

Lexium32

Auto Tuning Guide



This guide is valid for all Lexium32 drives. The described procedure works in the same way with Lexium32 A, C, M in all power classes and for all Schneider Electric standard motors.

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To increase the stability of a Servo system, it is necessary to adjust the control loop parameter values of the servo drive properly. The Auto Tuning functionality provides easy and effective tools to help the users adjusting these important settings to receive best in class results.

In the Lexium32 servo drive two different ways of Auto Tuning are realized:

“**Easy Tuning**” and “**Comfort Tuning**”

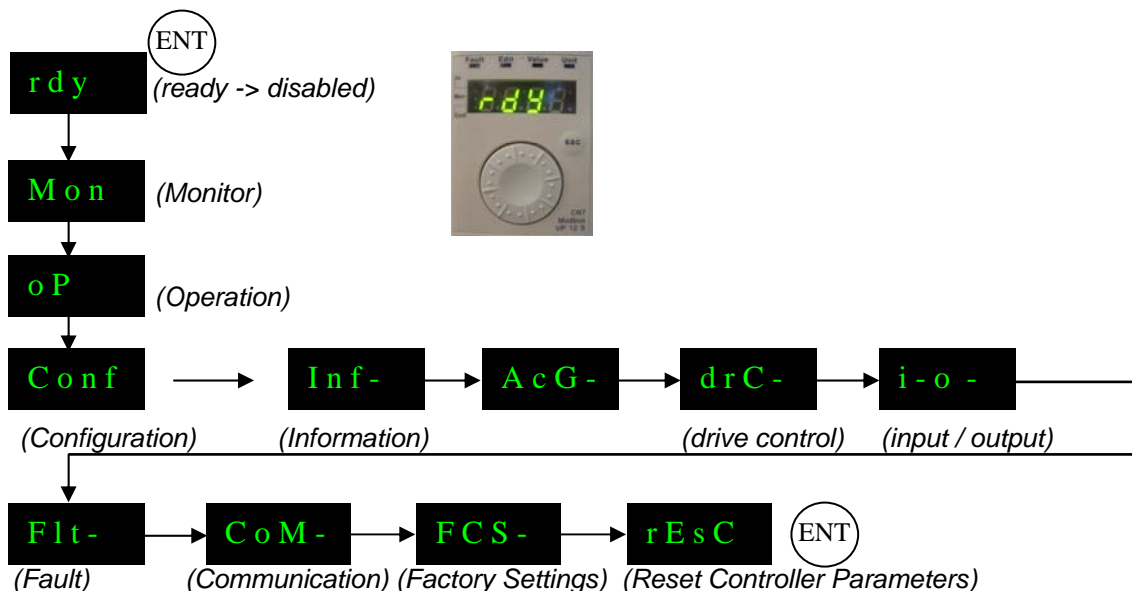
Main differences:

- Easy Tuning can be handled only from the drive without any commissioning software
- Comfort Tuning has better tuning results, because the mechanical environment is taken into account

1) Easy Tuning with internal HMI

First of all a controller parameter reset is fundamental.

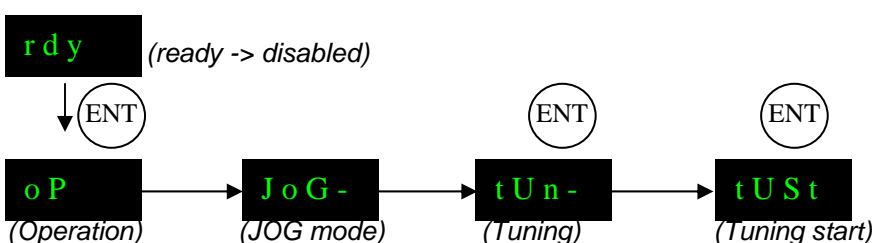
For this procedure the drive has to be in state disable!



Confirm with “Yes” and

Start the Auto Tuning

Ensure that the axis is not in a mechanical collision area!



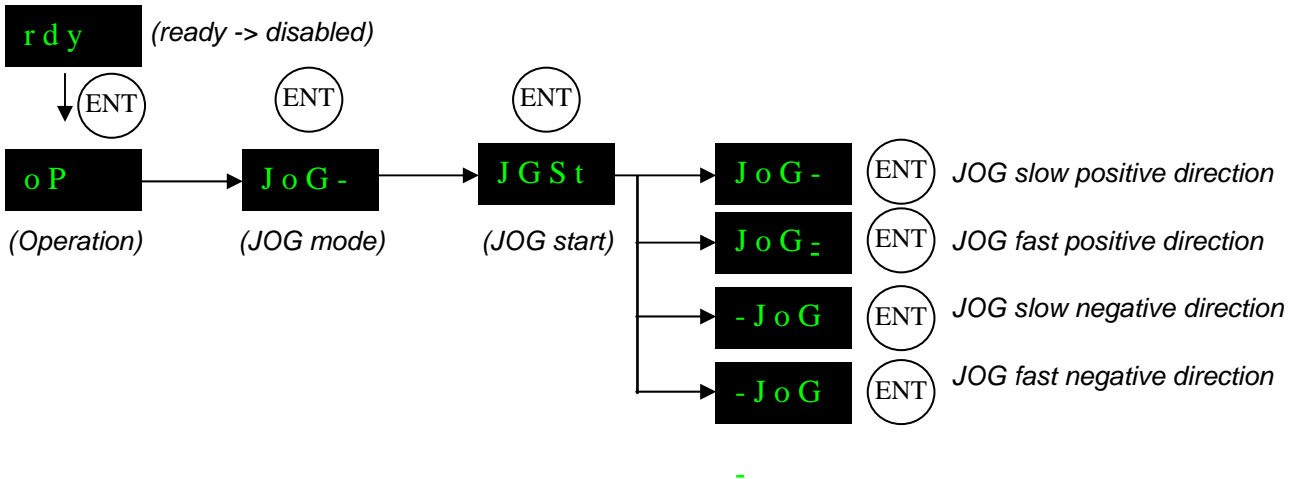
After finishing the “Easy Auto Tuning” procedure all parameters are automatically saved in the device.

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Test the result of the Auto Tuning with internal HMI

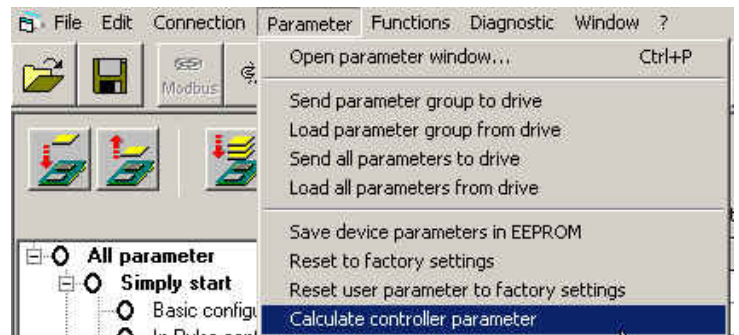
Use first of all the JOG mode in order to move the motor (with the slow and fast JOG mode speed) in both directions to test, if the adjustment of the control loop parameters is fitting to your application.



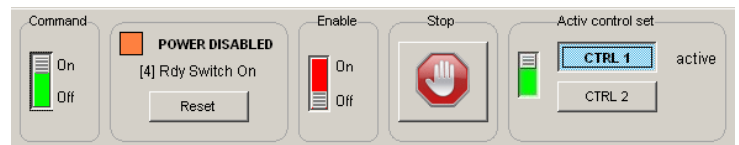
2) Easy Tuning with the commissioning tool LexiumCT

Start the LexiumCT commissioning tool and connect to the device.

First of all reset of the control loop parameter set is fundamental
-> Calculate controller parameter



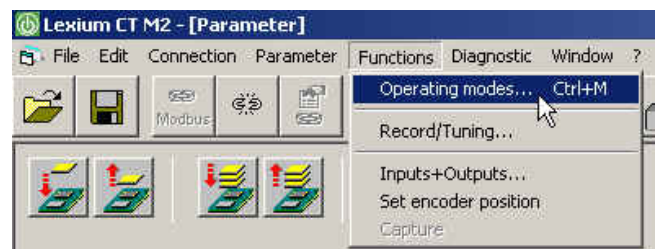
For this procedure the drive has to be in state **disable** !



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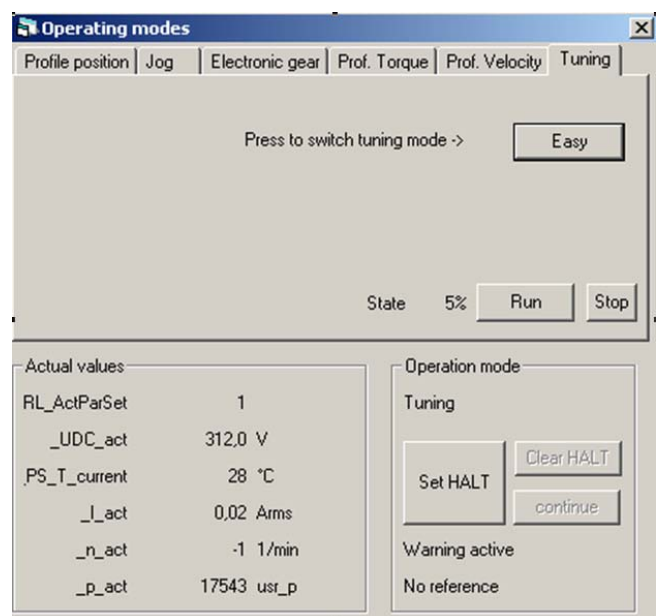
Open the window: Functions/Operating modes
And choose "Tuning".



(or)



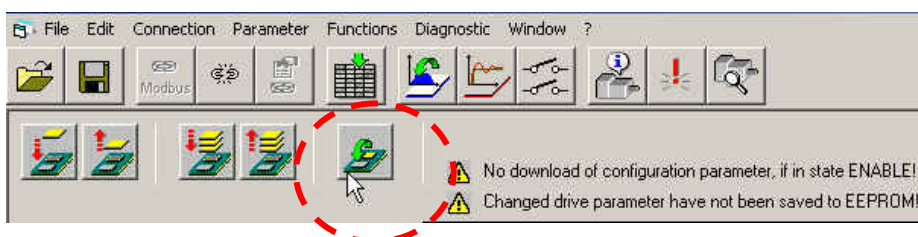
"Easy Tuning"



Ensure that the axis is not in a mechanical collision area during the Auto Tuning procedure!

Press "Run" to start the Easy Auto Tuning procedure.

After finishing the "Easy Auto Tuning" procedure, all parameters are not saved in the EEPROM and will be lost when the drive is switched off. The parameters have to be saved in the device.



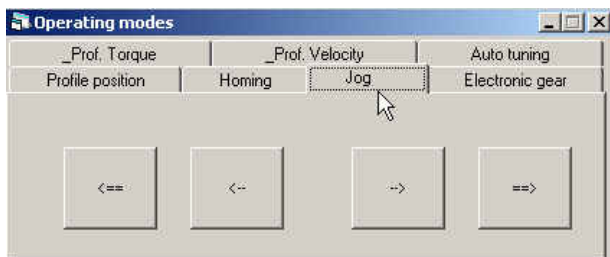
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Test the result of the Auto Tuning with the commissioning tool

Use first of all the JOG mode in order to move the motor (with the slow and fast JOG mode speed) in both directions to test, if the adjustment of the control loop parameter is fitting to your mechanical system. After that a start a homing mode and/or initiate Point-to-Point (PtP) movements with your requested position profile can be performed.

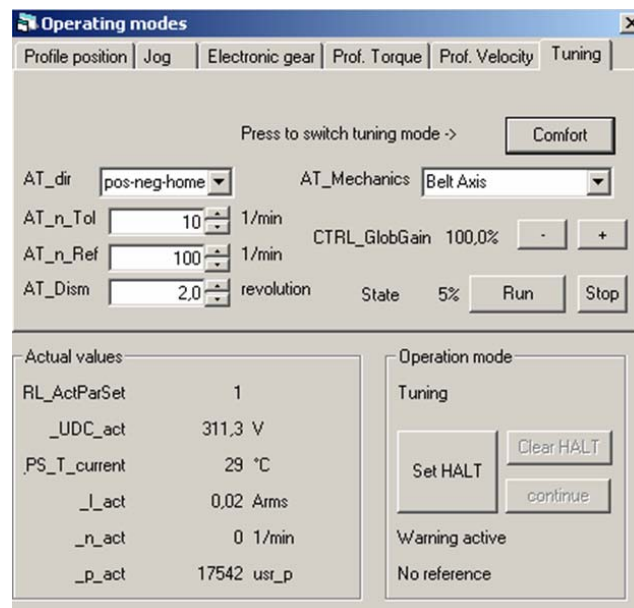
Test the whole movement range area with different values for the speed in order to check, if the movement is smooth and there are no resonances on the mechanics.





3) Comfort Tuning with the commissioning tool LexiumCT

Perform the same steps as described in chapter 2 but change in the operating mode tuning to “Comfort Tuning”. Start the LexiumCT commissioning tool and connect to the device. Additional settings for the “Comfort Tuning” can end up in better tuning results.



Ensure that the axis is not in a mechanical collision area during the Auto Tuning procedure!

Press “Run” to start the Comfort Auto Tuning procedure.
After finishing the “Easy Auto Tuning” procedure all parameters have to be saved in the device.



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Description of adjustable Parameter for Comfort Tuning:

AT_dir	pos-neg-home	AT_Mechanics	Belt Axis
AT_n_Tol	10	1/min	CTRL_GlobGain 100,0% - +
AT_n_Ref	100	1/min	
AT_Dism	2,0	revolution	State 5% Run Stop

“CTRL_GlobGain”:

After the auto tuning is finished, it is possible to influence the complete set of control loop parameter with the Global Gain.

The value 100% represents the set of parameters found by the AutoTuning procedure. Decreasing the Global Gain will end up in a softer control loop adjustment.

“AT_dir”

The following options are available:

Pos-neg-home: First positive direction, then negative direction with return to initial position

Neg-pos-home: First negative direction, then positive direction with return to initial position

Pos-home: Only positive direction with return to initial position

Rotary_axis_Pos: Only positive direction without return to initial position

Neg-home: Only negative direction with return to initial position

Rotary_axis_Neg: Only negative direction without return to initial position

“AT_Mechanics”:

With this parameter the basic mechanical system can be selected:

- Belt Axis
- Spindle Axis
- Direct Coupling

“AT_dism”:

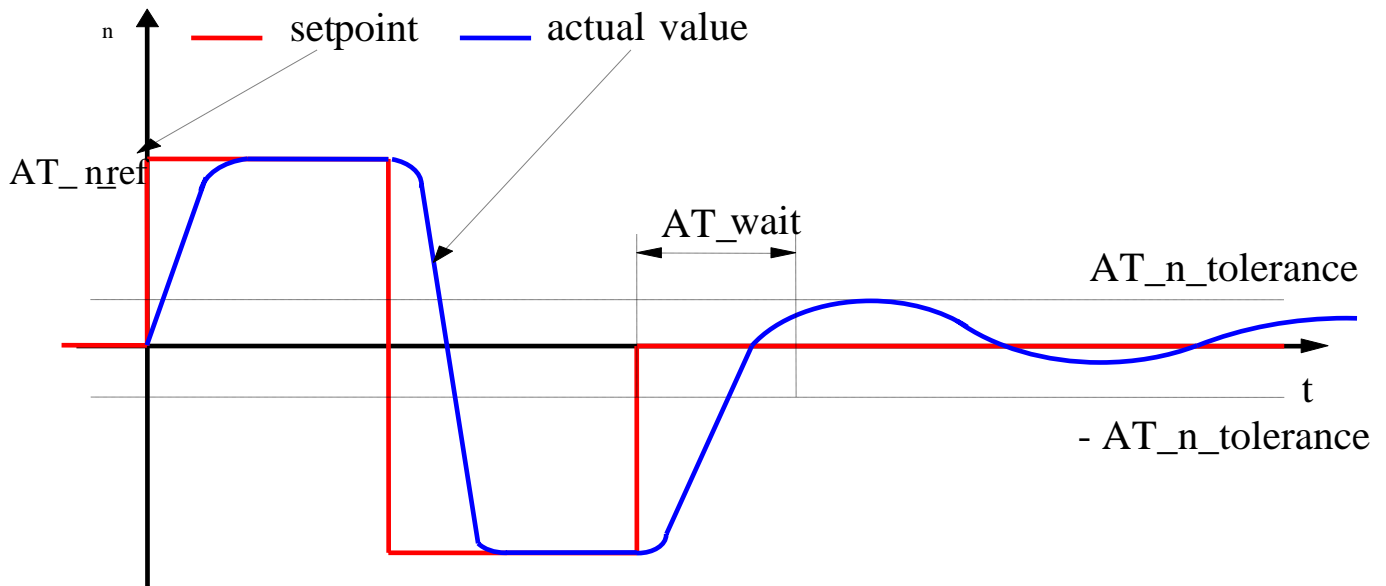
This parameter describes the distance of Movement during the AutoTuning process. The range is input relative to the current position.

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“AT_n_ref”, “AT_n_tolerance”:

To find the optimal controller settings, auto tuning starts a speed jump (**AT_n_ref**) and check the actual speed (**n_act**) performance. Afterwards the actual speed has to be in the rotation window (**AT_n_tolerance**).



Test the result of the Auto Tuning in the same was as described in the Easy Tuning.

Responsible for the contents:

Schneider Electric Motion
Motion Support Center