

[Instruction Set](#) > [Motion Move Instructions](#) > Motion Redefine Position (MRP)

Motion Redefine Position (MRP)

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 Redefine Position (MRP) instruction to change the command or actual position of an axis. The value specified by Position is used to update the Actual or Command position of Axis. The position redefinition can be calculated on an Absolute or Relative basis. If Absolute is selected the Position value is assigned to the current Actual or Command position. If Relative is selected the Position value is added as a displacement to the current Actual or Command position. The process of redefining the current axis position has no affect on motion in progress as the instruction preserves the current servo following error during the redefinition process. As a result, axis position can be redefined on-the-fly without disturbing axis motion.

Available Languages

Ladder Diagram



Function Block

This instruction is not available in function block.

Structured Text

MRP(Axis,MotionControl,Type,PositionSelect,Position);

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_VIRTUAL	AXIS_CIP_DRIVE AXIS_VIRTUAL AXIS_SERVO AXIS_SERVO_DRIVE	Tag	Name of the axis to perform operation on.
Motion Control	MOTION_INSTRUCTION		Tag	Structure used to access instruction parameters.

Search



- [Quick Start Steps](#)
- [Logix Designer](#)
- [Module Information](#)
- ▴ [Instruction Set](#)
 - [Logix 5000 Controllers Instruction and Application Considerations](#)
 - [Logix Designer Application Instruction Set](#)
 - [Interpret the Attribute Tables Array Concepts](#)
- [CIP Axis Attributes](#)
- [Module Configuration Attributes](#)
- [Bit Addressing](#)
- [Common Attributes](#)
- [Data Conversions](#)
- [Elementary data types](#)
- [LINT data types](#)
- [Floating Point Values](#)
- [Immediate values](#)
- [Index Through Arrays](#)
- [Math Status Flags](#)
- [Motion Error Codes \(.ERR\)](#)
- [Structures](#)
- [Equipment Sequence instructions](#)
- [Equipment Phase Instructions](#)
- [Alarm Instructions](#)
- [Advanced Math Instructions](#)
- [Array \(File\)/Misc Instructions](#)
- [Array \(File\)/Shift Instructions](#)
- [ASCII Conversion Instructions](#)
- [ASCII Serial Port Instructions](#)
- [ASCII String Instructions](#)
- [Bit Instructions](#)
- [Compare Instructions](#)
- [Debug Instructions](#)
- [Drives Instructions](#)
- [Drive Safety Instructions](#)
- [For/Break Instructions](#)
- [Filter Instructions](#)
- [Function Block Attributes](#)
- [Structured Text Attributes](#)
- [Compute/Math Instructions](#)
- [Move/Logical Instructions](#)
- [Input/Output Instructions](#)
- [License Instructions](#)
- [Math Conversion Instructions](#)
- [Metal Form Instructions](#)
- [Motion Configuration](#)

Type	BOOLEAN		Immediate	The way you want the redefinition operation to work. Select either: 0 = absolute 1 = relative
Position Select	BOOLEAN		Immediate	Choose what position to perform the redefinition operation on. Select either: 0 = actual position 1 = command position
Position	REAL		Immediate or Tag	The value to use to change the axis position to or offset to current position.

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

For the operands that require you to select from available options, enter your selection as:

This Operand	Has These Options Which You	
	Enter as Text	Or Enter as a Number
Type	Absolute	0
	Relative	1
PositionSelect	Actual	0
	Command	1

MOTION_INSTRUCTION Structure

Mnemonic	Description
----------	-------------

Instructions

- ▷ [Motion Event Instructions](#)
- ▷ [Motion Group Instructions](#)
- ▲ [Motion Move Instructions](#)
 - [Master Driven Axis Control \(MDAC\)](#)
 - [Motion Axis Gear \(MAG\)](#)
 - [MAG Flow Chart \(True\)](#)
 - [Motion Axis Home \(MAH\)](#)
 - [MAH Flow Chart \(True\)](#)
 - [Motion Axis Jog \(MAJ\)](#)
 - [Motion Axis Move \(MAM\)](#)
 - [Motion Axis Position Cam \(MAPC\)](#)
 - [MAPC Flow Chart \(True\)](#)
 - [Motion Axis Stop \(MAS\)](#)
 - [Motion Axis Time Cam \(MATC\)](#)
 - [MATC Flow Chart \(True\)](#)
 - [Motion Calculate Cam Profile \(MCCP\)](#)
 - [Motion Calculate Slave Values \(MCSV\)](#)
 - [Motion Change Dynamics \(MCD\)](#)
 - [MCD Flow Chart \(True\)](#)
 - [Motion Redefine Position \(MRP\)](#)
 - [MRP Flow Chart \(True\)](#)
 - [Speed, Acceleration, Deceleration, and Jerk Enumerations](#)
 - [Status Bits for Motion Instructions \(MAM, MATC, MAJ\) When MDAC Is Active](#)
 - [Time Based Planning](#)
 - [Change between Master Driven and Time Driven Modes for Single Axis Motion instructions](#)
 - [Common Action Table for Slave and Master Axis](#)
- ▷ [Motion State Instructions](#)
- ▷ [Multi-Axis Coordinated Motion Instructions](#)
- ▷ [Logical and Move Instructions](#)
- ▷ [Program Control Instructions](#)
- ▷ [Sequencer Instructions](#)
- ▷ [Special Instructions](#)
- ▷ [Timer and Counter Instructions](#)
- ▷ [Trigonometric Instructions](#)
- ▷ [Process Control Instructions](#)
- ▷ [Select/Limit Instructions](#)

.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' position action has been successfully redefined.
.ER (Error) Bit 28	It is set to indicate that the instruction detected an error, such as if you specified an unconfigured axis.

- ▷ [Sequential Function Chart \(SFC\) Instructions](#)
- ▷ [Statistical Instructions](#)
- ▷ [Safety Instructions](#)
- ▷ [Studio 5000 Logix Designer Glossary](#)

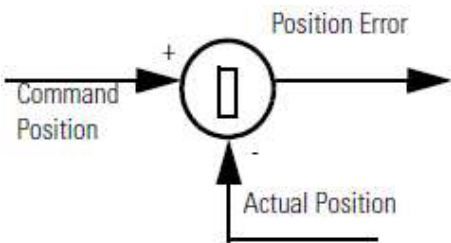
Description

The MRP instruction directly sets the actual or command position of the specified axis to the specified absolute or relative position. No motion is caused by this instruction—the current axis position is simply redefined. Select or enter the desired Axis, Type, Position Selection, and enter a value or tag variable for the desired New Position.

If the targeted axis does not appear in the list of available axes, the axis has not been configured for operation. Use the Tag Editor to create and configure a new axis.

The MRP instruction may be used while the axis is moving as well as when it is at rest. MRP is used to redefine position on-the-fly for certain registration, slip compensation, and re-calibration applications.

Selection	Description
Absolute Mode	<p>When Absolute is selected or entered as the MRP Type, the New Position specifies the new absolute position of the axis. No motion occurs—the current axis position (actual or command) is simply redefined to be the specified new position.</p> <p>If software overtravel limits are used (refer to Motion Axis Object specification for more information on software overtravel configuration), the new position must be between the Max Positive and Max Negative Travel configuration values. Otherwise a software overtravel fault is generated when the instruction is executed.</p> <p>Important: If software overtravel limit checking is in effect, execution of an MRP in Absolute Mode may invalidate the current Max Positive and Max Negative Travel limits in the absolute sense. Exercise caution when redefining the absolute position of an axis that has travel limits.</p> <p>Absolute and relative mode MRP instructions have the same effect when the axis is not moving. When the axis is moving, however, absolute mode introduces a position error equal to the motion of the axis during the time it takes to execute the MRP instruction and assign the new position. Relative mode does not introduce this error and guarantees an exact correction independent of axis speed or position.</p>
Relative Mode	<p>When Relative is selected or entered as the MRP Type, the New Position value is used to offset the current position of the axis. No motion occurs—the current axis position (actual or command) is simply redefined to be the current position plus the specified new position.</p> <p>In relative mode, axis position is redefined in such a way that no position errors are introduced if the axis is moving. It is particularly useful for unwinding axis position under program control rather than using the built-in rotary axis feature.</p> <p>Absolute and relative mode MRP instructions have the same effect when the axis is not moving. When the axis is moving, however, absolute mode introduces a position error equal to the motion of the axis during the time it takes to execute the MRP instruction and assign the new position. Relative mode does not introduce this error and guarantees an exact</p>

	correction independent of axis speed or position.
Actual Position	When Actual is selected or entered as the MRP Position Selection, the New Position is directly applied to the actual position of the physical axis. The command position of the axis is also adjusted along with the new actual position to preserve any position error which exists. This ensures that there is no unexpected motion of the axis when the positions are redefined. See the Motion Axis Object Specification for more discussion of command position, actual position, and position error.
Command Position	<p>When Command is selected or entered as the MRP Position Selection, the New Position is directly applied to the command position of the servo or imaginary axis. For an axis with a Position Loop type of Feedback Only, the Command Position and the Actual Position are the same. The MRP can be used with ether the Command or Actual Position with the same effect. The actual position of servo axes is also adjusted along with the new command position to preserve any position error which exists. This ensures that there is no unexpected motion of the axis when the positions are redefined.</p> <p>Command position is the desired or commanded position of a servo as generated by any previous motion instructions. Actual position is the current position of a physical or virtual axis as measured by the encoder or other feedback device. Position error is the difference between these two and is used to drive the motor to make the actual position equal to the command position. The Figure below shows the relationship of these three positions.</p> <div></div> <p>To successfully execute a MRP instruction, the targeted axis must be configured as either a Servo or Feedback Only axis. Otherwise, the instruction errs.</p> <p>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.</p>

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 MRP Instruction

You can execute an MRP on the Master or the Slave axes or coordinate system when an MDSC is active.

The Master axis position is changed when an MRP is executed (goes IP) on the Master while it is moving in MDSC mode; the slave is not affected.

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, .ER, and .IP bits 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.
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 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 MRP instruction receives a Servo Message Failure (12) error message.

Associated Error Code (decimal)	Extended Error Code (decimal)	Meaning
SERVO_MESSAGE_FAILURE (12)	Device in wrong state (16)	Redefine Position, Home, and Registration 2 are mutually exclusive.

Extended Error codes for the Parameter Out of Range (13) error code work a little differently. Rather than having a standard enumeration, the number that appears for the Extended Error code refers to the number of the operand as they are listed in the faceplate from top to bottom with the first operand being counted as zero. Therefore for the MRP instruction, an extended error code of 4 would refer to the Position operand’s value. You would then have to check your value with the accepted range of values for the instruction.

MRP Changes to Single Axis Status Bits

The AxisHomedStatus bit is not impacted by the execution of the MRP instruction. The status is the same before and after the MRP is execution. If the axis has been homed using the absolute home procedure, the AbsoluteReferenceStatus is set. AxisHomedStatus may also be set is the axis has not been subject to a power cycle. AbsoluteReferenceStatus is cleared when the MRP is executed and this is only true to Axis_Servo_Drive axis. This indicates the axis position is no longer referenced to the absolute home position.

Examples

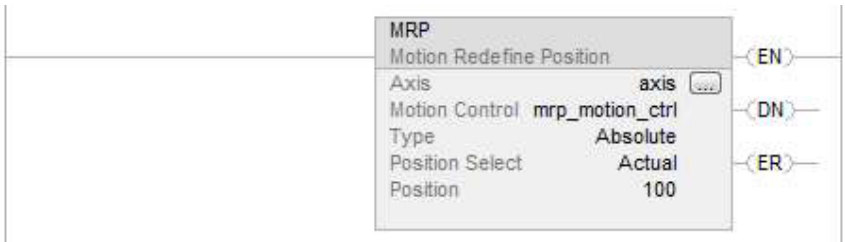
Example 1

Ladder Diagram



Example 2

Ladder Diagram



See also

[Structured Text Syntax](#)

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

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

[Motion Move Instructions](#)