

AKD Motion Tasking Blending Examples:

From Workbench Help:

Blending

As an alternative to dwells, the AKD can blend motion tasks to provide smooth transitions between multiple tasks. This feature extends the life of your machine life by minimizing mechanical wear due to hard move transitions (jerks).

- **No blend.** No blend, move starts upon completion of the previous task
- **Blend into Acceleration.** Blends the acceleration of the current task into the following task. As the target position of the first task is reached, the acceleration blends into the second task. This prevents the motor from decelerating to zero before starting the second move. This only works where both accelerations are driving the motor in the same direction.
- **Blend into Velocity.** Blends the velocity of the current task into the following task. In this method, the target position is reached as the velocity of the second move is reached. The **blending** begins prior to reaching the target position, and is completed at the target position of the first move, and the traverse velocity of the second move. This only works when both velocities are in the same direction.

Details of operation:

When blending motion tasks, the drive will always use the new motion task's acceleration, even if the new velocity is lower than the current velocity.

When executing a motion task the drive constantly checks if it has to start the following motion task.

It calculates the distance the trajectory will move while accelerating from the current velocity to the following task's target velocity using the following task's acceleration ramp (even if it has to decelerate).

In the example of velocity blending, the new task has to be started once the current position plus the calculated distance moved during acceleration(deceleration) is larger than the current motion task's target position. Note in the example that follows, if the acceleration of the next task is decreased to a point, following these rules, the drive will have to skip over the 2nd and move on to the 3rd. This will yield a scope trace where it appears move 3 blends into 1 (move 2 is skipped).

Test:

Blend into Velocity



Motion Tasks

[? Learn more about this](#)

Motion Tasks allow you to define and configure drive motion tasks with their respective sequence.

▶ Start Motion Task Running: Idle

	Position [deg]	Velocity [rpm]	Acceleration [rpm/s]	Deceleration [rpm/s]	Profile	Type	Next Task
0	3600.000	200.000	200.048	400.096	Trapezoidal	▼ Absolute	▼ 1
▶ 1	7200.000	100.000	99.912	149.980	Trapezoidal	▼ Absolute	▼ 2
2	10800.000	200.000	50.068	69.961	Trapezoidal	▼ Absolute	▼ None

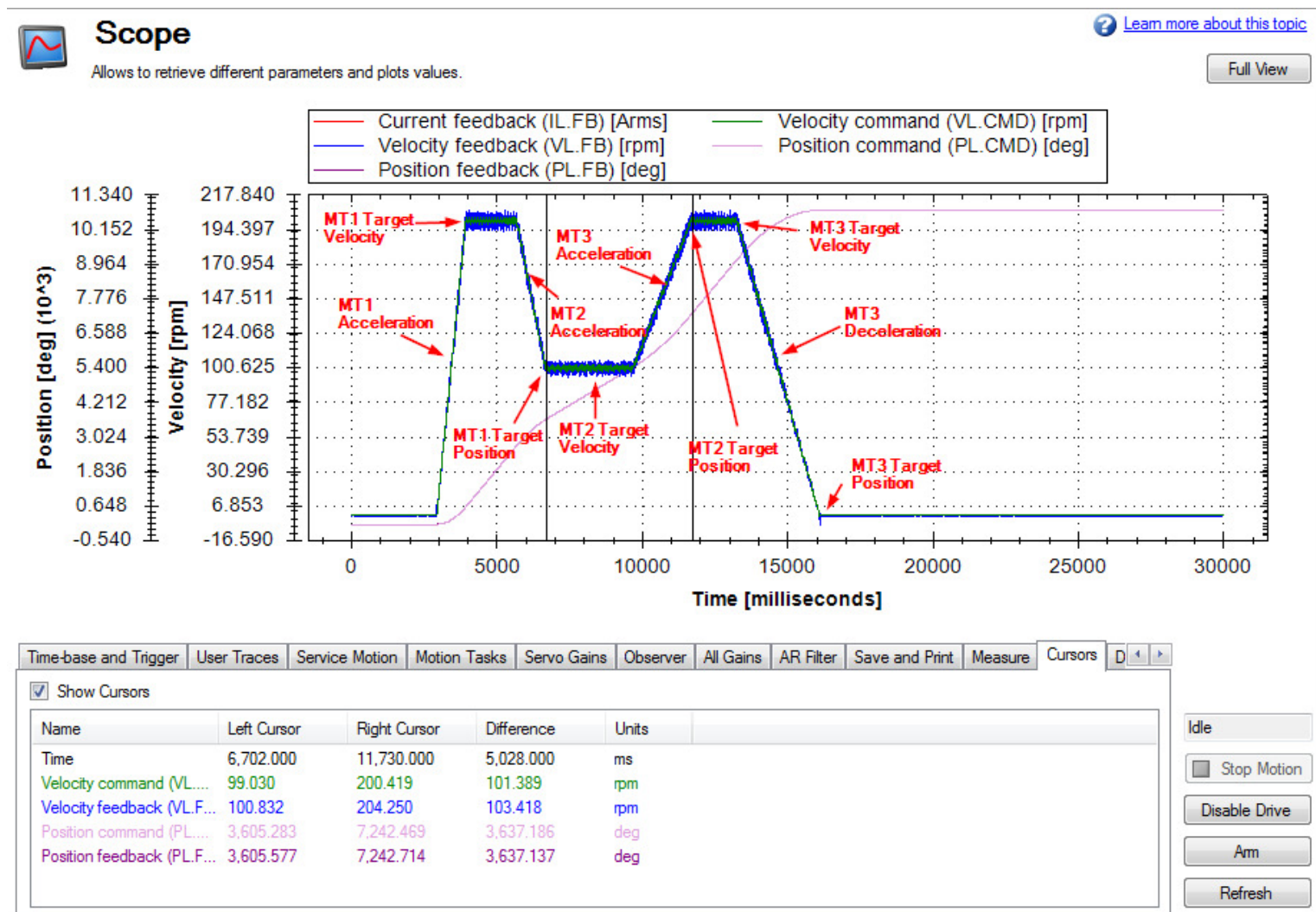
On start, MT1 ramps to MT 1 Target Velocity using MT 1 Acceleration. Prior to reaching MT 1 Target Position MT 1 blends into velocity of MT 2 meaning

MT 1 acceleration ramp is used to accel or decel to the MT 2 target velocity at the point the MT 1 Target Position is reached. Note without stopping MT 1 Decel is not used.

Whether the MT 2 target velocity is greater or less than the MT 1 velocity will result in an acceleration or deceleration at the rate defined by MT 2 Accel.

MT 2 ramps to the MT3 Target Velocity using MT3 acceleration and the MT2 target position is reached when the MT3 Target Velocity is reached. Note without stopping MT2 Decel is not used.

At the end of the MT chain of next moves (in this example MT 3 does not have a next task defined), the deceleration ramp defined by MT 3 Decel and is used to decelerate to the MT 3 Target Position.



Blend into Acceleration

Next the same motion tasks are setup with the same data except the next tasks are blended into acceleration.

On start, MT1 ramps to MT 1 Target Velocity using MT 1 Acceleration. MT 1 Target Position is reached at the MT 1 Target Velocity but “blending into acceleration of MT2”.

At the MT 1 Target Position, the motor is ramped to MT 2 Target Velocity at a rate defined by the MT 2 Accel. Note without stopping MT 1 deceleration is not used.

Whether the MT 2 target velocity is greater or less than the MT 1 velocity will result in an acceleration or deceleration at the rate defined by MT 2 Accel.

At the MT 2 Target Position is reached at the MT 2 Velocity but “blending into acceleration of MT3”. At the MT 2 Target Position, the motor is ramped to the MT3 Target Velocity at a rate defined by the MT 3 Accel. Note without stopping MT 2 Deceleration is not used.

Whether MT 3 target velocity is greater or less than MT 2 velocity will result in an acceleration or deceleration at the rate defined by MT 3 Accel. At the end of the MT chain of next moves (in this example MT 3 does not have a next task defined), the deceleration ramp defined by MT 3 Decel and is used to decelerate to the MT 3 Target Position.

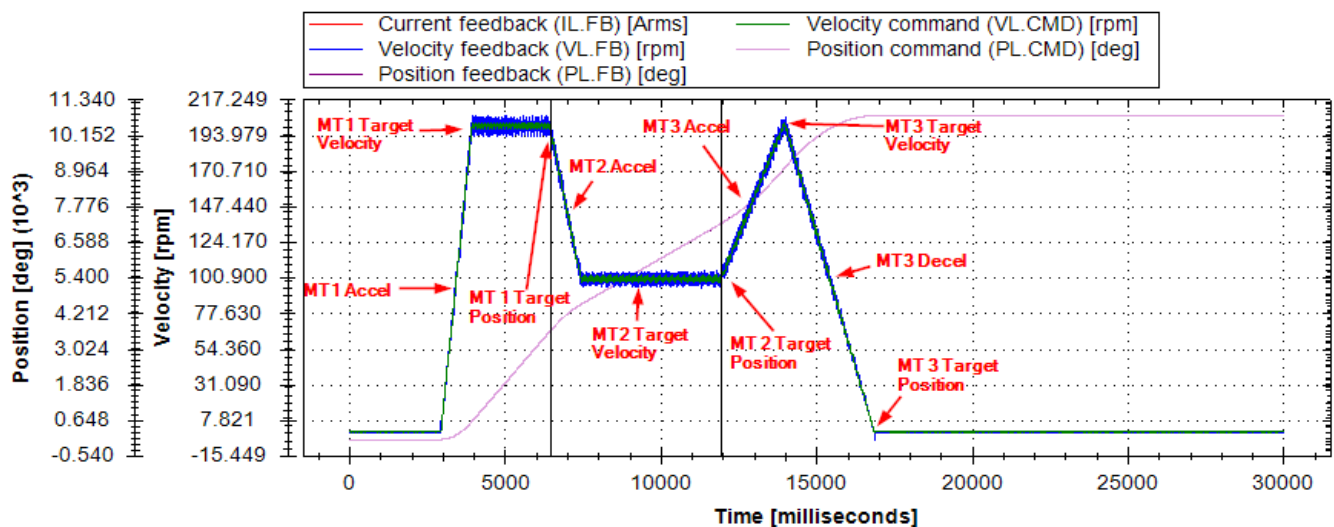


Scope

Allows to retrieve different parameters and plots values.

[Learn more about this topic](#)

Full View



Time-base and Trigger	User Traces	Service Motion	Motion Tasks	Servo Gains	Observer	All Gains	AR Filter	Save and Print	Measure	Cursors
<input checked="" type="checkbox"/> Show Cursors										
Name	Left Cursor	Right Cursor	Difference	Units						
Time	6,456.000	11,928.000	5,472.000	ms						
Velocity command (VL.CMD)	199.554	100.725	98.829	rpm						
Velocity feedback (VL.FB)	193.696	102.838	90.858	rpm						
Position command (PL.CMD)	3,617.035	7,192.081	3,575.046	deg						
Position feedback (PL.FB)	3,617.112	7,192.093	3,574.981	deg						

Idle
Stop Motion
Disable Drive
Arm
Refresh