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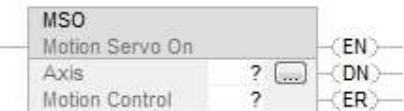
Motion Servo On (MSO)

This information applies to the CompactLogix 5370, ControlLogix 5570, Compact GuardLogix 5370, GuardLogix 5570, Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, and GuardLogix 5580 controllers. Controller differences are noted where applicable.

Use the Motion Servo On (MSO) instruction to activate the drive amplifier for the specified axis and to activate the axis' servo control loop.

Available Languages

Ladder Diagram



Function Block

This instruction is not available in function block.

Structured Text

MSO(Axis,MotionControl);

Operands

Ladder Diagram and Structured Text

Operand	Type	Type	Format	Description
	CompactLogix 5370, Compact GuardLogix 5370, Compact GuardLogix 5380, CompactLogix 5380, CompactLogix 5480	ControlLogix 5570, GuardLogix 5570, ControlLogix 5580, and GuardLogix 5580 controllers		
Axis	AXIS_CIP_DRIVE	AXIS_CIP_DRIVE AXIS_GENERIC AXIS_GENERIC_DRIVE AXIS_SERVO AXIS_SERVO_DRIVE Tip: AXIS_GENERIC is supported by the ControlLogix 5570 and the GuardLogix 5570 controllers only.	tag	Name of the axis to perform operation on
Motion Control	MOTION_INSTRUCTION		tag	Structure used to access instruction status parameters.

See *Structured Text Syntax* for more information on the syntax of expressions within structured text.

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Mnemonic	Description
.EN (Enable) Bit 31	It is set when the rung makes a false-to-true transition and remains set until the servo message transaction is completed and the rung goes false.
.DN (Done) Bit 29	It is set when the axis’ servo action has been successfully enabled and the drive enable and servo active status bits have been set.
.ER (Error) Bit 28	It is set to indicate that the instruction detected an error, such as if you specified an unconfigured axis.

Description

The MSO instruction directly activates the drive and enables the configured servo loops associated with a physical servo axis. It can be used anywhere in a program, but should not be used while the axis is moving. If this is attempted, the MSO instruction generates an Axis in Motion error.

The MSO instruction automatically enables the specified axis by activating the drive and by activating the associated servo loop. With a non-CIP axis, the resulting state of the axis is referred to as the Servo Control state. With a CIP axis, the resulting state of the axis is referred to as the Running state.

The most common use of this instruction is to activate the servo loop for the specified axis in its current position in preparation for commanding motion.

Important:

The instruction execution may take multiple scans to execute because it requires multiple coarse updates to complete the request. The Done (.DN) bit is not set immediately, but only after the request is completed.

In this transitional instruction, the relay ladder, toggle the Rung-condition-in from cleared to set each time the instruction should execute.

Affects Math Status Flags

No

Major/Minor Faults

None specific to this instruction. See *Common Attributes* for operand-related faults.

Execution

Ladder Diagram

Condition/State	Action Taken
Prescan	The .EN, .DN, and .ER are cleared to false.
Rung-condition-in is false	The .EN bit is cleared to false if the .DN or .ER bit is true.
Rung-condition-in is true	The .EN bit is set to true and the instruction executes. If the EN bit is set to false, there is no action taken,
Postscan	N/A

Structured Text

Condition/State	Action Taken
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- ▷ [Motion Move Instructions](#)
- ▲ [Motion State Instructions](#)
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 - [MAFR Flow Chart \(True\)](#)
 - [Motion Axis Shutdown \(MASD\)](#)
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Prescan	See Prescan in the Ladder Diagram table
Normal execution	See Rung-condition-in is false, followed by rung is true in the Ladder Diagram table.
Postscan	See Postscan in the Ladder Diagram table.

Error Codes

See *Motion Error Codes (.ERR)* for Motion Instructions.

Extended Error Codes

Extended Error Codes provide additional instruction specific information for the Error Codes that are generic to many instructions. See *Motion Error Codes (.ERR)* for Motion Instructions. The following Extended Error codes help to pinpoint the problem when the MSO instruction receives a Servo Message Failure (12) error message.

Extended Error Code (decimal)	Associated Error Code (decimal)	Meaning
Object Mode conflict (12)	SERVO_MESSAGE_FAILURE (12)	Axis is shutdown.
Process terminated on request (15)	SERVO_MESSAGE_FAILURE (12)	Enable input switch error. (SERCOS)
Device in wrong state (16)	SERVO_MESSAGE_FAILURE (12)	Device State not correct for action. (SERCOS)

MSO Changes to Status Bits

Axis Status Bit

Bit Name	State	Meaning
ServoActionStatus	TRUE	Axis is in Servo Control state with the servo loop active.
DriveEnableStatus	TRUE	The axis drive enable output is active.

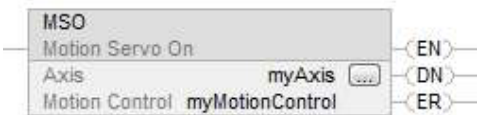
Motion Status Bits

None

Examples

Example 1

Ladder Diagram



Structured Text

```
MSO(myAxis, myMotionControl);
```

See also

MSO

- [MSO Flow Chart](#)
- [Common Attributes](#)

[Structured Text Syntax](#)

[Motion Error Codes \(.ERR\)](#)

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