
	TRUE	Following error larger than set switching threshold		
C03964				Following error monitoring activated Read only
	FALSE	Deactivated		
	TRUE	Activated		

5.14.12 MonitFollowError2

Is an instance of	Function
L_LdMonitFollowError	► Following error monitoring (28)

Parameter	Possible settings			Information
C03965	-214748.3647	unit	214748.3647	Following error at the input Display of the input signal <i>dnFollowErrorIn_p</i> in the real unit of the machine.
C03966	String of digits			Position unit Read only
C03968				Following error out of tolerance Read only
	FALSE	Following error smaller than set switching threshold		
	TRUE	Following error larger than set switching threshold		
C03969				Following error monitoring activated Read only
	FALSE	Deactivated		
	TRUE	Activated		

5.14.13 PosStarted

Is an instance of	Function
L_TbTransition	Edge generation for resetting the "drive at the target" state

Parameter	Possible settings			Information
C04000				Trigger edge
	0	Rising edge		Lenze setting
	1	Falling edge		
	2	Both edges		
C04001	0.001	s	60.000	Pulse duration • Initialisation: 0.001 s



Your opinion is important to us

These instructions were created to the best of our knowledge and belief to give you the best possible support for handling our product.

If you have suggestions for improvement, please e-mail us to:

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Thank you for your support.

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