Command Generator Configuration Attributes

The following are the command generator configuration attributes associated with a Motion Control Axis:

Skip Speed 1

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - F	Set/SSV	REAL	0	-∞	∞	Velocity Units

The Skip Speed 1 attribute sets the central speed of a skip speed band within which the device does not operate. The skip speed value is signed.

Skip Speed 2

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - F	Set/SSV	REAL	0	-∞	∞	Velocity Units

The Skip Speed 2 attribute sets the central speed of a skip speed band within which the device does not operate. The skip speed value is signed.

Skip Speed 3

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - F	Set/SSV	REAL	0	-∞	∞	Velocity Units

The Skip Speed 3 attribute sets the central speed of a skip speed band within which the device does not operate. The skip speed value is signed.

Skip Speed Band

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - F	Set/SSV	REAL	0	0	∞	Velocity Units

When operating in Closed Loop Velocity mode, the Fine Velocity Command block also supports Skip Bands that are most frequently used in applications where certain speeds excite mechanical resonance frequencies of the motor and load.

The Skip Speed Band attribute determines the speed window around a skip speed that cannot be commanded. Any command set-point within this window is adjusted by the Skip Speed block to fall at either the upper or lower Skip Speed Band boundary value. The device can smoothly accelerate or decelerate through the skip speed band based on the ramp generator block but may not operate at a set speed within the band. The Skip Speed Band is distributed ½ above and ½ below the skip speed. This Skip Speed Band attribute applies to all skip speeds supported in the device. A value of 0 for this attribute disables this feature.

Ramp Velocity - Positive

Usage	Access	Data Type	Default	Min	Max	Semantics of Values

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Optional - FV Derived from Max Speed	Get/SSV	REAL	0	0	∞	Velocity Units

The Ramp Velocity - Positive attribute is a positive value that defines the maximum positive velocity command output of the Ramp Generator.

Ramp Velocity - Negative

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - FV Derived from Max Speed	Get/SSV	REAL	0	-∞	0	Velocity Units

The Ramp Velocity - Negative attribute is a negative value that defines the maximum negative velocity command output of the Ramp Generator.

Ramp Acceleration

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - FV Derived from Max Accel	Get/SSV	REAL	0	0	∞	Accel Units

The Ramp Acceleration attribute is a positive value that defines the maximum acceleration (increasing speed) of the velocity command output by the Ramp Generator.

Ramp Deceleration

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - FV Derived from Max Decel	Get/SSV	REAL	0	0	∞	Accel Units

The Ramp Deceleration attribute is a positive value that defines the maximum deceleration (decreasing speed) of the velocity command output by the Ramp Generator.

Ramp Jerk Control

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - FV	Get/SSV	REAL	0	0	100	%

The Ramp Jerk Control attribute sets the percentage of accel or decel time that is applied to the speed ramp as jerk limited S Curve based on a step change in velocity. The S Curve time is added ½ at the beginning and ½ at the end of the ramp. A value of 0 results in no S-Curve, for example, a linear acceleration or deceleration ramp.

A value of 100% results in a triangular acceleration profile with the peak being the

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A value of 100% results in a triangular acceleration profile with the peak being the configured ramp acceleration or deceleration.

As the Jerk Control value increases the derived accelerating jerk value decreases based on:

0.5 * 0.01 * Jerk Control * Ramp Vel Positive / Ramp Accel

and the decelerating Jerk limit value also decreases according to:

0.5 * 0.01 * Jerk Control * Ramp Vel Negative / Ramp Decel.

Flying Start Enable

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - FV	Set/SSV	USINT	0	0	1	0 = Flying Start Disabled 1 = Flying Start Enabled

The Flying Start Enable attribute is used to enable or disable the Flying Start feature of the device. When Flying Start Enable is true and the motion axis is enabled, the device determines the current velocity of the motor, using either the configured Flying Start Method or, if not supported, a method that is left to the drive vendor's discretion. This operation is done as part of the Starting State initialization activities. Just prior to transitioning to the Running state, the device presets the output of the Ramp Generator to the current velocity. In this way, the motor seamlessly ramps from its current velocity to the commanded velocity from the controller. When Flying Start Enable is false, the motor velocity is irrelevant and a preset of 0 is applied to the Ramp Generator output.

Some drive vendors do not allow the Flying Start feature to be disabled when connected to a feedback device. To support this behavior, these drives do not support the Flying Start Enable attribute, but do support the Flying Start Method attribute.

Flying Start Method

Usage	Access	Data Type	Default	Min	Max	Semantics of Values
Optional - FV	Set/SSV	USINT	0	-	-	Enumerations: 0 = Encoder Only (R) 1 = Counter EMF (O) 2 = Sweep Frequency (O)

The Flying Start Method attribute is an enumerated value which establishes the method used to "catch" a moving motor when the drive is enabled. The configured Flying Start Method is applied if Flying Start Enable is true or if the Flying Start Enable attribute is not supported.

When Encoder Only is selected, the drive uses encoder feedback to determine the current speed of the motor to initialize the Ramp Generator output. This method is not applicable without a connected feedback device. If Encoder Only is selected without a connected feedback device, the Flying Start function is effectively disabled.

When Counter EMF is selected, the drive determines the speed of the motor by measuring the motor's Counter EMF and applying the estimated speed to the Ramp Generator output.

When Sweep Frequency is selected the drive applies an algorithm that excites the motor at a predetermined frequency and, while "sweeping" the frequency to zero, checks for the motor current to change sign when the frequency matches the speed of the motor. The drive then applies this speed to the to the Ramp Generator output.

See also

General Motor Attributes

General Permanent Magnet Motor Attributes

General Rotary Motor Attributes

Guard Safety Attributes

Guard Safety Status Attributes

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