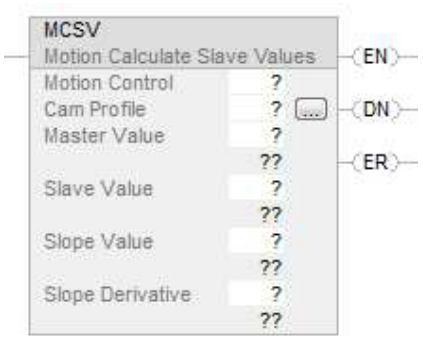
Motion Calculate Slave Values (MCSV)

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.

Use the Motion Calculate Slave Values (MCSV) instruction to calculate the slave value, the slope value, and the derivative of the slope for a given cam profile and master value.

Available Languages

Ladder Diagram



Function Block

This instruction is not available in function block.

Structured Text

MCSV(MotionControl,CamProfile,MasterValue,SlaveValue,SlopeValue,SlopeDerivative)

Operands

There are data conversion rules for mixed data types within an instruction. See *Data Conversion*.

Ladder Diagram and Structured Text

Operand	Type	Format	Description
Motion Control	MOTION_INSTRUCTION	Tag	Structure used to access block status parameters.
Cam Profile	CAM_PROFILE	Array Tag	An array of elements with the array index set to 0. It defines the cam profile used in calculating the slave values.
Master Value	SINT, INT, DINT, or REAL	Immediate or Tag	The exact value along the master axis of the cam profile that is used in calculating the slave values.
Slave Value	REAL	Tag	The value along the slave axis of the cam profile with the master at the specified master value.
Slope Value	REAL	Tag	The first derivative of the value along the slave axis of the cam profile with the master at the specified master value.

Slope Derivative	REAL	Tag	The second derivative of the value along the slave axis of the cam profile with the master at the specified master value.

Structured Text

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

Description

The MCSV instruction determines the slave value, the slope value, and the derivative of the slope for a given cam profile and master value. As an extension to the position and time camming functionality it supplies the values essential for the recovery from faults during camming operations.

Motion Control

The following control bits are affected by the MCSV instruction.

Mnemonic	Description
.EN (Enable) Bit 31	The Enable Bit sets when the rung transitions from false to true. It resets when the rung goes from true to false.
.DN (Done) Bit 29	The Done Bit sets when the slave values have been calculated successfully. It resets when the rung transitions from false to true.
.ER (Error) Bit 28	The Error Bit sets when the slave values have not been calculated successfully. It resets when the rung transitions from false to true.

This is a transitional instruction:

- In relay ladder, toggle Rung-condition-in from 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, .ER, and .IP bits are cleared to false.
Rung-condition-in is false	The .EN bit is cleared to false if either 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.

Extended Error Codes

Extended Error Codes provide additional instruction specific information for the Error Codes that are generic to many instructions. Extended Error codes for the Parameter Out of Range (13) error code lists a number that 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 MCSV instruction, an extended error code of 2 would refer to the Master Value operand's value. You would then have to check your value with the accepted range of values for the instruction. See *Motion Error Codes (.ERR)* for Motion Instructions.

MCSV Changes to Status Bits

None

Example

See also

Motion Error Codes (.ERR)

Structured Text Syntax

Common Attributes

Multi-Axis Coordinated Motion Instructions

Data Conversions

Sequential Function Chart (SFC) Instructions
Statistical Instructions
Safety Instructions
Studio 5000 Logix Designer Glossary

How are we doing?