TOSHIBA

AS3 Application Note 2.9.1

Sleep Function (PID control)

How to program the drive to shut down under certain conditions to save energy in PID mode.

Estimated Time: 10 - 20 Minutes
Level: 3
Prerequisite:

- AS3 Application Note 1.1.1 Navigating Menus & Parameters
- AS3 Application Note 2.1.1 PID Setup

STEP A

Theory of Operation

The sleep function on the AS3 is used for energy saving and extending the lifespan of the pump.

This function puts the drive to sleep when there is no demand for mass flow, which would decrease the run time for the motor and prolong the lifespan.

The Sleep function will automatically decelerate and bring the drive to a stop when programmed conditions have been met.

The drive's Sleep function begins once the output frequency is at the programmed <LL: Lower Limit frequency>.

The drive will continue to run at the <LL: Lower Limit frequency> for the specified time in the <F256: Run Sleep detection time> parameter prior to the drive's sleep cycle.

Once the drive has met these condition, the screen will display "LStP" while the drive is in "sleep" mode.

You can also enable a feature with the Sleep function that will automatically stop the drive after a time period programmed in <F259: Run Sleep detection time at start-up> if the output frequency does not increase past the <LL: Lower Limit frequency> due to load error at start-up.

The drive will begin to run after the sleep cycle based on the value set in <F393: Wakeup feedback>.

This parameter is not based on time, it is based on the feedback value reaching the set value and it will begin to run immediately once the feedback has done so.

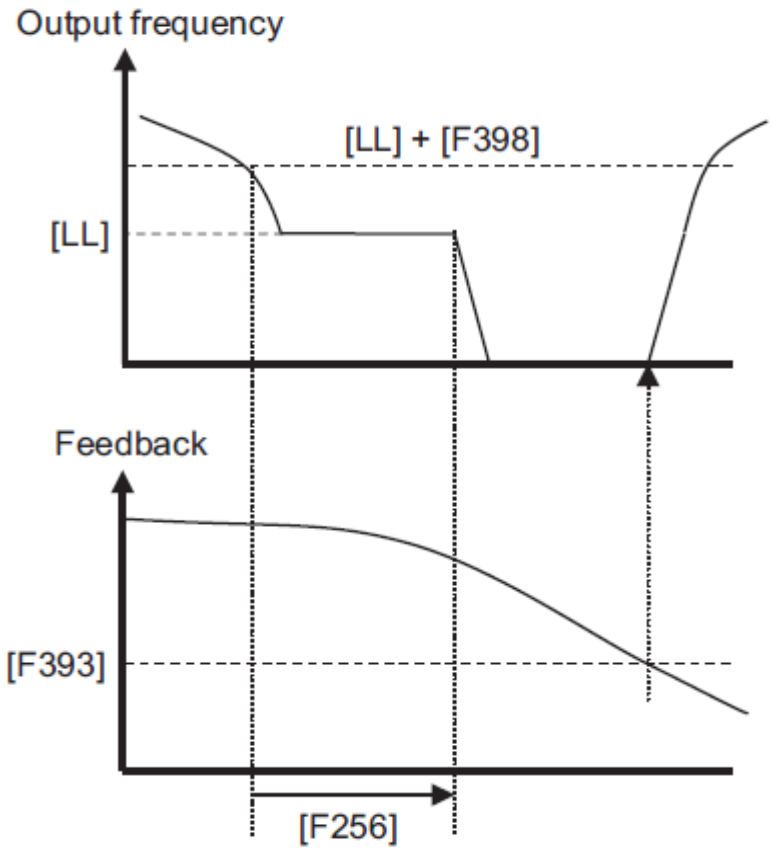
Note: **Refer to Section 6.9 in the AS3 PID Control Instruction Manual E6582112 for additional information on the Sleep function.**

TOSHIBA

STEP B

Explanation

The sleep function during operation is shown in the diagram below.



This diagram shows the output frequency falling below the <LL: Lower Limit frequency>. The output frequency would go into the sleep state after running for a duration based on <F256: Run Sleep detection time>. The second graph shows the time interval during the operation. The AS3 will wake up based on the <F393: Wakeup feedback> and the output frequency will increase based on the demand of your application.

Check Your Work

✓ **Check your understanding of the condition required to enable or disable the Sleep function.**

TOSHIBA

STEP C
Programming

1. Program the Lower Limit Frequency. The lower limit frequency will determine the frequency at which the drive will go to sleep.

Parameter	Description	Default Value	New Value
F013	LL: Lower Limit Frequency	0.0	Choose New LL Value

2. Program the Sleep detection time. The drive will need to run at the lower limit for the set period of time to go into a sleep state.

Parameter	Description	Default Value	New Value
F256	Sleep Detection Time	0.0	Choose New Value

3. Program the Wakeup Feedback. This is the set value at which the drive will wake up from its sleep state.

Parameter	Description	Default Value	New Value
F393	Wakeup Feedback	0.0	Choose New Value

4. (If applicable) Program the Run Sleep detection at start-up. This is the set time value at which the drive will go into a sleep state if the output frequency does not increase to the value of Lower Limit Frequency due to a load error.

Parameter	Description	Default Value	New Value
F259	Run Sleep detection at start-up	0.0	Choose New Value

Check Your Work

✓ **Verify parameter change was made by verifying new value programmed.**

✓ **Ensure the drive is properly programmed for PID, otherwise the drive will not go into a sleep state nor wake up from the sleep state correctly. Refer to the AS3 App Note 2.1.0 PID Setup for additional information.**

