ADVANCED MOTION CONTROLS

Mode Switching

Introduction

Supported *ADVANCED* Motion Controls drives allow switching between configuration to allow for different loop configurations, command sources, and command limiter settings. Hot switching between the two user specified "default" configurations is supported through hardware (digital inputs), network commands, or stored initial value. Hot switching between any other modes is supported only through a network command. A mode switch establishes a known "baseline" of behavior by loading a known configuration. Once established, the following aspects of a configuration may be changed without a mode switch:

- Active gain set
- Active command limiter settings
- Active Source Modifier

When a mode switch is performed, a "chain-reset" is executed to initialize the different algorithms. The chain reset will do the following:

- Minimize transients by applying the previous command from the outermost loop for the first sample after the mode switch
- Zero out all of the offsets
- Load the gain set associated with the configuration being loaded
- Load the command limiter parameter set associated with the configuration being loaded
- Load the source modifier parameter set associated with the configuration being loaded

Mode Switching Interfaces

Mode Switching can be controlled by one of two interfaces, a Network or Discrete interface. The interface is used to initiate the mode switch.

Discrete Interface

A Discrete Interface is typically used when the host/machine controller is a PLC or another drive. The host/machine controller will use the Digital I/O for controlling the Motion Engine.

Network Interface

A Network Interface is typically used when the host/machine controller is a HMI or PC. The host/machine controller will use one of the communication protocols supported by the drive.

Configuration

Configuration 0 and configuration 1 must be initially configured using the DriveWare setup and configuration software. For more details, reference the DriveWare Software Guide, available for download at www.a-m-c.com.

Start-Up Configuration

A pre-defined configuration can be loaded automatically, immediately after the drive is powered up. Configuration settings for this option can be selected in the DriveWare software or over the network.

Start-Up Config	Index RS232/485	Index CANopen	Description	Access
Start-Up Configuration	08.00h	2008.01h	Bit 1: 0: Load configuration 0 on start-up 1: Load configuration 1 on start-up	R/W

Table 1 – Start-Up Configuration

Active Configuration RS485/232

The drive may be configured in a way that differs from the stored configurations. This is known as the active configuration. Index D1h is used to write to the active configuration, while index D3h is used to read the active configuration.

Set Active Configuration	Index RS232/485	Description	Access
Configuration Select	D1.00h/D3.00h	Bit 0 0: Configuration 0 Active, Load Gains, Profiles, Filter, and Source Modifier configurations that have been mapped to Configuration 0. 1: Configuration 1 Active, Load Gains, Profiles, Filter, and Source Modifier configurations that have been mapped to Configuration 1.	WO/RO
Active Loops	D1.00h/D3.00h	Bits 1-3 0: Use the loops specified by the selected configuration 1:Torque Only 2: Velocity around Torque 3: Position around Torque 4: Position around Velocity around Torque	WO/RO

Set Active Configuration	Index RS232/485	Description	Access
Command Limiter Select	D1.00h/D3.00h	Bits 4-7 Valid values 0: Use the limiter specified by the selected configuration 1:None 2:First Difference Rate Limiter 3:Linear Interpolation 4: Accel/Decel 5: Camming Valid active loop configurations 1: 1,2,3,4 2: 1,2,3,4 3: 1,2,3,4 4: 3,4 5: 3,4	WO/RO
Source Modifier Select	D1.00h/D3.00h	Bits 8-12 Selects the Command Source Modifier to be used. Valid values are as follows: 0: Use the source modifier specified by the selected configuration 1: None 2: Dead band only 3: Gearing only 4: Dead band -> Gearing 5: Summation Node Only 6: Dead band -> Summation Node 7: Gearing -> Summation Node 8: Dead band -> Gearing -> Summation Node	WO/RO
Loop Offset Control	D1.00h/D3.00h	Bits 13-14 0: Use loop offsets specified by the selected configuration 1: All loop offsets are Not Connected 2: All offsets are supplied by the Communication Channel 3: Stand Alone configuration	WO/RO
Reserved	D1.00h/D3.00h	Bit 15 Reserved	WO/RO

Table 2 – Active Configuration RS485/232

Active Configuration CANopen

The CANopen interface allows for the configuration to be changed using the Modes of Operation object 6060h. Unless specified otherwise, CANopen modes use configuration 0 settings. For more information on using the Modes of Operation object, refer to the *ADVANCED* Motion Controls' CANopen Communication Manual.