

## Introduction

ADVANCED Motion Controls® AxCent™ servo drives are configurable for use with a wide variety of brushless and brushed motors.

This application note details the basic steps required to configure and set up AxCent Panel Mount and Vehicle Mount servo drives.

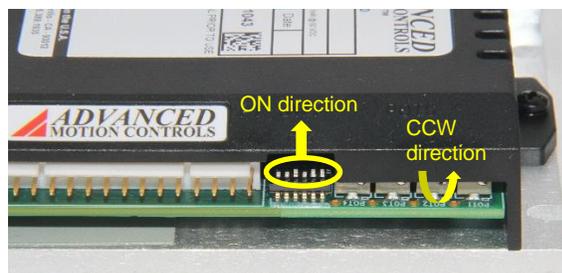


**Note:** This application note does not apply to PCB Mount AxCent servo drives.

## Mode Selection

ADVANCED Motion Controls' AxCent servo drives can operate in several different modes. Mode selection is accomplished via DIP Switches on the drive. For setup purposes, use Duty Cycle (Open Loop) or Voltage Mode. The mode selection table on the drive's datasheet shows the proper settings. The ON direction for the switches is toward the inside of the drive.

**Note:** The final mode of operation for the system may be different than the mode used for setup.



## Current Ratings

The first number to appear in the drive part number is the maximum peak current available.

AB15A100

Peak Amps

Continuous Amps =  $\frac{1}{2}$  (15A) = 7.5A

Peak current is available for approximately 2 seconds; then the drive's current fold-back feature reduces the current to the continuous rating. Continuous current from the drive is normally  $\frac{1}{2}$  of the peak current value, except when the drive is equipped with a CONT CURR REDUCTION switch (see section on Current Limit Switches).

## Current Limiting

ADVANCED Motion Controls' AxCent servo drives have a current limiting feature that offers over-current protection for both motor and system.

Current limiting can be accomplished by adjusting the Current Limit potentiometer (Pot 2). The Current Limit pot has 12 active turns plus 1 inactive turn at each end, for a total of 14 turns. Turning the pot in a clockwise direction will increase the current output and turning it a counterclockwise (CCW) direction will reduce (or limit) the current output. ADVANCED Motion Controls' AxCent servo drives ship with the current limit pot fully clockwise for full current output.

When adjusting the Current Limit pot, it is recommended to always start from the fully counterclockwise position. Turn the pot counterclockwise 14 turns to ensure it is fully counterclockwise. Contact ADVANCED Motion Controls for a potentiometer adjustment tool.

**Note:** Adjusting the Current Limit pot changes both Peak and Continuous current levels, but the ratio of continuous-to-peak current will remain at 50%. See section on Current Limit Switches for other ratio possibilities.

The Current Limit pot needs to be adjusted to limit the continuous current delivered to the motor to avoid damaging the motor. The motor datasheet will give a maximum value of continuous current allowed. Using the value, the number of turns of the Current Limit pot can be calculated using the formula:

$$\frac{I_{cont}}{I_{max}} * 12 + (1 \text{ turn}) = \# \text{ of turns}$$

Where:

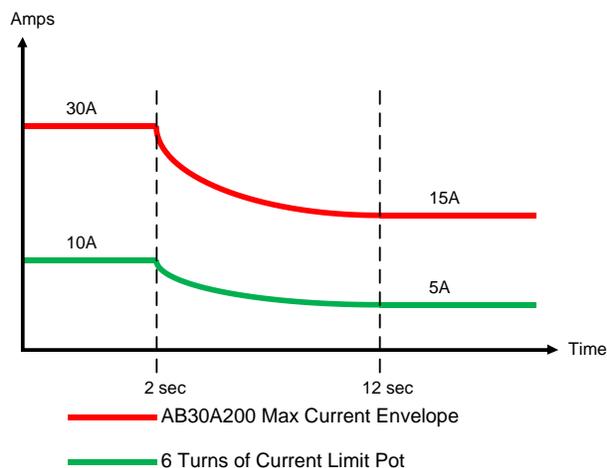
$I_{cont}$  = motor max. continuous current  
 $I_{max}$  = drive max. continuous current

**Example: An AB30A200 is used with a motor rated for 5 Amps continuous current.**

$$\frac{5A}{15A} * 12 + (1 \text{ turn}) = 5 \text{ turns}$$

To set the continuous current limit to 5A, first turn the Current Limit pot fully counterclockwise (14 turns), then turn the Current Limit pot 5 turns clockwise.

**Note: The peak current in this example is now 10A (twice the continuous value of 5A).**



## Current Limit Switches

Some **ADVANCED** Motion Controls' AxCent servo drives feature current limit switches that can be used to reduce the current output and change the peak-to-continuous current ratio. Unless otherwise specified on the drive in use, the current limit switches by default will allow maximum current output, with a peak-to-continuous current ratio of 50%. Consult the

drive in use to determine what current limit switch options are available.

### Example: B060A400AC Peak and Continuous Current Values

Current Scaling (SW1-3)	Cont. Curr. Reduction (SW1-4)	Max. Peak (Amps)	Max. Continuous (Amps)
ON	ON	60	30
ON	OFF	60	15
OFF	ON	30	15
OFF	OFF	30	7.5

**A B060A400AC is used with a motor rated for 10A continuous and 40A peak current.**

To obtain these current limits, first set the Current Scaling switch (SW1-3) ON for 100% current output, and the Cont. Current Reduction switch (SW1-4) OFF for a 25% peak-to-continuous current ratio.

Next, use the equation for the Current Limit potentiometer:

$$\frac{10A}{15A} * 12 + (1 \text{ turn}) = 9 \text{ turns}$$

To set the current limit to 10A, first turn the Current Limit potentiometer fully counterclockwise (14 turns), then turn the Current Limit potentiometer 9 turns clockwise.

**Note: Because the Cont. Current Reduction switch is OFF, the peak current is now 40A (4x the new continuous value of 10A).**

## Enabling the Drive

Make sure the drive is in the enabled state via all inhibit / enable inputs. See the drive datasheet for specific pinouts. If the drive in use features an INHIBIT IN pin, then grounding the inhibit input will inhibit (disable the drive). If the drive model number ends with -INV, then the inhibit input must be grounded to enable the drive.

Some drive models feature three inhibit inputs:

INHIBIT/ENABLE  
 +INHIBIT/ENABLE  
 -INHIBIT/ENABLE

The +/- inhibit inputs will enable/or disable the drive in the defined direction. For example, if the

+INHIBIT/ENABLE pin is grounded, then the drive will not output current corresponding with the positive motor direction. If the drive model ends with -INV, then these directional inhibit inputs must be grounded to enable motion in the defined directions.

## **Inhibit / Enable Switch**

Certain drive models feature an INHIBIT/ENABLE switch to control the logic of the inhibit inputs. This allows selection of grounding the INHIBIT pin(s) to enable the drive, or grounding the INHIBIT pin(s) to disable the drive.

## **Command from Test/Offset Pot**

When setting up a motor and drive for the first time, operation may be verified by using the Test/Offset switch and potentiometer to command voltage at the motor terminals. Turn the Test/Offset switch ON, and use the Test/Offset potentiometer to command voltage. With this configuration, the motor can be commanded in both directions. By default, the Test/Offset potentiometer is in the middle position, which corresponds to no command voltage. However, if it is adjusted to a different setting, be aware that the motor will spin up to this commanded speed immediately when power is applied and the drive is enabled.

***Note: When setting up a brushless motor, testing of all six possible motor connections is recommended to verify commutation.***