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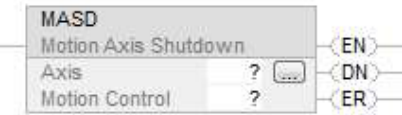
# Motion Axis Shutdown (MASD)

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 Axis Shutdown (MASD) instruction to force a specified axis into the Shutdown state. The Shutdown state of an axis is the condition where the drive output is disabled, servo loop deactivated, and any available or associated OK solid-state relay contacts open. The axis remains in the Shutdown state until either an Axis or Group Shutdown Reset is executed.

## Available Languages

### Ladder Diagram



### Function Block

This instruction is not available in function block.

### Structured Text

MASD(Axis,MotionControl);

## Operands

### Ladder Diagram and Structured Text

Operand	Type	Type	Format	Description
	<b>CompactLogix 5380, CompactLogix 5480, ControlLogix 5580, Compact GuardLogix 5380, and GuardLogix 5580 controllers</b>	<b>CompactLogix 5370, ControlLogix 5570, Compact GuardLogix 5370, and GuardLogix 5570 controllers</b>		
Axis	AXIS_CIP_DRIVE  AXIS_VIRTUAL	AXIS_CIP_DRIVE  AXIS_GENERIC  AXIS_GENERIC_DRIVE  AXIS_SERVO  AXIS_SERVO_DRIVE  AXIS_VIRTUAL  <b>Tip:</b> 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.

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

## MOTION\_INSTRUCTION Structure

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 axes have been successfully set to Shutdown state.
.ER (Done) Bit 28	It is set to indicate that the instruction detected an error, such as if you specified an unconfigured axis.

## Description

The MASD instruction directly and immediately disables drive output, disables the servo loop, and opens any associated OK contacts. This action places the axis into the Shutdown state.

Another action initiated by the MASD instruction is the clearing of all motion processes in progress and the clearing of all the motion status bits. Associated with this action, the command also clears all motion instruction IP bits that are currently set for the targeted axis.

The MASD instruction forces the targeted axis into the Shutdown state. One of the unique characteristics of the Shutdown state is that, when available, the OK solid state relay contact for the motion module or drive is Open. Where available this feature can be used to open up the E-Stop string that controls main power to the drive system. Note that there is typically only one OK contact per motion module which means that execution of an MASD instruction for either axis associated with a given module opens the OK contact.

Another characteristic of the Shutdown state is that any instruction that initiates axis motion is blocked from execution. Attempts to do so result in an execution error. Only by executing one of the Shutdown Reset instructions can motion be successfully initiated.

The axis remains in the shutdown state until a Motion Axis Shutdown Reset (MASR), a Motion Group Shutdown Reset (MGSR), or a Motion Coordinate Shutdown Reset (MCSR) instruction executes. If the axis is associated with a Coordinate System, the axis will be reset if the Motion Coordinate Shutdown Reset (MCSR) instruction executes.

**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.

Additionally, for CIP motion, the MASD instruction supports canceling the Motion Drive Start (MDS) instruction. This includes clearing the MDS In Process (.IP) bit, and clearing the DirectVelocityControlStatus and the DirectTorqueControlStatus bit in the Motion Status attribute.

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

## Master Driven Speed Control (MDSC) and the MASD Instruction

When the axis is shut down:

### Instructions

- ▷ [Motion Event Instructions](#)
- ▷ [Motion Group Instructions](#)
- ▷ [Motion Move Instructions](#)
- ▲ [Motion State Instructions](#)
  - [Motion Axis Fault Reset \(MAFR\)](#)
  - [MAFR Flow Chart \(True\)](#)
  - [Motion Axis Shutdown \(MASD\)](#)
  - [MASD Flow Chart \(True\)](#)
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  - [Motion Direct Drive Off \(MDF\)](#)
  - [MDF Flow Chart \(True\)](#)
  - [Motion Direct Drive On \(MDO\)](#)
  - [MDO Flow Chart \(True\)](#)
  - [Motion Drive Start \(MDS\)](#)
  - [Motion Servo Off \(MSF\)](#)
  - [MSF Flow Chart \(True\)](#)
  - [Motion Servo On \(MSO\)](#)
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- The IP bit of the Master Driven Axis Control (MDAC) instruction is reset on an axis that is shutdown.
- The AC bit of the MDAC instruction is reset when the axis is stopped as it is shutdown.
- The MASD instruction clears the pending Master Axis for all future single motion instructions.

## 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, then there is no action taken.
Postscan	N/A

## Structured Text

Condition/State	Action Taken
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.

## MASD Changes to Single Axis Status Bits

## Axis Status Bits

Bit Name	State	Meaning
ServoActionStatus	FALSE	The axis is in the Servo Off state with the servo loop inactive.

DriveEnableStatus	FALSE	The drive enable output is inactive.
ShutdownStatus	TRUE	The axis is in the shutdown state.

## Motion Status Bits

Bit Name	State	Meaning
AccelStatus	FALSE	Axis is not Accelerating.
DecelStatus	FALSE	Axis is not Decelerating.
MoveStatus	FALSE	Axis is not Moving.
JogStatus	FALSE	Axis is not Jogging.
GearingStatus	FALSE	Axis is not Gearing.
HomingStatus	FALSE	Axis is not Homing.
StoppingStatus	FALSE	Axis is not Stopping.
PositionCamStatus	FALSE	Axis is not Position Camming.
TimeCamStatus	FALSE	Axis is not Time Camming.
PositionCamPendingStatus	FALSE	Axis does not have a Position Cam Pending.
TimeCamPendingStatus	FALSE	Axis does not have a Time Cam Pending.
GearingLockStatus	FALSE	Axis is not in a Gear Locked condition.
PositionCamLockStatus	FALSE	Axis is not in a Cam Locked condition.
DirectVelocityControlStatus	FALSE	Axis is not under Direct Velocity Control.
DirectTorqueControlStatus	FALSE	Axis is not under Direct Torque Control.

## Examples

### Ladder Diagram



## Structured Text

MASD(myAxis, myMotionControl);

## See also

[Structured Text Syntax](#)

[MASD Flow Chart \(True\)](#)

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

[Motion State Instructions](#)

[Common Attributes](#)

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