



Subset of the

Technical Specification

PLCopen - Technical Committee 2 – Task Force

Function blocks for motion control

(Formerly Part 1 and Part 2)

Version 2.0

Appendix B

Compliance Procedure and Compliance List

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March 17, 2011.

Appendix B. Compliance Procedure and Compliance List

Listed in this Appendix are the requirements for the compliance statement from the supplier of the Motion Control Function Blocks. The compliance statement consists of two main groups: supported data types and supported Function Blocks, in combination with the applicable inputs and outputs. The supplier is required to fill out the tables for the used data types and Function Blocks, according to their product, committing their support to the specification.

By submitting these tables to PLCopen, and after approval by PLCopen, the list will be published on the PLCopen website, www.plcopen.org as well as a shortform overview, as specified in Appendix B 2 Supported Data types and Appendix B 3 Overview of the Function Blocks as below.

In addition to this approval, the supplier is granted access and usage rights of the PLCopen Motion Control logo, as described in Appendix B 4:

The PLCopen Motion Control Logo and Its Usage..



Data types

The data type REAL listed in the Function Blocks and parameters (e.g. for velocity, acceleration, distance, etc.) may be exchanged to SINT, INT, DINT or LREAL without to be seen as incompliant to this standard, as long as they are consistent for the whole set of Function Blocks and parameters.

Implementation allows the extension of data types as long as the basic data type is kept. For example: WORD may be changed to DWORD, but not to REAL.

Function Blocks and Inputs and Outputs

An implementation which claims compliance with this PLCopen specification shall offer a set of Function Blocks for motion control, meaning one or more Function Blocks, with at least the **basic** input and output variables, marked as “**B**” in the tables. These inputs and outputs have to be supported to be compliant.

For higher-level systems and future extensions any subset of the **extended** input and output variables, marked as “**E**” in the tables can be implemented.

Vendor specific additions are marked with “**V**”, and can be listed as such in the supplier documentation.

- | | |
|--|---|
| - Basic input/output variables are mandatory | Marked in the tables with the letter “ B ” |
| - Extended input /output variables are optional | Marked in the tables with the letter “ E ” |
| - Vendor Specific additions | Marked in the vendor’s compliance documentation with “ V ” |

All the vendor specific items will not be listed in the comparison table on the PLCopen website, but in the detailed vendor specific list, which also is published.

All vendor specific in- and outputs of all FBs must be listed in the certification list of the supplier. With this, the certification listing from a supplier describes all the I/Os of the relevant FBs, including vendor-specific extensions, and thus showing the complete FBs as used by the supplier.

Appendix B 1. Statement of Supplier

Supplier name	ISAC S.r.l.
Supplier address	Via Maestri del Lavoro, 30
City	Cascina (PI)
Country	Italy
Telephone	+39 050 711131
Fax	+39 050 711472
Email address	a.denardis@isacsrl.it
Product Name	Ilium
Product version	3.0
Release date	15/11/2016

I hereby state that the following tables as filled out and submitted do match our product as well as the accompanying user manual, as stated above.

Name of representation (person):
Andrea De Nardis

Date of signature (dd/mm/yyyy):
20/12/2016

Signature:



Appendix B 2. Supported Data types

Defined datatypes with MC library:	Supported	If not supported, which datatype used
BOOL	Yes	
INT	Yes	
WORD	Yes	
REAL	Yes	
ENUM	Yes	
UINT	Yes	

Table 1: Supported datatypes

Within the specification the following derived datatypes are defined. Define which of these structures are used in this system:

Derived datatypes:	Where used	Supported	Which structure
AXIS_REF	Nearly all FBs	Yes	
MC_DIRECTION (extended)	MC_MoveAbsolute MC_MoveVelocity MC_TorqueControl MC_MoveContinuousAbsolute	Yes	
MC_TP_REF	MC_PositionProfile	Yes	
MC_TV_REF	MC_VelocityProfile	Yes	
MC_TA_REF	MC_AccelerationProfile	Yes	
MC_CAM_REF	MC_CamTableSelect	Yes	
MC_CAM_ID (extended)	MC_CamTableSelect MC_CamIn	Yes	
MC_START_MODE (extended)	MC_CamIn MC_CamTableSelect	Yes	
MC_BUFFER_MODE	Buffered FBs	Yes	
MC_EXECUTION_MODE	MC_SetPosition MC_WriteParameter MC_WriteBoolParameter MC_WriteDigitalOutput MC_CamTableSelect	Yes	
MC_SOURCE	MC_ReadMotionState MC_CamIn MC_GearIn MC_GearInPos MC_CombineAxes MC_DigitalCamSwitch	Yes	
MC_SYNC_MODE	MC_GearInPos	Yes	
MC_COMBINE_MODE	MC_CombineAxes	Yes	
MC_TRIGGER_REF	MC_TouchProbe MC_AbortTrigger	Yes	
MC_INPUT_REF	MC_ReadDigitalInput	Yes	
MC_OUTPUT_REF	MC_DigitalCamSwitch MC_ReadDigitalOutput MC_WriteDigitalOutput	Yes	
MC_CAMSWITCH_REF	MC_DigitalCamSwitch	Yes	
MC_TRACK_REF	MC_DigitalCamSwitch	Yes	

Table 2: Supported derived datatypes

Appendix B 3. Overview of the Function Blocks

Single Axis Function Blocks	Supported as V1.0/ V1.1/ V2.0 or Not	Comments (<= 48 char.)
MC_Power	2.0	
MC_Home	2.0	
MC_Stop	2.0	
MC_Halt	2.0	
MC_MoveAbsolute	2.0	
MC_MoveRelative	2.0	
MC_MoveAdditive	2.0	
MC_MoveSuperimposed	2.0	
MC_HaltSuperimposed	2.0	
MC_MoveVelocity	2.0	
MC_MoveContinuousAbsolute	2.0	
MC_MoveContinuousRelative	2.0	
MC_TorqueControl	2.0	
MC_PositionProfile	2.0	
MC_VelocityProfile	2.0	
MC_AccelerationProfile	2.0	
MC_SetPosition	2.0	
MC_SetOverride	2.0	
MC_ReadParameter & MC_ReadBoolParameter	2.0	
MC_WriteParameter & MC_WriteBoolParameter	2.0	
MC_ReadDigitalInput	2.0	
MC_ReadDigitalOutput	2.0	
MC_WriteDigitalOutput	2.0	
MC_ReadActualPosition	2.0	
MC_ReadActualVelocity	2.0	
MC_ReadActualTorque	2.0	
MC_ReadStatus	2.0	
MC_ReadMotionState	2.0	
MC_ReadAxisInfo	2.0	
MC_ReadAxisError	2.0	
MC_Reset	2.0	
MC_DigitalCamSwitch	2.0	
MC_TouchProbe	2.0	
MC_AbortTrigger	2.0	
Multi-Axis Function Blocks	Supported as V1.0/ V1.1/ V2.0 or Not	Comments (<= 48 char.)
MC_CamTableSelect	2.0	
MC_CamIn	2.0	
MC_CamOut	2.0	
MC_GearIn	2.0	
MC_GearOut	2.0	
MC_GearInPos	2.0	
MC_PhasingAbsolute	2.0	
MC_PhasingRelative	2.0	
MC_CombineAxes	2.0	

Table 3: Short overview of the Function Blocks

Appendix B 3.1 MC_Power

If Supported	MC_Power	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	As long as 'Enable' is true, power is being enabled.
E	EnablePositive	Yes	As long as 'Enable' is true, this permits motion in positive direction
E	EnableNegative	Yes	As long as 'Enable' is true, this permits motion in negative direction
VAR_OUTPUT			
B	Status	Yes	As long as 'Enable' is true, power is being enabled.
E	Valid	Yes	As long as 'Enable' is true, this permits motion in positive direction
B	Error	Yes	As long as 'Enable' is true, this permits motion in negative direction
E	ErrorID	Yes	

Appendix B 3.2 MC_Home

If Supported	MC_Home	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
B	Position	Yes	Absolute position when the reference signal is detected [u]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Reference known and set successfully
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.3 MC_Stop

If Supported	MC_Stop	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the action at rising edge
E	Deceleration	Yes	Value of the 'Deceleration' [u/s ²]
E	Jerk	Yes	Value of the 'Jerk' [u/s ³]
VAR_OUTPUT			
B	Done	Yes	Zero velocity reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	CommandAborted	Yes	'Command' is aborted by switching off power (only possibility to abort)
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.4 MC_Halt

If Supported	MC_Halt	Sup. Y/N	
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the action at rising edge
E	Deceleration	Yes	Value of the 'Deceleration' [u/s ²]
E	Jerk	Yes	Value of the 'Jerk' [u/s ³]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Zero velocity reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.5 MC_MoveAbsolute

If Supported	MC_MoveAbsolute	Sup.Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
B	Position	Yes	Commanded 'Position' for the motion (in technical unit [u]) (negative or positive)
B	Velocity	Yes	Value of the maximum Velocity' (not necessarily reached) [u/s].
E	Acceleration	Yes	Value of the 'Acceleration' (always positive) (increasing energy of the motor) [u/s ²]
E	Deceleration	Yes	Value of the 'Deceleration' (always positive) (decreasing energy of the motor) [u/s ²]
E	Jerk	Yes	Value of the 'Jerk' [u/s ³]. (always positive)
B	Direction	Yes	mcCurrentDirection is used for modulo axis only.
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Commanded position finally reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.6 MC_MoveRelative

If Supported	MC_MoveRelative	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
B	Distance	Yes	Relative distance for the motion (in technical unit [u])
E	Velocity	Yes	Value of the maximum velocity (not necessarily reached) [u/s]
E	Acceleration	Yes	Value of the acceleration (increasing energy of the motor) [u/s ²]
E	Deceleration	Yes	Value of the deceleration (decreasing energy of the motor) [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Commanded distance reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.7 MC_MoveAdditive

If Supported	MC_MoveAdditive	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
B	Distance	Yes	Relative distance for the motion (in technical unit [u])
E	Velocity	Yes	Value of the maximum velocity (not necessarily reached) [u/s]
E	Acceleration	Yes	Value of the acceleration (increasing energy of the motor) [u/s ²]
E	Deceleration	Yes	Value of the deceleration (decreasing energy of the motor) [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Commanded distance reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command

B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.8 MC_MoveSuperimposed

If Supported	MC_MoveSuperimposed	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	The input 'ContinuousUpdate'
B	Distance	Yes	Additional distance that is to be superimposed (in technical unit [u])
E	VelocityDiff	Yes	Value of the velocity difference of the additional motion (not necessarily reached) [u/s]
E	Acceleration	Yes	Value of the acceleration (increasing energy of the motor) [u/s ²]
E	Deceleration	Yes	Value of the deceleration (decreasing energy of the motor) [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
VAR_OUTPUT			
B	Done	Yes	Additional distance superimposed to the ongoing motion
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
E	CoveredDistance	Yes	Displays continuously the covered distance contributed by this FB since it was started

Appendix B 3.9 MC_HaltSuperimposed

If Supported	MC_HaltSuperimposed	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the action at rising edge
E	Deceleration	Yes	Value of the deceleration [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
VAR_OUTPUT			
B	Done	Yes	Superimposed motion halted
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.10 MC_MoveVelocity

If Supported	MC_MoveVelocity	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
E	Velocity	Yes	Value of the maximum velocity [u/s]. Can be a signed value.
E	Acceleration	Yes	Value of the acceleration (increasing energy of the motor) [u/s ²]
E	Deceleration	Yes	Value of the deceleration (decreasing energy of the motor) [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
E	Direction	Yes	shortest way not applicable
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	InVelocity	Yes	Commanded velocity reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.11 MC_MoveContinuousAbsolute

If Supported	MC_MoveContinuousAbsolute	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
B	Position	Yes	Commanded position for the motion (in technical unit [u]) (negative or positive)
B	EndVelocity	Yes	Value of the end velocity [u/s]. Signed value
B	Velocity	Yes	Value of the maximum velocity [u/s]
E	Acceleration	Yes	Value of the acceleration [u/s ²]
E	Deceleration	Yes	Value of the deceleration [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
E	Direction	Yes	
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	InEndVelocity		Commanded distance reached and running at requested end velocity
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.12 MC_MoveContinuousRelative

If Supported	MC_MoveContinuousRelative	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
B	Distance	Yes	Relative distance for the motion [u]
B	EndVelocity	Yes	Value of the end velocity [u/s]. Signed value
B	Velocity	Yes	Value of the maximum velocity [u/s]
E	Acceleration	Yes	Value of the acceleration [u/s ²]
E	Deceleration	Yes	Value of the deceleration [u/s ²]
E	Jerk	Yes	Value of the Jerk [u/s ³]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	InEndVelocity	Yes	Commanded distance reached and running at requested end velocity
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.13 MC_TorqueControl

If Supported	MC_TorqueControl	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Starts the motion on a rising edge
E	ContinuousUpdate	Yes	
B	Torque	Yes	Value of the torque (Torque or force in technical unit [u])
E	TorqueRamp	Yes	The maximum time derivative of the target position of the torque or force (in technical unit per sec. [u/s])
E	Velocity	Yes	Absolute value of the maximum velocity.
E	Acceleration	Yes	Value of the maximum acceleration (acceleration is applicable with same sign of torque and velocity)
E	Deceleration	Yes	Value of the maximum deceleration (deceleration is applicable with opposite signs of torque and velocity)
E	Jerk	Yes	Value of the maximum jerk
E	Direction	Yes	Specifies the direction of the torque. (Note: Torque input can be signed value).
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	InTorque	Yes	Setpoint value of torque or force equals the commanded position
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis

E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.14 MC_PositionProfile

If Supported	MC_PositionProfile	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
B	TimePosition	Yes	Reference to Time / Position. Description
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
E	TimeScale	Yes	Overall time scaling factor of the profile
E	PositionScale	Yes	Overall Position scaling factor
E	Offset	Yes	Overall offset for profile [u]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Profile completed
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function block
E	ErrorID	Yes	Error identification

Appendix B 3.15 MC_VelocityProfile

If Supported	MC_VelocityProfile	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
B	TimeVelocity	Yes	Reference to Time / Velocity. Description
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
E	TimeScale	Yes	Overall time scaling factor of the profile
E	VelocityScale	Yes	Overall velocity scaling factor of the profile
E	Offset	Yes	Overall offset for profile [u/s]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	ProfileCompleted	Yes	End of profile reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.16 MC_AccelerationProfile

If Supported	MC_AccelerationProfile	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
B	TimeAcceleration	Yes	Reference to Time / Acceleration. Description
VAR_INPUT			
B	Execute	Yes	Start the motion at rising edge
E	ContinuousUpdate	Yes	
E	TimeScale	Yes	Overall time scaling factor of the profile
E	AccelerationScale	Yes	Scale factor for acceleration amplitude
E	Offset	Yes	Overall offset for profile [u/s ²]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	ProfileCompleted	Yes	End of profile reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.17 MC_SetPosition

If Supported	MC_SetPosition	Sup.Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Start setting position in axis
B	Position	Yes	Position unit [u] (Means 'Distance' if 'Relative'=TRUE)
E	Relative	Yes	'Relative' distance if True, 'Absolute' position if False (= Default)
E	ExecutionMode	Yes	
VAR_OUTPUT			
B	Done	Yes	'Position' has new value
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.18 MC_SetOverride

If Supported	MC_SetOverride	Sup.Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	If SET, it writes the value of the override factor continuously. If RESET it should keep the last value.
B	VelFactor	Yes	New override factor for the velocity
E	AccFactor	Yes	New override factor for the acceleration/deceleration
E	JerkFactor	Yes	New override factor for the jerk
VAR_OUTPUT			

B	Enabled	Yes	Signals that the override factor(s) is (are) set successfully
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.19 MC_ReadParameter & MC_ReadBoolParameter

If Supported	MC_ReadParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
B	ParameterNumber	Yes	Number of the parameter.
VAR_OUTPUT			
B	Valid	Yes	A valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
B	Value	Yes	Value of the specified parameter in the datatype, as specified by the vendor

If Supported	MC_ReadBoolParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
B	ParameterNumber	Yes	Number of the parameter. Note that number of parameter is shared with LREAL Parameter set.
VAR_OUTPUT			
B	Valid	Yes	A valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function block
E	ErrorID	Yes	Error identification
B	Value	Yes	Value of the specified parameter in the datatype, as specified by the vendor

Name	B/E	R/W	Supp. Y/N	Comments
CommandedPosition	B	R	Yes	Commanded position
SWLimitPos	E	R/W	Yes	Positive Software limit switch position
SWLimitNeg	E	R/W	Yes	Negative Software limit switch position
EnableLimitPos	E	R/W	Yes	Enable positive software limit switch
EnableLimitNeg	E	R/W	Yes	Enable negative software limit switch
EnablePosLagMonitoring	E	R/W	Yes	Enable monitoring of position lag
MaxPositionLag	E	R/W	Yes	Maximal position lag
MaxVelocitySystem	E	R	Yes	Maximal allowed velocity of the axis in the motion system
MaxVelocityAppl	B	R/W	Yes	Maximal allowed velocity of the axis in the application
ActualVelocity	B	R	Yes	Actual velocity
CommandedVelocity	B	R	Yes	Commanded velocity
MaxAccelerationSystem	E	R	Yes	Maximal allowed acceleration of the axis in the motion system
MaxAccelerationAppl	E	R/W	Yes	Maximal allowed acceleration of the axis in the application
MaxDecelerationSystem	E	R	Yes	Maximal allowed deceleration of the axis in the motion system

Name	B/E	R/W	Supp. Y/N	Comments
MaxDecelerationAppl	E	R/W	Yes	Maximal allowed deceleration of the axis in the application
MaxJerkSystem	E	R	Yes	Maximum allowed jerk of the axis in the motion system
MarkJerkAppl	E	R/W	Yes	Maximum allowed jerk of the axis in the application

Table 4: Parameters for MC_Read(Bool)Parameter and MC_Write(Bool)Parameter

Appendix B 3.20 MC_WriteParameter & MC_WriteBoolParameter

If Supported	MC_WriteParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Write the value of the parameter at rising edge
B	ParameterNumber	Yes	Number of the parameter (correspondence between number and parameter is specified in the table above)
B	Value	Yes	New value of the specified parameter
E	ExecutionMode	Yes	Defines the chronological sequence of the FB. <i>mcImmediately</i> - the functionality is immediately valid and may influence the on-going motion but not the state (note: is the default behaviour) <i>mcQueued</i> - Same functionality as buffer mode 'Buffered'
VAR_OUTPUT			
B	Done	Yes	Parameter successfully written
E	Busy	Yes	The FB is not finished and new output values are to be expected.
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

If Supported	MC_WriteBoolParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Write the value of the parameter at rising edge
B	ParameterNumber	Yes	Number of the parameter (correspondence between number and parameter is specified in the table above)
B	Value	Yes	New value of the specified parameter
E	ExecutionMode	Yes	
VAR_OUTPUT			
B	Done	Yes	Parameter successfully written
E	Busy	Yes	The FB is not finished and new output values are to be expected.
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.21 MC_ReadDigitalInput

If Supported	MC_ReadDigitalInput	Sup. Y/N	Comments
VAR_IN_OUT			
B	Input	Yes	Reference to the input signal source
VAR_INPUT			
B	Enable	Yes	<i>Get the value of the selected input signal continuously while enabled</i>
E	InputNumber	Yes	<i>Selects the input. Can be part of MC_INPUT_REF, if only one single input is referenced.</i>
VAR_OUTPUT			
B	Valid	Yes	<i>A valid output is available at the FB</i>

E	Busy	Yes	<i>The FB is not finished and new output values are to be expected</i>
B	Error	Yes	<i>Signals that an error has occurred within the Function Block</i>
E	ErrorID	Yes	<i>Error identification</i>
B	Value	Yes	<i>The value of the selected input signal</i>

Appendix B 3.22 MC_ReadDigitalOutput

If Supported	MC_ReadDigitalOutput	Sup.Y/N	Comments
VAR_IN_OUT			
B	Output	Yes	Reference to the signal outputs
VAR_INPUT			
B	Enable	Yes	Get the value of the selected output signal continuously while enabled
E	OutputNumber	Yes	Selects the output. Can be part of MC_OUTPUT_REF, if only one single output is referenced.
VAR_OUTPUT			
B	Valid	Yes	A valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the the Function Block
E	ErrorID	Yes	Error identification
B	Value	Yes	The value of the selected output signal

Appendix B 3.23 MC_WriteDigitalOutput

If Supported	MC_WriteDigitalOutput	Sup.Y/N	Comments
VAR_IN_OUT			
B	Output	Yes	Reference to the signal output
VAR_INPUT			
B	Execute	Yes	Write the value of the selected output
E	OutputNumber	Yes	Selects the output. Can be part of MC_OUTPUT_REF, if only one single input is referenced.
B	Value	Yes	The value of the selected output
E	ExecutionMode	Yes	
VAR_OUTPUT			
B	Done	Yes	Writing of the output signal value is done
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.24 MC_ReadActualPosition

If Supported	MC_ReadActualPosition	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
VAR_OUTPUT			
B	Valid	Yes	A valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
B	Position	Yes	New absolute position (in axis' unit [u])

Appendix B 3.25 MC_ReadActualVelocity

If Supported	MC_ReadActualVelocity	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
VAR_OUTPUT			
B	Valid	Yes	A valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
B	Velocity	Yes	The value of the actual velocity (in axis' unit [u/s])

Appendix B 3.26 MC_ReadActualTorque

If Supported	MC_ReadActualTorque	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
VAR_OUTPUT			
B	Valid	Yes	A valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
B	Torque	Yes	The value of the actual torque or force (in technical units)

Appendix B 3.27 MC_ReadStatus

If Supported	MC_ReadStatus	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
VAR_OUTPUT			
B	Valid	Yes	A valid set of outputs is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
B	ErrorStop	Yes	
B	Disabled	Yes	
B	Stopping	Yes	
E	Homing	Yes	
B	Standstill	Yes	
E	DiscreteMotion	Yes	

E	ContinuousMotion	Yes	
E	SynchronizedMotion	Yes	

Appendix B 3.28 MC_ReadMotionState

If Supported	MC_ReadMotionState	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
E	Source	Yes	
VAR_OUTPUT			
B	Valid	Yes	True if a valid set of outputs available
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function block
E	ErrorID	Yes	Error identification
E	ConstantVelocity	Yes	Velocity is constant. Velocity may be 0. For the actual position a window is applicable (window is vendor specific)
E	Accelerating	Yes	Increasing the absolute value of the velocity
E	Decelerating	Yes	Decreasing the absolute value of the velocity
E	DirectionPositive	Yes	Signals that the position is increasing
E	DirectionNegative	Yes	Signals that the position is decreasing

Appendix B 3.29 MC_ReadAxisInfo

If Supported	MC_ReadAxisInfo	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Enable	Yes	Get the axis information constantly while enabled
VAR_OUTPUT			
B	Valid	Yes	True if a valid set of outputs is available
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
E	HomeAbsSwitch	Yes	Digital home switch input is active
E	LimitSwitchPos	Yes	Positive hardware end switch is active
E	LimitSwitchNeg	Yes	Negative hardware end switch is active
E	Simulation	Yes	Axis is in simulation mode (e.g. motor is simulated)
E	CommunicationReady	Yes	“Network” is initialized and ready for communication
E	ReadyForPowerOn	Yes	Drive is ready to be enabled (power on)
E	PowerOn	Yes	If TRUE shows that the power stage is switched ON
E	IsHomed	Yes	The absolute reference position is known for the axis (axis is homed)
E	AxisWarning	Yes	Warning(s) on the axis is present

Appendix B 3.30 MC_ReadAxisError

If Supported	MC_ReadAxisError	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis

VAR_INPUT			
B	Enable	Yes	Get the value of the parameter continuously while enabled
VAR_OUTPUT			
B	Valid	Yes	True if a valid output is available at the FB
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
B	ErrorID	Yes	Error identification
E	AxisErrorID	Yes	The value of the axis error. These values are vendor specific

Appendix B 3.31 MC_Reset

If Supported	MC_Reset	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
VAR_INPUT			
B	Execute	Yes	Resets all internal axis-related errors
VAR_OUTPUT			
B	Done	Yes	'Standstill' or 'Disabled' state is reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.32 MC_DigitalCamSwitch

If Supported	MC_DigitalCamSwitch	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
B	Switches	Yes	Reference to the switching actions.
E	Outputs	Yes	Reference to the signal outputs, directly related to the referenced tracks. (max. 32 per function block) (First output = first TrackNumber)
E	TrackOptions	Yes	Reference to structure containing track related properties, e.g. the ON and OFF compensations per output/track.
VAR_INPUT			
B	Enable	Yes	Enables the 'Switches' outputs
E	EnableMask	Yes	32 bits of BOOL. Enables the different tracks. Least significant data is related to the lowest TrackNumber. With data SET (to '1' resp. TRUE) the related TrackNumber is enabled.
E	ValueSource	Yes	Defines the source for axis values (e.g. positions): mcSetValue - Synchronization on target position mcActualValue - Synchronization on actual position
VAR_OUTPUT			
B	InOperation	Yes	The commanded tracks are enabled
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Basic elements within the array structure of MC_CAMSWITCH_REF

B/E	Parameter	Sup. Y/N	Comments
B	TrackNumber	Yes	TrackNumber is the reference to the track
B	FirstOnPosition [u]	Yes	Lower boundary where the switch is ON
B	LastOnPosition [u]	Yes	Upper boundary where the switch is ON
E	AxisDirection	Yes	Both (=0; Default); Positive (1); Negative (2)
E	CamSwitchMode	Yes	Position based (=0; Default); Time based (=1); Consumed/not valid any more (= -1)
E	Duration	Yes	Coupled to time based CamSwitchMode

Basic elements within the array structure of MC_TRACK_REF

B/E	Parameter	Sup. Y/N	Comments
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E	OnCompensation	Yes	Compensation time with which the switching on is advanced or delayed in time per track (us).
E	OffCompensation	Yes	Time compensation the switching off is delayed per track (us).
E	Hysteresis [u]	Yes	Distance from the switching point (in positive and negative direction) in which the switch is not executed until the axis has left this area, in order to avoid multiple switching around the switching point.

Appendix B 3.33 MC_TouchProbe

If Supported	MC_TouchProbe	Sup.Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
E	TriggerInput	Yes	Reference to the trigger signal source
VAR_INPUT			
B	Execute	Yes	Starts touch probe recording at rising edge
E	WindowOnly	Yes	If SET, only use the window (defined hereunder) to accept trigger events
E	FirstPosition	Yes	Start position from where (positive direction) trigger events are accepted (in technical units [u]). Value included in window.
E	LastPosition	Yes	Stop position of the window (in technical units [u]). Value included in window.
VAR_OUTPUT			
B	Done	Yes	Trigger event recorded
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	CommandAborted	Yes	'Command' is aborted by another command (MC_AbortTrigger)
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
B	RecordedPosition	Yes	Position where trigger event occurred (in technical units [u])

Appendix B 3.34 MC_AbortTrigger

If Supported	MC_AbortTrigger	Sup.Y/N	Comments
VAR_IN_OUT			
B	Axis	Yes	Reference to the axis
E	TriggerInput	Yes	
VAR_INPUT			
B	Execute	Yes	Aborts trigger event at rising edge
VAR_OUTPUT			
B	Done	Yes	Trigger functionality aborted
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.35 MC_CamTableSelect

If Supported	MC_CamTableSelect	Sup. Y/N	Comments
VAR_IN_OUT			
E	Master	Yes	Reference to the master axis
E	Slave	Yes	Reference to the slave axis
B	CamTable	Yes	Reference to CAM description
VAR_INPUT			
B	Execute	Yes	Selection at rising edge
E	Periodic	Yes	1 = periodic, 0 = non periodic (single-shot)
E	MasterAbsolute	Yes	1 = absolute; 0 = relative coordinates
E	SlaveAbsolute	Yes	1 = absolute; 0 = relative coordinates
E	ExecutionMode	Yes	

VAR_OUTPUT			
B	Done	Yes	Pre-selection done
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
E	CamTableID	Yes	Identifier of CAM Table to be used in the MC_CamIn FB

Appendix B 3.36 MC_CamIn

If Supported	MC_CamIn	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Yes	Reference to the master axis
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start at rising edge
E	ContinuousUpdate	Yes	
E	MasterOffset	Yes	Offset of the master shaft to cam.
E	SlaveOffset	Yes	Offset of slave table.
E	MasterScaling	Yes	Factor for the master profile (default = 1.0). From the slave point of view the master overall profile is multiplied by this factor
E	SlaveScaling	Yes	Factor for the slave profile (default = 1.0). The overall slave profile is multiplied by this factor.
E	MasterStartDistance	Yes	The master distance for the slave to start to synchronize to the master.
E	MasterSyncPosition	Yes	The position of the master in the CAM profile where the slave is in-sync with the master. (if the 'MasterSyncPosition' does not exist, at the first point of the CAM profile the master and slave are synchronized.) Note: the inputs acceleration, decelerations and jerk are not added here
E	StartMode	Yes	Start mode: mcAbsolute, mcRelative; mcRampIn is not supported.
E	MasterValueSource	Yes	Defines the source for synchronization: mcSetValue - Synchronization on master target position mcActualValue - Synchronization on master actual position
E	CamTableID	Yes	Identifier of CAM Table to be used, linked to output of MC_CamTableSelect
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	InSync	Yes	Is TRUE if the target position = the commanded position.
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
E	EndOfProfile	Yes	Pulsed output signaling the cyclic end of the CAM Profile It is displayed every time the end of the cam profile is reached. In reverse direction, the 'EndOfProfile' is displayed also at the end of the cam profile (in this case the first point of the cam profile)

Appendix B 3.37 MC_CamOut

If Supported	MC_CamOut	Sup. Y/N	Comments
VAR_IN_OUT			
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start to disengage the slave from the master
VAR_OUTPUT			

B	Done	Yes	Disengaging completed
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.38 MC_GearIn

If Supported	MC_GearIn	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Yes	Reference to the master axis
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start the gearing process at the rising edge
E	ContinuousUpdate	Yes	
B	RatioNumerator	Yes	Gear ratio Numerator
B	RatioDenominator	Yes	Gear ratio Denominator
E	MasterValueSource	Yes	Defines the source for synchronization: mcSet-Value - Synchronization on master target position mcActualValue - Synchronization on master actual position
E	Acceleration	Yes	Acceleration for gearing in
E	Deceleration	Yes	Deceleration for gearing in
E	Jerk	Yes	Jerk of Gearing
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	InGear	Yes	Is TRUE if the target position = the commanded position.
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.39 MC_GearOut

If Supported	MC_GearOut	Sup. Y/N	Comments
VAR_IN_OUT			
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start disengaging process at the rising edge
VAR_OUTPUT			
B	Done	Yes	Disengaging completed
E	Busy	Yes	The FB is not finished and new output values are to be expected
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.40 MC_GearInPos

If Supported	MC_GearInPos	Sup.Y/N	Comments
VAR_IN_OUT			
B	Master	Yes	Reference to the master axis
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start the gearing process at the rising edge
B	RatioNumerator	Yes	Gear ratio Numerator
B	RatioDenominator	Yes	Gear ratio Denominator
E	MasterValueSource	Yes	Defines the source for synchronization: mcSetValue - Synchronization on master target position mcActualValue - Synchronization on master actual position
B	MasterSyncPosition	Yes	The position of the master in the CAM profile where the slave is in-sync with the master. (if the 'MasterSyncPosition' does not exist, at the first point of the CAM profile the master and slave are synchronized.) Note: the inputs acceleration, decelerations and jerk are not added here
B	SlaveSyncPosition	Yes	Slave Position at which the axes are running in sync
E	SyncMode	Yes	Defines the way to synchronize (like 'mcShortest'; 'mcCatchUp'; 'mcSlowDown'). Vendor specific
E	MasterStartDistance	Yes	Master Distance for gear in procedure (when the Slave axis is started to get into synchronization)
E	Velocity	Yes	Maximum Velocity during the time difference 'StartSync' and 'InSync'
E	Acceleration	Yes	Maximum Acceleration during the time difference 'StartSync' and 'InSync'
E	Deceleration	Yes	Maximum Deceleration during the time difference 'StartSync' and 'InSync'
E	Jerk	Yes	Maximum Jerk during the time difference 'StartSync' and 'InSync'
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
E	StartSync	Yes	Commanded gearing starts
B	InSync	Yes	Is TRUE if the target position = the commanded position (is calculated set of values derived of master position and gear ratio.)
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 3.41 MC_PhasingAbsolute

If Supported	MC_PhasingAbsolute	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Yes	Reference to the master axis
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start the phasing process at the rising edge

B	PhaseShift	Yes	Absolut phase difference in master position of the slave axis [u]. In case of modulo axis, specify a value that takes into account of the number of revolutions you need to phase.
E	Velocity	Yes	Maximum Velocity to reach phase difference [u/s]
E	Acceleration	Yes	Maximum Acceleration to reach phase difference [u/s ²]
E	Deceleration	Yes	Maximum Deceleration to reach phase difference [u/s ²]
E	Jerk	Yes	Maximum Jerk to reach phase difference [u/s ³]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Commanded phasing reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
E	AbsolutePhaseShift	Yes	Displays continuously the absolute phase shift [u] while Busy is set.

Appendix B 3.42 MC_PhasingRelative

If Supported	MC_PhasingRelative	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Yes	Reference to the master axis
B	Slave	Yes	Reference to the slave axis
VAR_INPUT			
B	Execute	Yes	Start the phasing process at the rising edge
B	PhaseShift	Yes	Additional phase difference in master position of the slave axis [u]. In case of modulo axis, specify a value that takes into account of the number of revolutions you need to phase.
E	Velocity	Yes	Maximum Velocity to reach phase difference [u/s]
E	Acceleration	Yes	Maximum Acceleration to reach phase difference [u/s ²]
E	Deceleration	Yes	Maximum Deceleration to reach phase difference [u/s ²]
E	Jerk	Yes	Maximum Jerk to reach phase difference [u/s ³]
E	BufferMode	Yes	Defines the chronological sequence of the FB.
VAR_OUTPUT			
B	Done	Yes	Commanded phasing reached
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification
E	CoveredPhaseShift	Yes	Displays continuously the covered phase shift since it was started

Appendix B 3.43 CombineAxes

If Supported	MC_CombineAxes	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master1	Yes	Reference to the first master axis
B	Master2	Yes	Reference to the second master axis
B	Slave	Yes	Reference to the resulting combined axis. Can be a virtual axis or linked directly to a real axis
VAR_INPUT			
B	Execute	Yes	Start the combination process at the rising edge
E	ContinuousUpdate	Yes	
E	CombineMode	Yes	Defines the type of combination applied to AxisOut : mcAddAxes : Addition of the 2 input axes positions mcSubAxes : Substraction of the 2 input axes positions
E	GearRationNumeratorM1	Yes	Numerator for the gear factor for master axis 1 towards the slave
E	GearRatioDenominatorM1	Yes	Corresponding denominator for master axis 1
E	GearRatioNumeratorM2	Yes	Numerator for the gear factor for master axis 2 towards the slave
E	GearRatioDenominatorM2	Yes	Corresponding denominator for master axis 2
E	MasterValueSourceM1	Yes	Defines the source for synchronization for master axis 1: mcSetValue - Synchronization on master target position mcActualValue - Synchronization on master actual position
E	MasterValueSourceM2	Yes	Defines the source for synchronization for master

			axis 2: mcSetValue - Synchronization on master target position mcActualValue - Synchronization on master actual position
E	BufferMode	Yes	Defines the behavior of the axis: modes are 'Aborting', 'Buffered', 'Blending'
VAR_OUTPUT			
B	InSync	Yes	Is TRUE if the target position = the commanded position.
E	Busy	Yes	The FB is not finished and new output values are to be expected
E	Active	Yes	Indicates that the FB has control on the combined axis
E	CommandAborted	Yes	'Command' is aborted by another command
B	Error	Yes	Signals that an error has occurred within the Function Block
E	ErrorID	Yes	Error identification

Appendix B 4. The PLCopen Motion Control Logo and Its Usage

For quick identification of compliant products, PLCopen has developed a logo for the Motion Control Function Blocks:

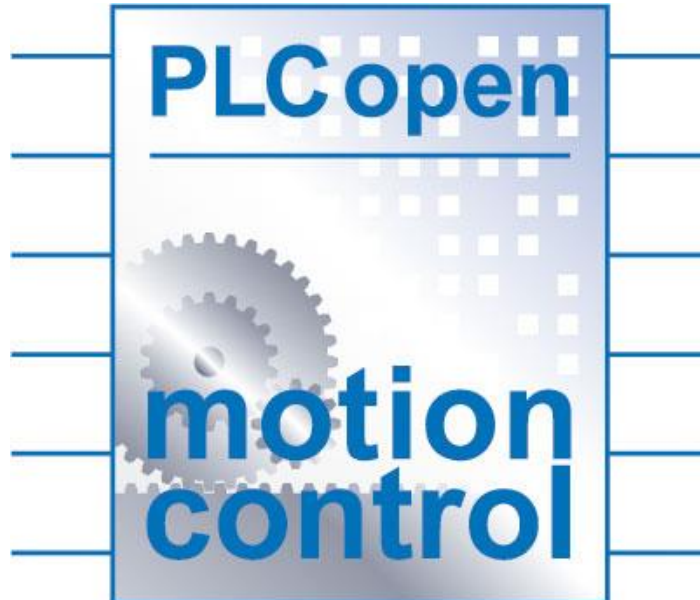


Figure 1: The PLCopen Motion Control Logo

This motion control logo is owned and trademarked by PLCopen.

In order to use this logo free-of-charge, the relevant company has to fulfill all the following requirements:

1. the company has to be a voting member of PLCopen;
2. the company has to comply with the existing specification, as specified by the PLCopen Task Force Motion Control, and as published by PLCopen, and of which this statement is a part;
3. this compliance application is provided in written form by the company to PLCopen, clearly stating the applicable software package and the supporting elements of all the specified tables, as specified in the document itself;
4. in case of non-fulfillment, which has to be decided by PLCopen, the company will receive a written statement concerning this from PLCopen. The company will have a one month period to either adopt their software package in such a way that it complies, represented by the issuing of a new compliance statement, or remove all reference to the specification, including the use of the logo, from all their specification, be it technical or promotional material;
5. the logo has to be used as is - meaning the full logo. It may be altered in size providing the original scale and color setting is kept.
6. the logo has to be used in the context of Motion Control.