
FOLLOW DIGITAL VELOCITY (BIPOLAR PWM COMMAND WITH VARIABLE TORQUE)

Available on

MCVC + MCPV

MODE DESCRIPTION

Control velocity and maximum torque independently and concurrently with this mode. Connect a digital PWM waveform from your PLC or other device to Input B, and ClearPath will run at a velocity proportional to the duty cycle of that waveform. Connect a separate digital or PWM signal to Input A to independently vary your motor's torque limit.

I/O FUNCTIONS

Enable Input - Asserting this input energizes the motor shaft.

Input A - This input is connected to a signal whose level or PWM duty cycle represents the desired torque limit.

Input B - This input is connected to a PWM signal whose duty cycle represents the desired velocity.

Output (HLFB) - See HLFB section for available modes.

Assert the Enable Input to energize the motor.

Velocity Control (Input B). Motor velocity is controlled by sending a PWM signal to Input B. Velocity is commanded as follows:

- Shaft velocity increases in the CW direction as PWM duty cycle decreases from 50% to 0%.
- Shaft velocity increases in the CCW direction as PWM duty cycle increases from 50% to 100%.
- As PWM duty cycle approaches 50%—from either side—motor velocity approaches 0.
- In practice, 0% and 100% (static low and static high conditions) are not valid PWM states. ClearPath treats these cases as zero-velocity commands.
- All changes in velocity occur at the user-defined acceleration rate.
- Set a PWM deadband to help reliably command zero velocity.
- PWM minimum on time and minimum off time = 300nS.

Torque Limit Control (Input A). Vary your motor's maximum torque between the "standard" Torque Limits and the Alternate Torque Limits using either digital or PWM control methods.

For **digital torque limit control**, toggle between the Torque Limits and Alternate Torque Limits by changing the state of Input A as follows:

- Deassert input A to operate using purely the "standard" Torque Limits.

- Assert input A to operate using purely the Alternate Torque Limits.

For **PWM torque limit control**, you can vary the active torque limit linearly between the two torque limit settings by varying the PWM duty cycle sent to Input A as follows:

- Apply a 0% duty cycle (static low) to operate using purely the "standard" Torque Limits.
- Apply a 100% duty cycle (static high) to operate using purely the Alternative Torque Limits.
- Apply a duty cycle anywhere in between 0% and 100% to create a linear combination of the two limits.

Additional Notes:

- PWM input frequency range: 20 Hz up to 30 kHz.
- If the PWM signal is off for 50mS or more the PWM input is considered off.
- Disable time = 10 mS.

MODE CONTROLS

Max Speed (RPM)
1,000

Enter max. desired motor speed (i.e., full scale speed).

PWM Deadband (+/-%)
0

Enter optional deadband setting. See text for description of deadband operation.

Relax Time (ms)
50

Enter timespan over which changes made to torque limit occur.

Torque Limit OVR Setup...

When lit, the main torque limit is being overridden by a secondary, user-set torque limit (e.g., when an axis is homing, the main torque limit may be overridden by the separate homing torque limit setting).

Active Torque Limits (% of Max)
-23.4 to +23.4

Displays torque limit values that are currently in effect.

Max Accel (RPM/s)
5,000

Enter maximum desired motor acceleration rate.

Decel = Accel

Check here to set motor deceleration rate to same value as acceleration rate.

Max Decel (RPM/s)
500

Enter maximum desired motor deceleration rate.

Profile Conversion
RAS™ 25 ms
Setup...

Adjust settings for RAS™ (or optional g-Stop™) to convert standard trapezoidal move profiles into profiles that reduce noise, resonance, and vibration.

Click to open Torque Limit Setup dialog.

Invert Torque PWM Input
 Invert Speed PWM Input

Check box to invert how PWM duty cycle is measured by ClearPath.

NO CHECK
 Duty cycle is % of period high

CHECK
 Duty cycle is % of period low

Hardware Enable Status LED
Light = Input asserted (on)
Dark = Input de-asserted (off)

PWM Meter (Torque Limiting)
Displays duty cycle of PWM signal connected to Input A.

PWM Meter (Velocity)
Displays duty cycle of PWM signal connected to Input B.

Displays commanded velocity (when using hard controls).

Inputs and Commands

Override Inputs

Enable On/Off

Input A Torque Limiting
No PWM

Input B Velocity
80% Duty Cycle

Cmd. Velocity (RPM)
590

Servo On Output
Servo On

Check to turn on Soft Controls. Override cannot be activated when ClearPath is hardware enabled.

Soft Enable Control
Check to enable. For use only when Soft Controls are active. **Caution:** motor may spin when enabled.

Input A PWM Soft Slider
Emulates PWM input (for use with Soft Controls).

Input B PWM Soft Slider
Emulates PWM input (for use with Soft Controls).

Displays commanded velocity (when using Soft Controls).

Displays HLFB output status

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