



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	OMRON Corporation
Supplier address	2-1, 2 CHOME, NISHIKUSATSU
City	KUSATSU-CITY
Country	JAPAN
Telephone	+81-77-565-5215
Fax	+81-77-565-5568
Email address	naoki_seno@omron.co.jp
Product Name	Machine Automation Controller, NJ-series Automation Software, Sysmac Studio
Product version	1.0
Release date	29/07/2011

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):
Naoki Seno,
General Manager of Automation Development Dept.
Automation Systems Division HQ. Development Center

Date of signature (dd/mm/yyyy):
29/07/2011

Signature:



Appendix B 2. Supported Data types

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

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	Y	_sAXIS_REF : Please see Annex to table 2
MC_DIRECTION (extended)	MC_MoveAbsolute MC_MoveVelocity MC_TorqueControl MC_MoveContinuousAbsolute	Y	_eMC_DIRECTION : _mcPositiveDirection _mcShortestWay _mcNegativeDirection _mcCurrentDirection _mcNoDirection
MC_TP_REF	MC_PositionProfile	N	
MC_TV_REF	MC_VelocityProfile	N	
MC_TA_REF	MC_AccelerationProfile	N	
MC_CAM_REF	MC_CamTableSelect MC_CamIn	Y	ARRAY [0..Max] OF _sMC_CAM_REF Where: _sMC_CAM_REF : STRUCT Phase : REAL; Distance : REAL; END_STRUCT;
MC_CAM_ID (extended)	MC_CamTableSelect MC_CamIn	N	_sMC_CAM_REF is used instead
MC_START_MODE (extended)	MC_CamIn MC_CamTableSelect	Y	_eMC_START_MODE : _mcAbsolutePosition _mcRelativePosition
MC_BUFFER_MODE	Buffered FBs	Y	_eMC_BUFFER_MODE : _mcAborting _mcBuffered _mcBlendingHigh _mcBlendingLow _mcBlendingNext _mcBlendingPrevious
MC_EXECUTION_MODE	MC_SetPosition MC_WriteParameter MC_WriteBoolParameter MC_WriteDigitalOutput MC_CamTableSelect	Y	_eMC_EXECUTION_MODE : _mcImmediately (Reserved)
MC_SOURCE	MC_ReadMotionState MC_CamIn MC_GearIn	N	_eMC_REFERENCE_TYPE is used instead

	MC_GearInPos MC_CombineAxes MC_DigitalCamSwitch		
MC_SYNC_MODE	MC_GearInPos	N	
MC_COMBINE_MODE	MC_CombineAxes	Y	_eMC_COMBINE_MODE : _mcAddAxes _mcSubAxes
MC_TRIGGER_REF	MC_TouchProbe MC_AbortTrigger	Y	_sTRIGGER_REF : STRUCT Mode : ENUM; LatchID : ENUM; InputDrive: ENUM; END_STRUCT;
MC_INPUT_REF	MC_ReadDigitalInput	N	Direct access in AXIS_REF
MC_OUTPUT_REF	MC_DigitalCamSwitch MC_ReadDigitalOutput MC_WriteDigitalOutput	N	
MC_CAMSWITCH_REF	MC_DigitalCamSwitch	N	OMRON's FB MC_ZoneSwitch is used instead
MC_TRACK_REF	MC_DigitalCamSwitch	N	

Table 2: Supported derived datatypes

Annex to Table 2: OMRON's NJ-Series **_sAXIS_REF**

_sAXIS_REF	_sAXIS_REF_CFG	AxNo
		AxEnable
		AxType
		NodeAddress
	_sAXIS_REF_SCALE	Num
		Den
		Units
	_sAXIS_REF_CMD_DATA	Pos
		Vel
		AccDec
		Jerk
		Trq
	_sAXIS_REF_STA	Ready
		Disabled
		Standstill
		Discrete
		Continuous
		Synchronized
		Homing
		Stopping
		ErrorStop
		Coordinated
	_sAXIS_REF_DET	Idle
		InPosWaiting
		Homed
		InHome
		VelLimit
	_sAXIS_REF_DIR	Posi
		Nega
	_sAXIS_REF_STA_DRV	ServoOn
		Ready
		MainPower
		P_OT
		N_OT
		HomeSw
		Home
		ImdStop
		Latch1
		Latch2
		DrvAlarm
		DrvWarning
		ILA
		CSP
		CSV
		CST
	_sAXIS_REF_ACT_DATA	Pos
		Vel
		Trq
	_sMC_REF_EVENT	Active (Observation Level)
		Code (Observation Level)
	_sMC_REF_EVENT	Active (Fault Level)
		Code (Fault Level)

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	V1.1 (Part 1)	
MC_Home	V1.1 (Part 1)	
MC_Stop	V1.1 (Part 1)	
MC_Halt	N	
MC_MoveAbsolute	V1.1 (Part 1)	
MC_MoveRelative	V1.1 (Part 1)	
MC_MoveAdditive	N	
MC_MoveSuperimposed	N	
MC_HaltSuperimposed	N	
MC_MoveVelocity	V1.1 (Part 1)	
MC_MoveContinuousAbsolute	N	
MC_MoveContinuousRelative	N	
MC_TorqueControl	V1.0 (Part 2)	
MC_PositionProfile	N	
MC_VelocityProfile	N	
MC_AccelerationProfile	N	
MC_SetPosition	V1.0 (Part 2)	
MC_SetOverride	V1.0 (Part 2)	
MC_ReadParameter & MC_ReadBoolParameter	N	EC_CoESDORead FB can read the parameter in the drive
MC_WriteParameter & MC_WriteBoolParameter	N	EC_CoESDOWrite FB can write the parameter in the drive
MC_ReadDigitalInput	N	
MC_ReadDigitalOutput	N	
MC_WriteDigitalOutput	N	
MC_ReadActualPosition	N	Element of AXIS_REF
MC_ReadActualVelocity	N	Element of AXIS_REF
MC_ReadActualTorque	N	Element of AXIS_REF
MC_ReadStatus	N	Element of AXIS_REF
MC_ReadMotionState	N	Element of AXIS_REF
MC_ReadAxisInfo	N	Element of AXIS_REF
MC_ReadAxisError	N	Element of AXIS_REF
MC_Reset	V1.1 (Part 1)	
MC_DigitalCamSwitch	N	MC_ZoneSwitch is used instead
MC_TouchProbe	V1.0 (Part 2)	
MC_AbortTrigger	V1.0 (Part 2)	
Multi-Axis Function Blocks	Supported as V1.0/ V1.1/ V2.0 or Not	Comments (<= 48 char.)
MC_CamTableSelect	N	No need, MC_CAMIn can address directly to CamTables
MC_CamIn	V1.1 (Part 1)	
MC_CamOut	V1.1 (Part 1)	
MC_GearIn	V1.1 (Part 1)	
MC_GearOut	V1.1 (Part 1)	
MC_GearInPos	V1.0 (Part 2)	
MC_PhasingAbsolute	V1.1 (Part 1)	MC_Phasing is used
MC_PhasingRelative	N	
MC_CombineAxes	V2.0	

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	Y	
VAR_INPUT			
B	Enable	Y	
E	EnablePositive	N	
E	EnableNegative	N	
VAR_OUTPUT			
B	Status	Y	
E	Valid	N	
B	Error	Y	
E	ErrorID	Y	
V	Busy	Y	

Appendix B 3.2 MC_Home

If Supported	MC_Home	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
B	Position	N	It's part of the AXIS_REF
E	BufferMode	N	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
E	Active	N	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.3 MC_Stop

If Supported	MC_Stop	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
E	Deceleration	Y	
E	Jerk	Y	
E	BufferMode	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	
V	Active	Y	

Appendix B 3.4 MC_Halt

If Supported	MC_Halt	Sup. Y/N	
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
E	Deceleration		
E	Jerk		
E	BufferMode		
VAR_OUTPUT			
B	Done		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.5 MC_MoveAbsolute

If Supported	MC_MoveAbsolute	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	N	
B	Position	Y	
B	Velocity	Y	
E	Acceleration	Y	
E	Deceleration	Y	
E	Jerk	Y	
B	Direction	Y	
E	BufferMode	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.6 MC_MoveRelative

If Supported	MC_MoveRelative	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	N	
B	Distance	Y	
E	Velocity	Y	
E	Acceleration	Y	
E	Deceleration	Y	
E	Jerk	Y	
E	BufferMode	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.7 MC_MoveAdditive

If Supported	MC_MoveAdditive	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
B	Distance		
E	Velocity		
E	Acceleration		
E	Deceleration		
E	Jerk		
E	BufferMode		
VAR_OUTPUT			
B	Done		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.8 MC_MoveSuperimposed

If Supported	MC_MoveSuperimposed	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
B	Distance		
E	VelocityDiff		
E	Acceleration		
E	Deceleration		
E	Jerk		
VAR_OUTPUT			
B	Done		
E	Busy		
E	CommandAborted		
B	Error		
E	ErrorID		
E	CoveredDistance		

Appendix B 3.9 MC_HaltSuperimposed

If Supported	MC_HaltSuperimposed	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
E	Deceleration		
E	Jerk		
VAR_OUTPUT			
B	Done		
E	Busy		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.10 MC_MoveVelocity

If Supported	MC_MoveVelocity	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	Y	Reserved in Version 1.0
E	Velocity	Y	
E	Acceleration	Y	
E	Deceleration	Y	
E	Jerk	Y	
E	Direction	Y	
E	BufferMode	Y	
VAR_OUTPUT			
B	InVelocity	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.11 MC_MoveContinuousAbsolute

If Supported	MC_MoveContinuousAbsolute	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
B	Position		
B	EndVelocity		
B	Velocity		
E	Acceleration		
E	Deceleration		
E	Jerk		
E	Direction		
E	BufferMode		
VAR_OUTPUT			
B	InEndVelocity		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.12 MC_MoveContinuousRelative

If Supported	MC_MoveContinuousRelative	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
B	Distance		
B	EndVelocity		
B	Velocity		
E	Acceleration		
E	Deceleration		
E	Jerk		
E	BufferMode		
VAR_OUTPUT			
B	InEndVelocity		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.13 MC_TorqueControl

If Supported	MC_TorqueControl	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	N	
B	Torque	Y	
E	TorqueRamp	Y	
E	Velocity	Y	
E	Acceleration	N	
E	Deceleration	N	
E	Jerk	N	
E	Direction	Y	
E	BufferMode	Y	
VAR_OUTPUT			
B	InTorque	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.14 MC_PositionProfile

If Supported	MC_PositionProfile	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
B	TimePosition		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
E	TimeScale		
E	PositionScale		
E	Offset		
E	BufferMode		
VAR_OUTPUT			
B	Done		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.15 MC_VelocityProfile

If Supported	MC_VelocityProfile	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
B	TimeVelocity		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
E	TimeScale		
E	VelocityScale		
E	Offset		
E	BufferMode		
VAR_OUTPUT			
B	ProfileCompleted		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.16 MC_AccelerationProfile

If Supported	MC_AccelerationProfile	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
B	TimeAcceleration		
VAR_INPUT			
B	Execute		
E	ContinuousUpdate		
E	TimeScale		
E	AccelerationScale		
E	Offset		
E	BufferMode		
VAR_OUTPUT			
B	ProfileCompleted		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		

Appendix B 3.17 MC_SetPosition

If Supported	MC_SetPosition	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
B	Position	Y	
E	Relative	Y	Reserved in Version 1.0
E	ExecutionMode	Y	Reserved in Version 1.0
V	ReferenceType	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.18 MC_SetOverride

If Supported	MC_SetOverride	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Enable	Y	
B	VelFactor	Y	
E	AccFactor	Y	Reserved in Version 1.0
E	JerkFactor	Y	Reserved in Version 1.0
VAR_OUTPUT			
B	Enabled	Y	
E	Busy	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.19 MC_ReadParameter & MC_ReadBoolParameter

If Supported	MC_ReadParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
B	ParameterNumber		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Value		

If Supported	MC_ReadBoolParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
B	ParameterNumber		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Value		

Name	B/E	R/W	Sup. Y/N	Comments
CommandedPosition	B	R		
SWLimitPos	E	R/W		
SWLimitNeg	E	R/W		
EnableLimitPos	E	R/W		
EnableLimitNeg	E	R/W		
EnablePosLagMonitoring	E	R/W		
MaxPositionLag	E	R/W		
MaxVelocitySystem	E	R		
MaxVelocityAppl	B	R/W		
ActualVelocity	B	R		
CommandedVelocity	B	R		
MaxAccelerationSystem	E	R		
MaxAccelerationAppl	E	R/W		
MaxDecelerationSystem	E	R		
MaxDecelerationAppl	E	R/W		
MaxJerkSystem	E	R		
MarkJerkAppl	E	R/W		

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		
VAR_INPUT			
B	Execute		
B	ParameterNumber		
B	Value		
E	ExecutionMode		
VAR_OUTPUT			
B	Done		
E	Busy		
B	Error		
E	ErrorID		

If Supported	MC_WriteBoolParameter	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Execute		
B	ParameterNumber		
B	Value		
E	ExecutionMode		
VAR_OUTPUT			
B	Done		
E	Busy		
B	Error		
E	ErrorID		

Appendix B 3.21 MC_ReadDigitalInput

If Supported	MC_ReadDigitalInput	Sup. Y/N	Comments
VAR_IN_OUT			
B	Input		
VAR_INPUT			
B	Enable		
E	InputNumber		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Value		

Appendix B 3.22 MC_ReadDigitalOutput

If Supported	MC_ReadDigitalOutput	Sup. Y/N	Comments
VAR_IN_OUT			
B	Output		
VAR_INPUT			
B	Enable		
E	OutputNumber		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Value		

Appendix B 3.23 MC_WriteDigitalOutput

If Supported	MC_WriteDigitalOutput	Sup. Y/N	Comments
VAR_IN_OUT			
B	Output		
VAR_INPUT			
B	Execute		
E	OutputNumber		
B	Value		
E	ExecutionMode		
VAR_OUTPUT			
B	Done		
E	Busy		
B	Error		
E	ErrorID		

Appendix B 3.24 MC_ReadActualPosition

If Supported	MC_ReadActualPosition	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Position		

Appendix B 3.25 MC_ReadActualVelocity

If Supported	MC_ReadActualVelocity	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Velocity		

Appendix B 3.26 MC_ReadActualTorque

If Supported	MC_ReadActualTorque	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	Torque		

Appendix B 3.27 MC_ReadStatus

If Supported	MC_ReadStatus	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
B	ErrorStop		
B	Disabled		
B	Stopping		
E	Homing		
B	Standstill		
E	DiscreteMotion		
E	ContinuousMotion		
E	SynchronizedMotion		

Appendix B 3.28 MC_ReadMotionState

If Supported	MC_ReadMotionState	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
E	Source		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
E	ConstantVelocity		
E	Accelerating		
E	Decelerating		
E	DirectionPositive		
E	DirectionNegative		

Appendix B 3.29 MC_ReadAxisInfo

If Supported	MC_ReadAxisInfo	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
E	ErrorID		
E	HomeAbsSwitch		
E	LimitSwitchPos		
E	LimitSwitchNeg		
E	Simulation		
E	CommunicationReady		
E	ReadyForPowerOn		
E	PowerOn		
E	IsHomed		
E	AxisWarning		

Appendix B 3.30 MC_ReadAxisError

If Supported	MC_ReadAxisError	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis		
VAR_INPUT			
B	Enable		
VAR_OUTPUT			
B	Valid		
E	Busy		
B	Error		
B	ErrorID		
E	AxisErrorID		

Appendix B 3.31 MC_Reset

If Supported	MC_Reset	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
VAR_INPUT			
B	Execute	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
B	Error	Y	
E	ErrorID	Y	
V	Failure	Y	TRUE when the instruction is not executed normally

Appendix B 3.32 MC_DigitalCamSwitch

If Supported	MC_DigitalCamSwitch	Sup.Y/N	Comments
VAR_IN_OUT			
B	Axis		
B	Switches		
E	Outputs		
E	TrackOptions		
VAR_INPUT			
B	Enable		
E	EnableMask		
E	ValueSource		
VAR_OUTPUT			
B	InOperation		
E	Busy		
B	Error		
E	ErrorID		

Basic elements within the array structure of MC_CAMSWITCH_REF

B/E	Parameter	Sup.Y/N	Comments
B	TrackNumber		
B	FirstOnPosition [u]		
B	LastOnPosition [u]		
E	AxisDirection		
E	CamSwitchMode		
E	Duration		

Basic elements within the array structure of MC_TRACK_REF

B/E	Parameter	Sup.Y/N	Comments
E	OnCompensation		
E	OffCompensation		
E	Hysteresis [u]		

Appendix B 3.33 MC_TouchProbe

If Supported	MC_TouchProbe	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
E	TriggerInput	Y	
V	TriggerVariable	Y	
VAR_INPUT			
B	Execute	Y	
E	WindowOnly	Y	
E	FirstPosition	Y	
E	LastPosition	Y	
V	ReferenceType	Y	Reserved in Version 1.0
V	StopMode	Y	Specify the stopping method
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	
B	RecordedPosition	Y	

Appendix B 3.34 MC_AbortTrigger

If Supported	MC_AbortTrigger	Sup. Y/N	Comments
VAR_IN_OUT			
B	Axis	Y	
E	TriggerInput	Y	
VAR_INPUT			
B	Execute	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
B	Error	Y	
E	ErrorID	Y	
V	CommandAborted	Y	

Appendix B 3.35 MC_CamTableSelect

If Supported	MC_CamTableSelect	Sup. Y/N	Comments
VAR_IN_OUT			
E	Master		
E	Slave		
B	CamTable		
VAR_INPUT			
B	Execute		
E	Periodic		
E	MasterAbsolute		
E	SlaveAbsolute		
E	ExecutionMode		
VAR_OUTPUT			
B	Done		
E	Busy		
B	Error		
E	ErrorID		
E	CamTableID		

Appendix B 3.36 MC_CamIn

If Supported	MC_CamIn	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Y	
B	Slave	Y	
V	CamTable	Y	Specify the cam data structure
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	N	
E	MasterOffset	Y	
E	SlaveOffset	Y	
E	MasterScaling	Y	
E	SlaveScaling	Y	
E	MasterStartDistance	Y	
E	MasterSyncPosition	N	
E	StartMode	Y	
E	MasterValueSource	Y	ReferenfeType is used
E	CamTableID	N	We use ARRAY OF _sMC_CAM_REF
E	BufferMode	Y	
V	Periodic	Y	Specify whether to execute the specified cam table periodically or only once
V	StartPosition	Y	Specify the starting point of the cam table (0 phase) as an absolute position of the master axis
V	Direction	Y	The slave axis cam moves when the master axis moves in the specified direction only
V	CamTransition	Y	Reserved in Version 1.0
VAR_OUTPUT			
B	InSync	Y	
E	Busy	Y	
E	Active	N	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	
E	EndOfProfile	Y	
V	InCam	Y	TRUE when the cam table start point is executed
V	Index	Y	Contains the cam data index number

Appendix B 3.37 MC_CamOut

If Supported	MC_CamOut	Sup. Y/N	Comments
VAR_IN_OUT			
B	Slave	Y	
VAR_INPUT			
B	Execute	Y	
V	Deceleration	Y	
V	Jerk	Y	Reserved in Version 1.0
V	OutMode	Y	Reserved in Version 1.0
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
B	Error	Y	
E	ErrorID	Y	
V	CommandAborted	Y	

Appendix B 3.38 MC_GearIn

If Supported	MC_GearIn	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Y	
B	Slave	Y	
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	N	
B	RatioNumerator	Y	
B	RatioDenominator	Y	
E	MasterValueSource	Y	ReferenceType is used instead
E	Acceleration	Y	
E	Deceleration	Y	
E	Jerk	Y	Reserved in Version 1.0
E	BufferMode	Y	
VAR_OUTPUT			
B	InGear	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.39 MC_GearOut

If Supported	MC_GearOut	Sup. Y/N	Comments
VAR_IN_OUT			
B	Slave	Y	
VAR_INPUT			
B	Execute	Y	
V	Deceleration	Y	
V	Jerk	Y	Reserved in Version 1.0
V	Outmode	Y	Reserved in Version 1.0
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
B	Error	Y	
E	ErrorID	Y	
V	CommandAborted	Y	

Appendix B 3.40 MC_GearInPos

If Supported	MC_GearInPos	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Y	
B	Slave	Y	
VAR_INPUT			
B	Execute	Y	
B	RatioNumerator	Y	
B	RatioDenominator	Y	
E	MasterValueSource	Y	ReferenfeType is used instead
B	MasterSyncPosition	Y	
B	SlaveSyncPosition	Y	
E	SyncMode	N	
E	MasterStartDistance	N	
E	Velocity	Y	
E	Acceleration	Y	
E	Deceleration	Y	
E	Jerk	Y	
E	BufferMode	Y	
VAR_OUTPUT			
E	StartSync	Y	
B	InSync	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

Appendix B 3.41 MC_PhasingAbsolute (MC_Phasing)

If Supported	MC_PhasingAbsolute	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master	Y	
B	Slave	Y	
VAR_INPUT			
B	Execute	Y	
B	PhaseShift	Y	
E	Velocity	Y	
E	Acceleration	Y	
E	Deceleration	Y	
E	Jerk	Y	
E	BufferMode	Y	
VAR_OUTPUT			
B	Done	Y	
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	
E	AbsolutePhaseShift	N	

Appendix B 3.42 MC_PhasingRelative

If Supported	MC_PhasingRelative	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master		
B	Slave		
VAR_INPUT			
B	Execute		
B	PhaseShift		
E	Velocity		
E	Acceleration		
E	Deceleration		
E	Jerk		
E	BufferMode		
VAR_OUTPUT			
B	Done		
E	Busy		
E	Active		
E	CommandAborted		
B	Error		
E	ErrorID		
E	CoveredPhaseShift		

Appendix B 3.43 CombineAxes

If Supported	MC_CombineAxes	Sup. Y/N	Comments
VAR_IN_OUT			
B	Master1	Y	Master is used instead
B	Master2	Y	Auxiliary is used instead
B	Slave	Y	
VAR_INPUT			
B	Execute	Y	
E	ContinuousUpdate	N	
E	CombineMode	Y	
E	GearRationNumeratorM1	Y	Reserved in Version 1.0
E	GearRatioDenominatorM1	Y	Reserved in Version 1.0
E	GearRatioNumeratorM2	Y	Reserved in Version 1.0
E	GearRatioDenominatorM2	Y	Reserved in Version 1.0
E	MasterValueSourceM1	Y	ReferenceTypeMaster is used instead
E	MasterValueSourceM2	Y	ReferenceTypeAuxiliary is used instead
E	BufferMode	Y	
VAR_OUTPUT			
B	InSync	Y	InCombination is used instead
E	Busy	Y	
E	Active	Y	
E	CommandAborted	Y	
B	Error	Y	
E	ErrorID	Y	

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.