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# Motion Direct Drive Off (MDF)

This information applies to the CompactLogix 5370, ControlLogix 5570, Compact GuardLogix 5370, GuardLogix 5570, and ControlLogix 5580 controllers.

Use the Motion Direct Drive Off (MDF) instruction to deactivate the servo drive and to set the servo output voltage to the output offset voltage. The output offset voltage is the output voltage that generates zero or minimal drive motion. You can specify this value during axis configuration.

## Available Languages

### Ladder Diagram



## Function Block

This instruction is not available in function block.

## Structured Text

MDF(Axis,MotionControl);

## Operands

## Ladder Diagram and Structured Text

Operand	Type	Format	Description
	<b>ControlLoigx 5570, ControlLogix 5580, GuardLogix 5570 and GuardLogix 5580</b>		
Axis	AXIS_SERVO	Tag	Motion Axis of data type AXIS_SERVO only.
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.

## 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 axis' drive signals have been successfully disabled and the drive enable status bit is cleared.
.ER (Done) Bit 28	It is set to indicate that the instruction detected an error, such as if you specified an unconfigured axis.

## Description

For motion module’s with an external servo drive interface, the MDF instruction directly disables the motion module Drive Enable output of the specified physical axis and also zeroes the modules' servo output to the external drive by applying the configured Output Offset value.

The MDF instruction is used to stop motion initiated by a preceding Motion Direct Drive On (MDO) instruction and transition the axis from the Direct Drive Control state back to the Axis Ready state.

To successfully execute an MDF instruction, the targeted axis must be configured as a Servo axis. Otherwise, the instruction errors.

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.

This is a transitional instruction:

- In relay ladder, toggle the EanbleIn false to true each time the instruction should execute.
- In structured text, condition the instruction so that it only executes on a transition.

## 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.

## Extended Error Codes

### 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 \(True\)](#)

[Motion Axis Shutdown Reset \(MASR\)](#)

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

[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 \(MSO\)](#)

[MSO Flow Chart \(True\)](#)
- ▷ [Multi-Axis Coordinated Motion Instructions](#)
- ▷ [Logical and Move Instructions](#)
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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.

# MDF Changes to Single Axis Status Bits

## Axis Status Bits

Bit Name	State	Meaning
DriveEnableStatus	TRUE	Axis is in Axis Ready state with the Drive Enable output now active.

## Example

### Ladder Diagram



## See also

- [MDF Flow Chart](#)
- [Structured Text Syntax](#)
- [MDF Flow Chart \(True\)](#)
- [Motion Error Codes \(.ERR\)](#)
- [Common Attributes](#)