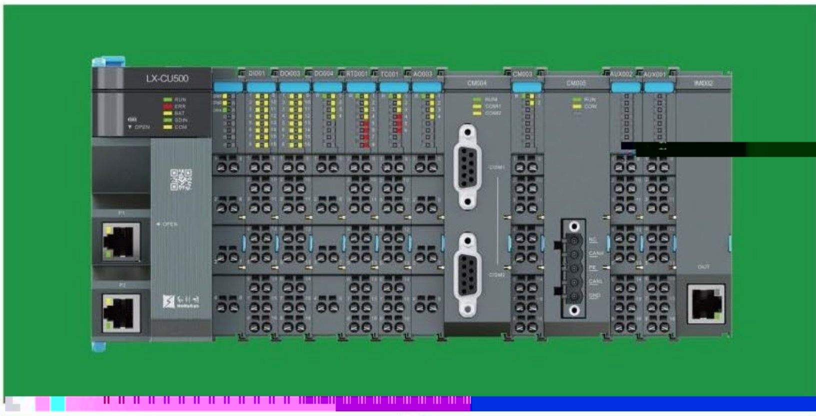

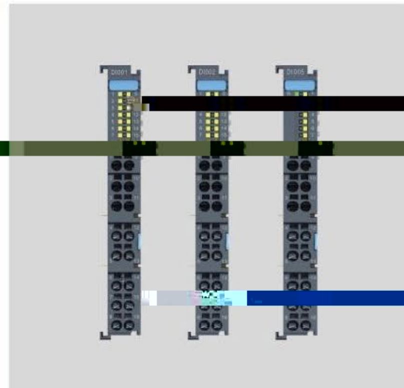

PLCopen Command Manual

LX Series Programmable Logic Controllers

Version: 2024.09

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”

Table of Contents

1.5 Safety Precautions

1.5.1 Safety Statement

1.5.2 Warning

Chapter 2 Document Guide

2.1 Related Manuals

Manual Name	Purpose	Content

2.2 Usage Convention

•

2.3 How to Get the Manual

Chapter 3 Manual Revision History

Manual Version	Revision Date	Revision Contents

Chapter 4 Overview commands

4.1 List of commands

Command Library	Commands	Name	Function Description

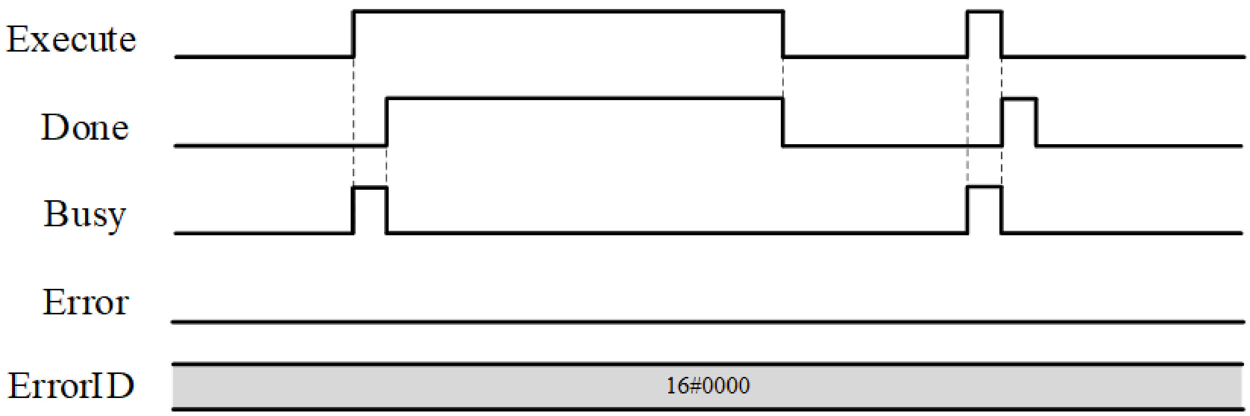
4.2 Description of commands

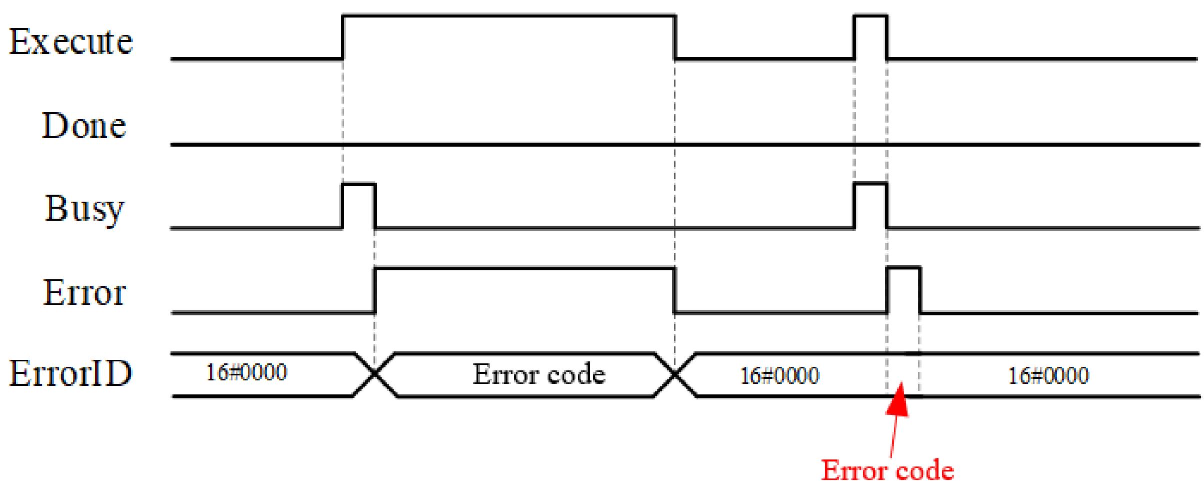
Information Item	Description

5.2.2 Functions

M: MOTOR/ENCODER, W:TABLE

$$\text{Pulse} = \frac{(1)\text{PlusePerCycle[LREAL]} * (4)\text{GearNumerator[UDINT]}}{(2)\text{DistancePerCycle[LREAL]} * (5)\text{GearDenominator[UDINT]}} * \text{Table Movement Amount (unit)}$$

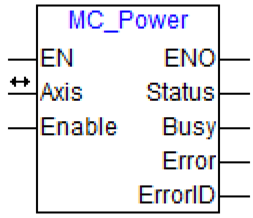




5.2.3 Examples

Sr.No	Variable Name	Variable Type	Initial Value	Variable Description

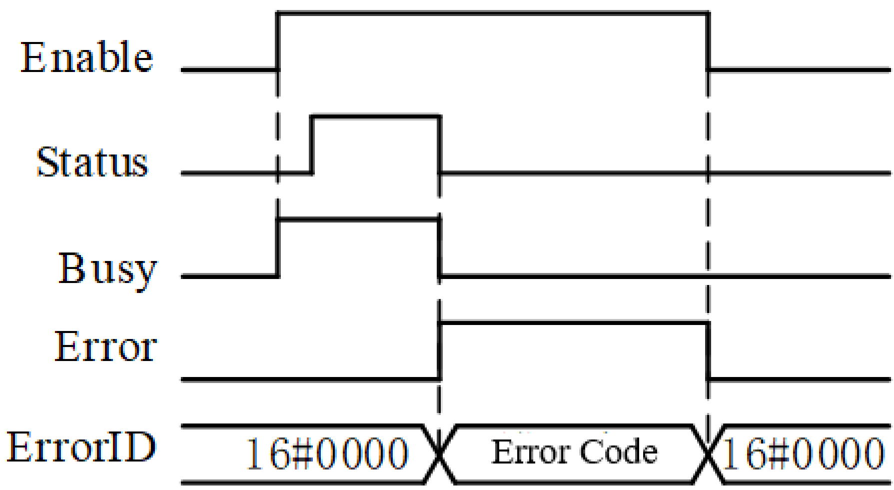
5.2.4 Precautions



5.3.1 Parameter

Parameter Type	Title	Description	Empty or not	Default Value	Scope	Data Type

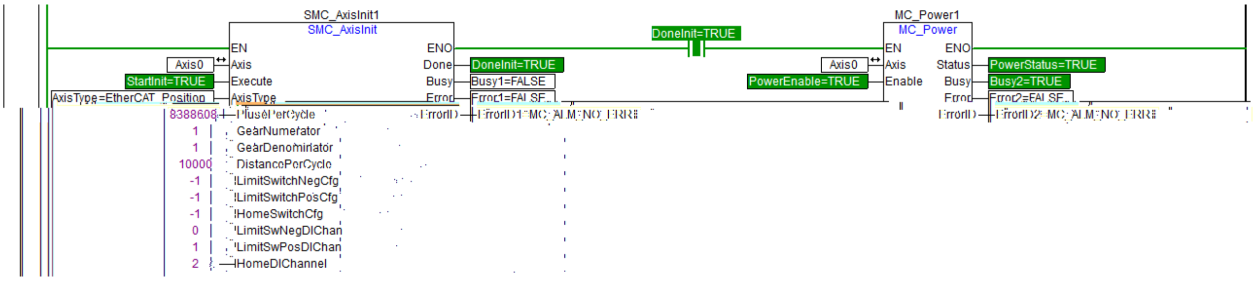
5.3.2 Functions

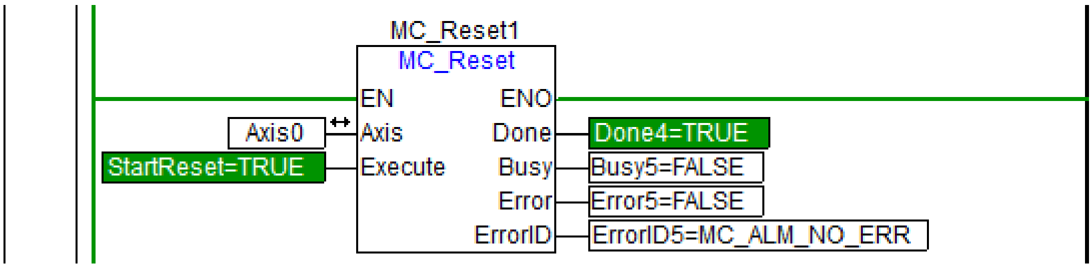


5.3.3 Examples

Definition of Primary Variables

Title	Data Type	Initial Value	Description


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
StartInit=TRUE
Execute
AxisType=EtherCAT_Positiong
AxisType
Done
DoneInit=TRUE
Busy
Busy1=FALSE
Error
8388608
GearNumerator
GearDenominator
DistancePerCycle
1
1
10000
-1
-1
-1
0
1
2
HomeSwitchCfg
LimitSwNegDIChan
LimitSwPosDIChan
HomeDIChannel
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
Status
PowerStatus=TRUE
PowerEnable=TRUE
Enable
Busy
Busy2=TRUE
Error


MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
Done
Done4=TRUE
StartReset=TRUE
Execute
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

5.3.4 Precautions

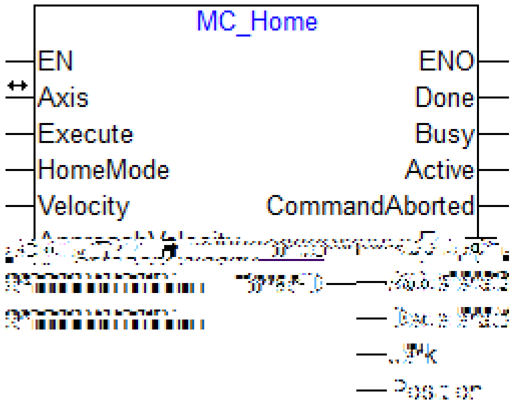
■

■

5.3.5 Refererence

■

5.4 MC_Home (Home)



5.4.1 Parameter

Parameter Type	Title	Description	Empty or not	Default Value	Scope	Data Type

5.4.2 Functions

Description of the homing mode

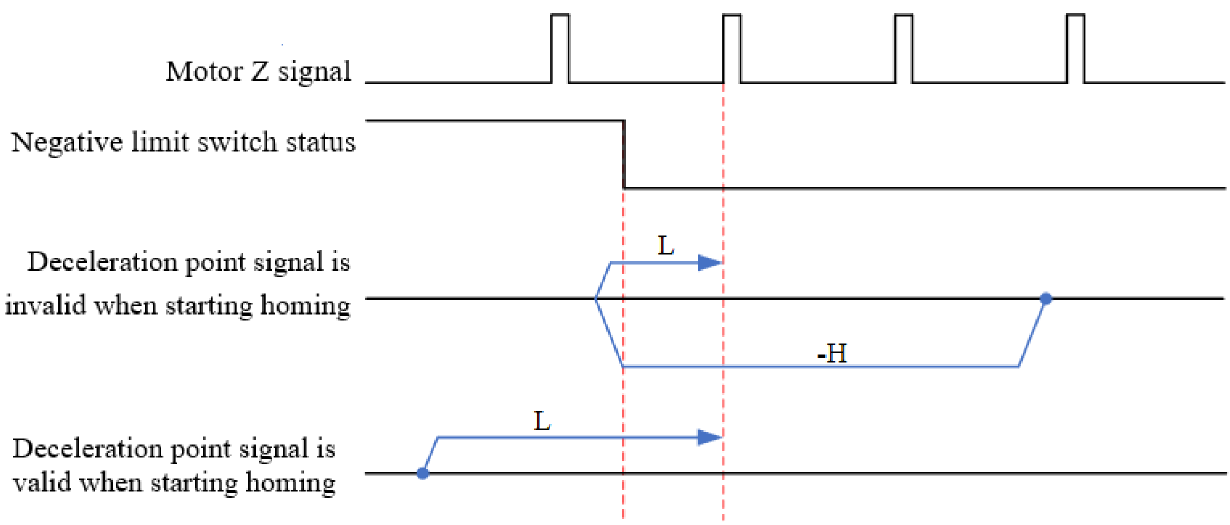
Mode	Homing Direction	Signals Used for Homing	Final Position of Origin	Description
			↓	
			OT↓	
			HMSW↓	
			HMSW↓	
			HMSW↓	
			HMSW↓	

●

OT indicates the positive limit switch signal, HMSW indicates the origin switch signal, and ↓

Origin: motor Z signal

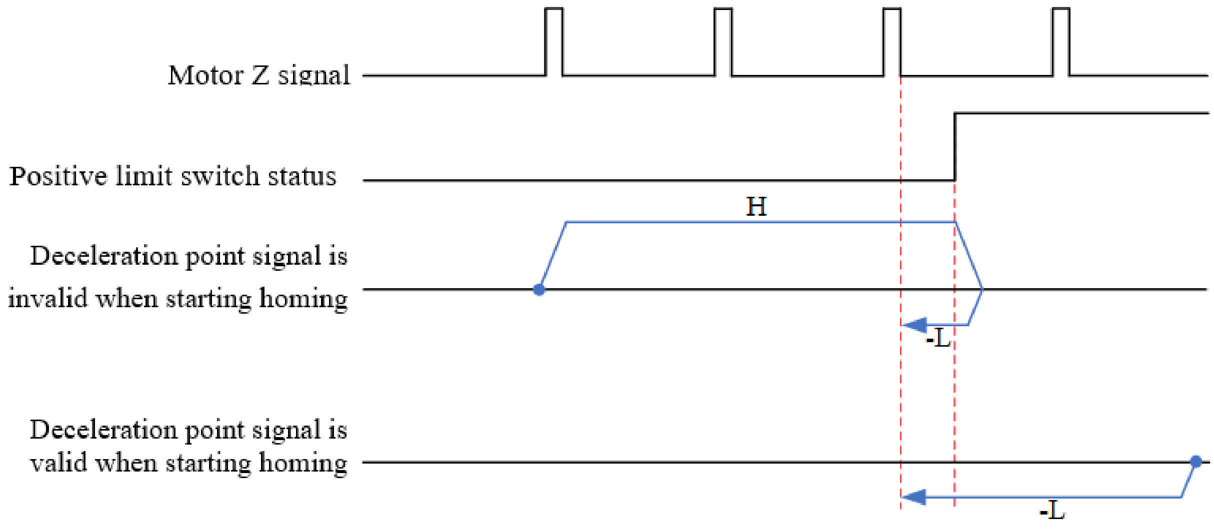
Deceleration point: negative limit switch



•

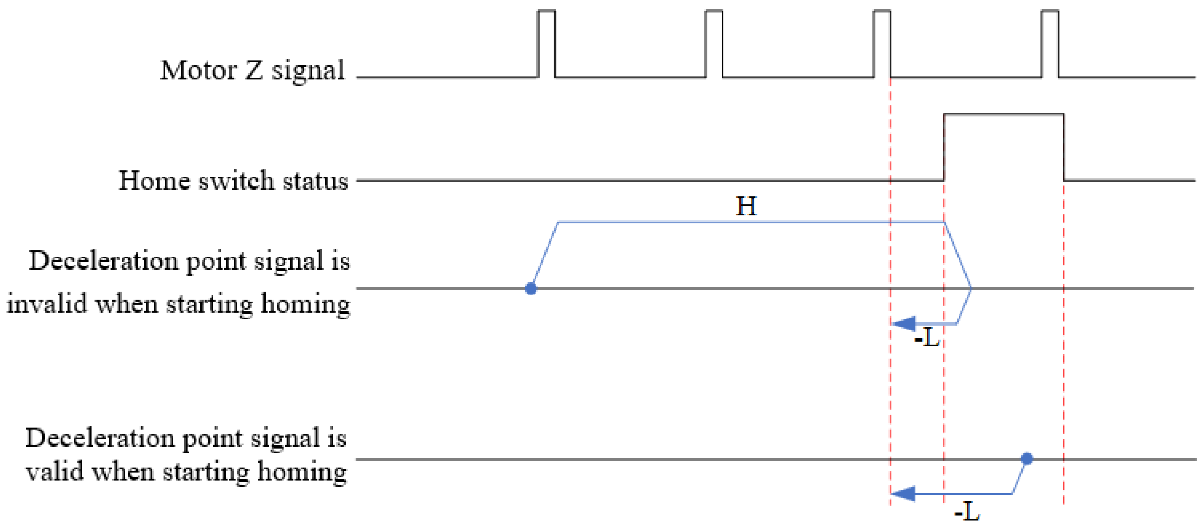
Origin: motor Z signal

Deceleration point: positive limit switch



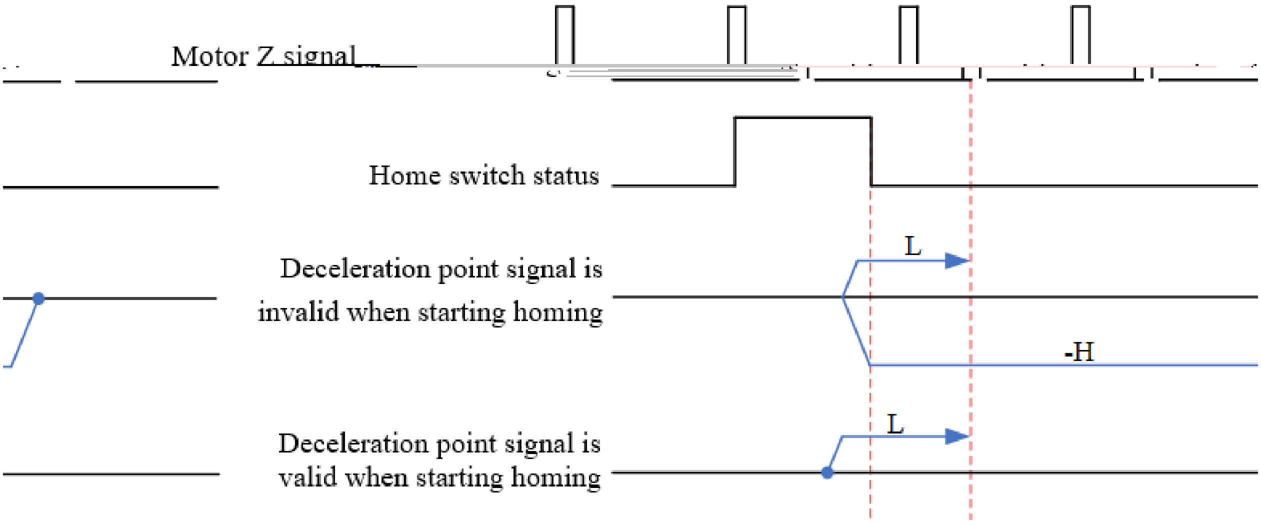
Origin: motor Z signal

Deceleration point: origin switch



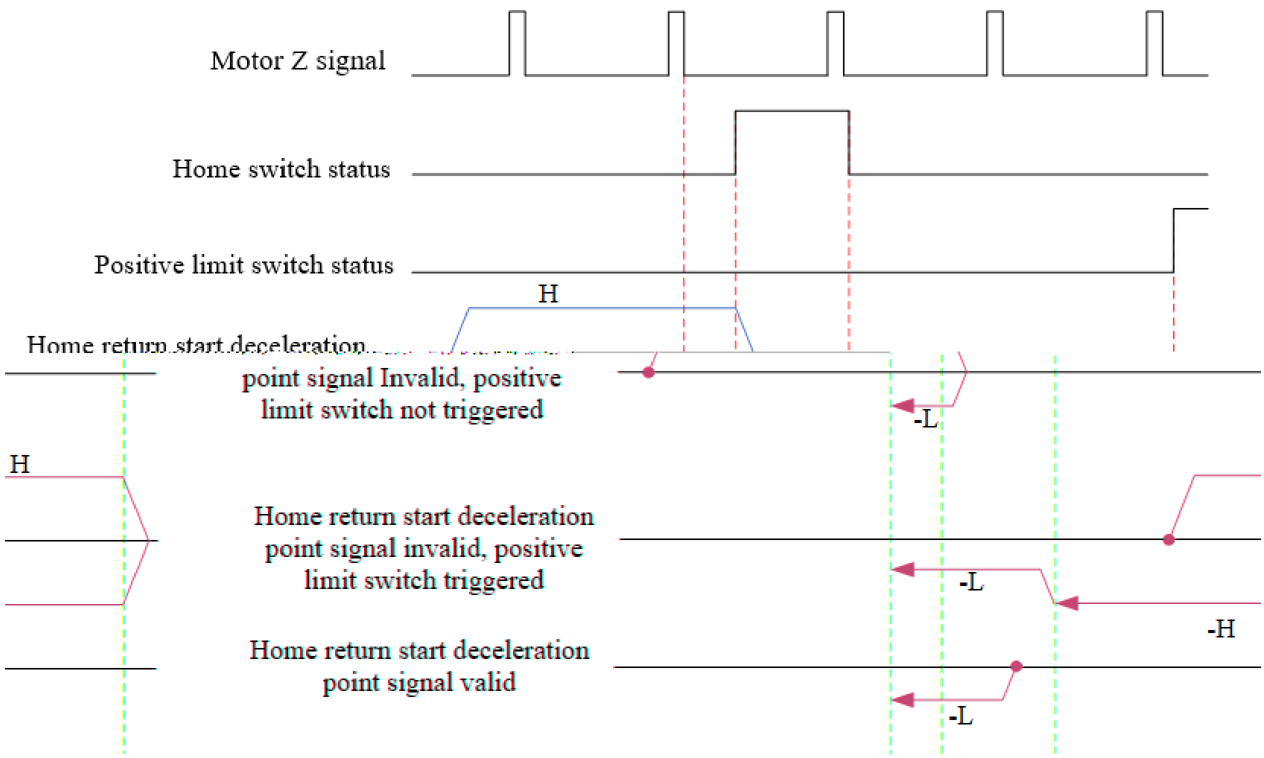
Origin: motor Z signal

Deceleration point: origin switch

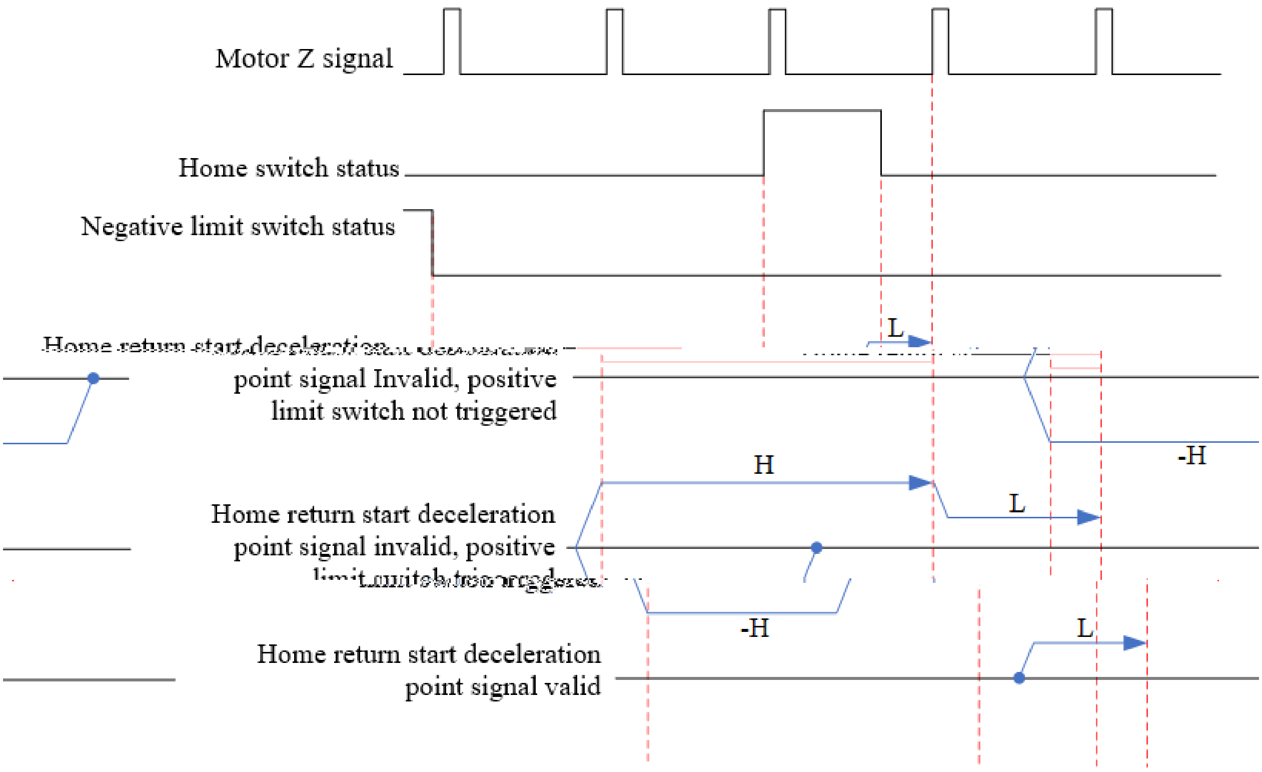


Origin: motor Z signal

Deceleration point: origin switch

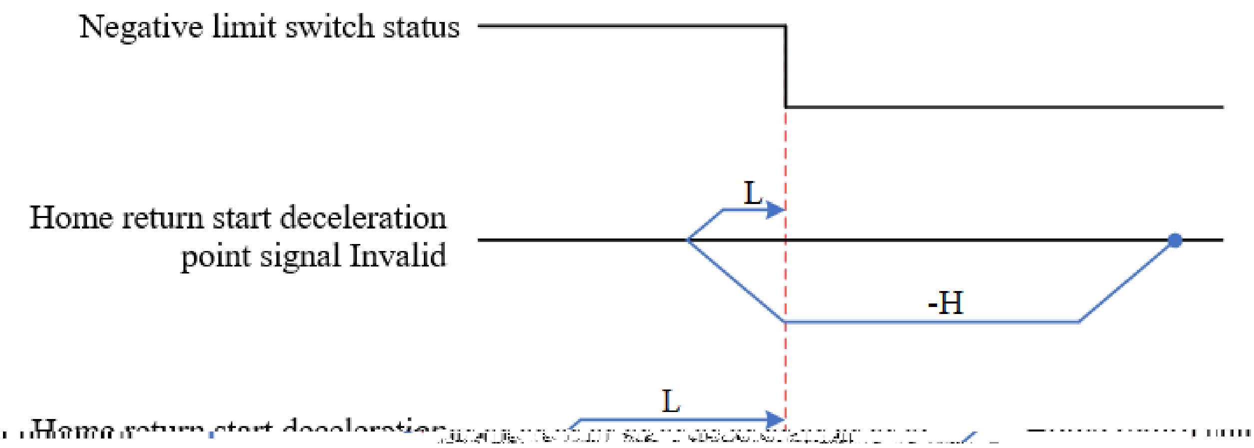


Motor Z signal
Home switch status
Positive limit switch status
H
Home return start deceleration point signal Invalid, positive limit switch not triggered
-L
H
Home return start deceleration point signal invalid, positive limit switch triggered
-L
-H
Home return start deceleration point signal valid
-L



Origin: negative limit switch

Deceleration point: negative limit switch

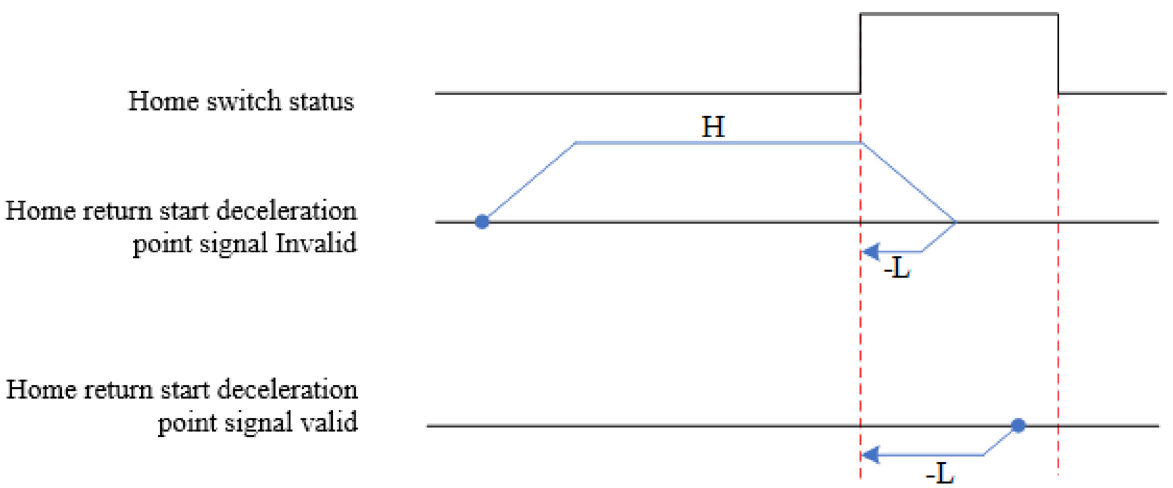


Origin: positive limit switch

Deceleration point: positive limit switch

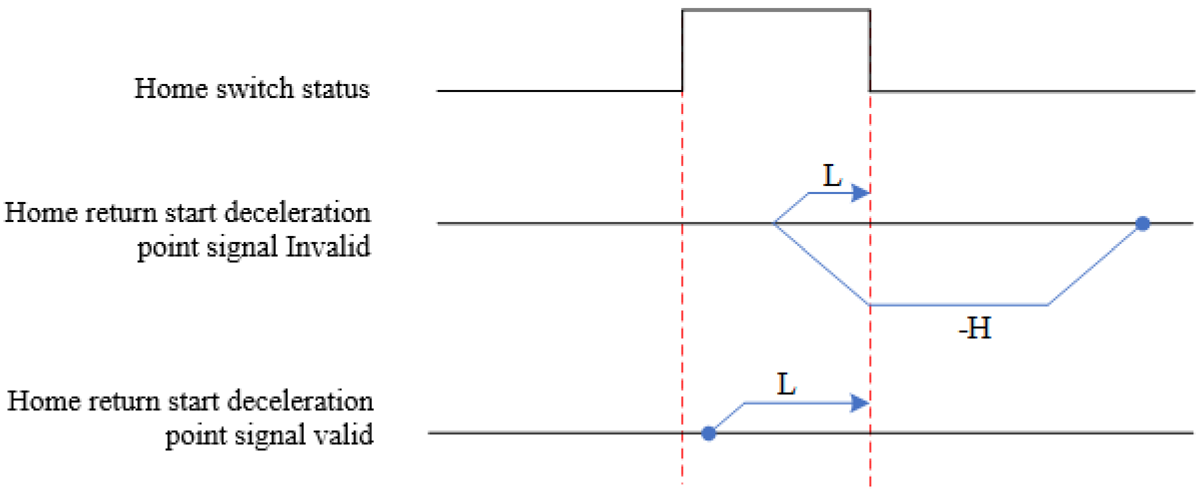
Origin: origin switch

Deceleration point: origin switch



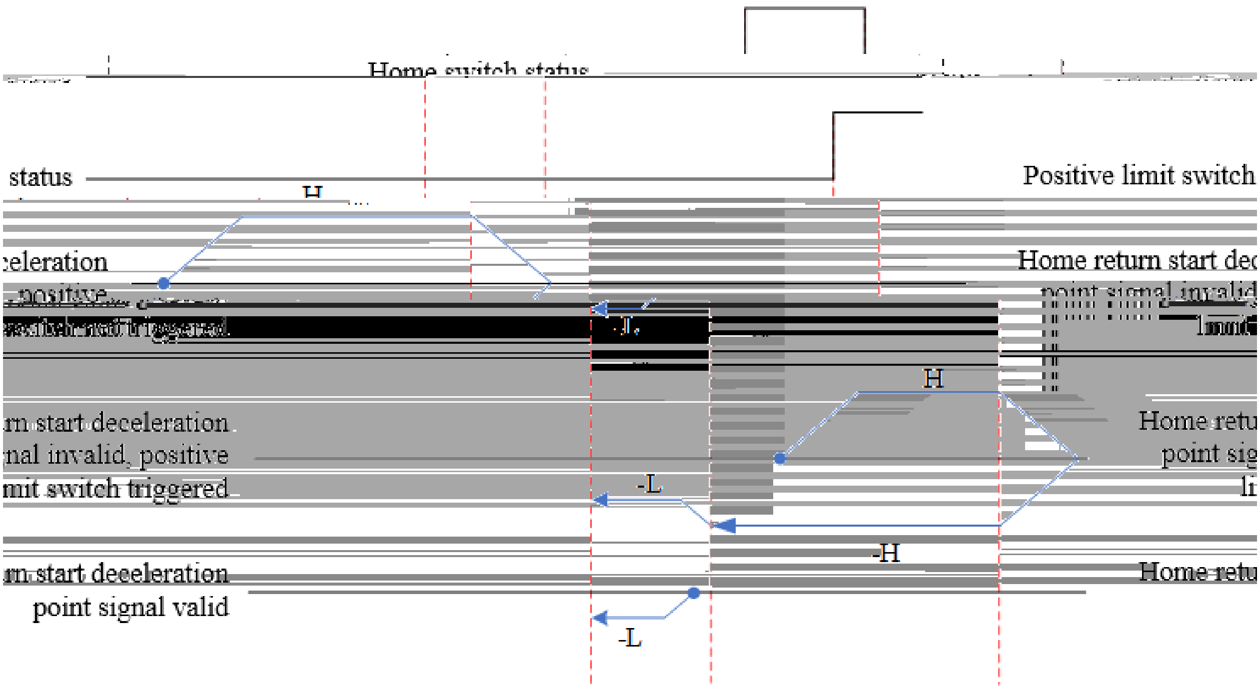
Origin: origin switch

Deceleration point: origin switch



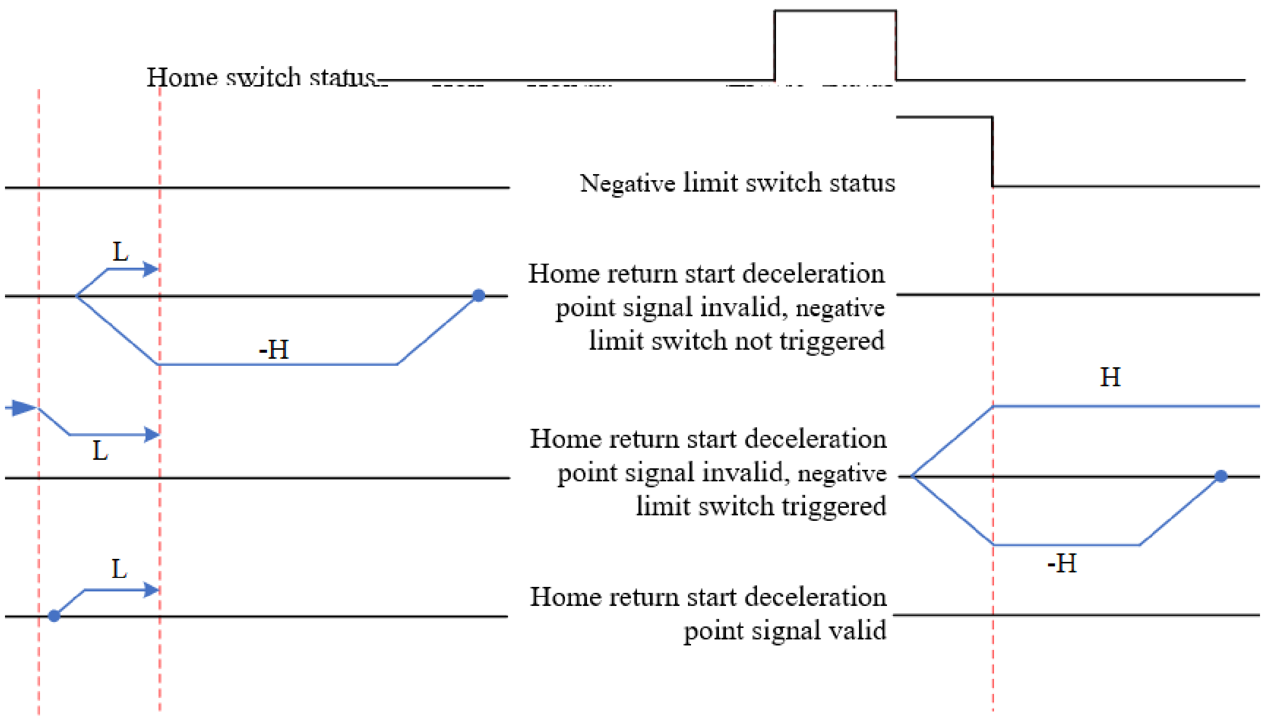
Origin: origin switch

Deceleration point: origin switch

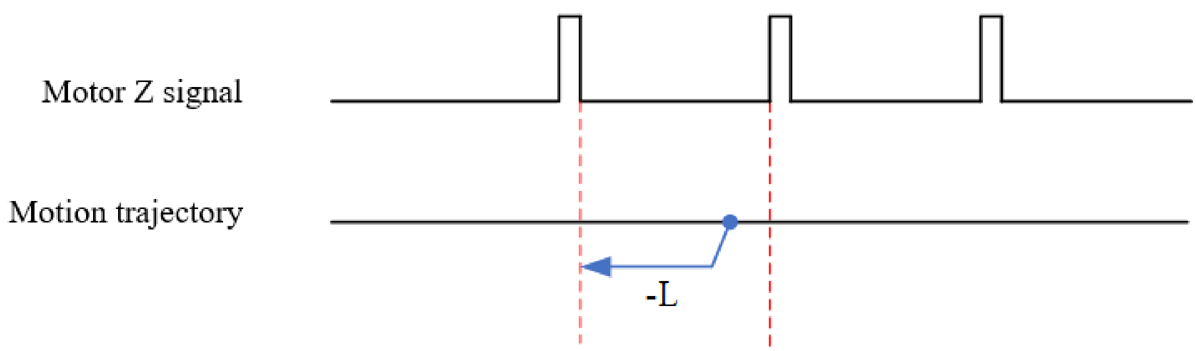


Origin: origin switch

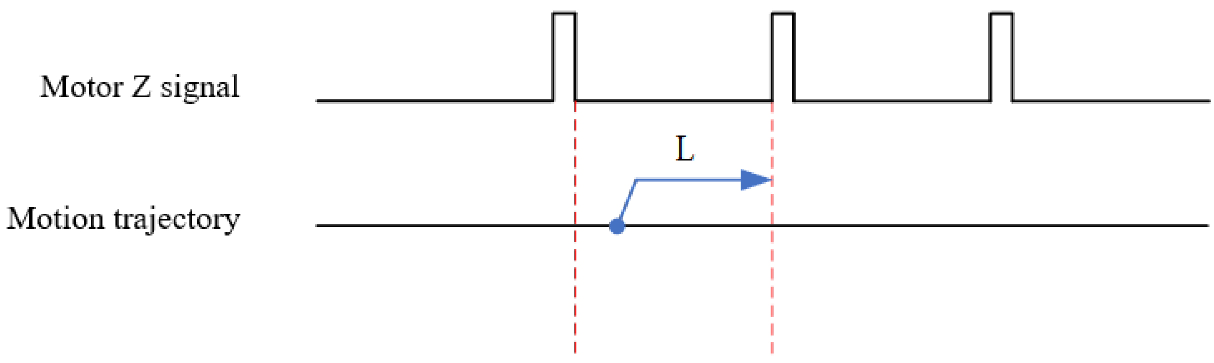
Deceleration point: origin switch

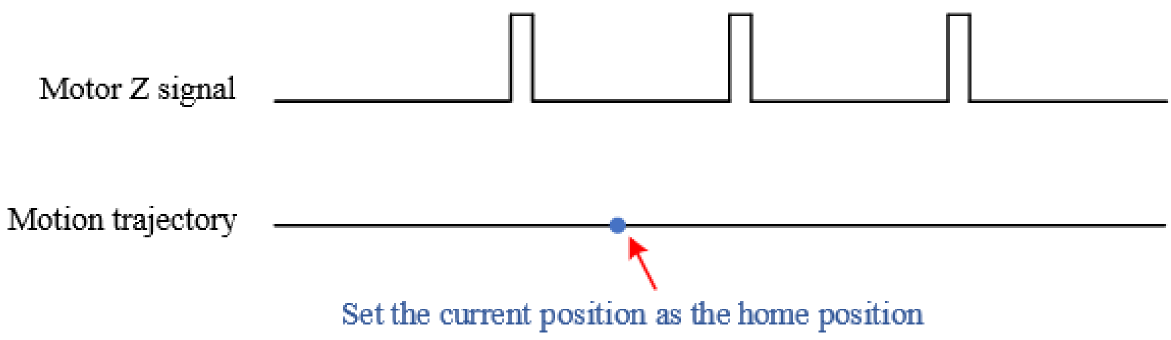


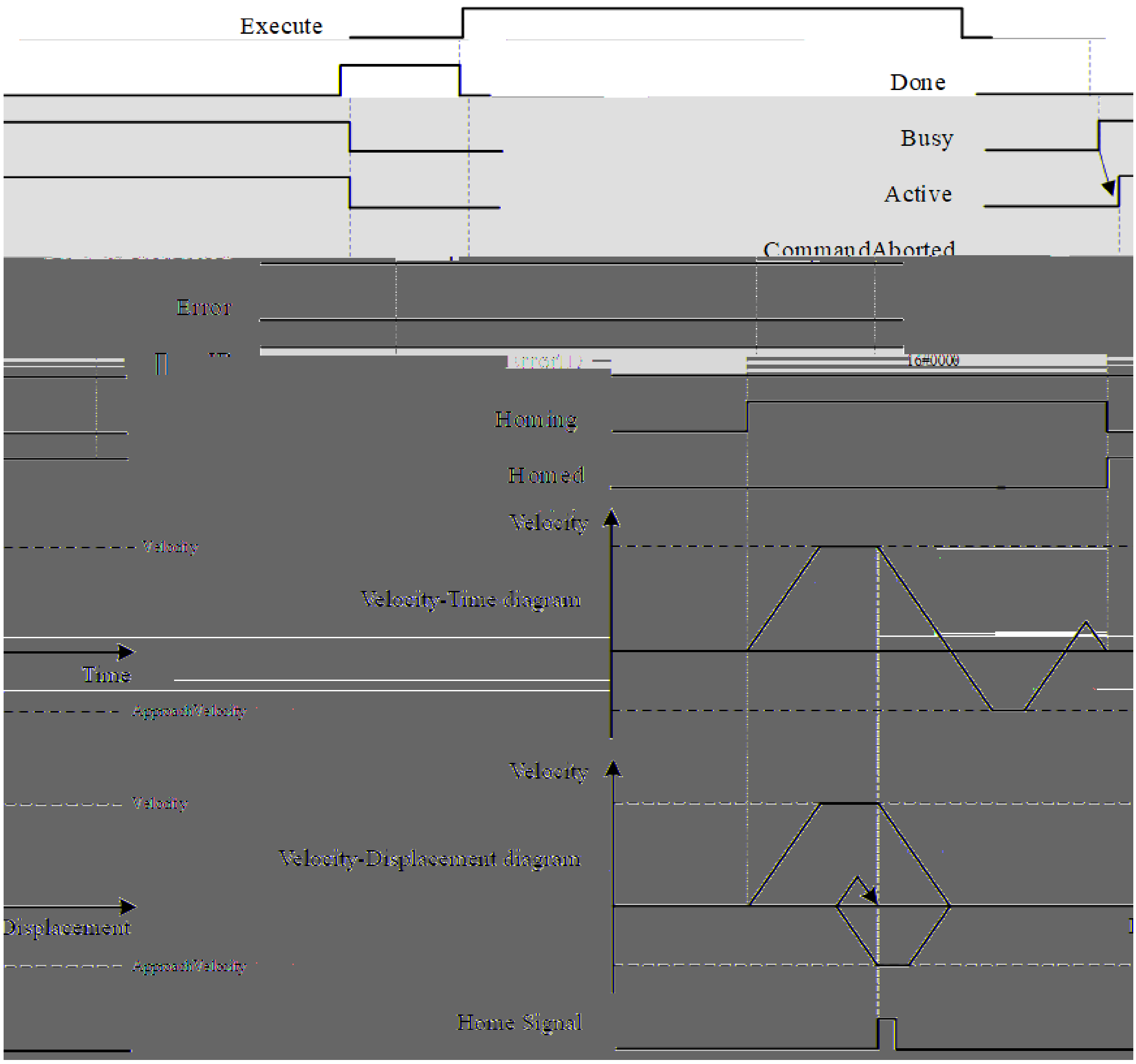
Origin: motor Z signal

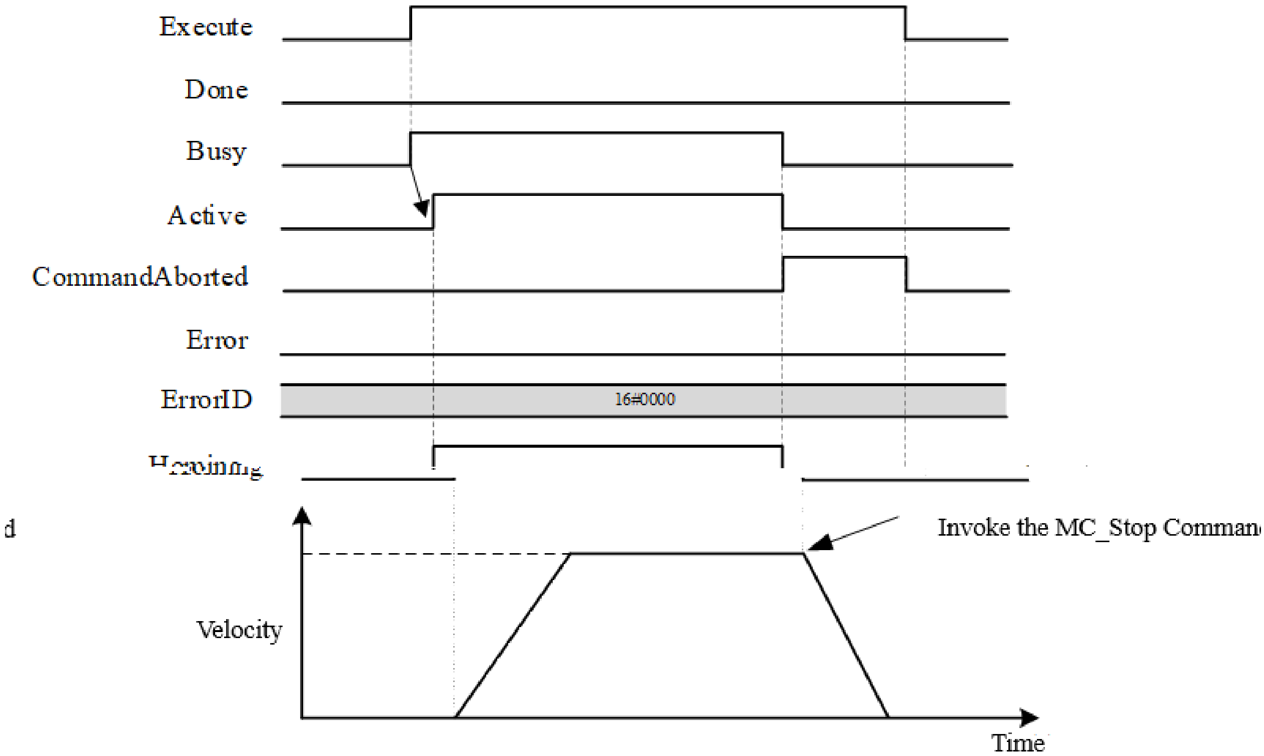


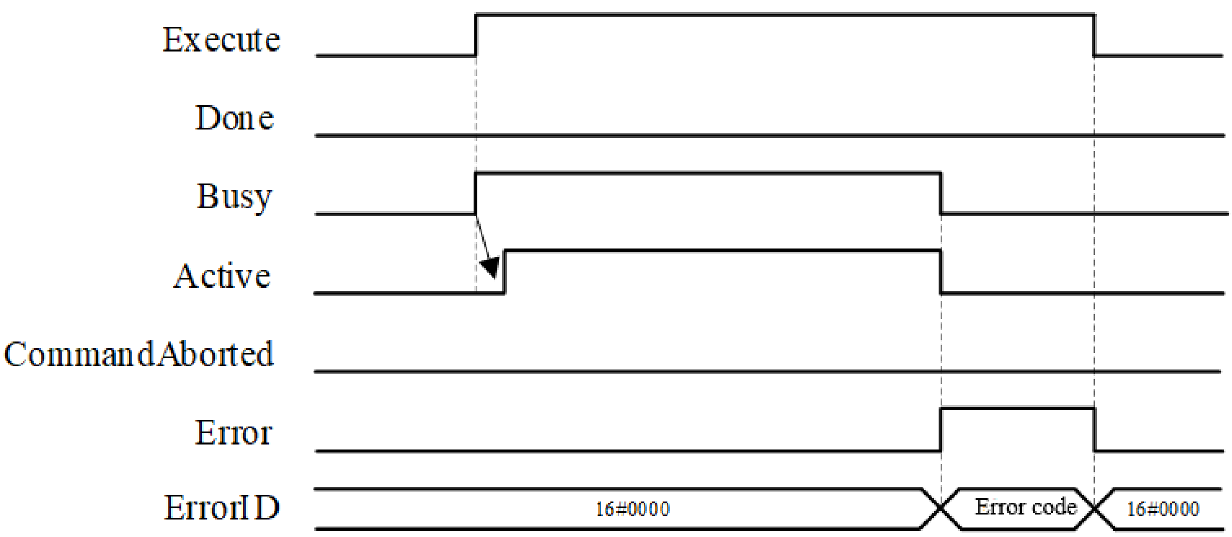
Origin: motor Z signal

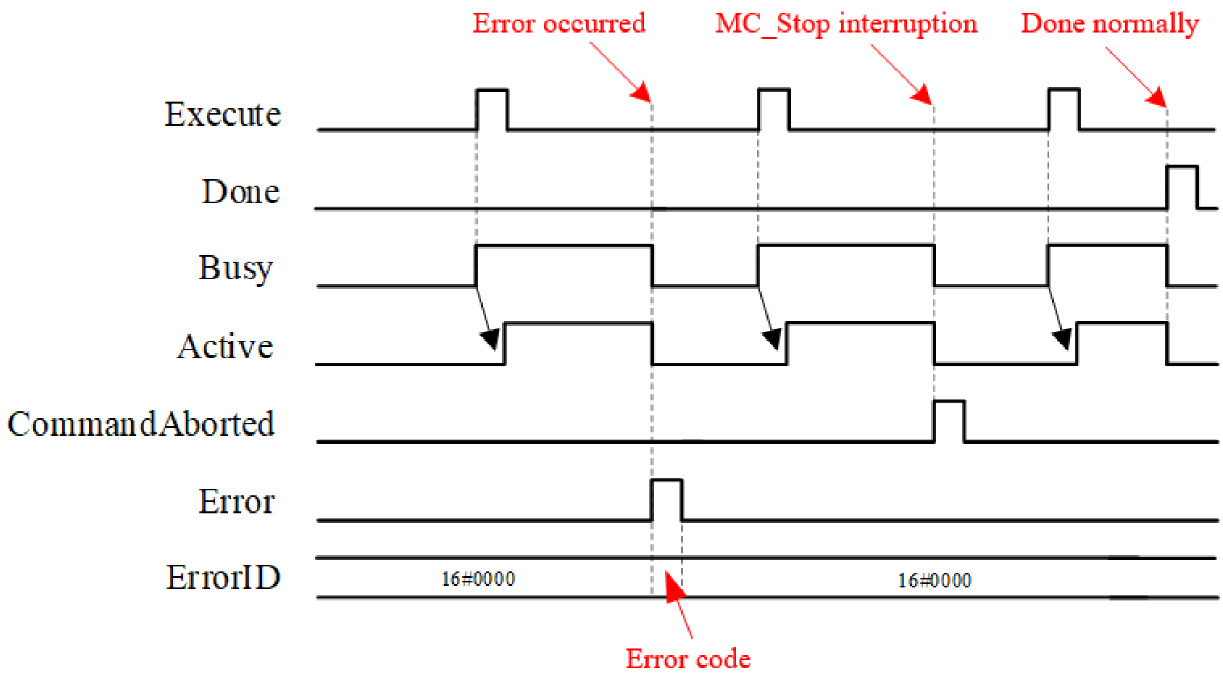

Motor Z signal
L
Motion trajectory


Motor Z signal
Motion trajectory
Set the current position as the home position

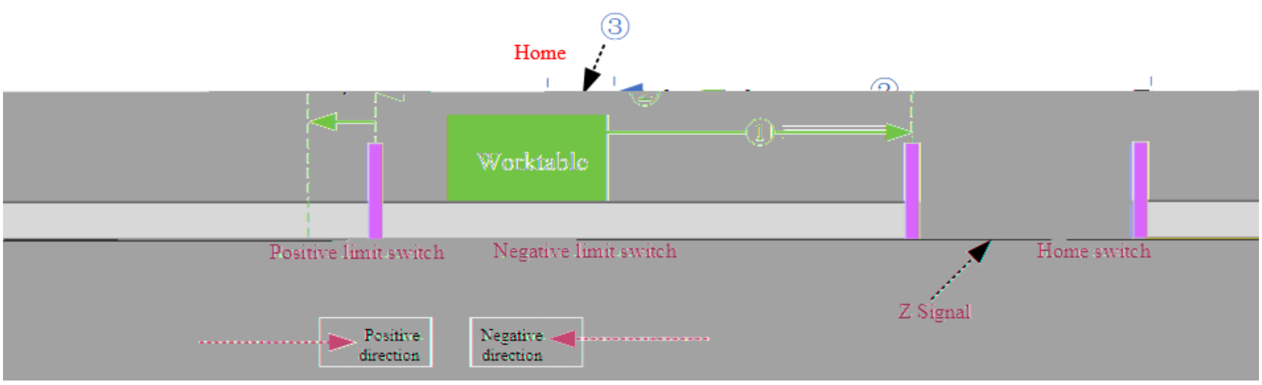

Execute
Done
Busy
Active
CommandAborted
Error
16#0000
Homing
Homed
Velocity
Velocity
Velocity-Time diagram
Time
ApproachVelocity
Velocity
Velocity
Velocity-Displacement diagram
Displacement
ApproachVelocity
Home Signal


Execute
Done
Busy
Active
CommandAborted
Error
ErrorID
16#0000
Homing
Velocity
Invoke the MC_Stop Comman
Time


Execute
Done
Busy
Active
CommandAborted
Error
ErrorID
16#0000
Error code
16#0000

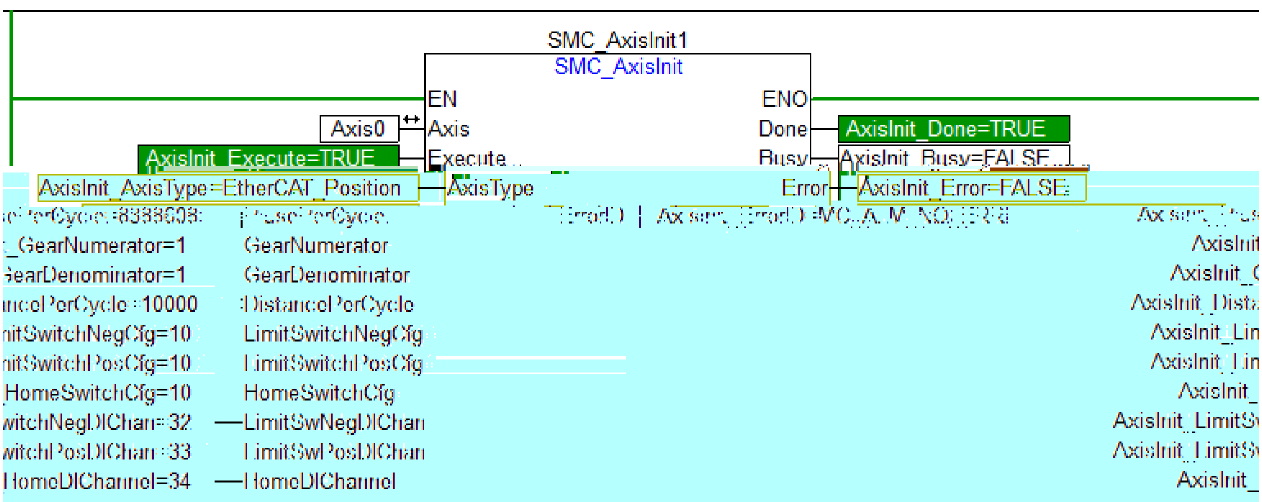


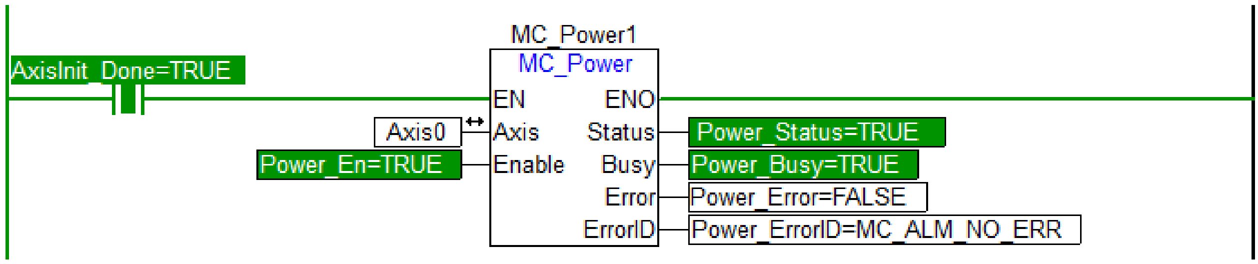
5.4.3 Examples

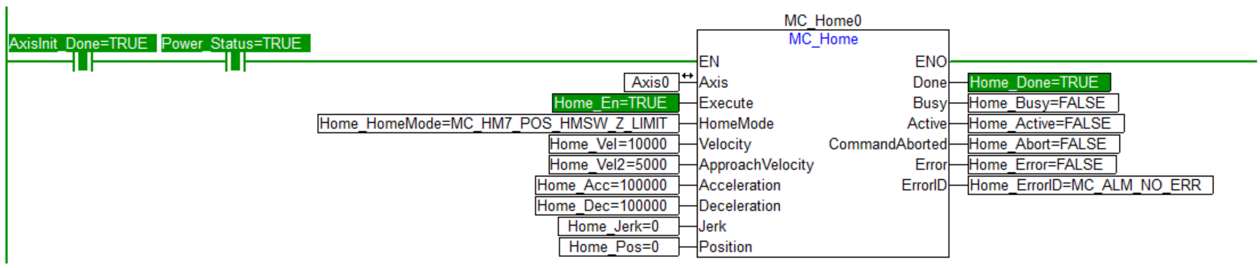


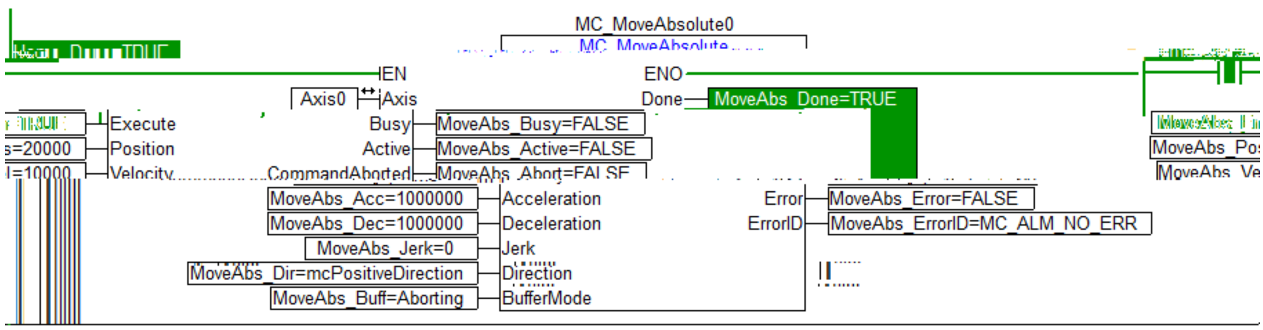
Variable

Sr.No	Variable Name	Variable Type	Initial Value	Variable Description


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
AxisInit_Done=TRUE
AxisInit_Execute=TRUE
Execute
Busy
AxisInit_AxisType=EtherCAT_Position
AxisType
Error
AxisInit_Error=FALSE
GearNumerator
GearDenominator
DistancePerCycle
LimitSwitchNegCfg
LimitSwitchPosCfg
HomeSwitchCfg
LimitSwNegDIChan
LimitSwPosDIChan
HomeDIChannel

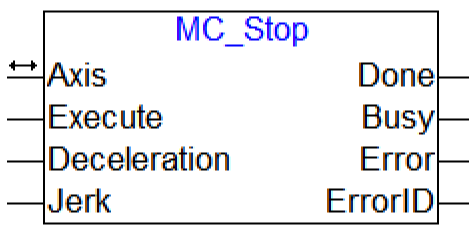

MC_Power1
MC_Power
AxisInit_Done=TRUE
EN
ENO
Axis0
Axis
Status
Power_Status=TRUE
Power_En=TRUE
Enable
Busy
Power_Busy=TRUE
Error
Power_Error=FALSE
ErrorID
Power_ErrorID=MC_ALM_NO_ERR


MC_Home0
MC_Home
AxisInit_Done=TRUE
Power_Status=TRUE
EN
ENO
Axis0
Axis
Done
Home_Done=TRUE
Home_En=TRUE
Execute
Busy
Home_Busy=FALSE
Home_HomeMode=MC_HM7_POS_HMSW_Z_LIMIT
HomeMode
Active
Home_Active=FALSE
Home_Vel=10000
Velocity
CommandAborted
Home_Abort=FALSE
Home_Vel2=5000
ApproachVelocity
Error
Home_Error=FALSE
Home_Acc=100000
Acceleration
ErrorID
Home_ErrorID=MC_ALM_NO_ERR
Home_Dec=100000
Deceleration
Home_Jerk=0
Jerk
Home_Pos=0
Position


MC_MoveAbsolute0
EN
ENO
Axis0
Axis
Done
MoveAbs_Done=TRUE
Execute
Busy
MoveAbs_Busy=FALSE
Position
Active
MoveAbs_Active=FALSE
Velocity
CommandAborted
Error
MoveAbs_Error=FALSE
MoveAbs_Acc=1000000
Acceleration
ErrorID
MoveAbs_ErrorID=MC_ALM_NO_ERR
MoveAbs_Dec=1000000
Deceleration
MoveAbs_Jerk=0
Jerk
MoveAbs_Dir=mcPositiveDirection
Direction
MoveAbs_Buff=Aborting
BufferMode

5.4.4 Precautions

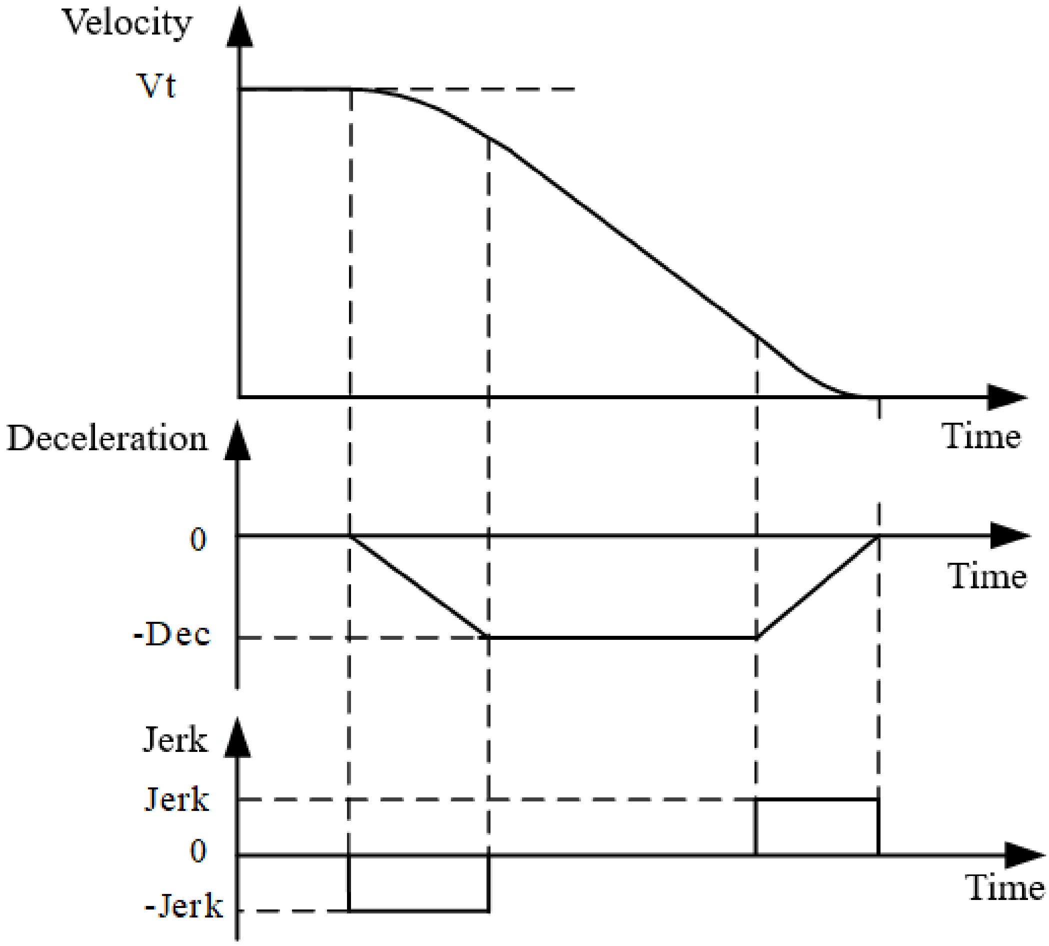
5.5 MC_Stop (Axis Stop)



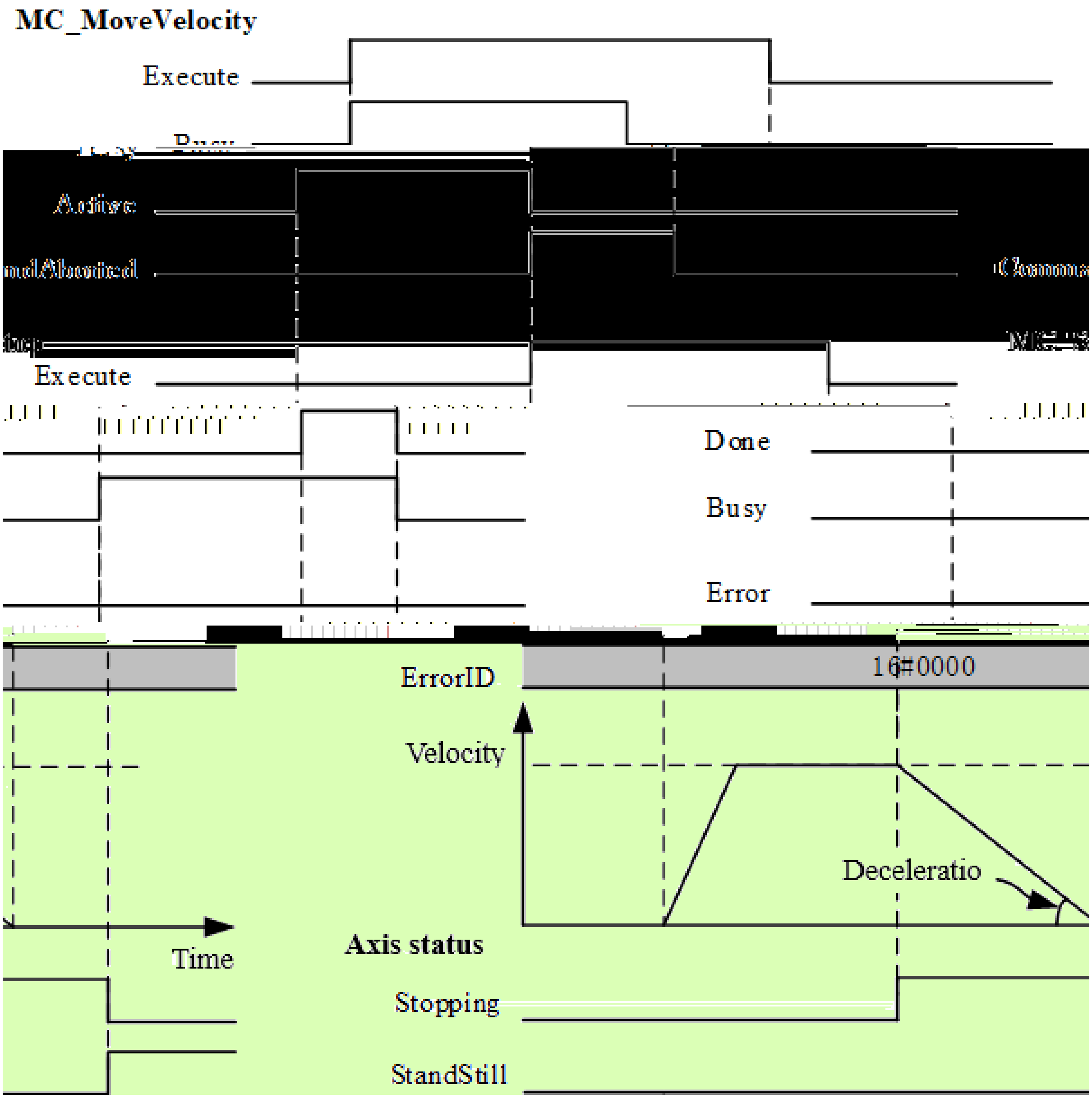
5.5.1 Parameter

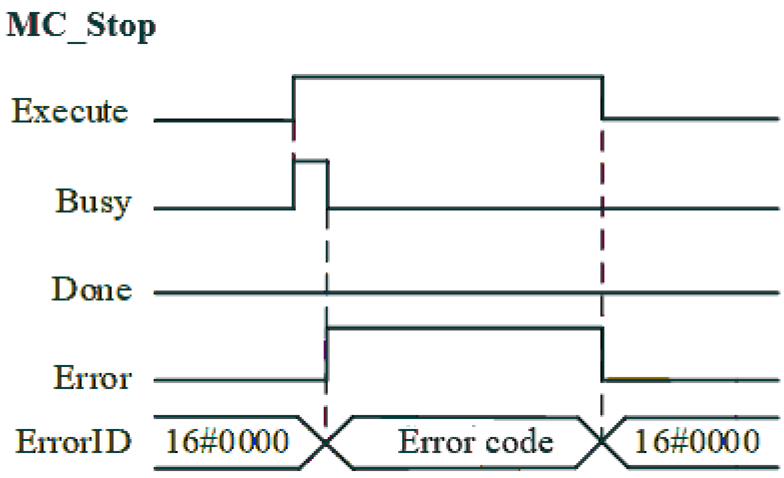
Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type

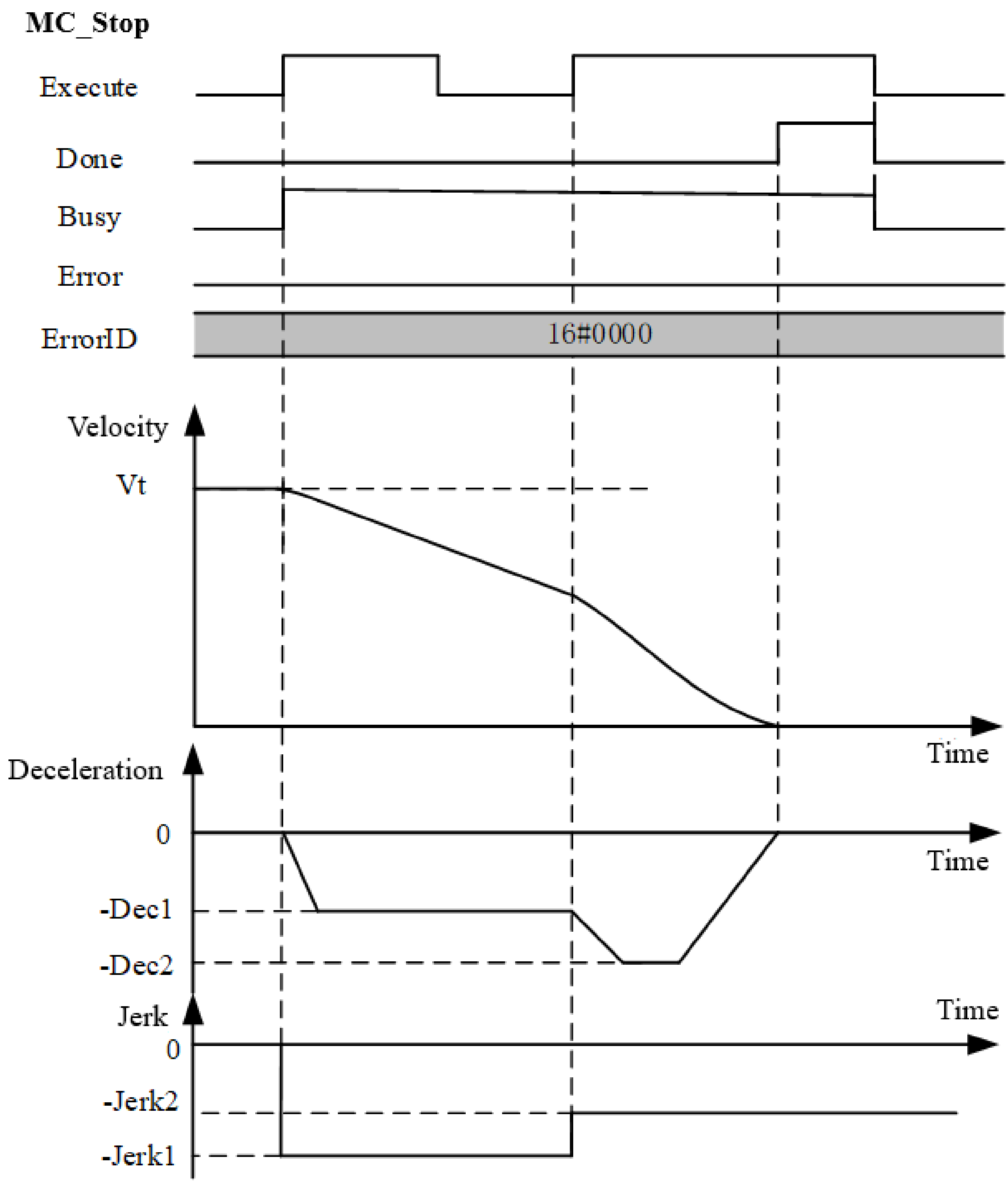
5.5.2 Functions



Vt: Velocity at the start of deceleration, Dec: Deceleration setting value, Jerk: Jerk setting value


MC_MoveVelocity
Execute
Busy
Active
Execute
Done
Busy
Error
ErrorID
16#0000
Velocity
Deceleratio
Time
Axis status
Stopping
StandStill

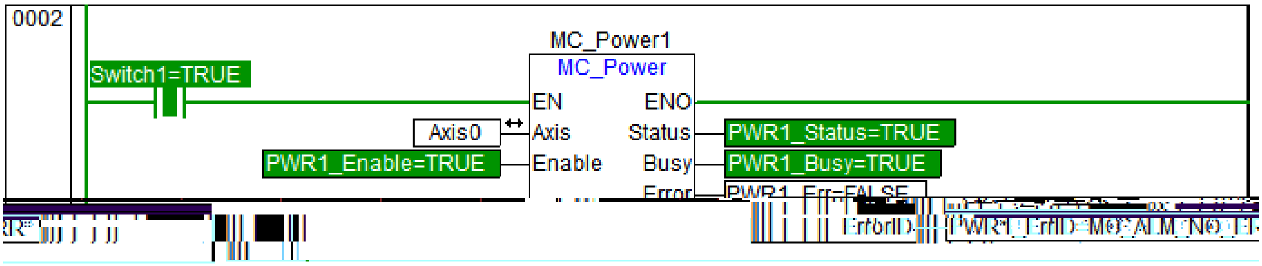

MC_Stop
Execute
Busy
Done
Error
ErrorID
16#0000
Error code
16#0000

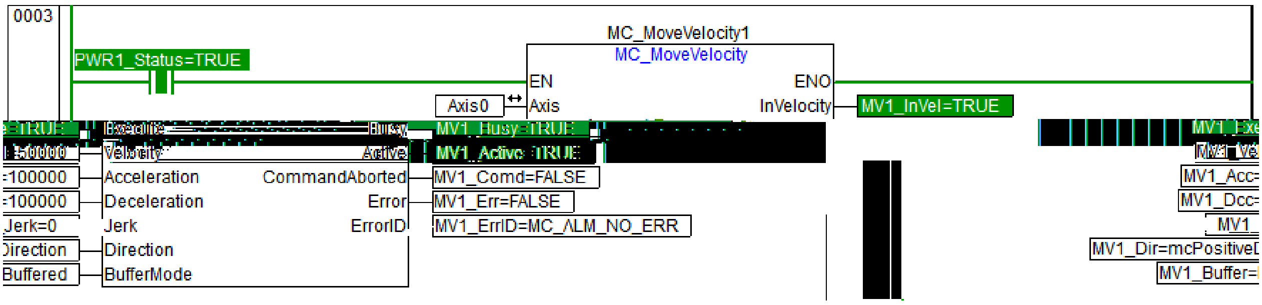


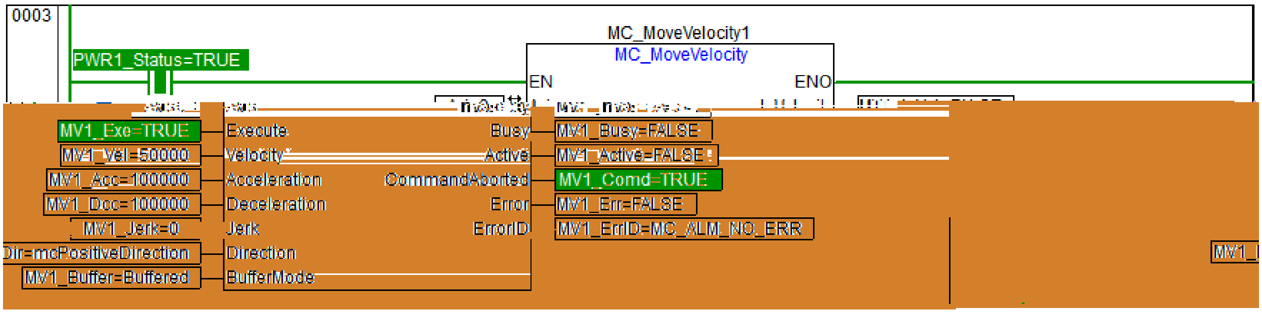
Vt: Velocity at the start of deceleration, Dec1: Deceleration during the first command execution, Dec2: Deceleration during the second command execution, Jerk1: Jerk during the first command execution, Dec2: Jerk during the second command execution

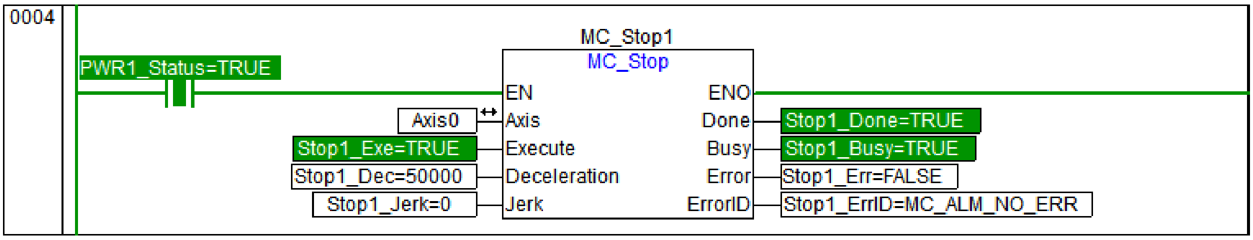
5.5.3 Examples

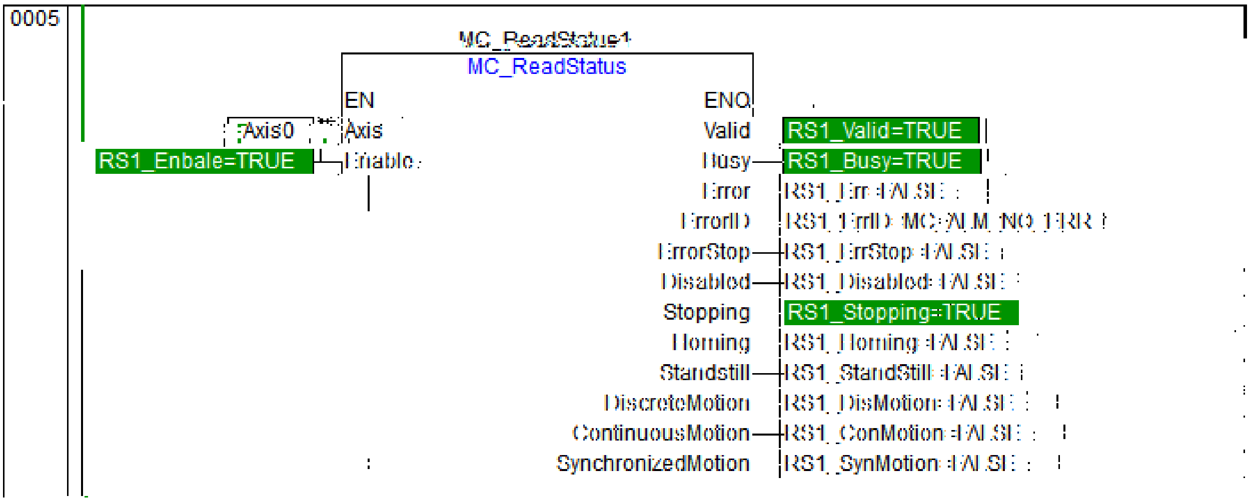
Description of Primary Variables


0002
MC_Power1
MC_Power
Switch1=TRUE
EN
ENO
Axis0
Axis
Status
PWR1_Status=TRUE
PWR1_Enable=TRUE
Enable
Busy
PWR1_Busy=TRUE
Error
ErrorID


0003
MC_MoveVelocity1
MC_MoveVelocity
PWR1_Status=TRUE
EN
ENO
Axis0
Axis
InVelocity
MV1_InVel=TRUE
Execute
Busy
MV1_Busy=TRUE
Velocity
Active
MV1_Active=TRUE
=100000
Acceleration
CommandAborted
MV1_Comd=FALSE
=100000
Deceleration
Error
MV1_Err=FALSE
Jerk=0
Jerk
ErrorID
MV1_ErrID=MC_ALM_NO_ERR
Direction
Buffered
BufferMode

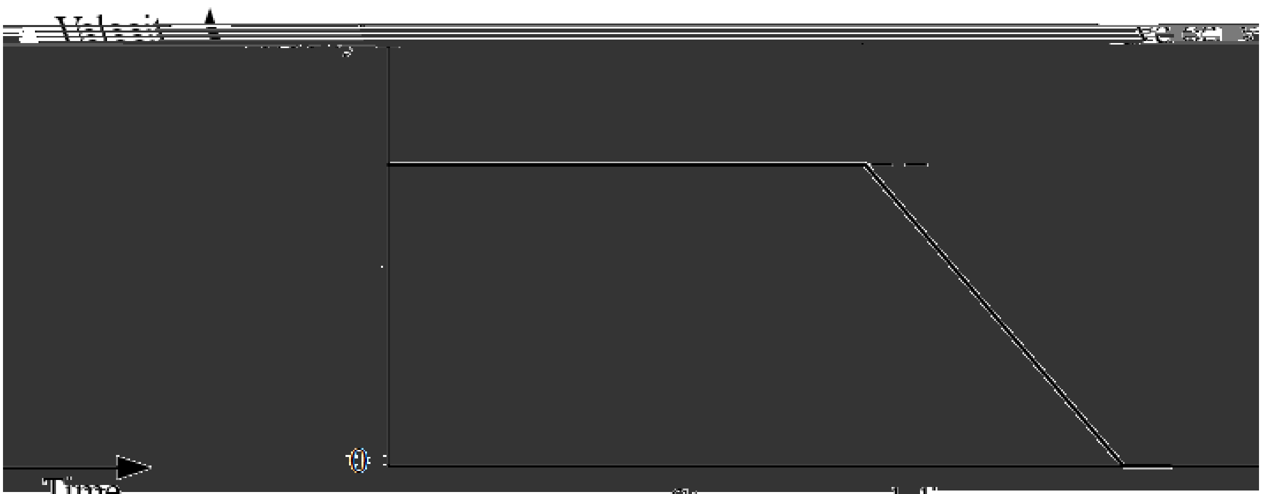






Description of Primary Variables

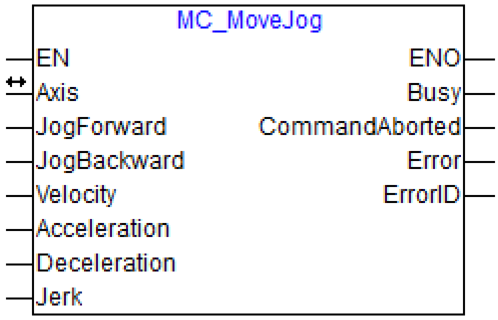
Variable Name	Variable Type	Initial Value	Notes



Stop command diagram

5.5.4 Precautions

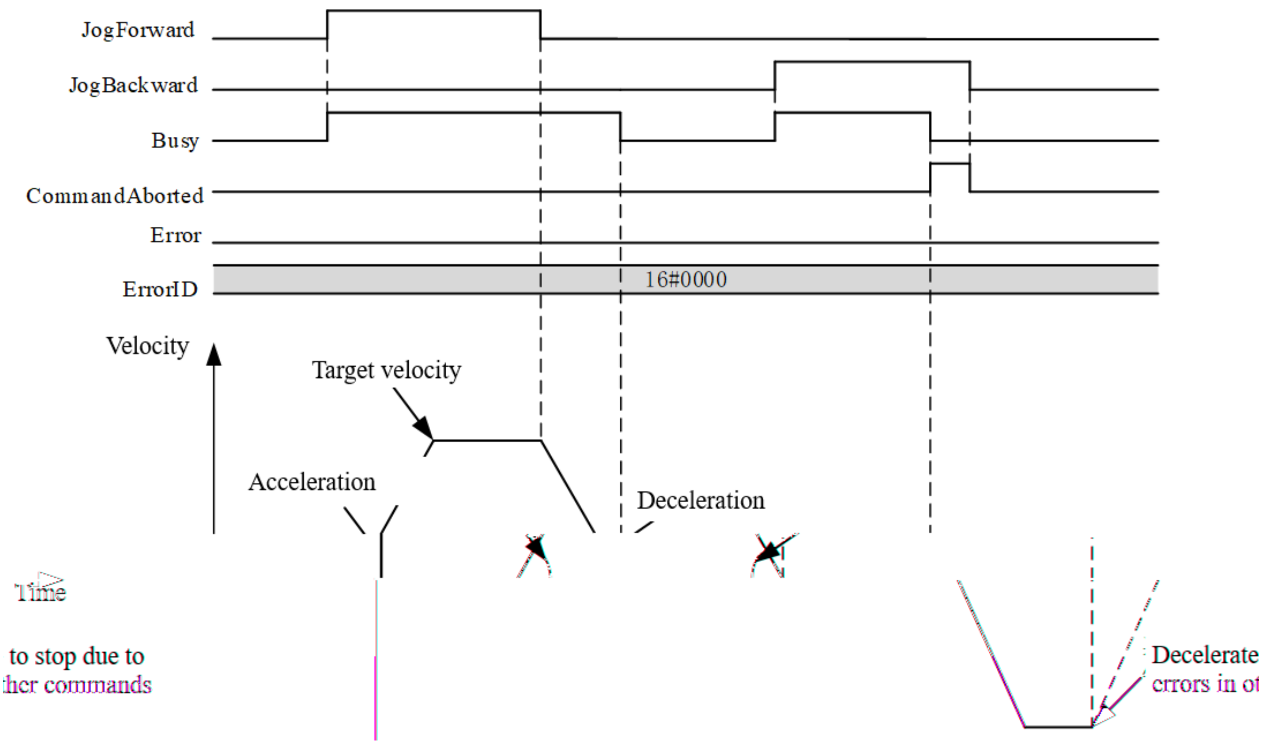
5.6 MC_MoveJog (JOG)



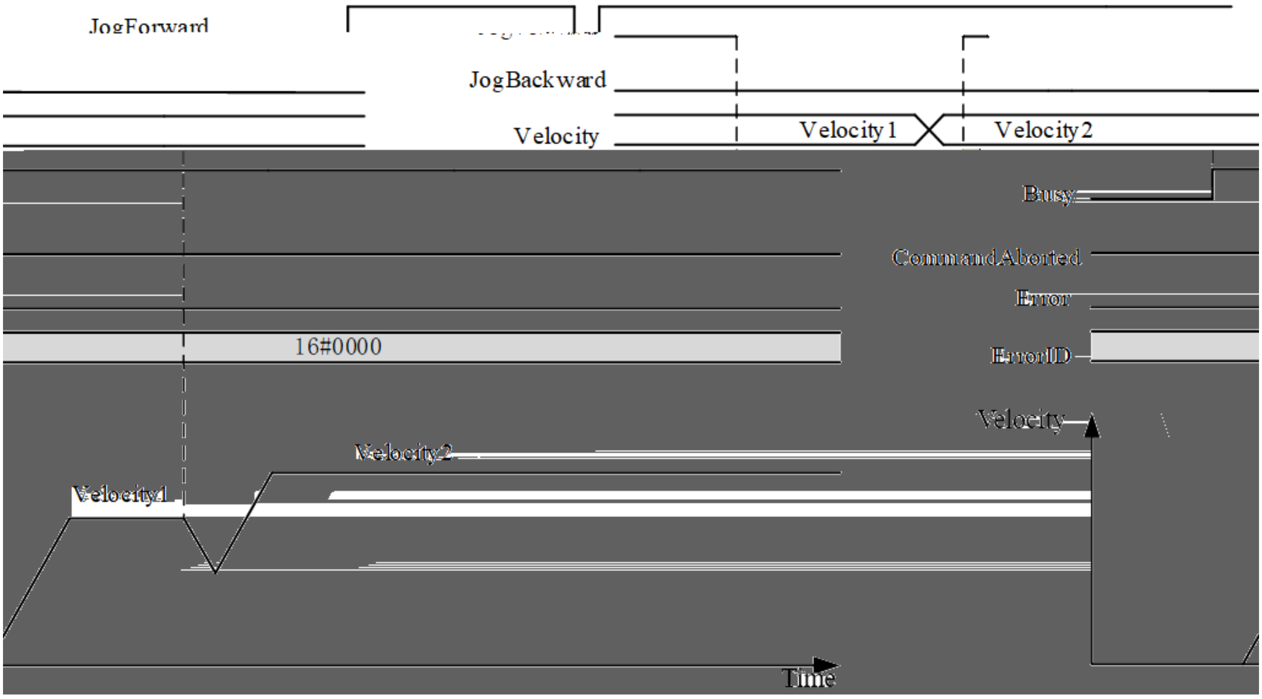
5.6.1 Parameter

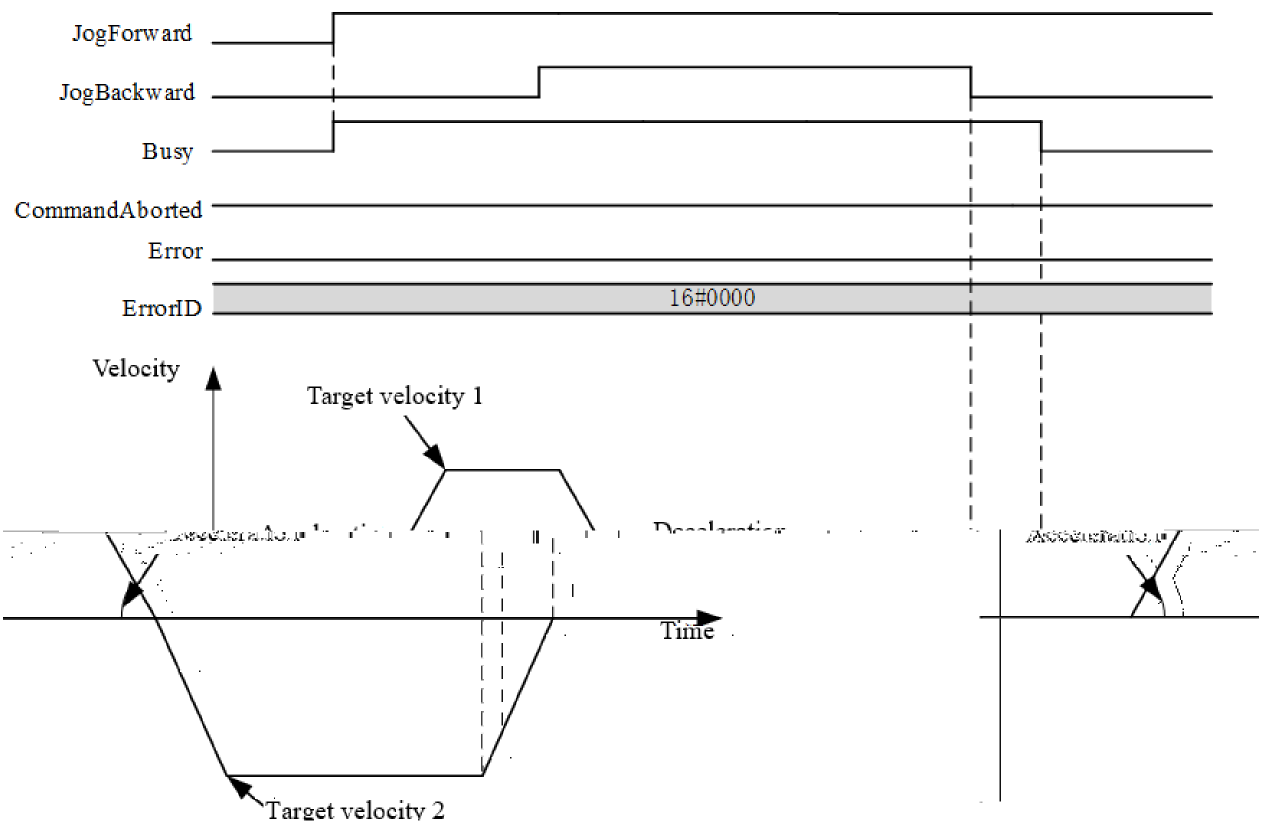
Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

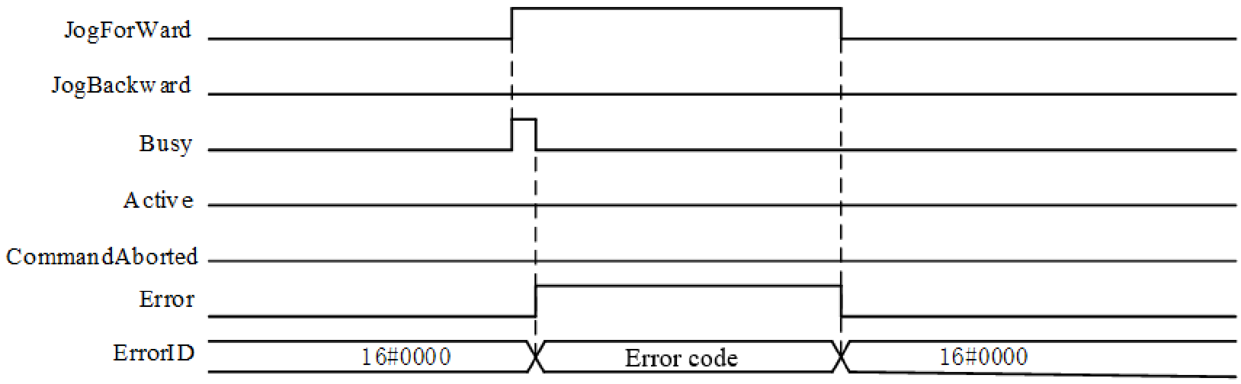
5.6.2 Functions



JogForward
JogBackward
Busy
CommandAborted
Error
ErrorID
16#0000
Velocity
Target velocity
Acceleration
Deceleration
Time
to stop due to
her commands
Decelerate
errors in ot


JogForward
JogBackward
Velocity
Velocity1
Velocity2
Busy
CommandAborted
Error
ErrorID
16#0000
Velocity
Velocity2
Velocity1
Time

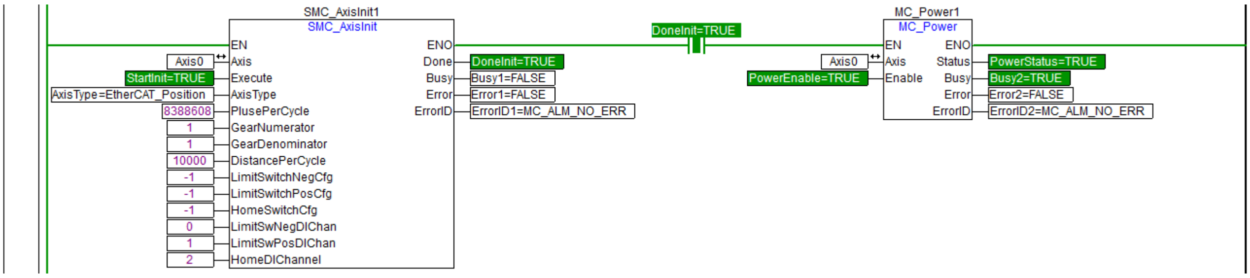

JogForward
JogBackward
Busy
CommandAborted
Error
ErrorID
16#0000
Velocity
Target velocity 1
Time
Target velocity 2



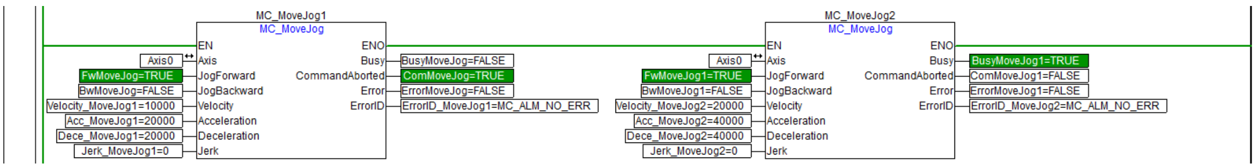
5.6.3 Examples

Definition of Primary Variable

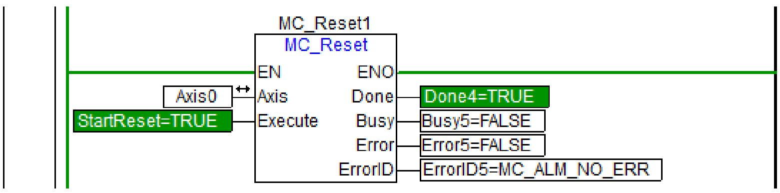
Name	Data Type	Initial Value	Notes



SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
StartInit=TRUE
Execute
AxisType=EtherCAT_Position
AxisType
8388608
PlusePerCycle
1
GearNumerator
1
GearDenominator
10000
DistancePerCycle
-1
LimitSwitchNegCfg
-1
LimitSwitchPosCfg
-1
HomeSwitchCfg
0
LimitSwNegDIChan
1
LimitSwPosDIChan
2
HomeDIChannel
Done
DoneInit=TRUE
Busy
Busy1=FALSE
Error
Error1=FALSE
ErrorID
ErrorID1=MC_ALM_NO_ERR
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
PowerEnable=TRUE
Enable
Status
PowerStatus=TRUE
Busy
Busy2=TRUE
Error
Error2=FALSE
ErrorID
ErrorID2=MC_ALM_NO_ERR



MC_MoveJog1
MC_MoveJog
EN
ENO
Axis0
Axis
FwMoveJog=TRUE
JogForward
BwMoveJog=FALSE
JogBackward
Velocity_MoveJog1=10000
Velocity
Acc_MoveJog1=20000
Acceleration
Dece_MoveJog1=20000
Deceleration
Jerk_MoveJog1=0
Jerk
Busy
BusyMoveJog=FALSE
CommandAborted
ComMoveJog=TRUE
Error
ErrorMoveJog=FALSE
ErrorID
ErrorID_MoveJog1=MC_ALM_NO_ERR
MC_MoveJog2
MC_MoveJog
EN
ENO
Axis0
Axis
FwMoveJog1=TRUE
JogForward
BwMoveJog1=FALSE
JogBackward
Velocity_MoveJog2=20000
Velocity
Acc_MoveJog2=40000
Acceleration
Dece_MoveJog2=40000
Deceleration
Jerk_MoveJog2=0
Jerk
Busy
BusyMoveJog1=TRUE
CommandAborted
ComMoveJog1=FALSE
Error
ErrorMoveJog1=FALSE
ErrorID
ErrorID_MoveJog2=MC_ALM_NO_ERR



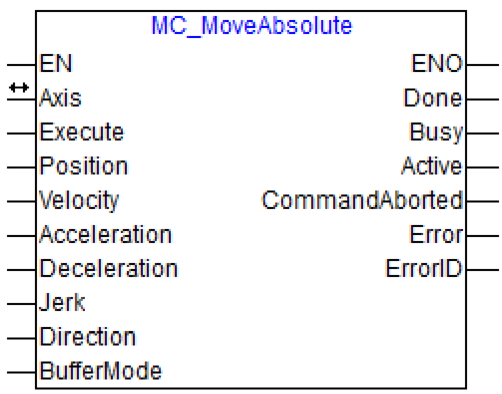
MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
StartReset=TRUE
Execute
Done
Done4=TRUE
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

[redacted]

5.6.4 Precautions

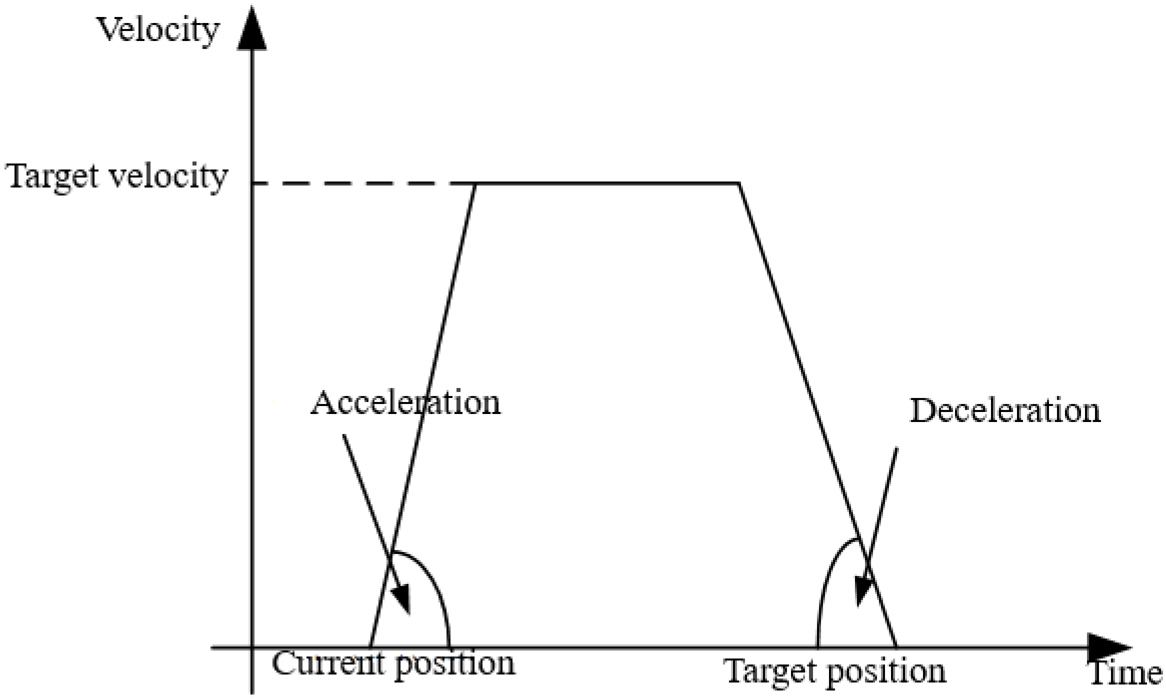
5.6.5 Reference

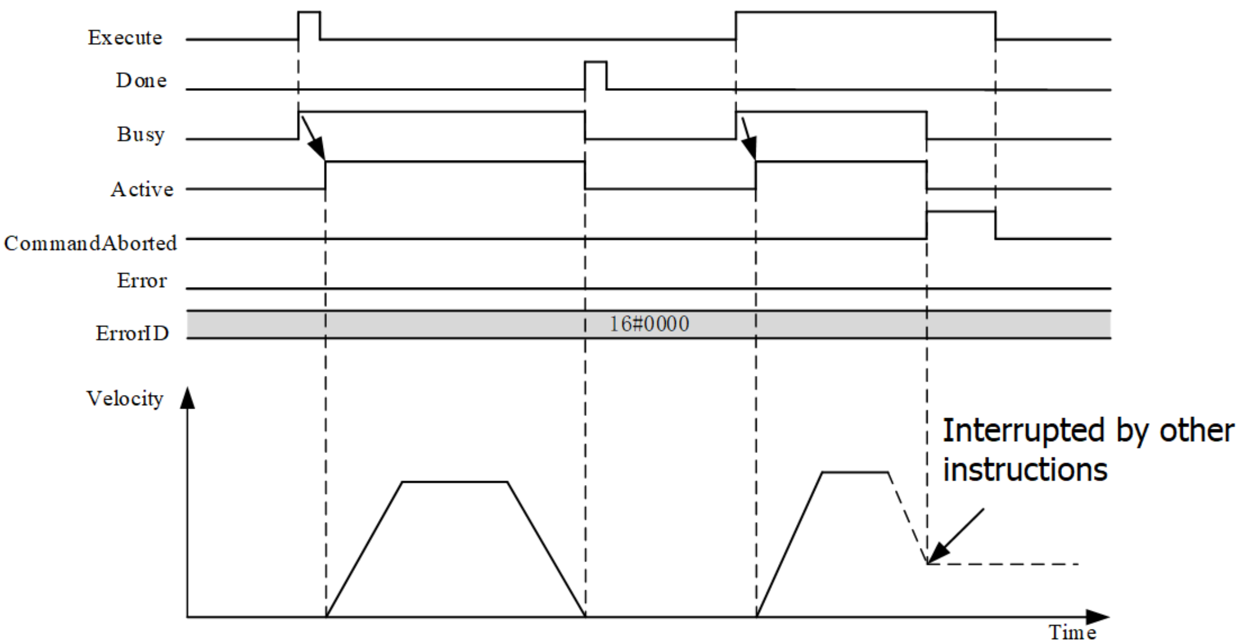
5.7 MC_MoveAbsolute (Absolute Positioning)

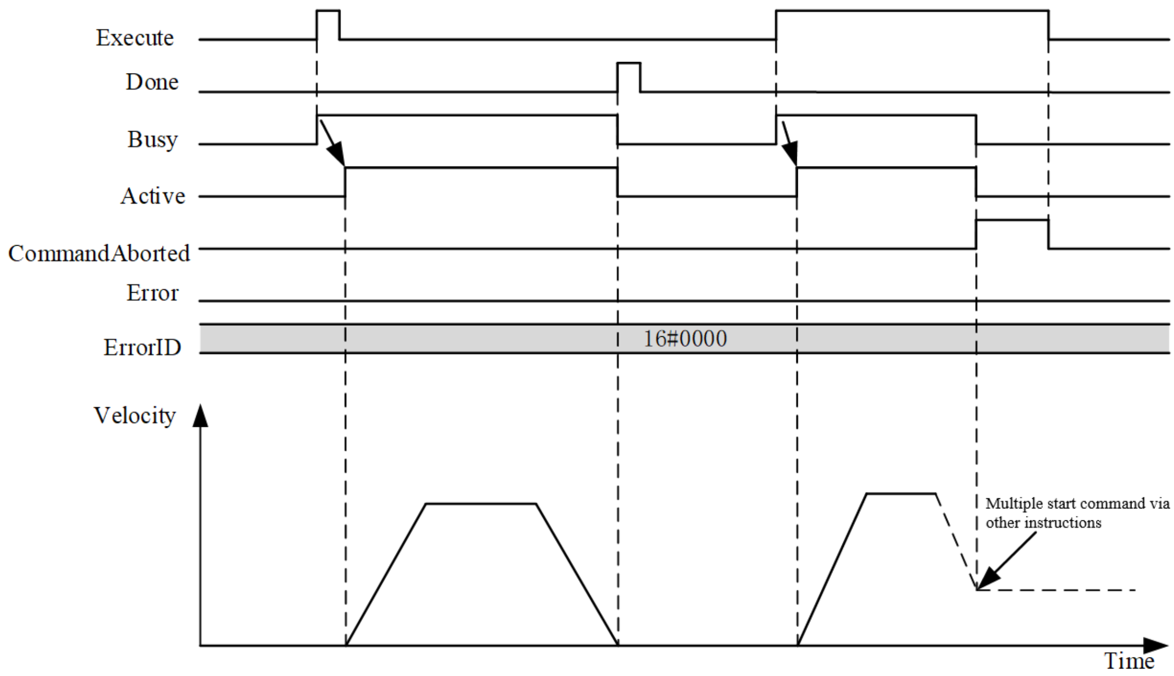


5.7.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type


Velocity
Target velocity
Acceleration
Deceleration
Current position
Target position
Time

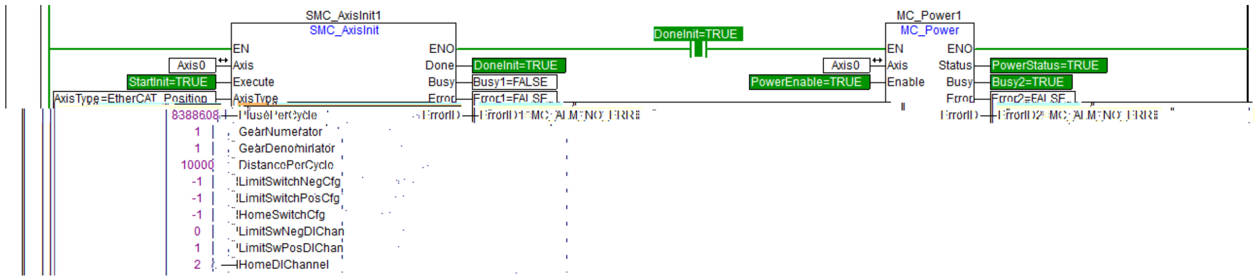

Execute
Done
Busy
Active
CommandAborted
Error
ErrorID
16#0000
Velocity
Interrupted by other instructions
Time

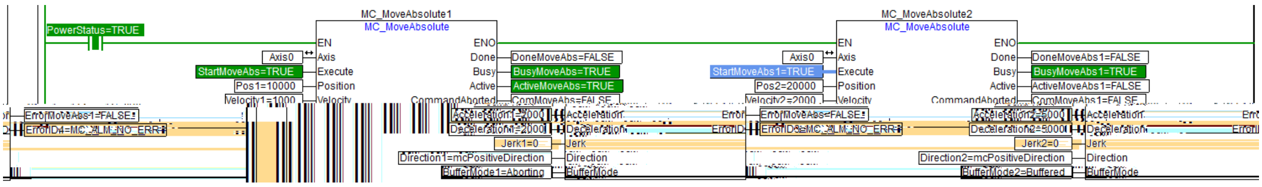


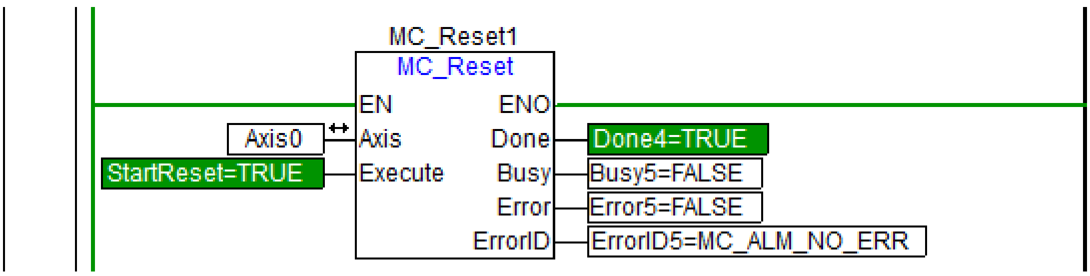
5.7.3 Examples

Definition of Primary Variable

Variable Name	Data Type	Initial Value	Notes


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
DoneInit=TRUE
StartInit=TRUE
Execute
Busy
Busy1=FALSE
AxisType=EtherCAT_Position
AxisType
Error
8388608
1
GearNumerator
1
GearDenominator
10000
DistancePerCycle
-1
LimitSwitchNegCfg
-1
LimitSwitchPosCfg
-1
HomeSwitchCfg
0
LimitSwNegDIChan
1
LimitSwPosDIChan
2
HomeDIChannel
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
Status
PowerStatus=TRUE
PowerEnable=TRUE
Enable
Busy
Busy2=TRUE
Error

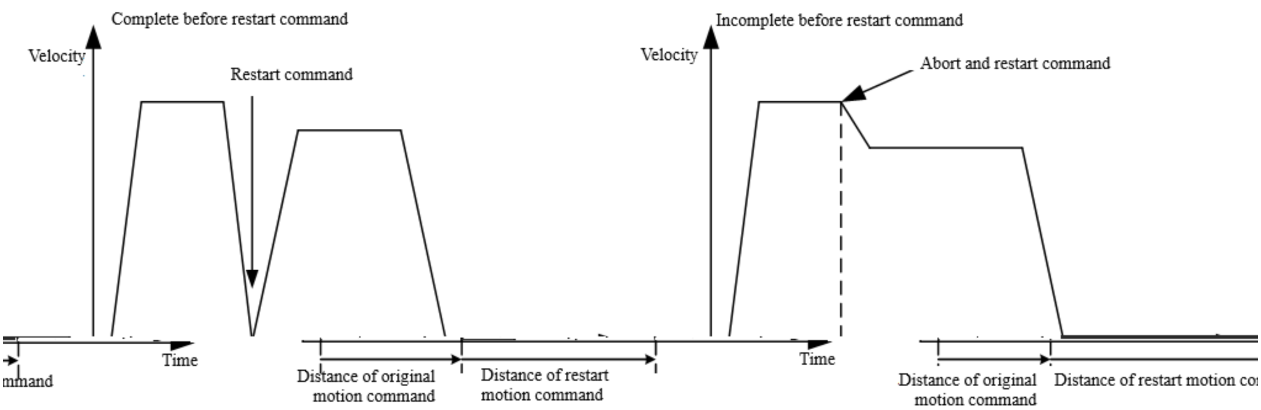

PowerStatus=TRUE
MC_MoveAbsolute1
MC_MoveAbsolute
EN
ENO
Axis0
Axis
Done
DoneMoveAbs=FALSE
StartMoveAbs=TRUE
Execute
Busy
BusyMoveAbs=TRUE
Pos1=10000
Position
Active
ActiveMoveAbs=TRUE
Jerk1=0
Jerk
Direction1=mcPositiveDirection
Direction
BufferMode1=Aborting
BufferMode
MC_MoveAbsolute2
MC_MoveAbsolute
EN
ENO
Axis0
Axis
Done
DoneMoveAbs1=FALSE
StartMoveAbs1=TRUE
Execute
Busy
BusyMoveAbs1=TRUE
Pos2=20000
Position
Active
ActiveMoveAbs1=FALSE
Jerk2=0
Jerk
Direction2=mcPositiveDirection
Direction
BufferMode2=Buffered
BufferMode

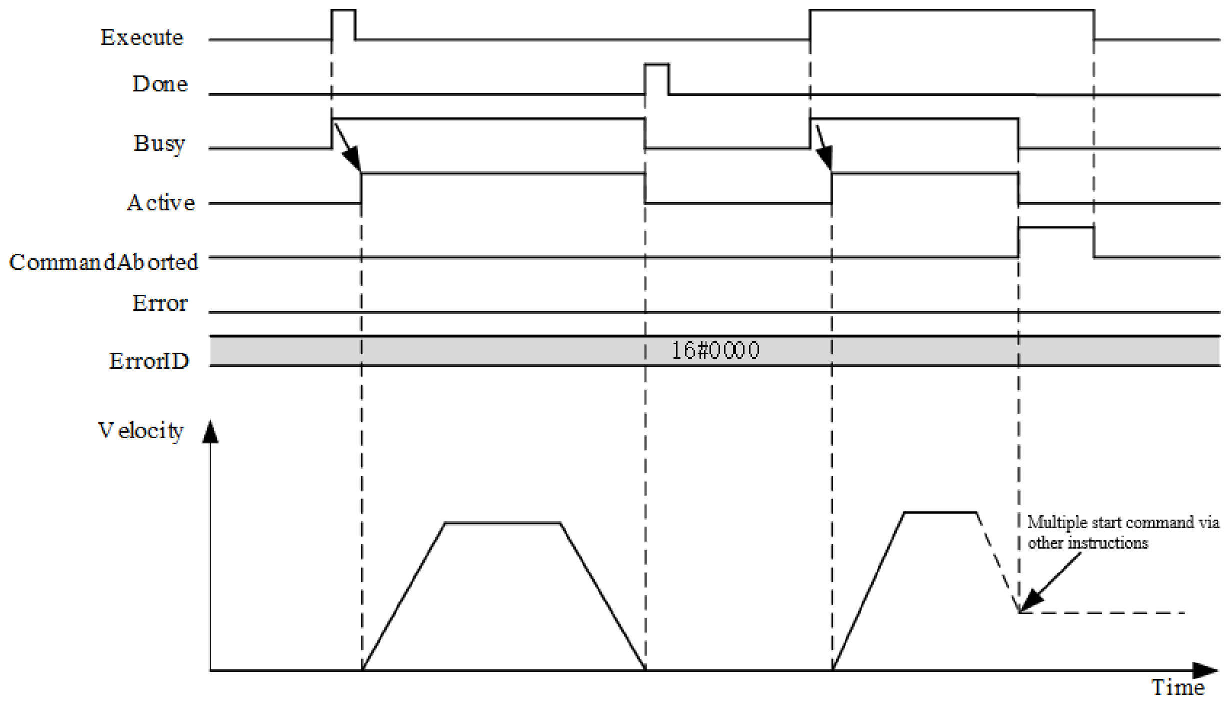

MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
Done
Done4=TRUE
StartReset=TRUE
Execute
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

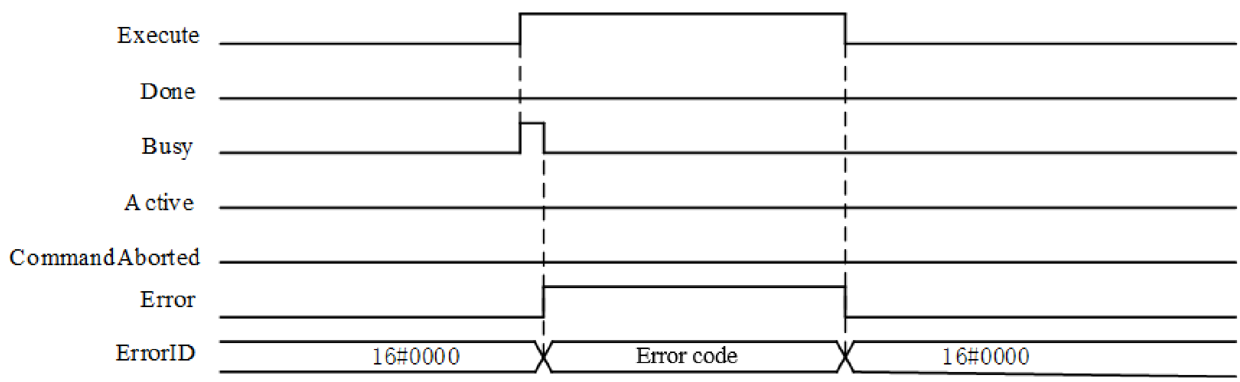
5.8.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default

5.8.2 Functions


Complete before restart command
Velocity
Restart command
Time
mmand
Distance of original motion command
Distance of restart motion command
Incomplete before restart command
Velocity
Abort and restart command
Time
Distance of original motion command
Distance of restart motion co

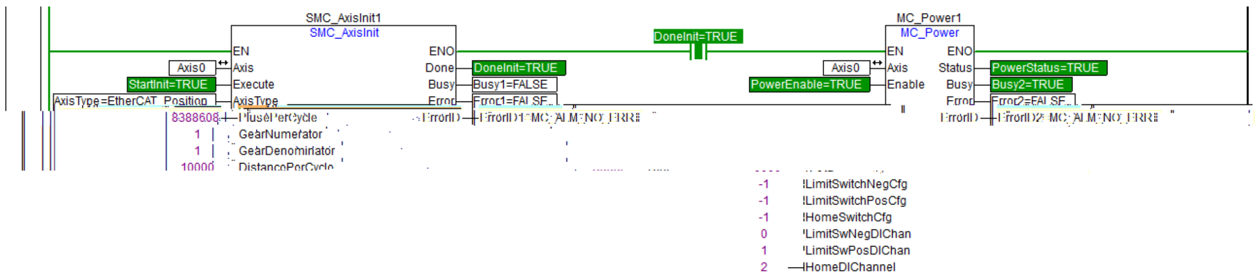


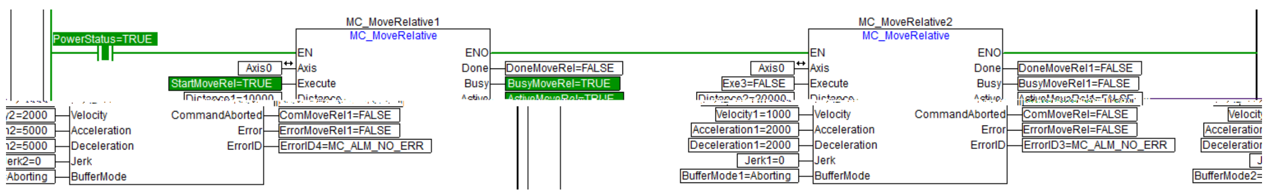


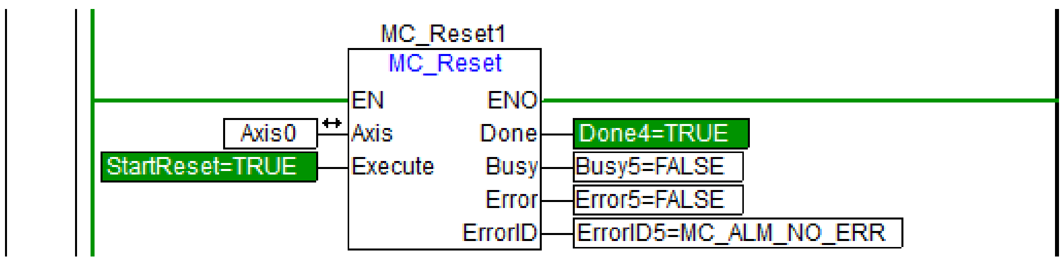
5.8.3 Examples

Definition of Primary Variable

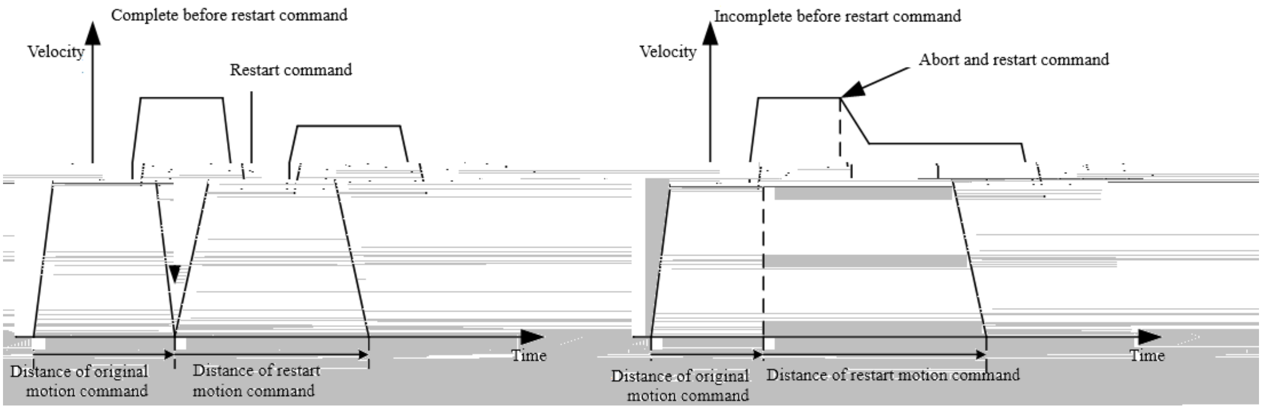
Variable Name	Data Type	Initial Value	Notes


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
StartInit=TRUE
Execute
AxisType
Done
DoneInit=TRUE
Busy
Busy1=FALSE
Error
ErrorID
8388608
1
1
10000
PulsePerCycle
GearNumerator
GearDenominator
DistancePerCycle
-1
-1
-1
0
1
2
LimitSwitchNegCfg
LimitSwitchPosCfg
HomeSwitchCfg
LimitSwNegDIChan
LimitSwPosDIChan
HomeDIChannel
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
PowerEnable=TRUE
Enable
Status
PowerStatus=TRUE
Busy
Busy2=TRUE
Error
ErrorID


PowerStatus=TRUE
MC_MoveRelative1
MC_MoveRelative
EN
ENO
Axis0
Axis
StartMoveRel=TRUE
Execute
Distance
Velocity
Acceleration
Deceleration
Jerk
BufferMode
Done
DoneMoveRel=FALSE
Busy
BusyMoveRel=TRUE
CommandAborted
ComMoveRel1=FALSE
Error
ErrorMoveRel1=FALSE
ErrorID
ErrorID4=MC_ALM_NO_ERR
MC_MoveRelative2
MC_MoveRelative
EN
ENO
Axis0
Axis
Exe3=FALSE
Execute
Distance
Velocity1=1000
Velocity
Acceleration1=2000
Acceleration
Deceleration1=2000
Deceleration
Jerk1=0
Jerk
BufferMode1=Aborting
BufferMode
Done
DoneMoveRel1=FALSE
Busy
BusyMoveRel1=FALSE
CommandAborted
ComMoveRel1=FALSE
Error
ErrorMoveRel=FALSE
ErrorID
ErrorID3=MC_ALM_NO_ERR

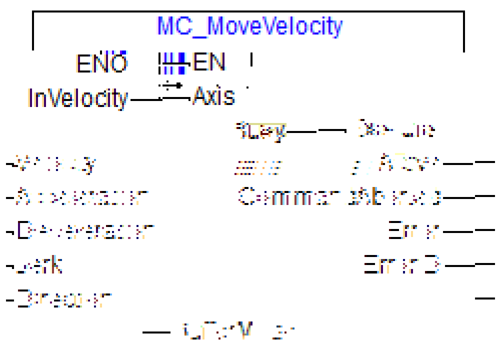

MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
StartReset=TRUE
Execute
Done
Done4=TRUE
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

5.8.4 Precautions



5.8.5 Reference

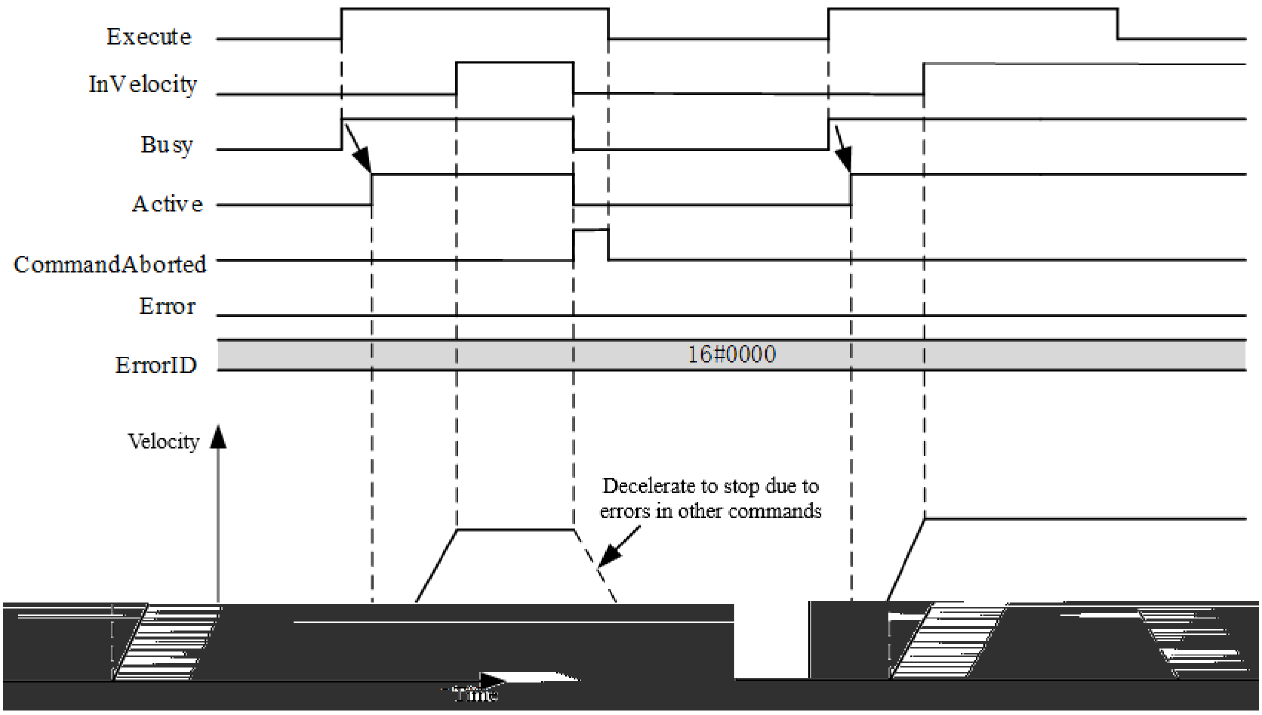
5.9 MC_MoveVelocity (Velocity Control)

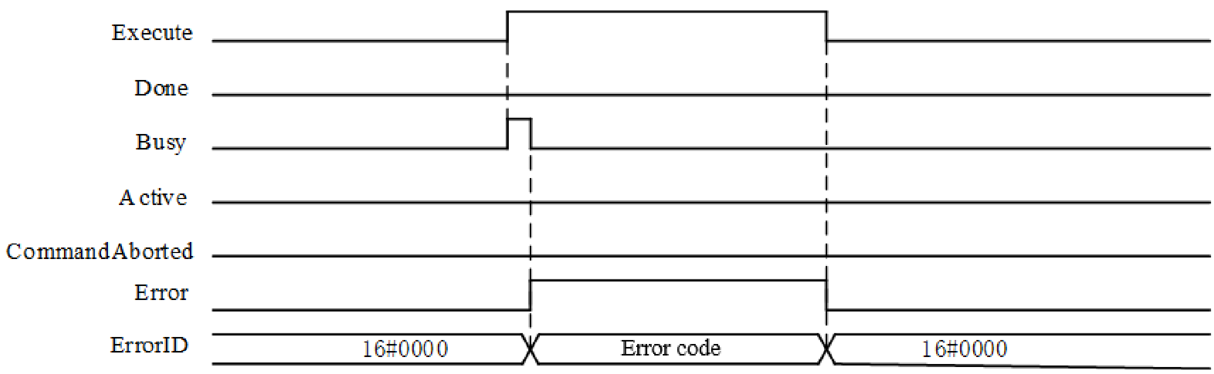


5.9.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	

5.9.2 Functions

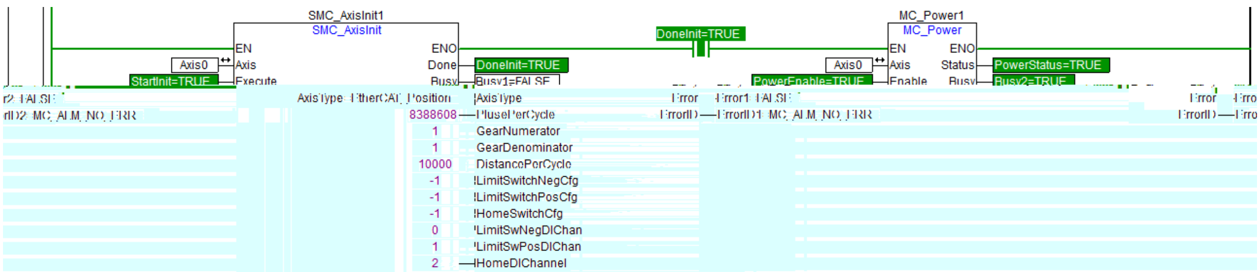


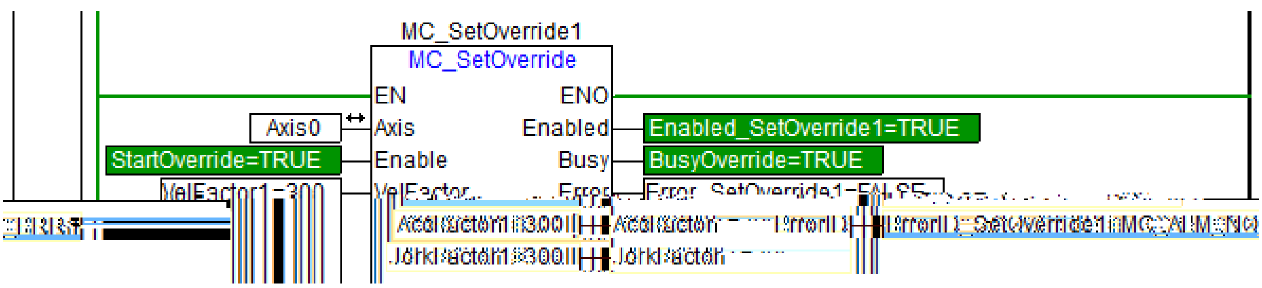


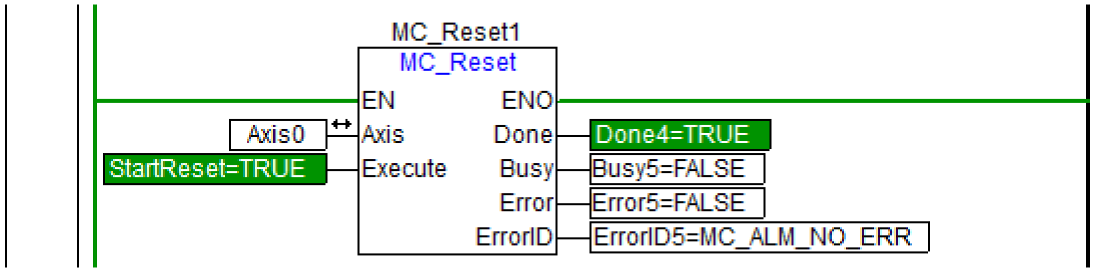
5.9.3 Examples

Definition of Primary Variable

Variable Name	Data Type	Initial Value	Notes


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
DoneInit=TRUE
StartInit=TRUE
Execute
Busy
Busy1=FALSE
8388608
1
1
10000
-1
-1
-1
0
1
2
GearNumerator
GearDenominator
LimitSwitchNegCfg
LimitSwitchPosCfg
HomeSwitchCfg
LimitSwNegDIChan
LimitSwPosDIChan
HomeDIChannel
MC_Power1
MC_Power
Status
PowerStatus=TRUE
PowerEnable=TRUE
Enable
Busy2=TRUE

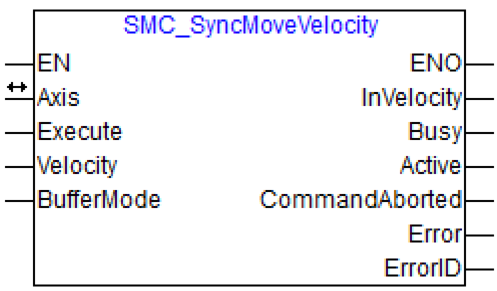

MC_SetOverride1
MC_SetOverride
EN
ENO
Axis0
Axis
Enabled
Enabled_SetOverride1=TRUE
StartOverride=TRUE
Enable
Busy
BusyOverride=TRUE


MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
Done
Done4=TRUE
StartReset=TRUE
Execute
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

5.9.4 Precautions

5.9.5 Reference

5.10 SMC_SyncMoveVelocity (Cyclic Synchronous Speed Control)

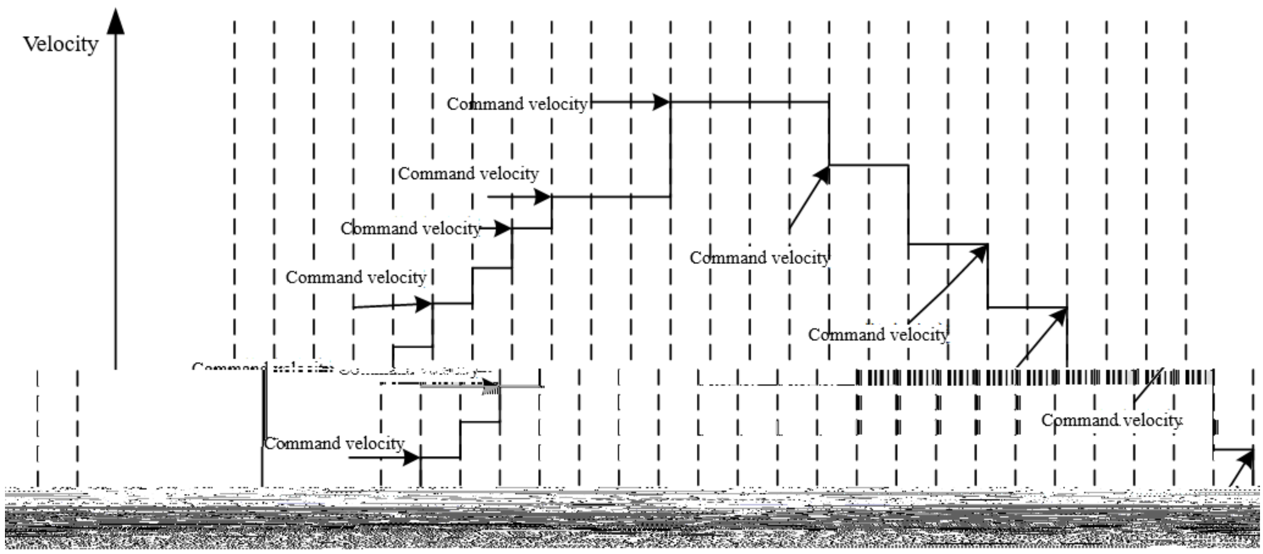


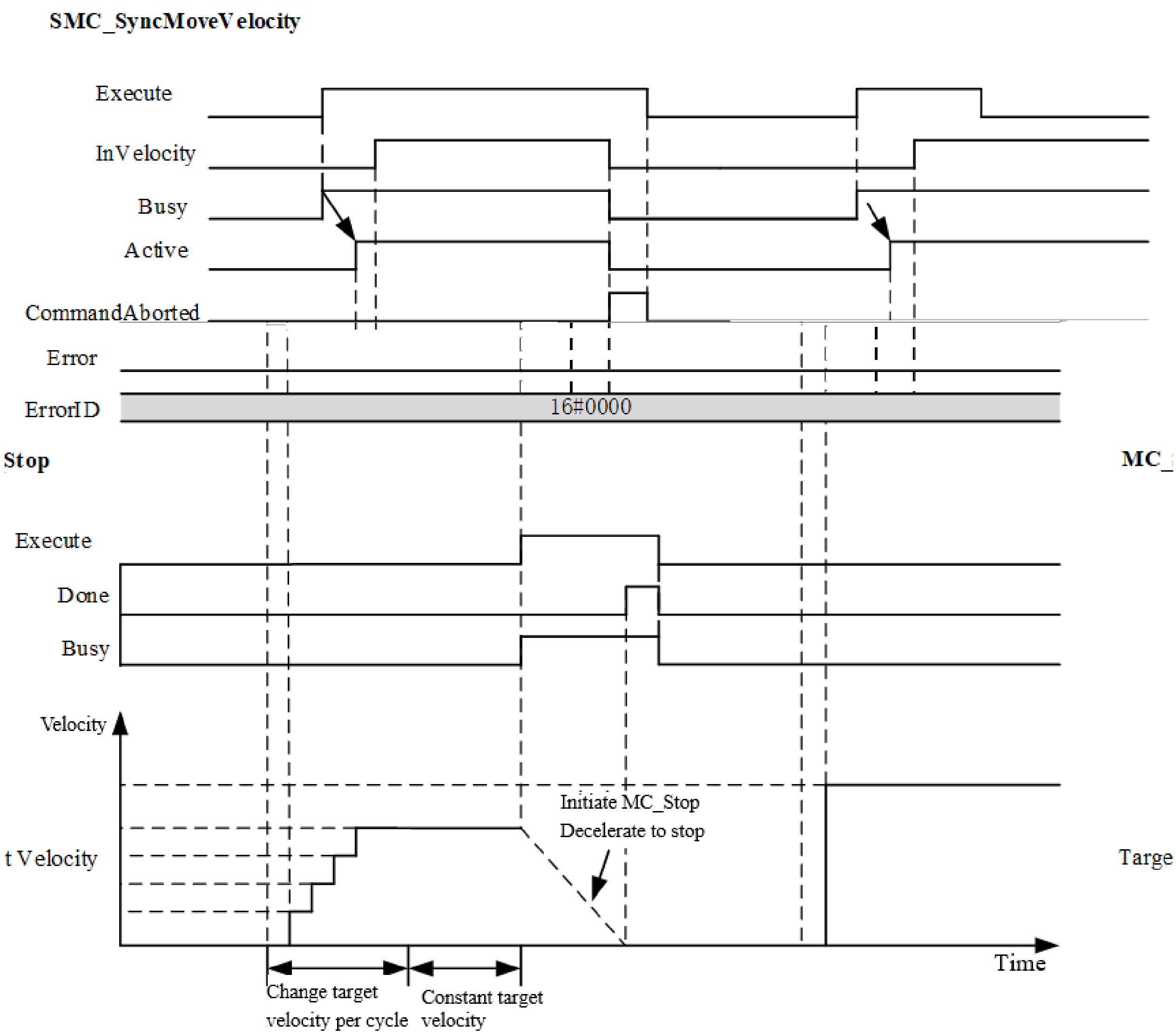
5.10.1 Parameter

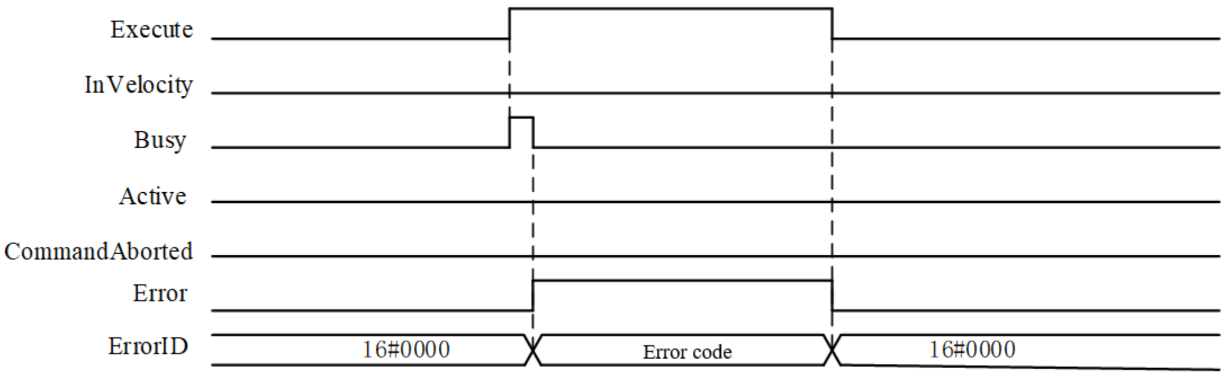
Parameter Description

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

5.10.2 Functions



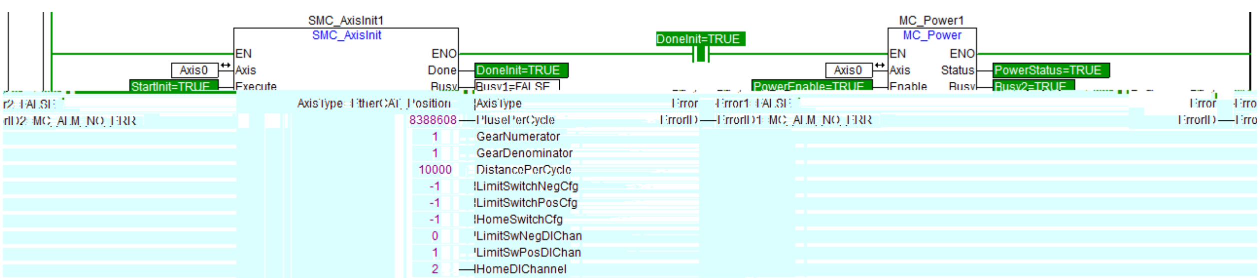

SMC_SyncMoveVelocity
Execute
InVelocity
Busy
Active
CommandAborted
Error
ErrorID
16#0000
Stop
MC_
Execute
Done
Busy
Velocity
Initiate MC_Stop
Decelerate to stop
t Velocity
Targe
Time
Change target
velocity per cycle
Constant target
velocity

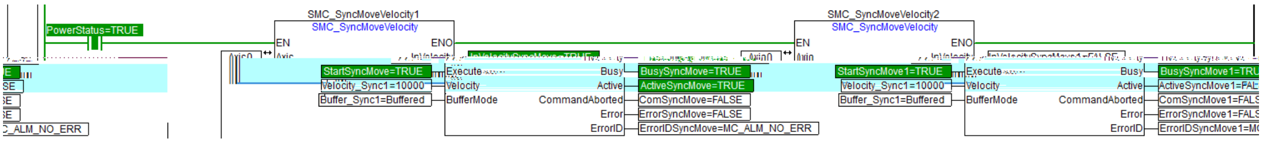


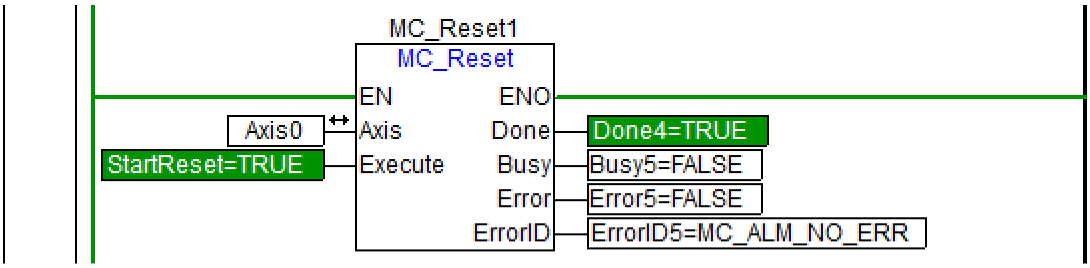
5.10.3 Examples

Definition of Primary Variable

Variable Name	Data Type	Initial Value	Notes



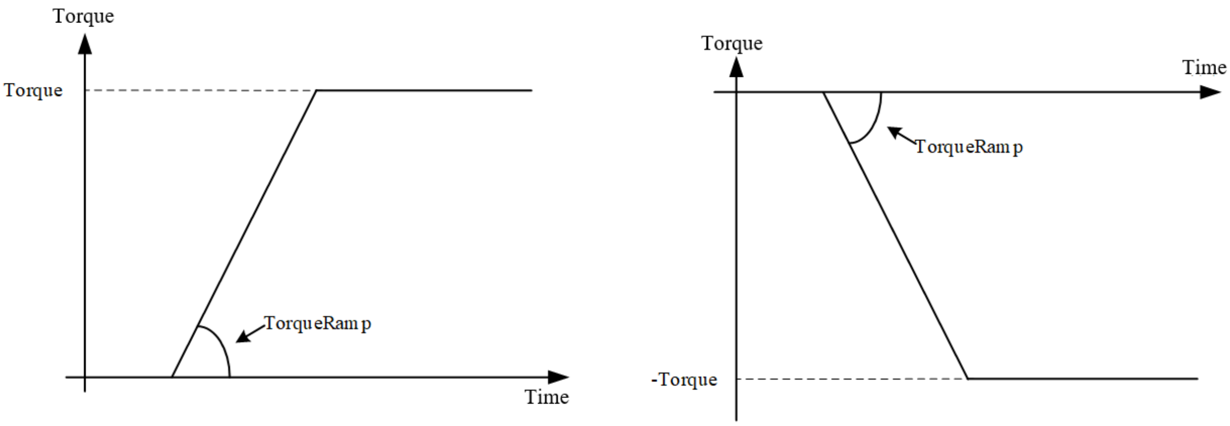

PowerStatus=TRUE
SMC_SyncMoveVelocity1
SMC_SyncMoveVelocity
EN
ENO
Execute
Velocity
BufferMode
Busy
Active
CommandAborted
Error
ErrorID
StartSyncMove=TRUE
Velocity_Sync1=10000
Buffer_Sync1=Buffered
BusySyncMove=TRUE
ActiveSyncMove=TRUE
ComSyncMove=FALSE
ErrorSyncMove=FALSE
ErrorIDSyncMove=MC_ALM_NO_ERR
SMC_SyncMoveVelocity2
SMC_SyncMoveVelocity
StartSyncMove1=TRUE
Velocity_Sync1=10000
Buffer_Sync1=Buffered


MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
Done
Done4=TRUE
StartReset=TRUE
Execute
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

5.11.2 Functions

Torque:

TorqueRamp:



TorqueRamp Diagram

Velocity:

□

□

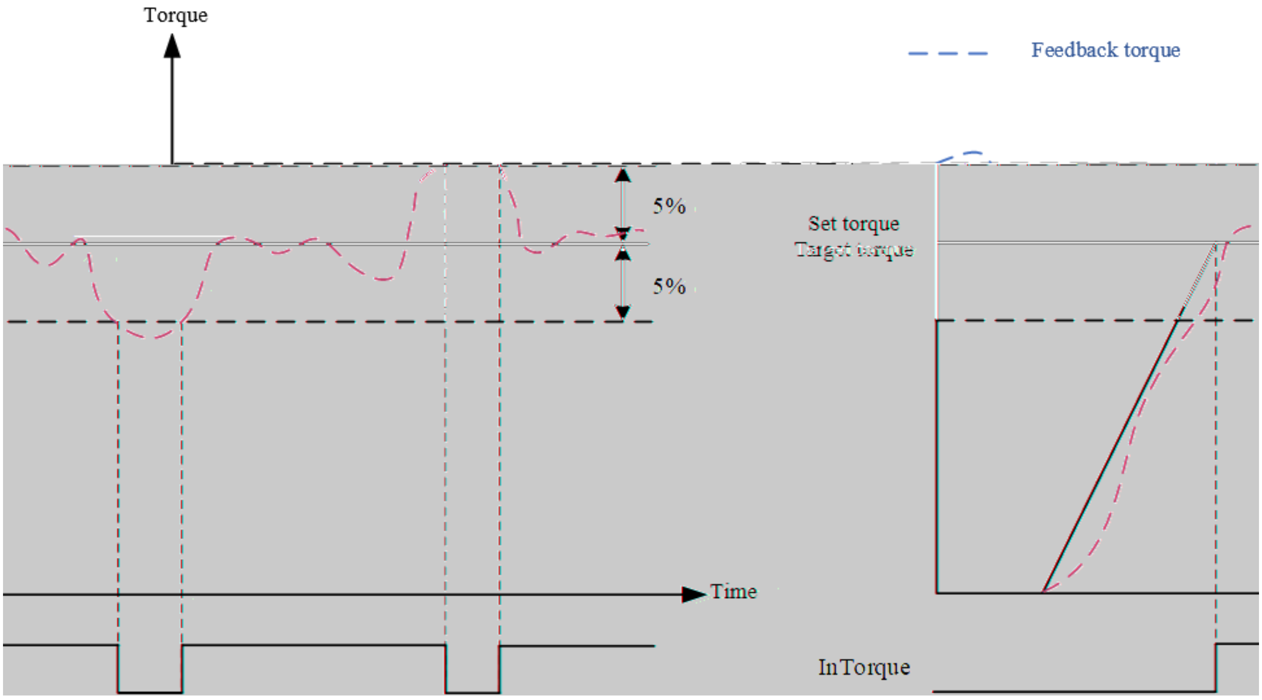
Direction:

BufferMode:

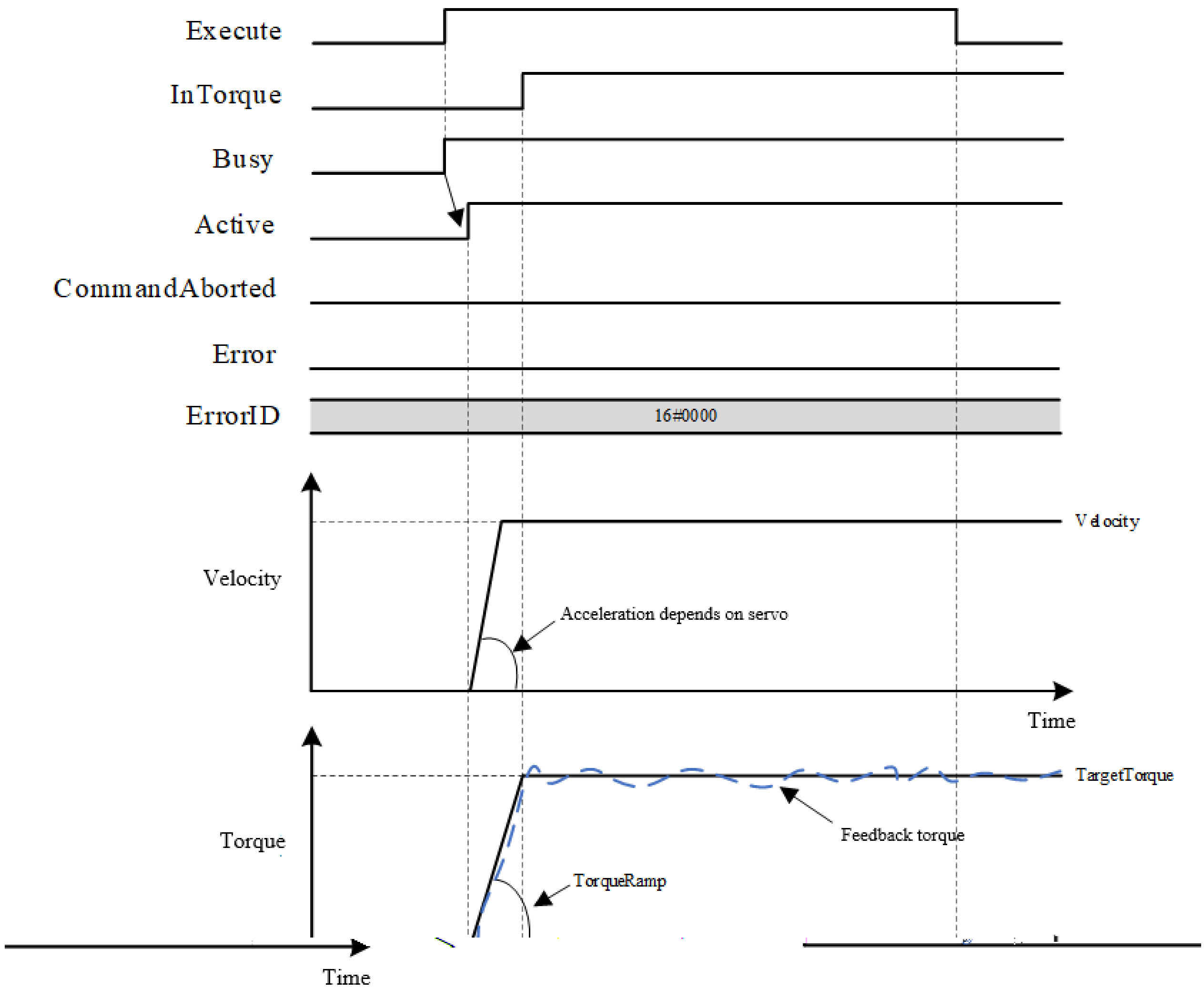
□

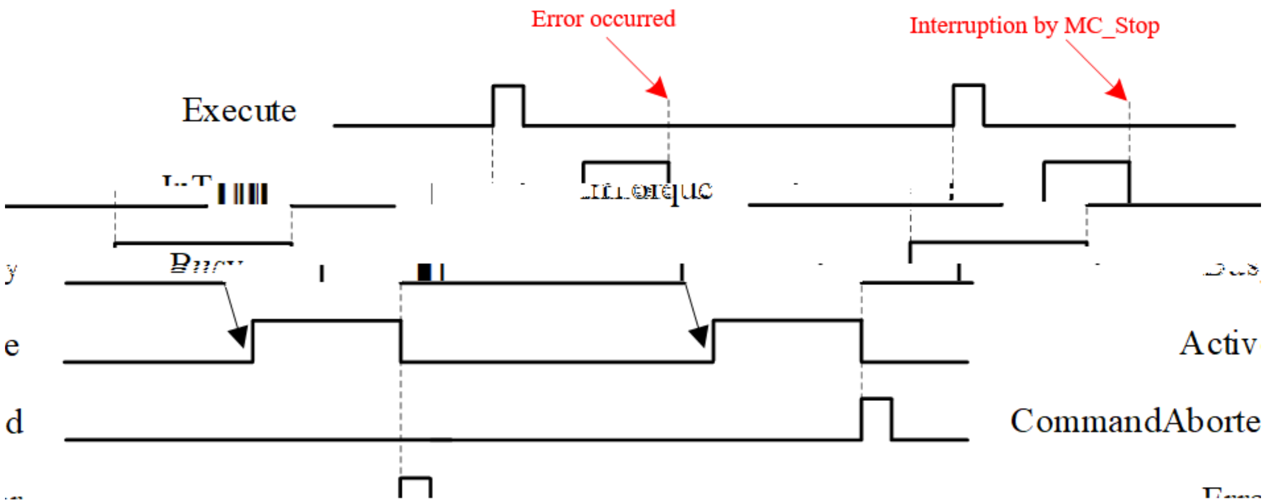
□

InTorque:



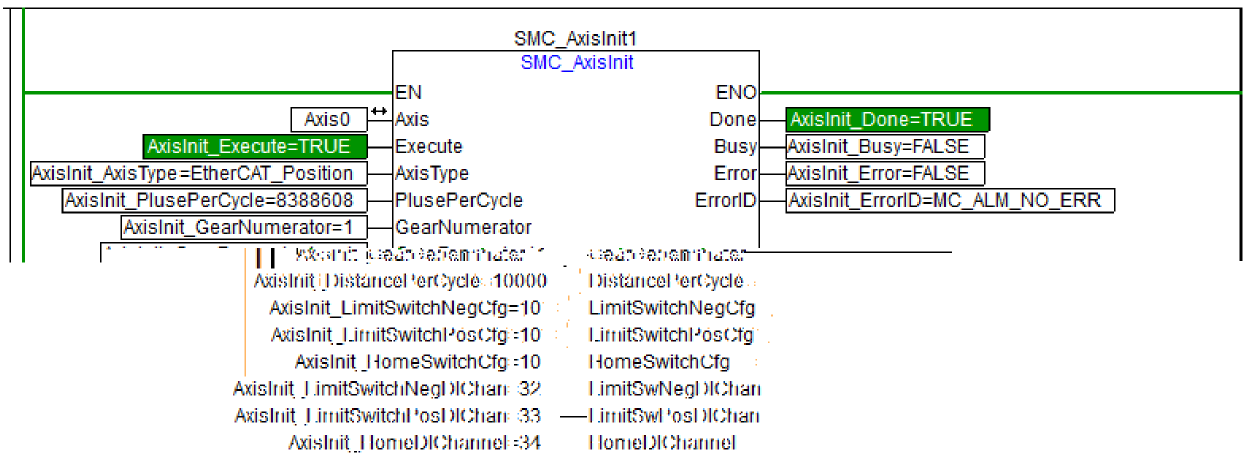
InTorque Diagram

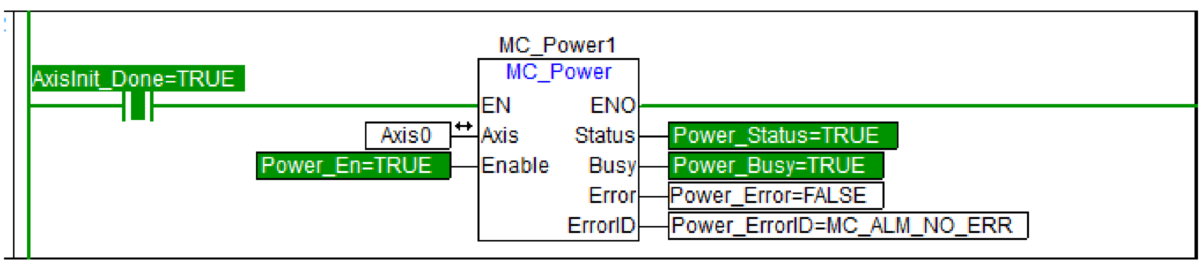

Execute
InTorque
Busy
Active
CommandAborted
Error
ErrorID
16#0000
Velocity
Velocity
Acceleration depends on servo
Time
Torque
TargetTorque
Feedback torque
TorqueRamp
Time



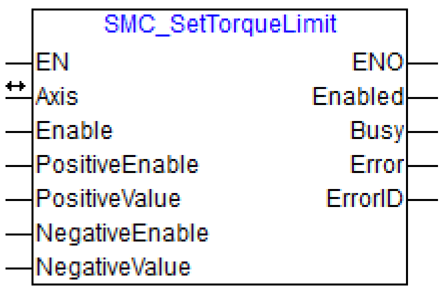
5.11.3 Examples

No.	Variable Name	Variable Type	Initialization Value	Variable Description


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
AxisInit_Done=TRUE
AxisInit_Execute=TRUE
Execute
Busy
AxisInit_Busy=FALSE
AxisInit_AxisType=EtherCAT_Position
AxisType
Error
AxisInit_Error=FALSE
AxisInit_PlusePerCycle=8388608
PlusePerCycle
ErrorID
AxisInit_ErrorID=MC_ALM_NO_ERR
AxisInit_GearNumerator=1
GearNumerator
DistancePerCycle
AxisInit_LimitSwitchNegCfg=10
LimitSwitchNegCfg
LimitSwitchPosCfg
HomeSwitchCfg
HomeDIChannel


MC_Power1
MC_Power
AxisInit_Done=TRUE
EN
ENO
Axis0
Axis
Status
Power_Status=TRUE
Power_En=TRUE
Enable
Busy
Power_Busy=TRUE
Error
Power_Error=FALSE
ErrorID
Power_ErrorID=MC_ALM_NO_ERR

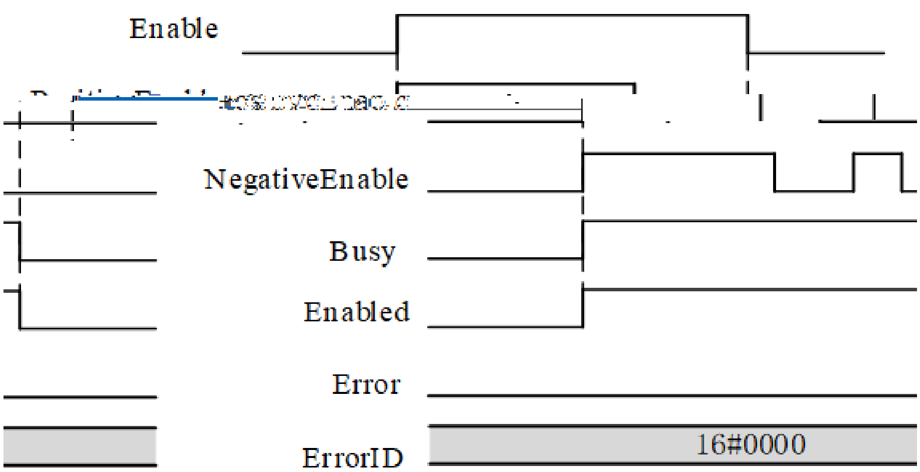
5.12 SMC_SetTorqueLimit (Set Axis Torque Limit)

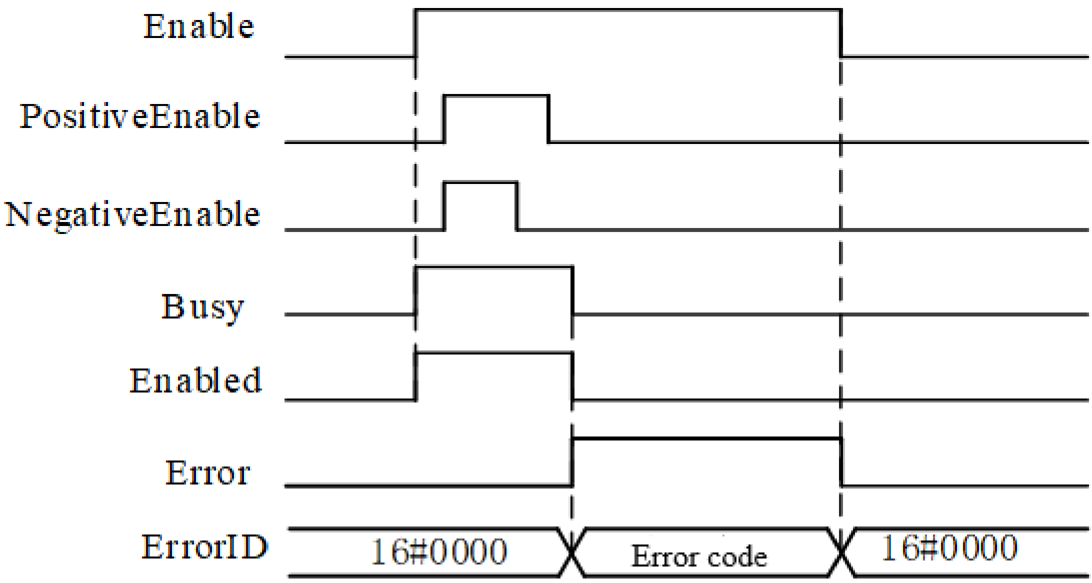


5.12.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

5.12.2 Functions

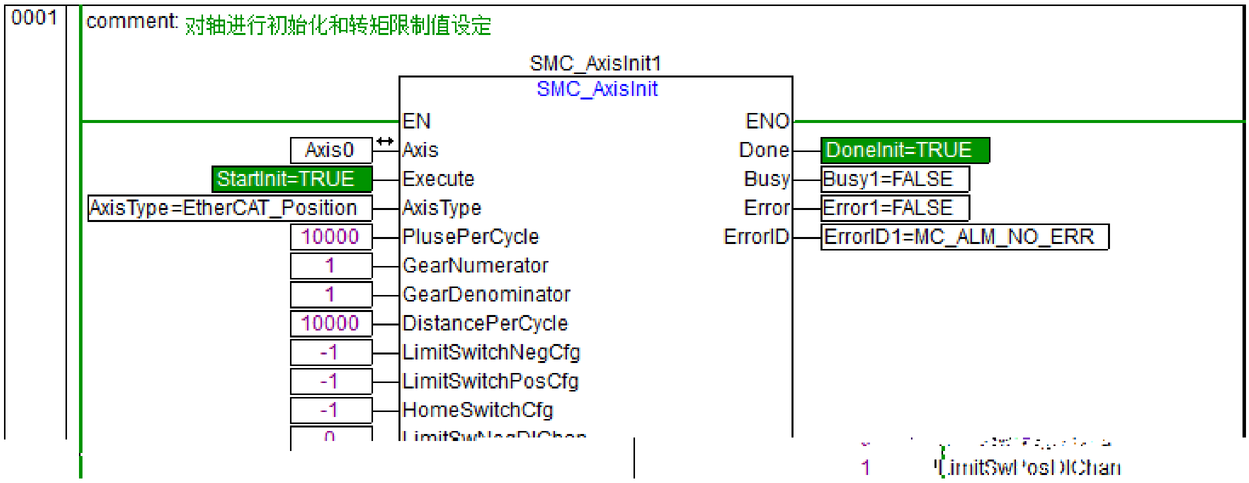


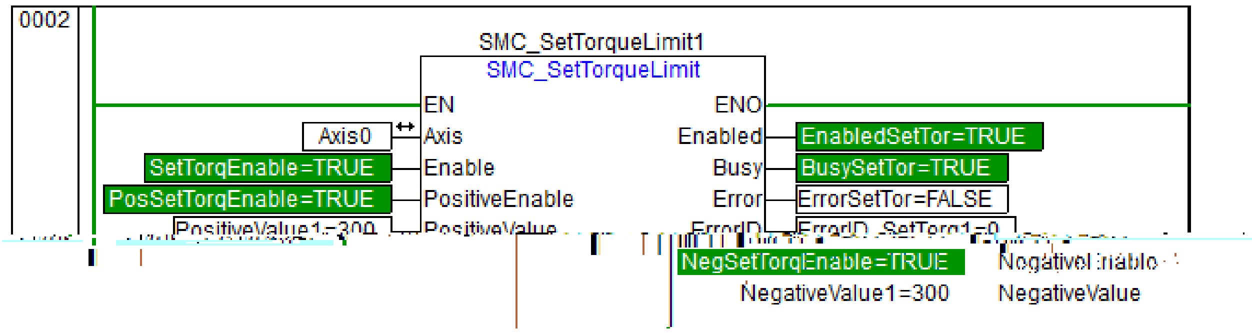


5.12.3 Examples

Primary variables

Variable Name	Data Type	Initial Value	Notes

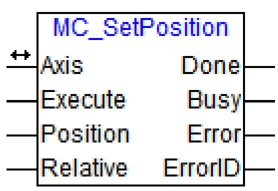

0001
comment: 对轴进行初始化和转矩限制值设定
SMC_AxisInit1
SMC_AxisInit
EN
Axis
Execute
AxisType
PlusePerCycle
GearNumerator
GearDenominator
DistancePerCycle
LimitSwitchNegCfg
LimitSwitchPosCfg
HomeSwitchCfg
ENO
Done
Busy
Error
ErrorID
Axis0
StartInit=TRUE
AxisType=EtherCAT_Position
10000
1
1
10000
-1
-1
-1
DoneInit=TRUE
Busy1=FALSE
Error1=FALSE
ErrorID1=MC_ALM_NO_ERR


0002
SMC_SetTorqueLimit1
SMC_SetTorqueLimit
EN
Axis
Enable
PositiveEnable
ENO
Enabled
Busy
Error
Axis0
SetTorqEnable=TRUE
PosSetTorqEnable=TRUE
EnabledSetTor=TRUE
BusySetTor=TRUE
ErrorSetTor=FALSE
NegSetTorqEnable=TRUE
NegativeValue1=300
NegativeValue

5.12.4 Precautions

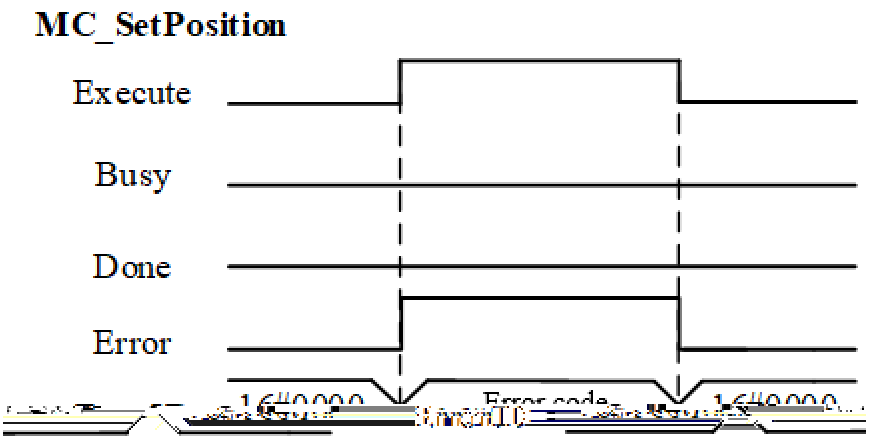
5.12.5 Reference

5.13 MC_SetPosition (Set Current Position)



5.13.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type



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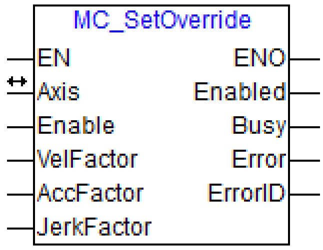
5.13.3 Examples

Description of Primary Variables

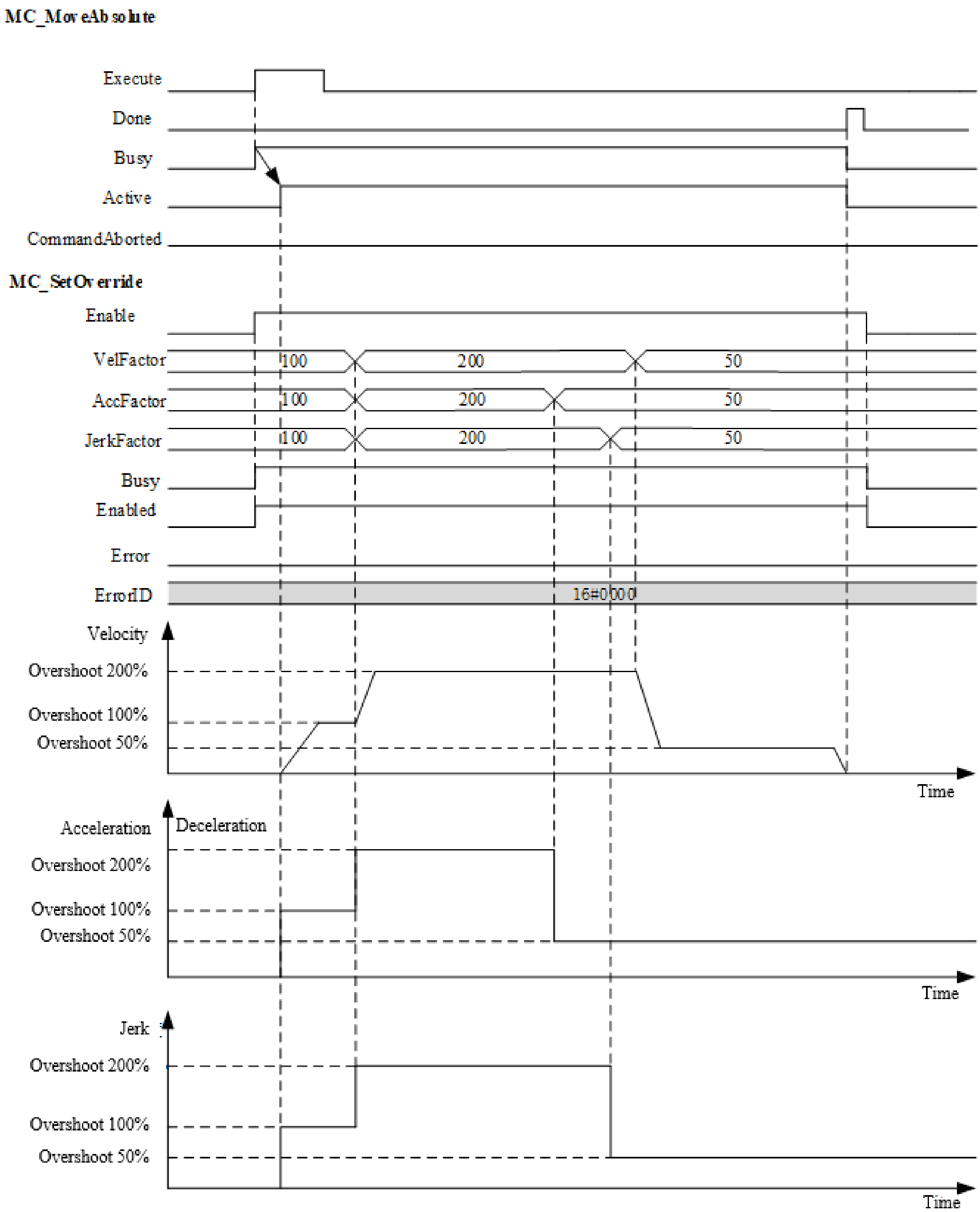
Variable Vame	Variable Type	Initial Value	Notes

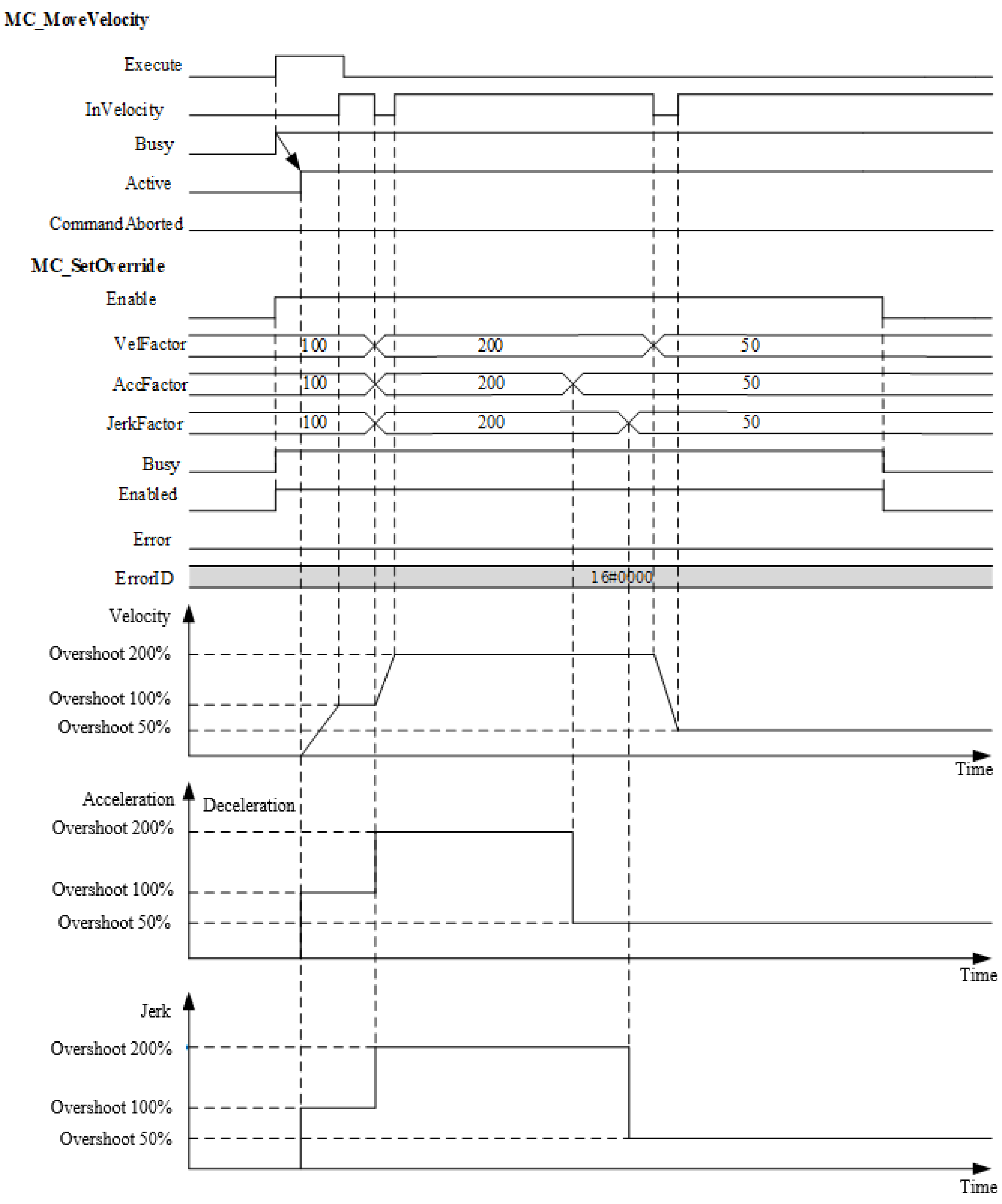
5.14 MC_SetOverride

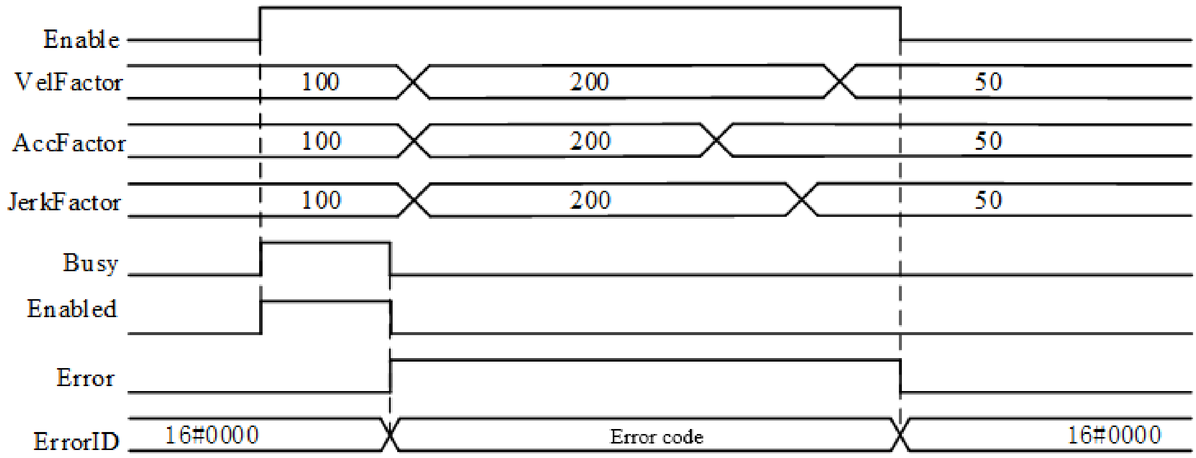


5.14.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

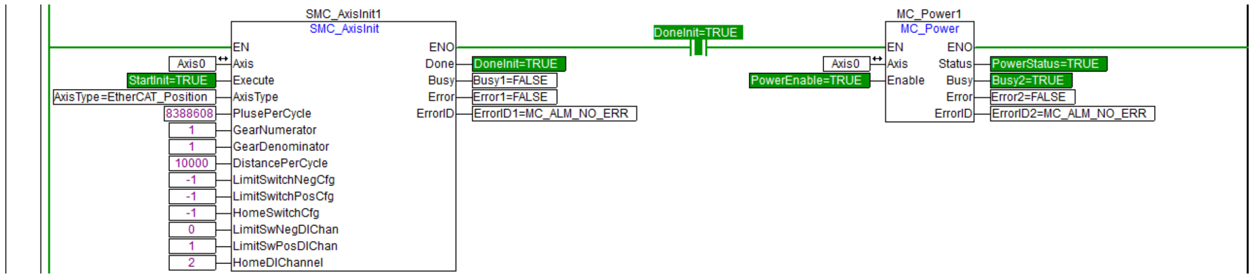

MC_MoveAbsolute
Execute
Done
Busy
Active
CommandAborted
MC_SetOverride
Enable
VelFactor
100
200
50
AccFactor
100
200
50
JerkFactor
100
200
50
Busy
Enabled
Error
ErrorID
16#0000
Velocity
Overshoot 200%
Overshoot 100%
Overshoot 50%
Time
Acceleration
Deceleration
Overshoot 200%
Overshoot 100%
Overshoot 50%
Time
Jerk
Overshoot 200%
Overshoot 100%
Overshoot 50%
Time

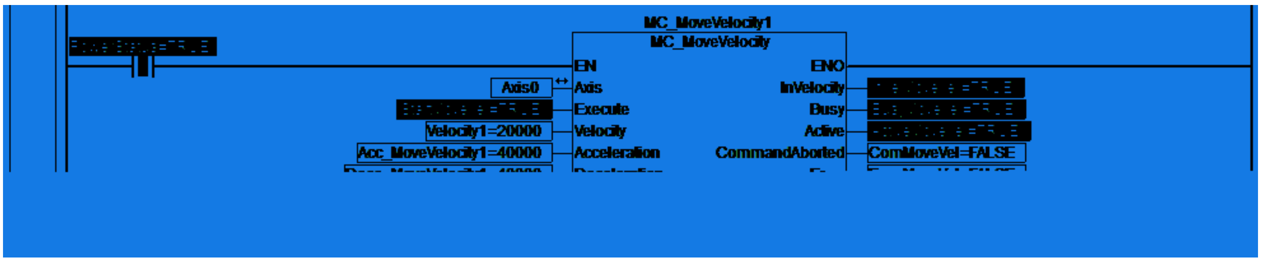

MC_MoveVelocity
Execute
InVelocity
Busy
Active
CommandAborted
MC_SetOverride
Enable
VelFactor
100
200
50
AccFactor
100
200
50
JerkFactor
100
200
50
Busy
Enabled
Error
ErrorID
16#0000
Velocity
Overshoot 200%
Overshoot 100%
Overshoot 50%
Time
Acceleration
Deceleration
Overshoot 200%
Overshoot 100%
Overshoot 50%
Time
Jerk
Overshoot 200%
Overshoot 100%
Overshoot 50%
Time

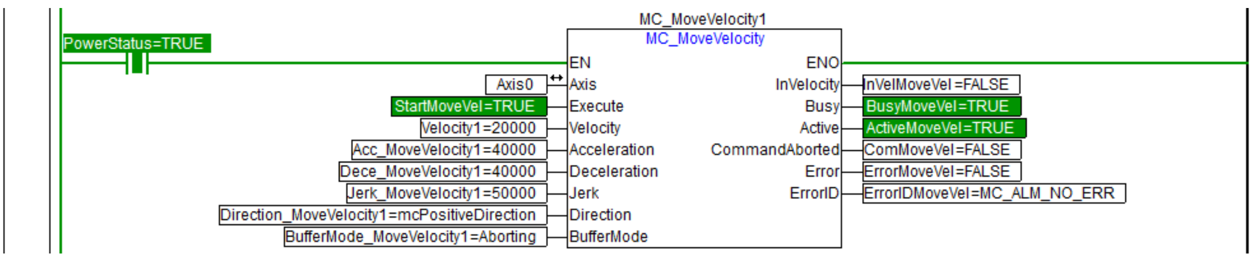


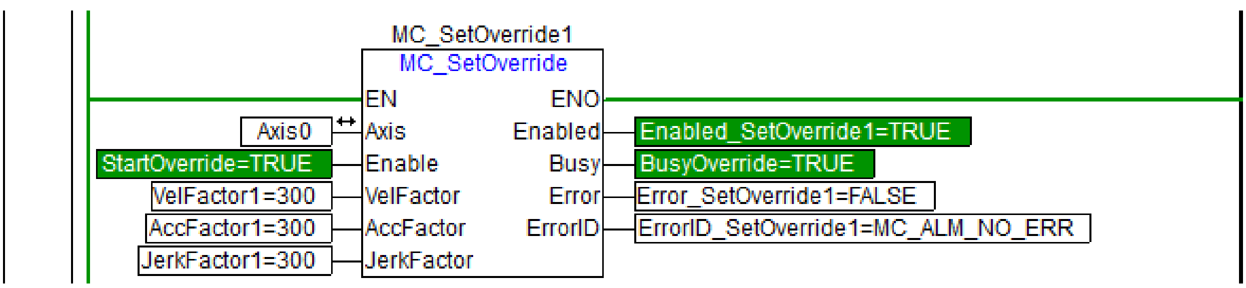
5.14.3 Examples

Variable Name	Data Type	Initial Value	Notes


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
DoneInit=TRUE
StartInit=TRUE
Execute
Busy
Busy1=FALSE
AxisType=EtherCAT_Position
AxisType
Error
Error1=FALSE
8388608
PlusePerCycle
ErrorID
ErrorID1=MC_ALM_NO_ERR
1
GearNumerator
1
GearDenominator
10000
DistancePerCycle
-1
LimitSwitchNegCfg
-1
LimitSwitchPosCfg
-1
HomeSwitchCfg
0
LimitSwNegDIChan
1
LimitSwPosDIChan
2
HomeDIChannel
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
Status
PowerStatus=TRUE
PowerEnable=TRUE
Enable
Busy
Busy2=TRUE
Error
Error2=FALSE
ErrorID
ErrorID2=MC_ALM_NO_ERR


MC_MoveVelocity1
MC_MoveVelocity
EN
ENO
Axis0
Axis
InVelocity
Execute
Busy
Velocity1=20000
Velocity
Active
Acc_MoveVelocity1=40000
Acceleration
CommandAborted
ComMoveVel=FALSE

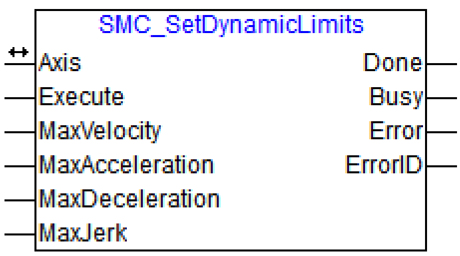

PowerStatus=TRUE
MC_MoveVelocity1
MC_MoveVelocity
EN
ENO
Axis0
Axis
InVelocity
InVelMoveVel=FALSE
StartMoveVel=TRUE
Execute
Busy
BusyMoveVel=TRUE
Velocity1=20000
Velocity
Active
ActiveMoveVel=TRUE
Acc_MoveVelocity1=40000
Acceleration
CommandAborted
ComMoveVel=FALSE
Dece_MoveVelocity1=40000
Deceleration
Error
ErrorMoveVel=FALSE
Jerk_MoveVelocity1=50000
Jerk
ErrorID
ErrorIDMoveVel=MC_ALM_NO_ERR
Direction_MoveVelocity1=mcPositiveDirection
Direction
BufferMode_MoveVelocity1=Aborting
BufferMode


MC_SetOverride1
MC_SetOverride
EN
ENO
Axis0
Axis
Enabled
Enabled_SetOverride1=TRUE
StartOverride=TRUE
Enable
Busy
BusyOverride=TRUE
VelFactor1=300
VelFactor
Error
Error_SetOverride1=FALSE
AccFactor1=300
AccFactor
ErrorID
ErrorID_SetOverride1=MC_ALM_NO_ERR
JerkFactor1=300
JerkFactor

5.14.4 Precautions

5.14.5 Reference

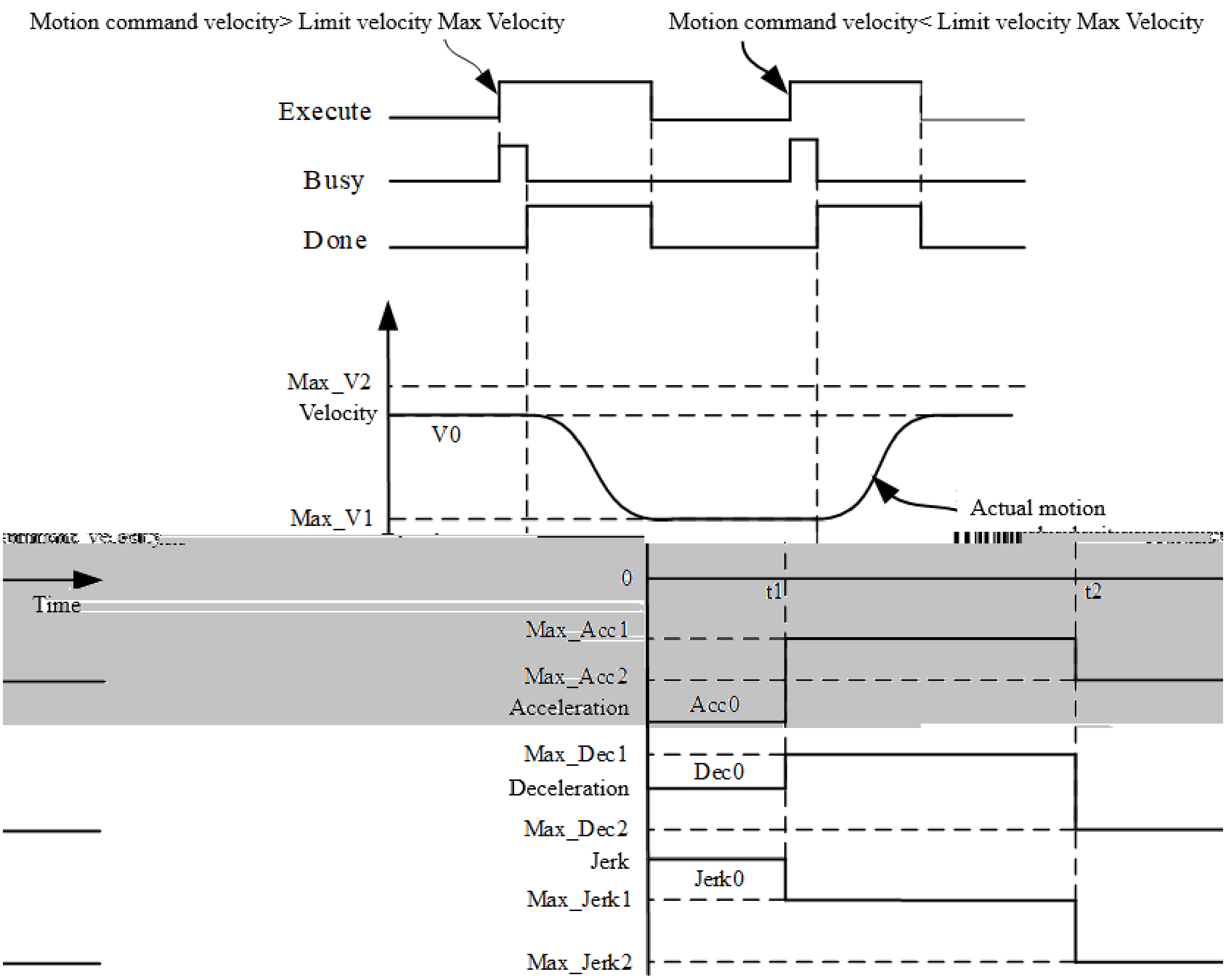
5.15 SMC_SetDynamicLimits (Set Axis Dynamic Parameter Limits)



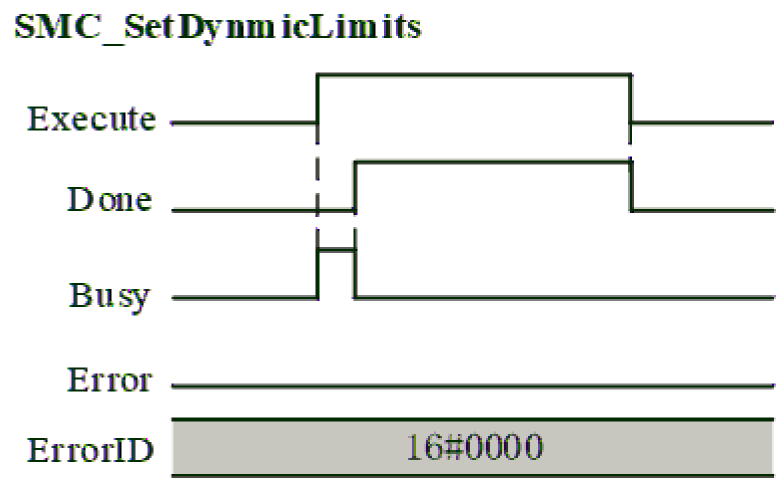
5.15.1 Parameter

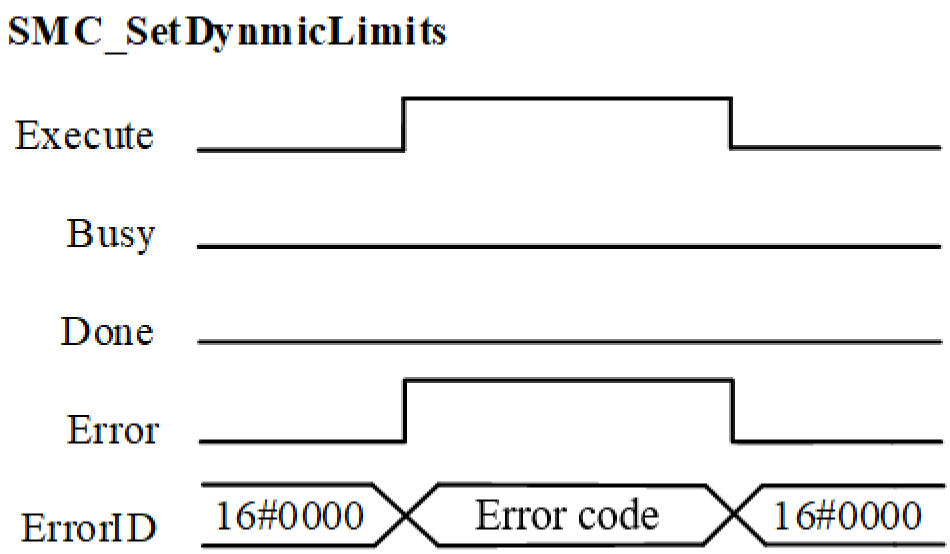
Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

5.15.2 Functions

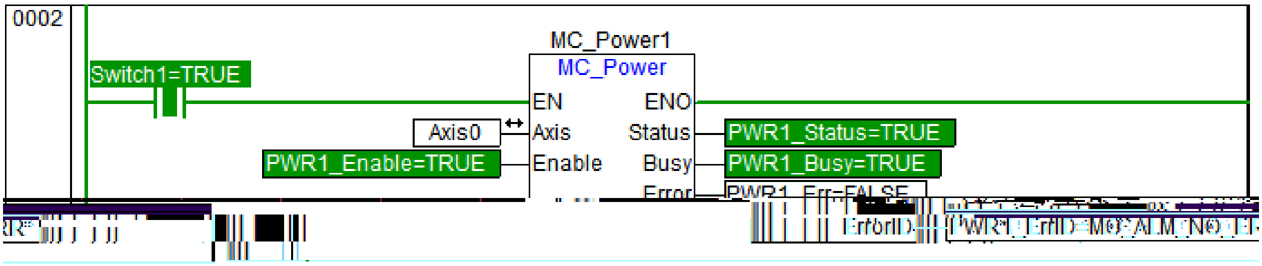


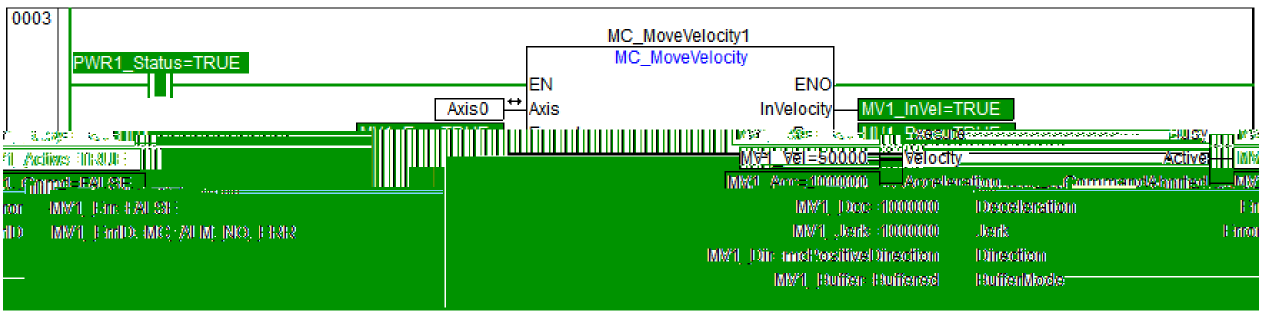
Motion command velocity> Limit velocity Max Velocity
Motion command velocity< Limit velocity Max Velocity
Execute
Busy
Done
Max_V2
Velocity
V0
Max_V1
Actual motion
0
Time
t1
t2
Max_Acc1
Max_Acc2
Acceleration
Acc0
Max_Dec1
Dec0
Deceleration
Max_Dec2
Jerk
Jerk0
Max_Jerk1
Max_Jerk2

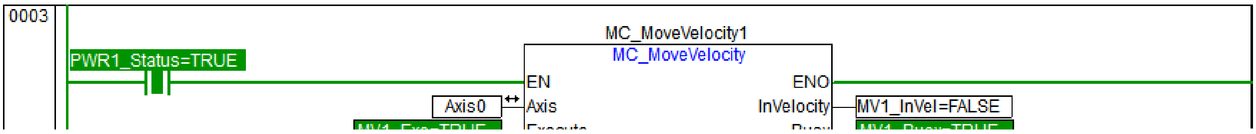

SMC_SetDynmicLimits
Execute
Done
Busy
Error
ErrorID
16#0000


SMC_SetDynmicLimits
Execute
Busy
Done
Error
ErrorID
16#0000
Error code
16#0000

•

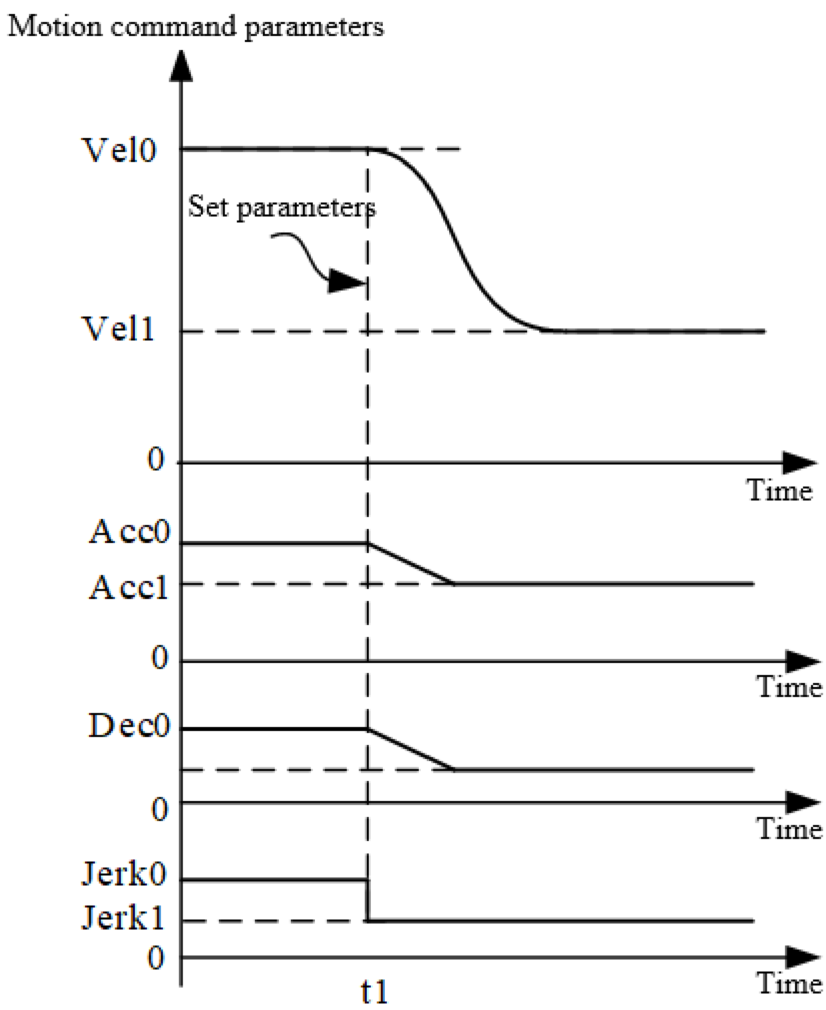

0002
MC_Power1
MC_Power
Switch1=TRUE
EN
ENO
Axis0
Axis
Status
PWR1_Status=TRUE
PWR1_Enable=TRUE
Enable
Busy
PWR1_Busy=TRUE
Error
ErrorID


0003
MC_MoveVelocity1
MC_MoveVelocity
PWR1_Status=TRUE
EN
ENO
Axis0
Axis
InVelocity
MV1_InVel=TRUE
Velocity
Active
Acceleration
Deceleration
Jerk
Direction
BufferMode



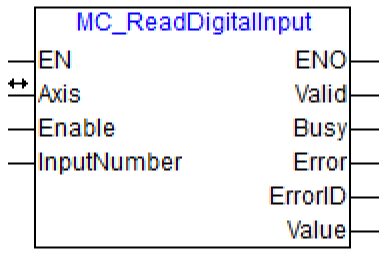
Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



5.15.4 Precautions

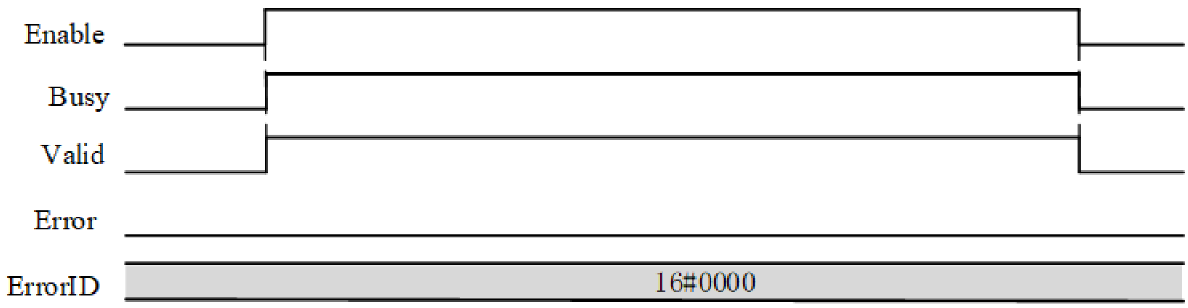
5.16 MC_ReadDigitalInput (Read Axis Digital Input)

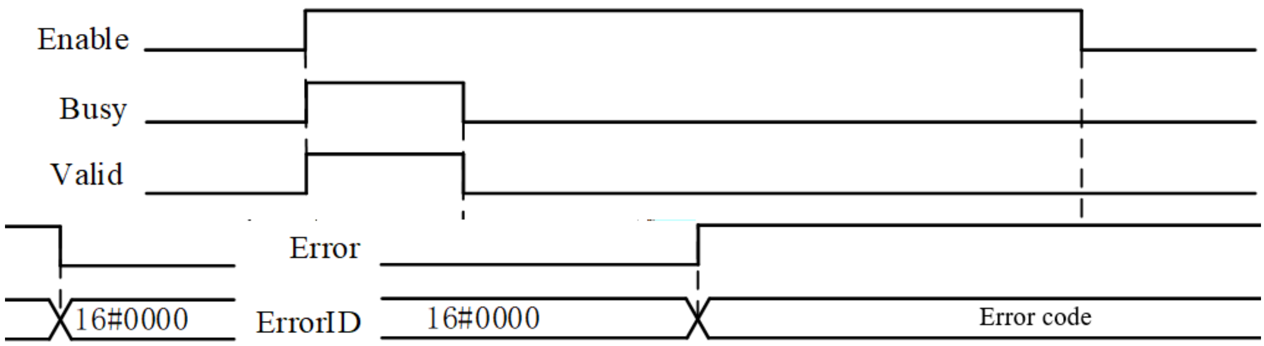


5.16.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

5.16.2 Functions

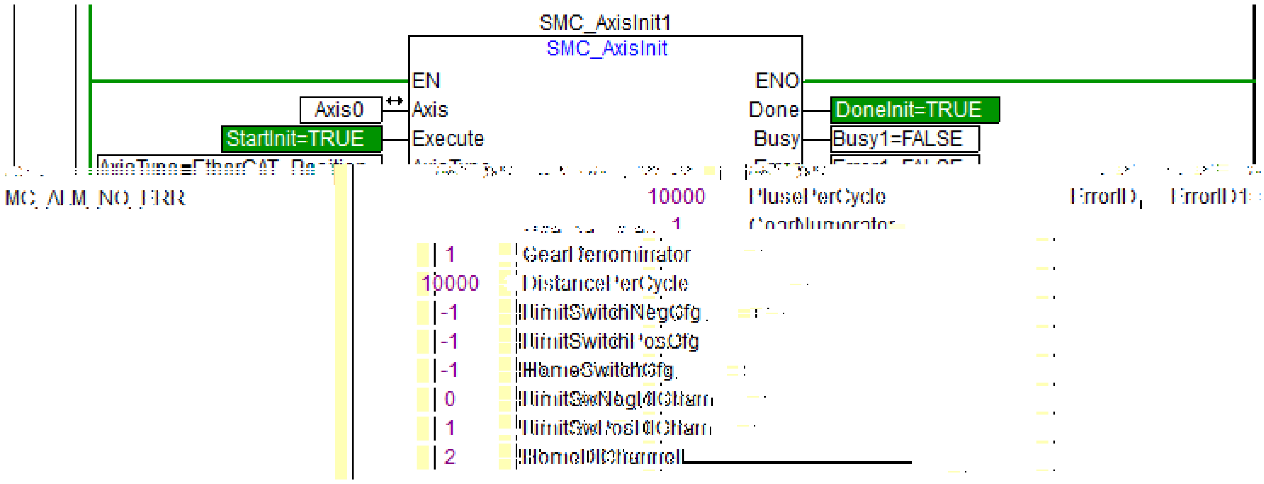


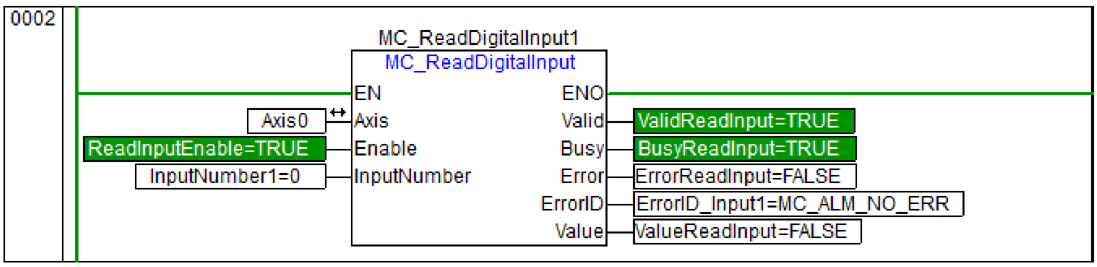


5.16.3 Examples

Description of Primary Variables

Variable Name	Data Type	Initial Value	Notes

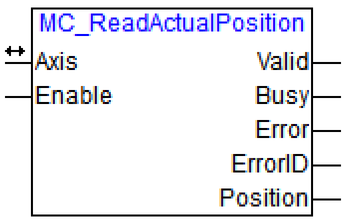

SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
DoneInit=TRUE
StartInit=TRUE
Execute
Busy
Busy1=FALSE
MC_ALM_NO_ERR
10000
PlusePerCycle
1
GearDenominator
10000
DistancePerCycle
-1
-1
-1
0
1
2


0002
MC_ReadDigitalInput1
MC_ReadDigitalInput
EN
ENO
Axis0
Axis
Valid
ValidReadInput=TRUE
ReadInputEnable=TRUE
Enable
Busy
BusyReadInput=TRUE
InputNumber1=0
InputNumber
Error
ErrorReadInput=FALSE
ErrorID
ErrorID_Input1=MC_ALM_NO_ERR
Value
ValueReadInput=FALSE

5.16.4 Precautions

5.16.5 Reference

5.17 MC_ReadActualPosition (Read Axis Actual Position)



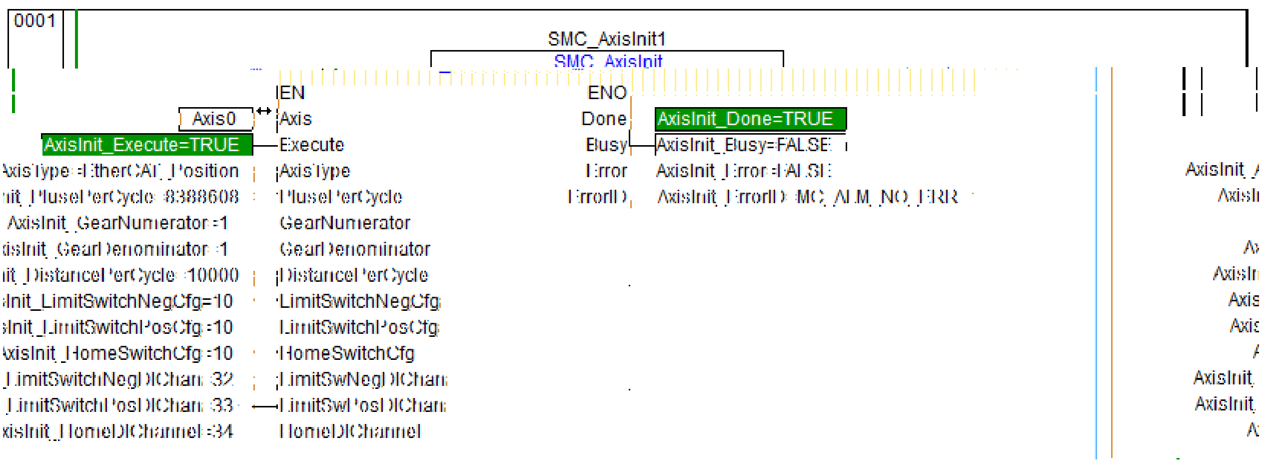
5.17.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

5.17.3 Examples

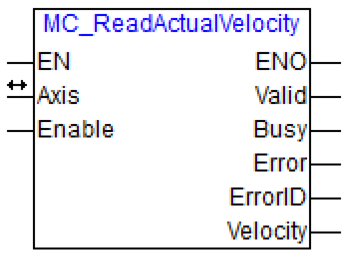
Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



5.17.4 Precautions

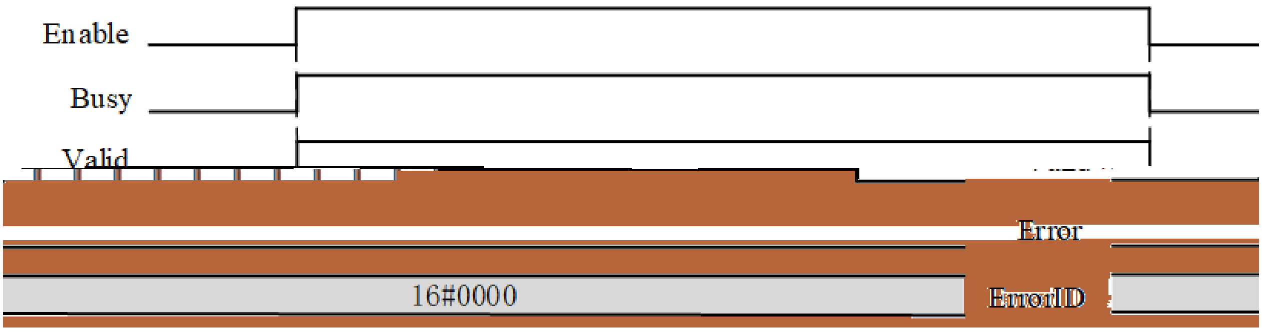
5.18 MC_ReadActualVelocity (Read Axis Actual Speed)

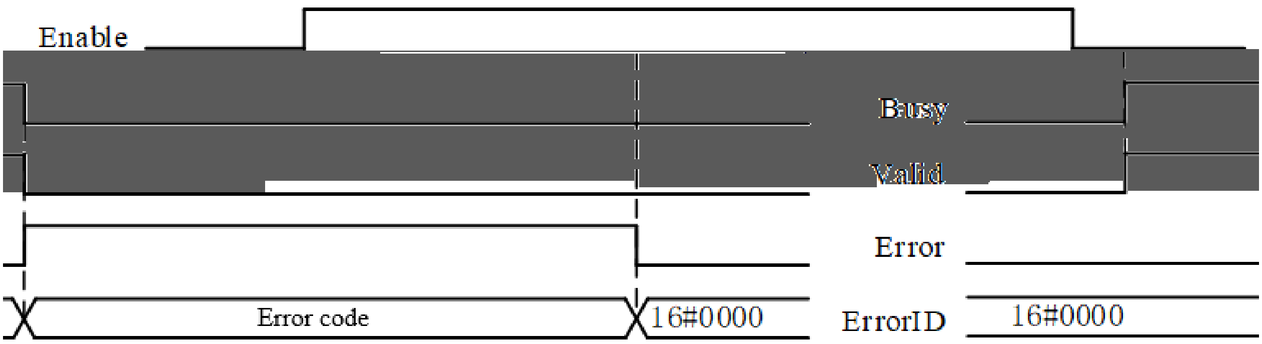


5.18.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

5.18.2 Functions

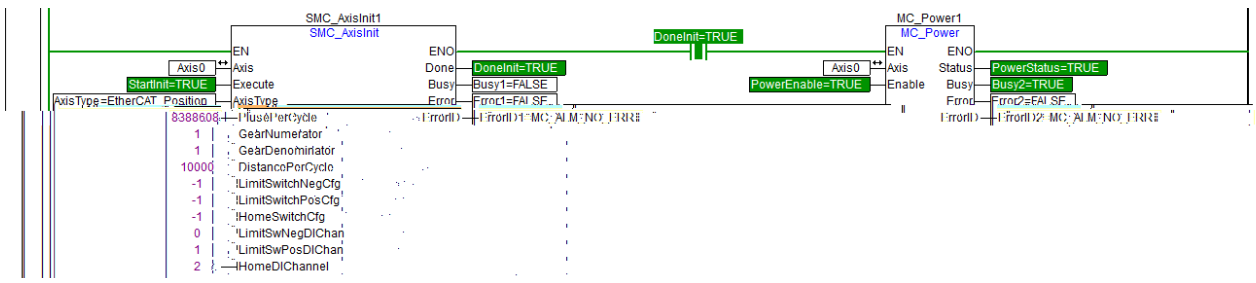


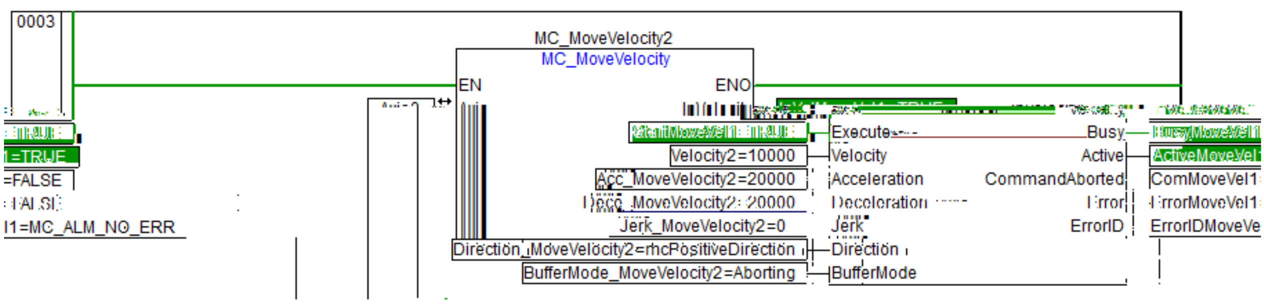


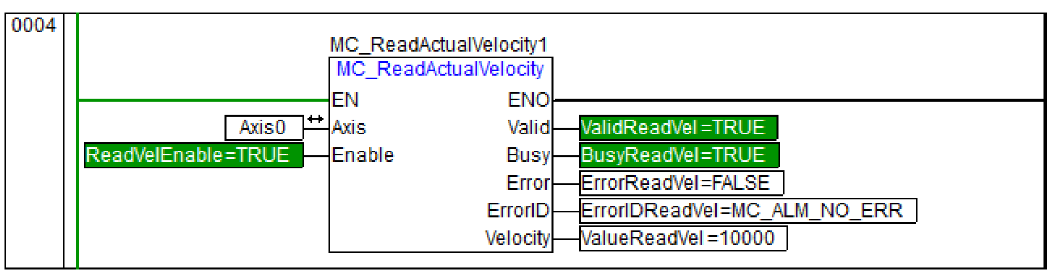
5.18.3 Examples

Description of Primary Variables

Title	Data Type	Initial Value	Notes


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
StartInit=TRUE
Execute
AxisType=EtherCAT_Position
AxisType
Done
DoneInit=TRUE
Busy
Busy1=FALSE
Error
Error1=FALSE
ErrorID
8388608
PulsePerCycle
1
GearNumerator
1
GearDenominator
10000
DistancePerCycle
-1
LimitSwitchNegCfg
-1
LimitSwitchPosCfg
-1
HomeSwitchCfg
0
LimitSwNegDIChan
1
LimitSwPosDIChan
2
HomeDIChannel
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
PowerEnable=TRUE
Enable
Status
PowerStatus=TRUE
Busy
Busy2=TRUE
Error
ErrorID

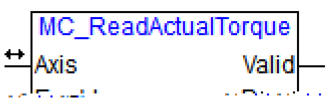

0003
MC_MoveVelocity2
MC_MoveVelocity
EN
ENO
=TRUE
=FALSE
1=MC_ALM_NO_ERR
Execute
Velocity2=10000
Velocity
Acc_MoveVelocity2=20000
Acceleration
Decc_MoveVelocity2=20000
Deceleration
Jerk_MoveVelocity2=0
Jerk
Direction_MoveVelocity2=mcPositiveDirection
Direction
BufferMode_MoveVelocity2=Aborting
BufferMode
Busy
Active
CommandAborted
Error
ErrorID
ActiveMoveVel1
ComMoveVel1
ErrorMoveVel1
ErrorIDMoveVe


0004
MC_ReadActualVelocity1
MC_ReadActualVelocity
EN
ENO
Axis0
Axis
ReadVelEnable=TRUE
Enable
Valid
ValidReadVel=TRUE
Busy
BusyReadVel=TRUE
Error
ErrorReadVel=FALSE
ErrorID
ErrorIDReadVel=MC_ALM_NO_ERR
Velocity
ValueReadVel=10000

5.18.4 Precautions

5.18.5 Reference

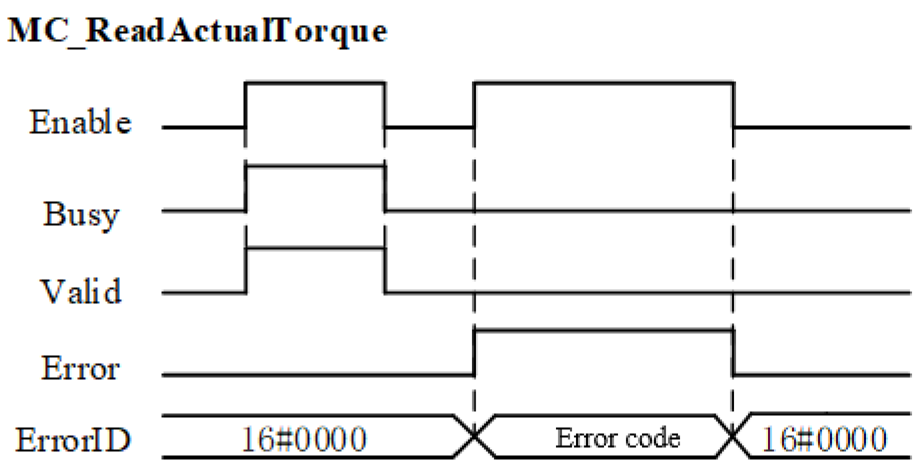
5.19 MC_ReadActualTorque (Read Axis Actual Torque)



5.19.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	Default Value	Scope	Data Type

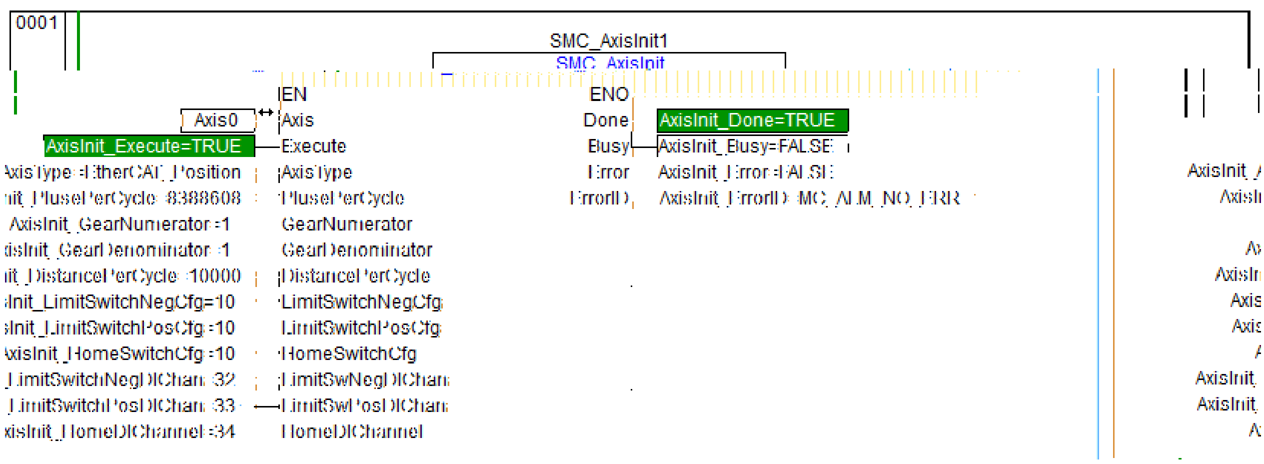
5.19.2 Functions

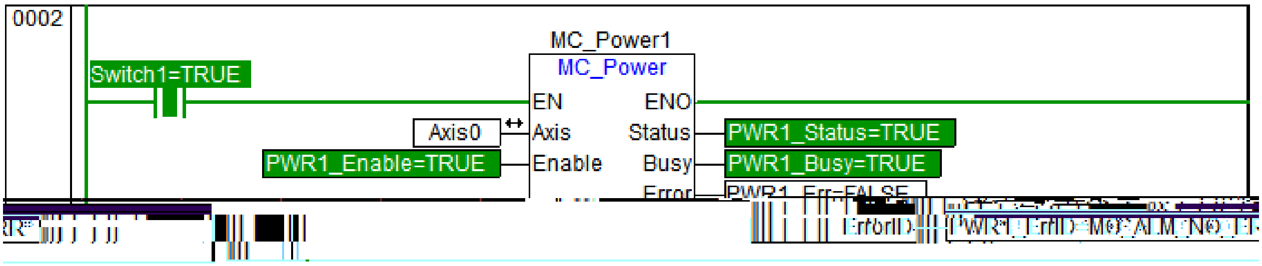


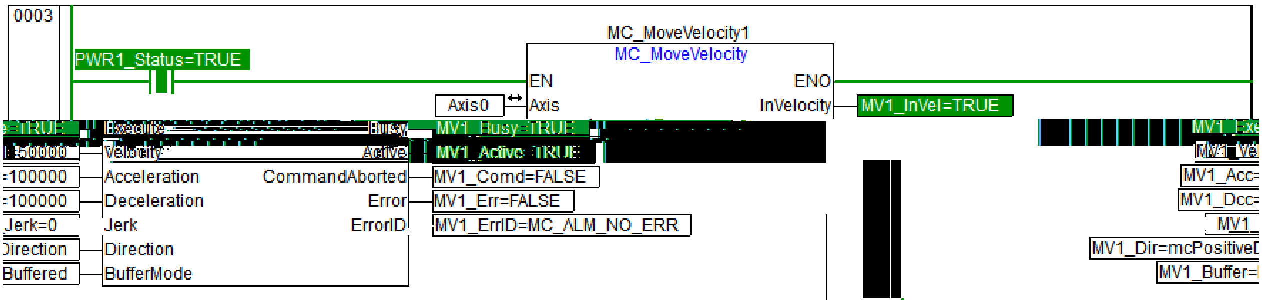
5.19.3 Examples

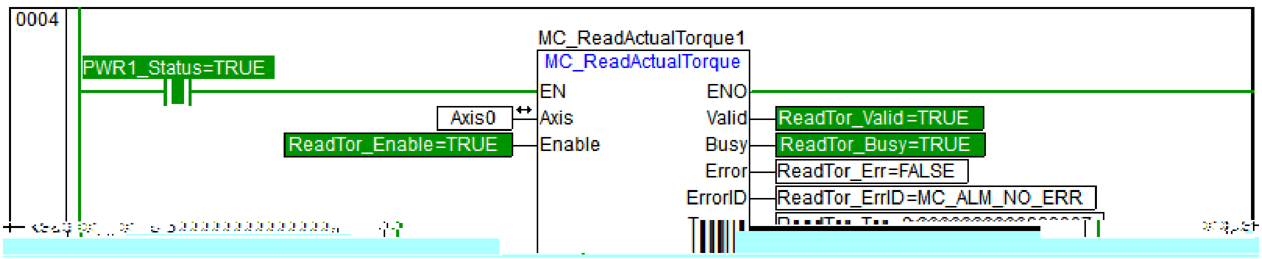
Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes




0002
MC_Power1
MC_Power
Switch1=TRUE
EN
ENO
Axis0
Axis
Status
PWR1_Status=TRUE
PWR1_Enable=TRUE
Enable
Busy
PWR1_Busy=TRUE

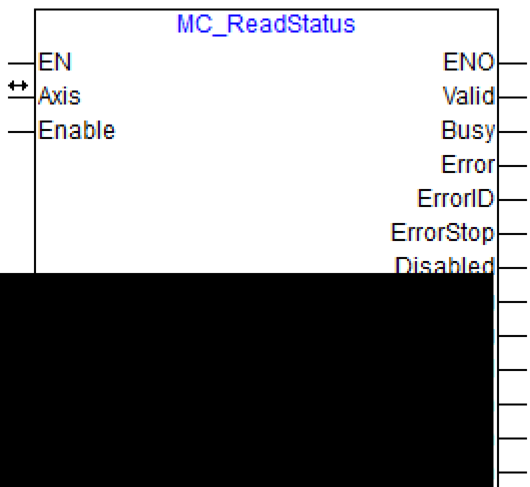

0003
MC_MoveVelocity1
MC_MoveVelocity
PWR1_Status=TRUE
EN
ENO
Axis0
Axis
InVelocity
MV1_InVel=TRUE
Acceleration
CommandAborted
MV1_Comd=FALSE
Deceleration
Error
MV1_Err=FALSE
Jerk
ErrorID
MV1_ErrID=MC_ALM_NO_ERR
Direction
BufferMode


0004
MC_ReadActualTorque1
MC_ReadActualTorque
PWR1_Status=TRUE
EN
ENO
Axis0
Axis
Valid
ReadTor_Valid=TRUE
ReadTor_Enable=TRUE
Enable
Busy
ReadTor_Busy=TRUE
Error
ReadTor_Err=FALSE
ErrorID
ReadTor_ErrID=MC_ALM_NO_ERR

5.19.4 Precautions

5.20 MC_ReadStatus (Read Axis Status)

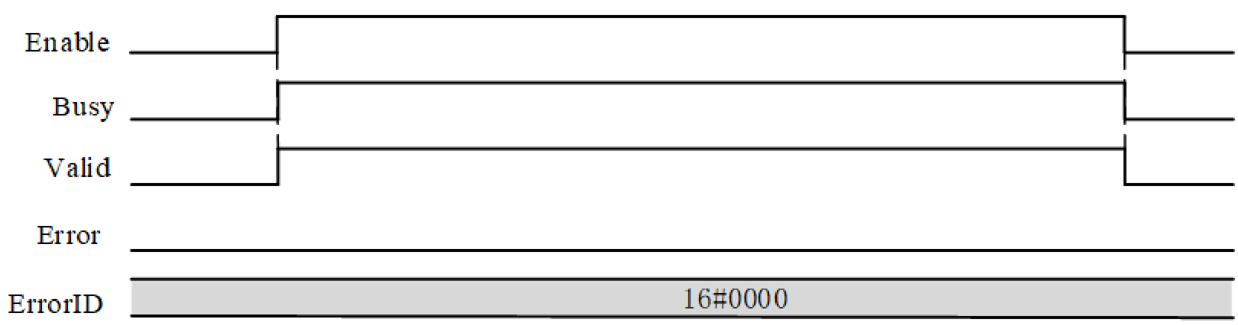
[redacted]

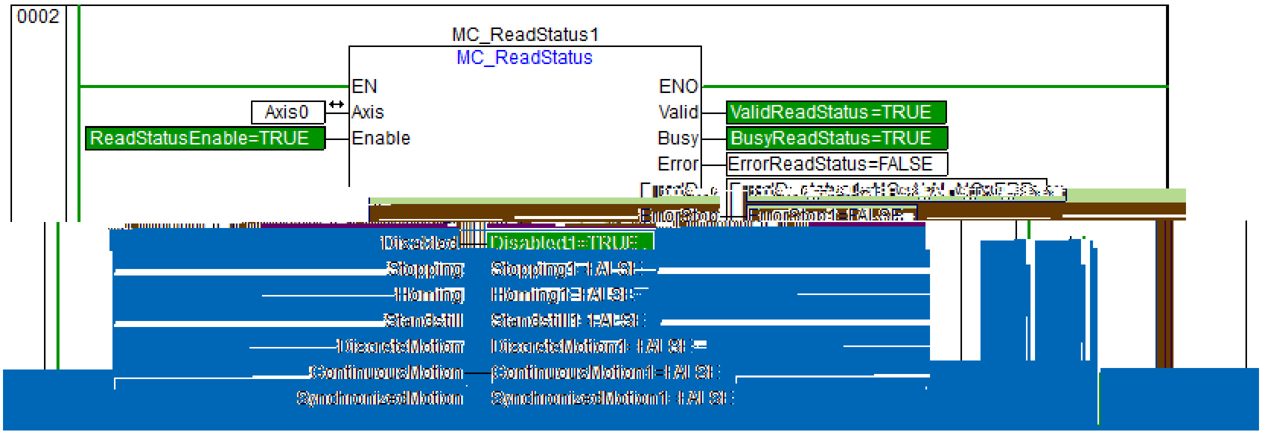


[redacted]

[redacted]	efault alue	Scope	Data Type
[redacted]			

5.20.2 Functions

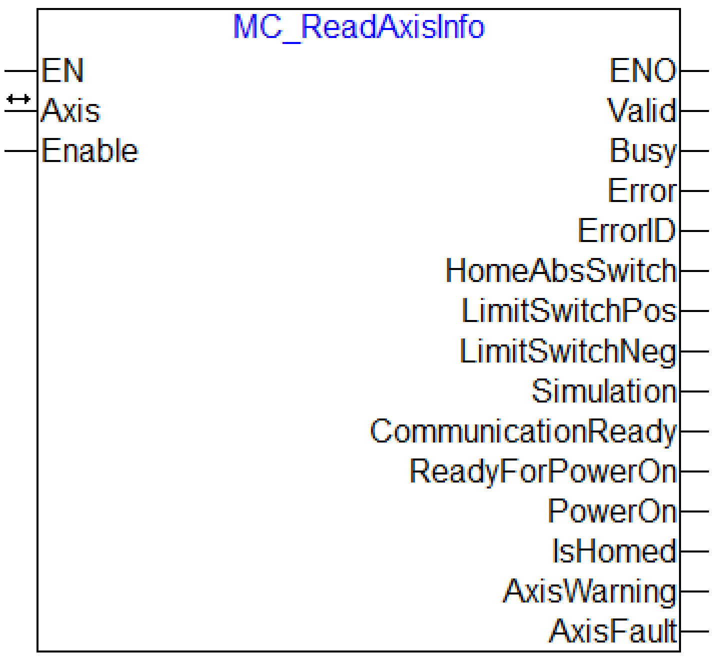



0002
MC_ReadStatus1
MC_ReadStatus
EN
ENO
Axis0
Axis
Valid
ValidReadStatus=TRUE
ReadStatusEnable=TRUE
Enable
Busy
BusyReadStatus=TRUE
Error
ErrorReadStatus=FALSE
ErrorStop
Disabled
Disabled1=TRUE
Stopping
Homing
Standstill
DiscreteMotion
ContinuousMotion
SynchronizedMotion

5.20.4 Precautions

5.20.5 Reference

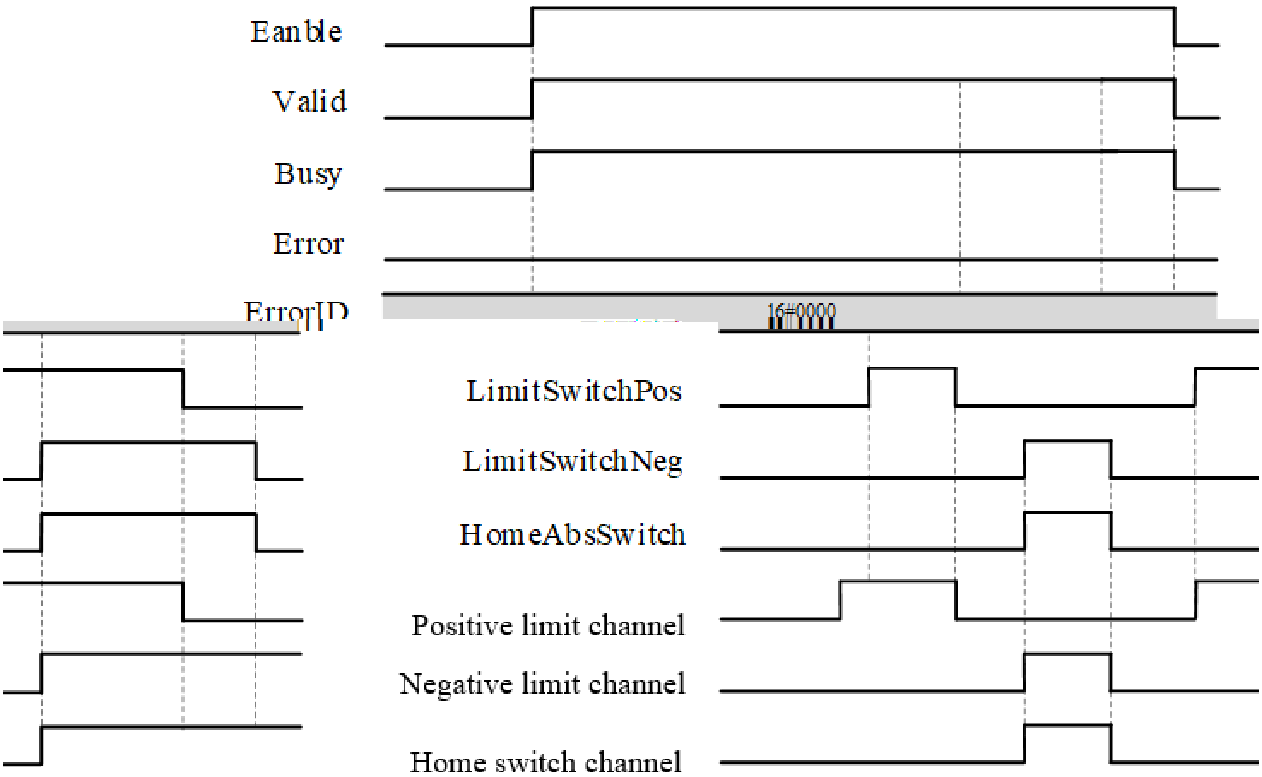
5.21 MC_ReadAxisInfo (Read Axis Info)

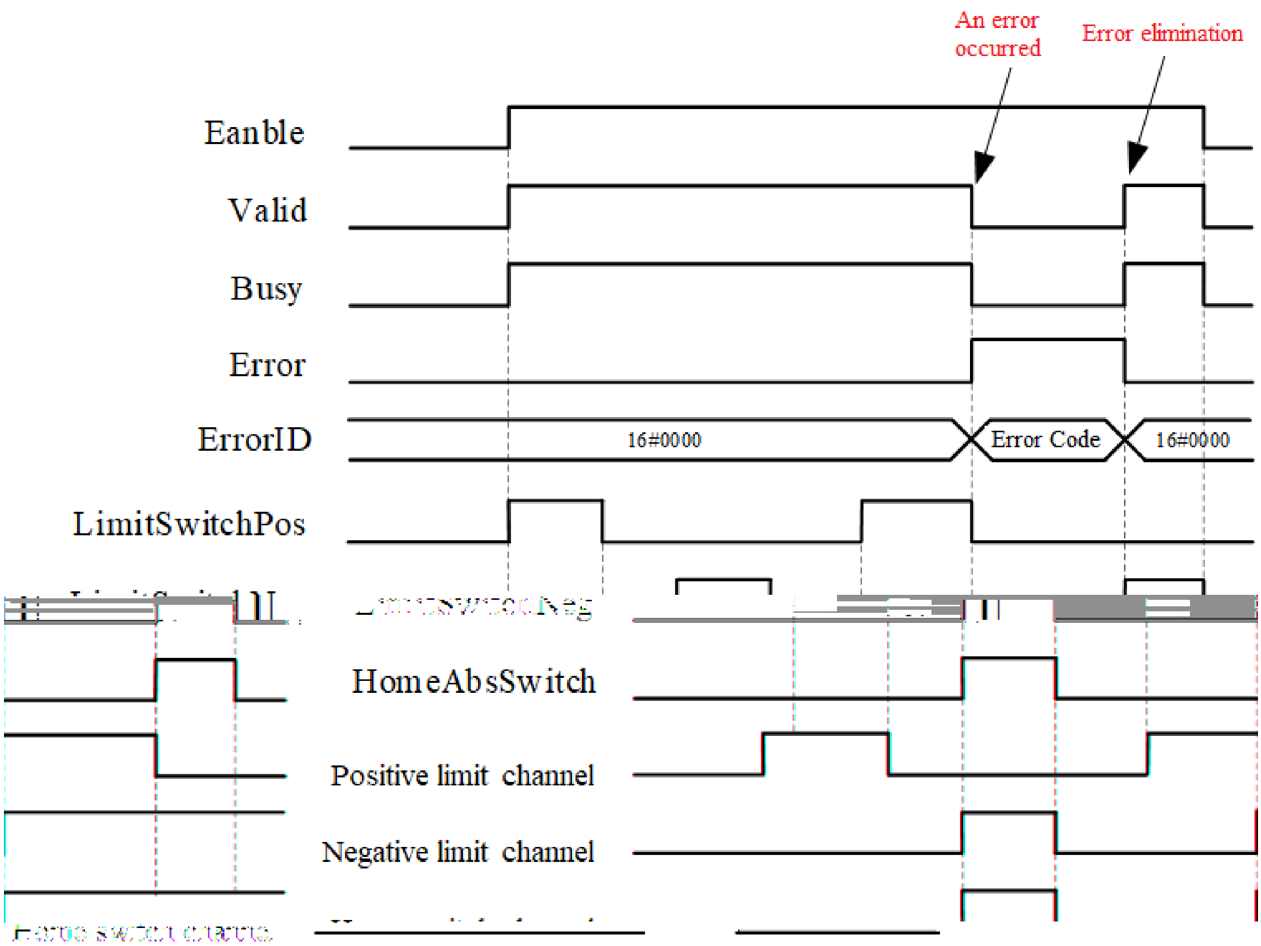


5.21.1 Parameter

Parameter Type	Variable Name	Description	Empty or Not	

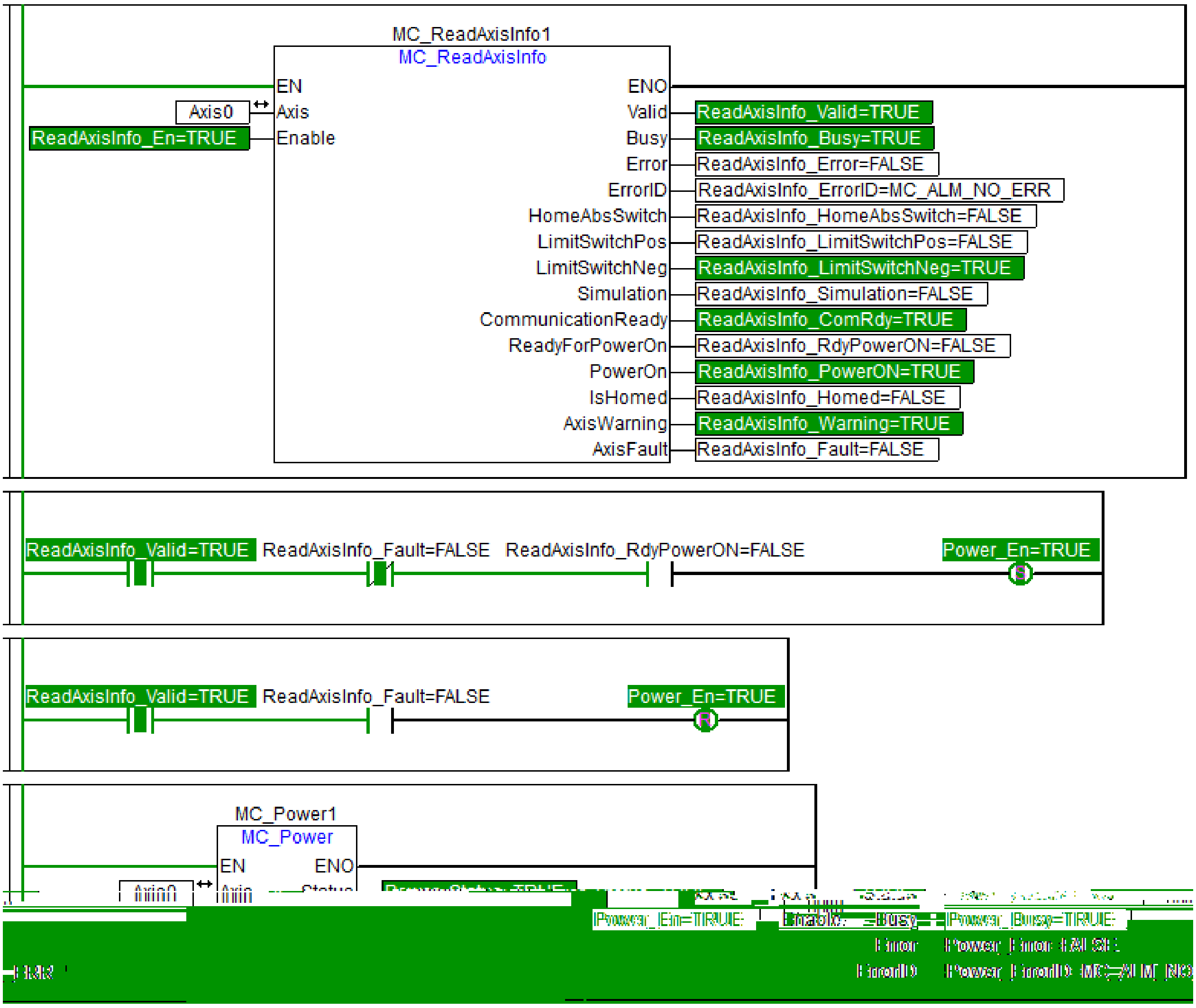
5.21.2 Functions


Eanble
Valid
Busy
Error
ErrorID
16#0000
LimitSwitchPos
LimitSwitchNeg
HomeAbsSwitch
Positive limit channel
Negative limit channel
Home switch channel



5.21.3 Examples

No.	Variable Name	Variable Type	Initial Value	Variable Description


MC_ReadAxisInfo1
MC_ReadAxisInfo
EN
ENO
Axis0
Axis
ReadAxisInfo_En=TRUE
Enable
Valid
ReadAxisInfo_Valid=TRUE
Busy
ReadAxisInfo_Busy=TRUE
Error
ReadAxisInfo_Error=FALSE
ErrorID
ReadAxisInfo_ErrorID=MC_ALM_NO_ERR
HomeAbsSwitch
ReadAxisInfo_HomeAbsSwitch=FALSE
LimitSwitchPos
ReadAxisInfo_LimitSwitchPos=FALSE
LimitSwitchNeg
ReadAxisInfo_LimitSwitchNeg=TRUE
Simulation
ReadAxisInfo_Simulation=FALSE
CommunicationReady
ReadAxisInfo_ComRdy=TRUE
ReadyForPowerOn
ReadAxisInfo_RdyPowerON=FALSE
PowerOn
ReadAxisInfo_PowerON=TRUE
IsHomed
ReadAxisInfo_Homed=FALSE
AxisWarning
ReadAxisInfo_Warning=TRUE
AxisFault
ReadAxisInfo_Fault=FALSE
ReadAxisInfo_Valid=TRUE
ReadAxisInfo_Fault=FALSE
ReadAxisInfo_RdyPowerON=FALSE
Power_En=TRUE
S
ReadAxisInfo_Valid=TRUE
ReadAxisInfo_Fault=FALSE
Power_En=TRUE
R
MC_Power1
MC_Power
EN
ENO
Power_En=TRUE
Busy
Power_Busy=TRUE
Error
ErrorID

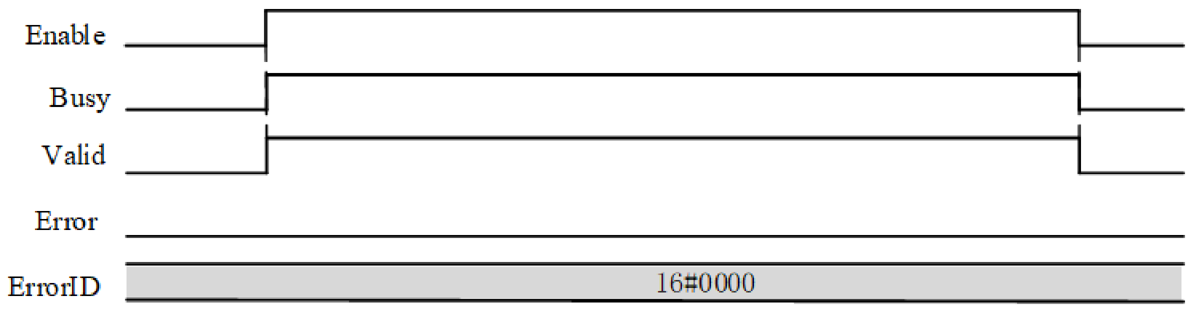
5.22 MC_ReadAxisError (Read Axis Error)

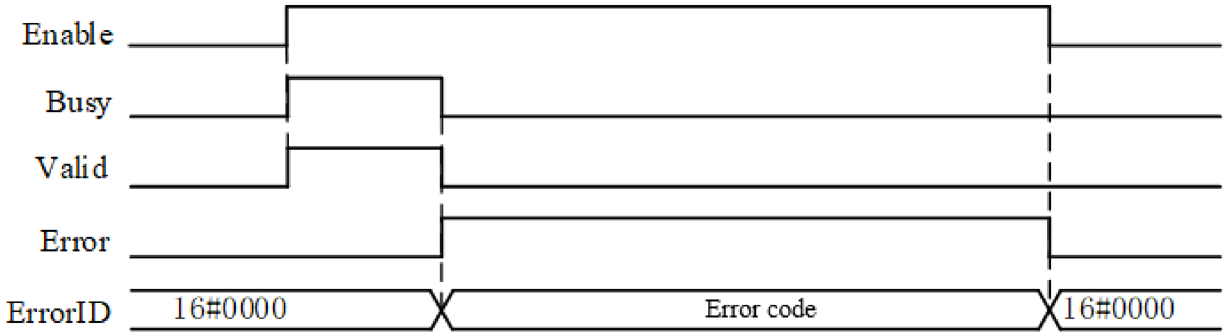
5.22.1 Parameter

Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type

5.22.2 Functions

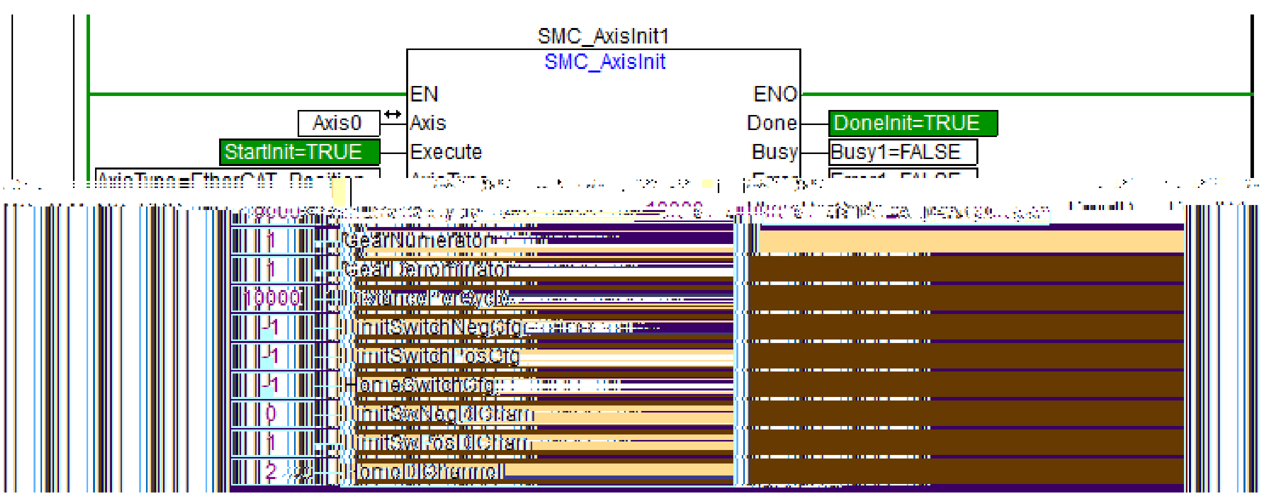
Error Code	Error Type	Error Description

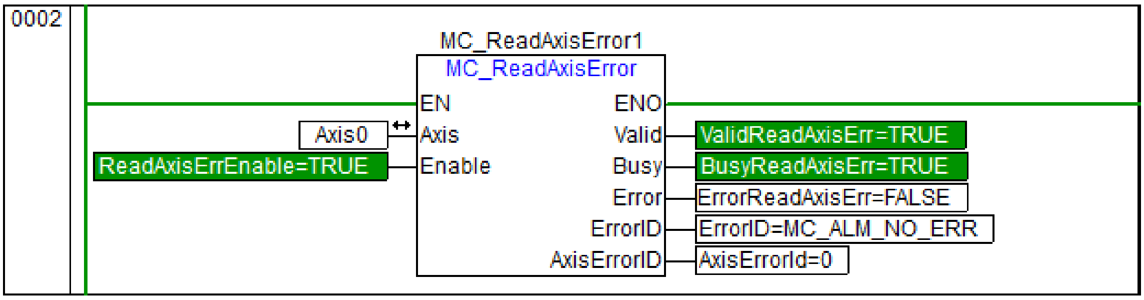




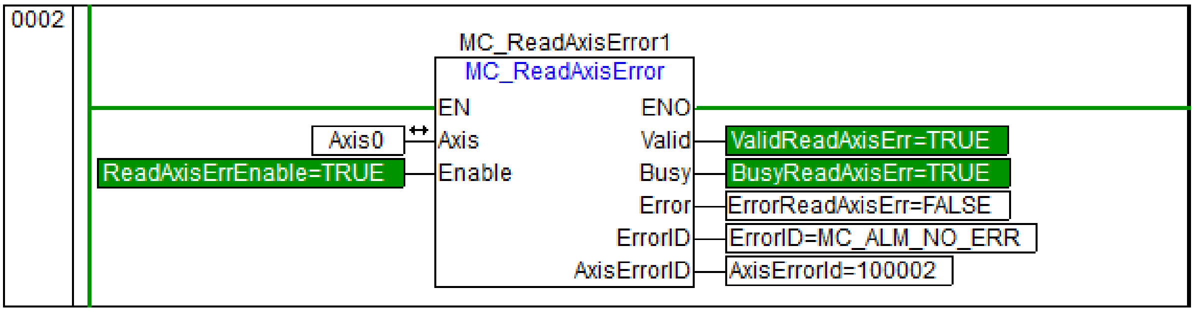
5.22.3 Examples

Name	Data Type	Initial Value	Notes





0002
MC_ReadAxisError1
MC_ReadAxisError
EN
ENO
Axis0
Axis
Valid
ValidReadAxisErr=TRUE
ReadAxisErrEnable=TRUE
Enable
Busy
BusyReadAxisErr=TRUE
Error
ErrorReadAxisErr=FALSE
ErrorID
ErrorID=MC_ALM_NO_ERR
AxisErrorID
AxisErrorId=0

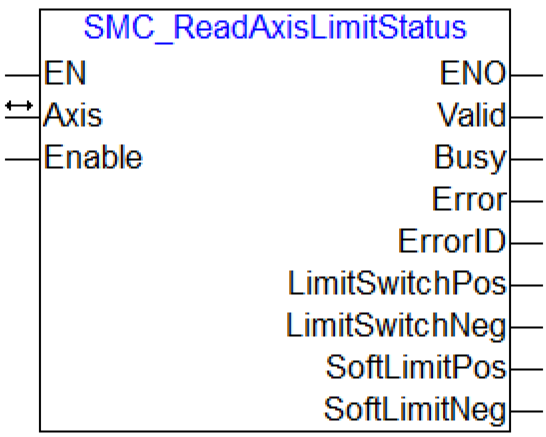


0002
MC_ReadAxisError1
MC_ReadAxisError
EN
ENO
Axis0
Axis
Valid
ValidReadAxisErr=TRUE
ReadAxisErrEnable=TRUE
Enable
Busy
BusyReadAxisErr=TRUE
Error
ErrorReadAxisErr=FALSE
ErrorID
ErrorID=MC_ALM_NO_ERR
AxisErrorID
AxisErrorId=100002

5.22.4 Precautions

5.22.5 Reference

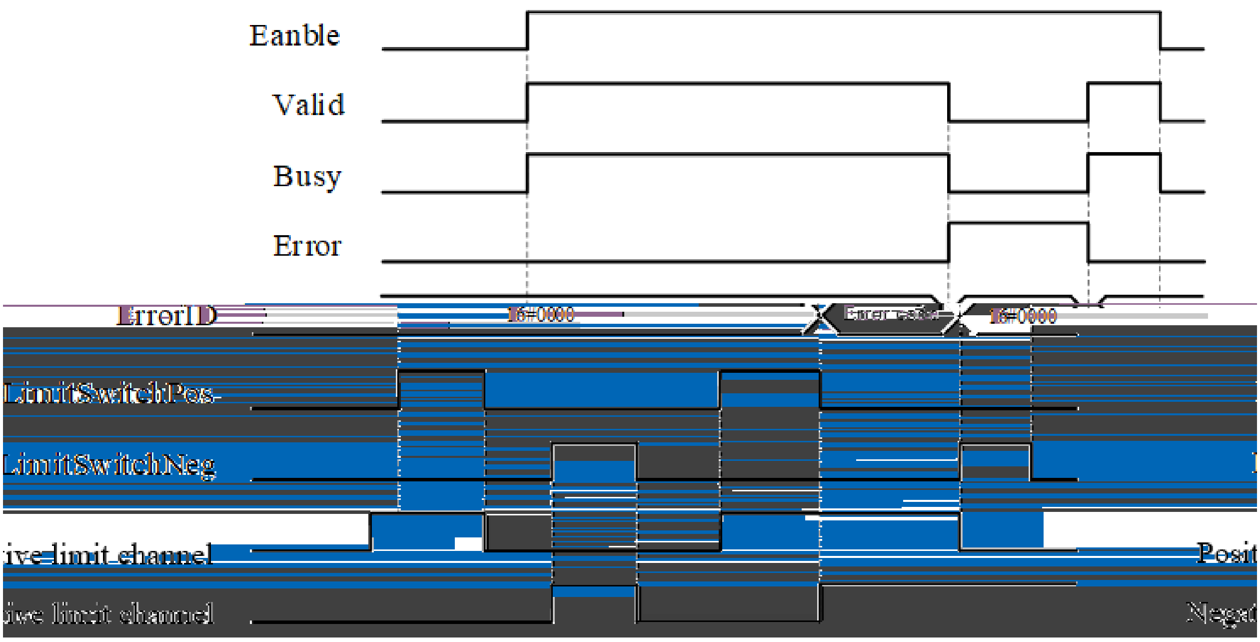
5.23 SMC_ReadAxisLimitStatus (Read Axis Limit Status)

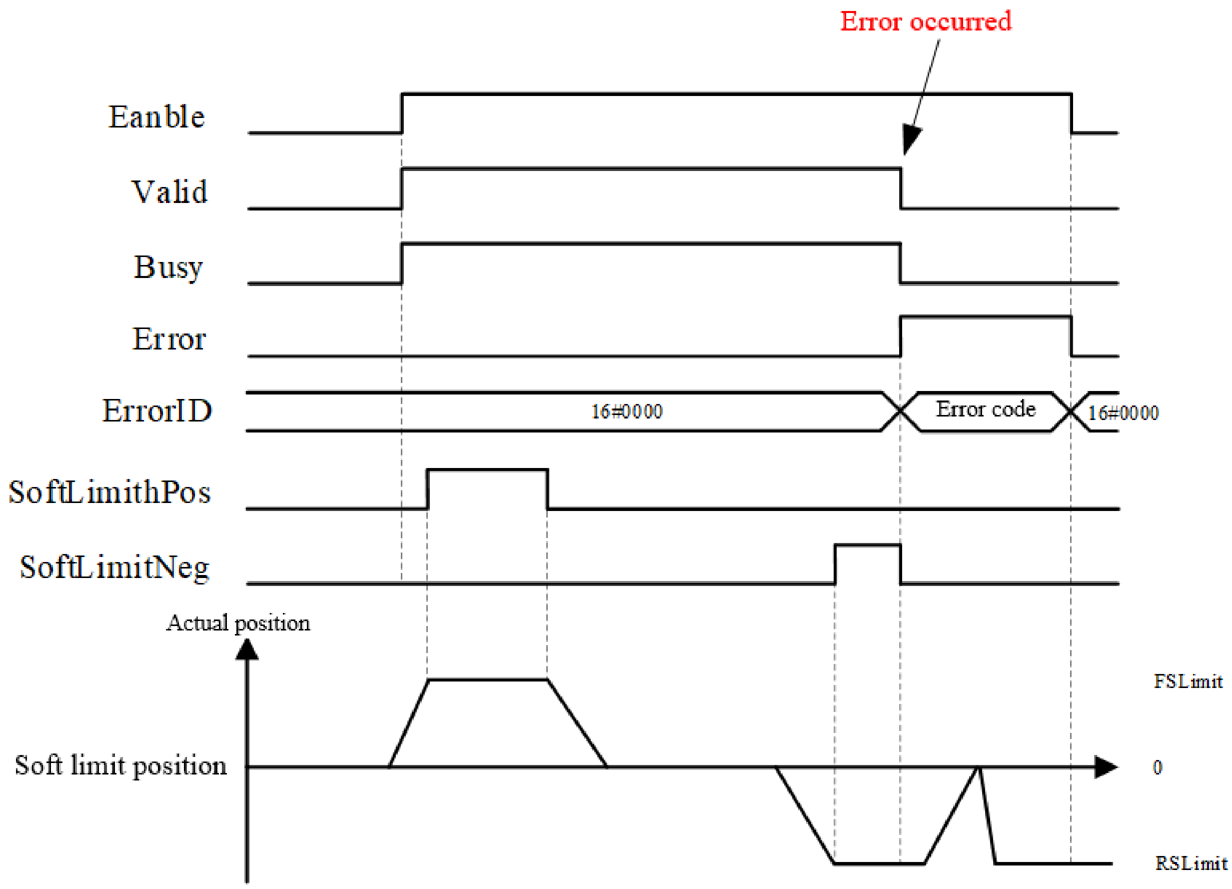


5.23.1 Parameter

Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type

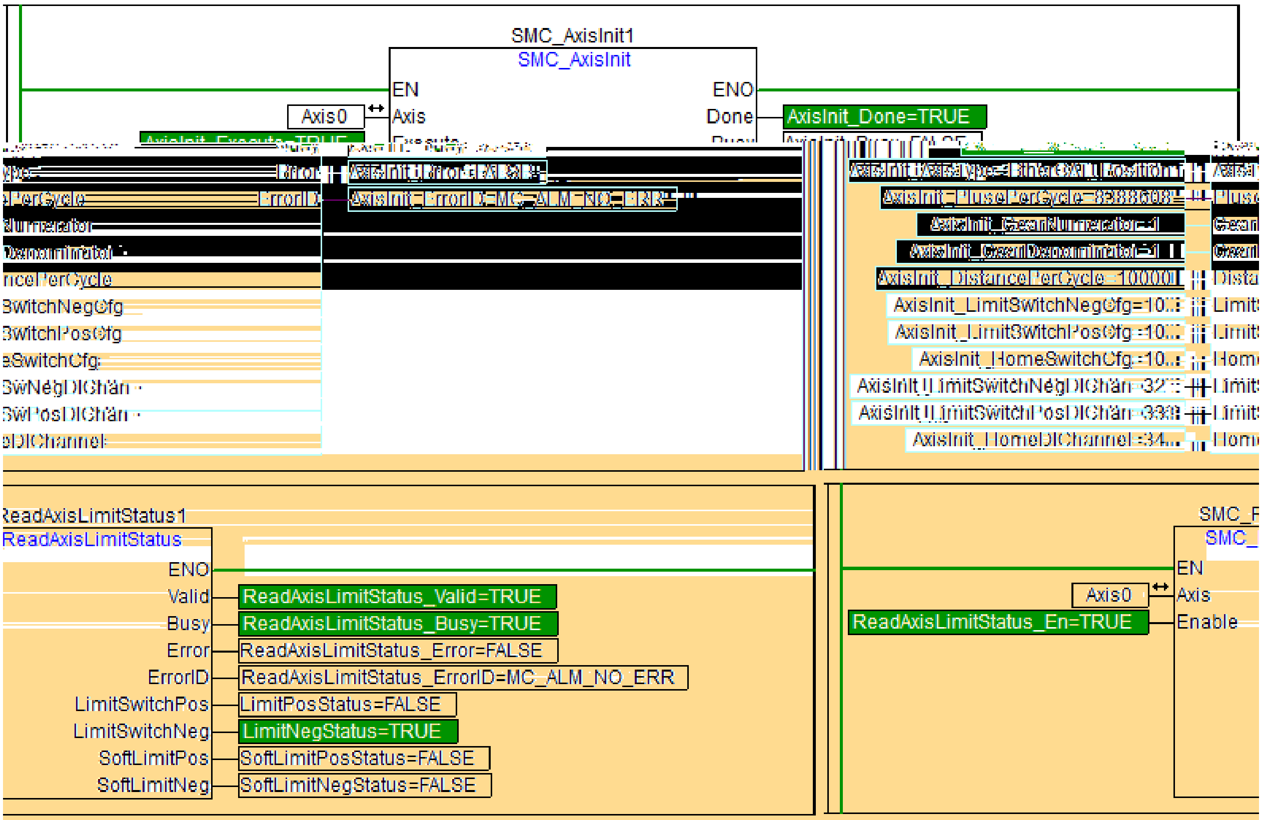
5.23.2 Functions


Eanble
Valid
Busy
Error
ErrorID
16#0000
Error code
16#0000
LimitSwitchPos
LimitSwitchNeg



5.23.3 Examples

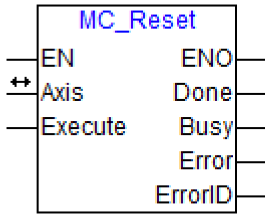
No.	Variable Name	Variable Type	Initial Value	Variable Description


SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
AxisInit_Done=TRUE
AxisInit_LimitSwitchNegCfg=10...
AxisInit_LimitSwitchPosCfg=10...
AxisInit_HomeSwitchCfg=10...
ReadAxisLimitStatus1
ReadAxisLimitStatus
ENO
Valid
ReadAxisLimitStatus_Valid=TRUE
Busy
ReadAxisLimitStatus_Busy=TRUE
Error
ReadAxisLimitStatus_Error=FALSE
ErrorID
ReadAxisLimitStatus_ErrorID=MC_ALM_NO_ERR
LimitSwitchPos
LimitPosStatus=FALSE
LimitSwitchNeg
LimitNegStatus=TRUE
SoftLimitPos
SoftLimitPosStatus=FALSE
SoftLimitNeg
SoftLimitNegStatus=FALSE
EN
Axis0
Axis
ReadAxisLimitStatus_En=TRUE
Enable

5.23.4 Precautions

5.23.5 Reference

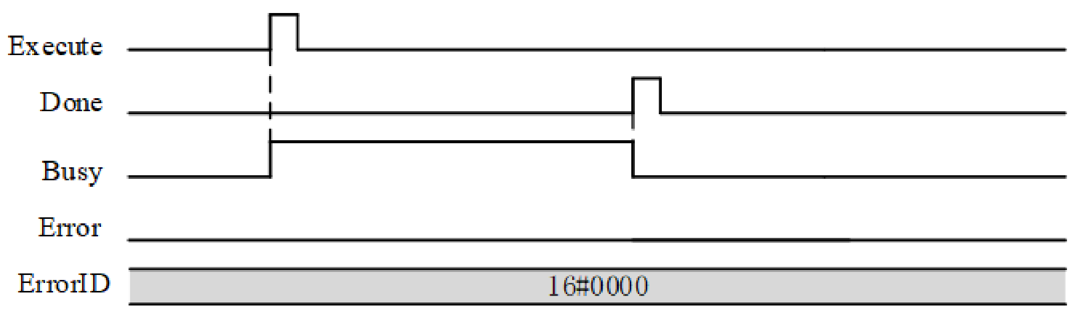
5.24 MC_Reset (Reset Axis Error)

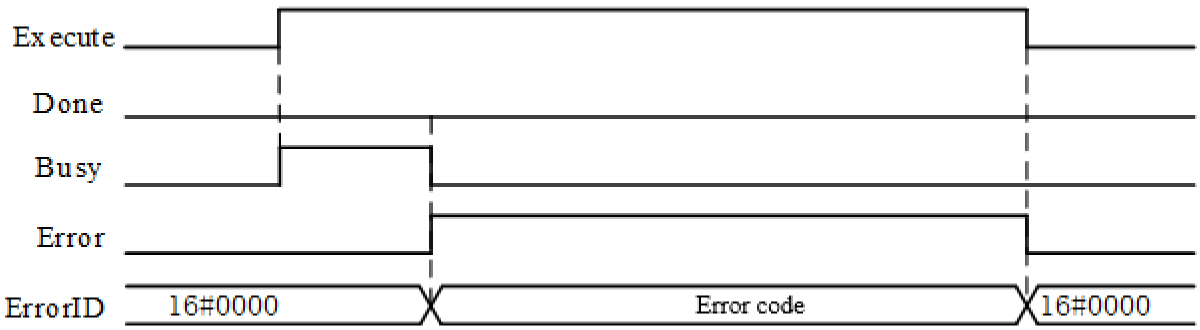


5.24.1 Parameter

Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

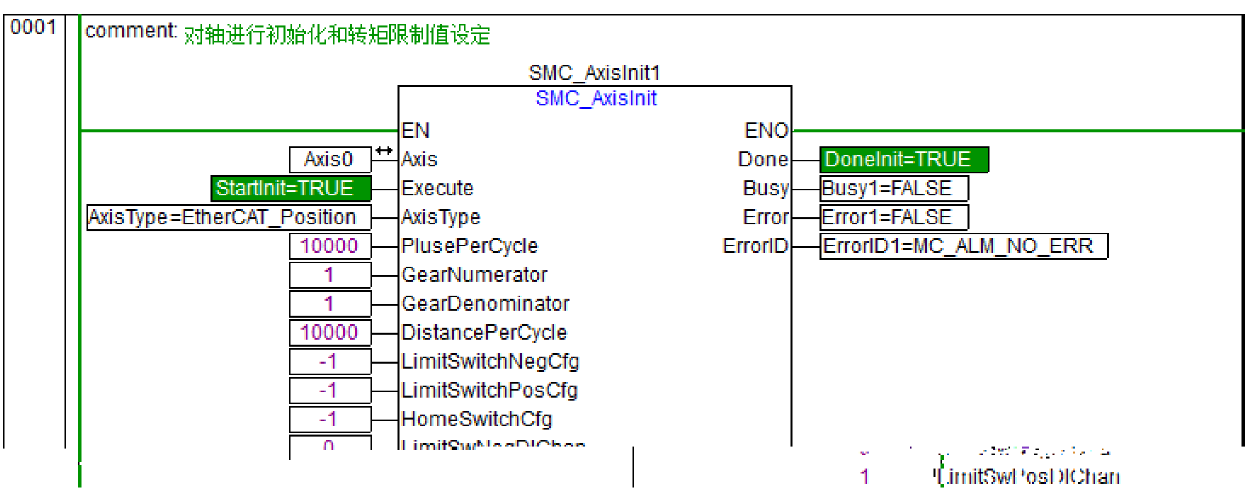
5.24.2 Functions

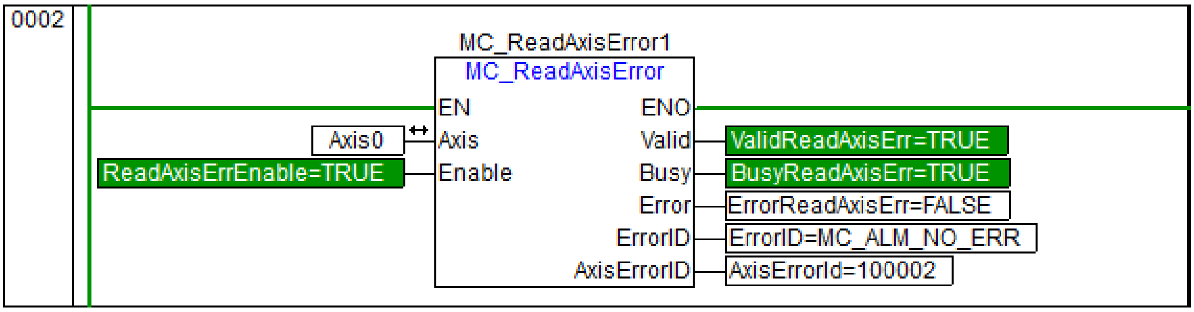


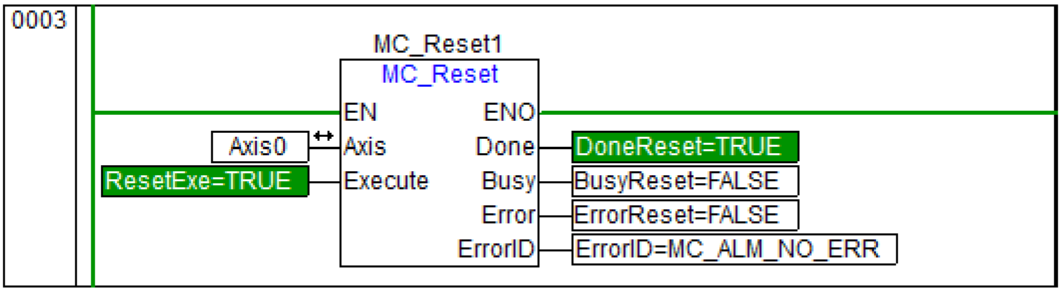


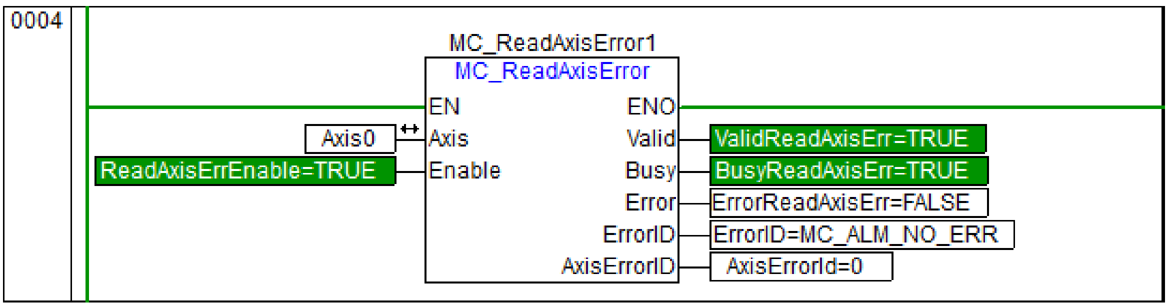
5.24.3 Examples

Name	Data Type	Initial Value	Notes




0002
MC_ReadAxisError1
MC_ReadAxisError
EN
ENO
Axis0
Axis
Valid
ValidReadAxisErr=TRUE
ReadAxisErrEnable=TRUE
Enable
Busy
BusyReadAxisErr=TRUE
Error
ErrorReadAxisErr=FALSE
ErrorID
ErrorID=MC_ALM_NO_ERR
AxisErrorID
AxisErrorId=100002


0003
MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
Done
DoneReset=TRUE
ResetExe=TRUE
Execute
Busy
BusyReset=FALSE
Error
ErrorReset=FALSE
ErrorID
ErrorID=MC_ALM_NO_ERR


0004
MC_ReadAxisError1
MC_ReadAxisError
EN
ENO
Axis0
Axis
Valid
ValidReadAxisErr=TRUE
ReadAxisErrEnable=TRUE
Enable
Busy
BusyReadAxisErr=TRUE
Error
ErrorReadAxisErr=FALSE
ErrorID
ErrorID=MC_ALM_NO_ERR
AxisErrorID
AxisErrorId=0

Type			or Not	Value		

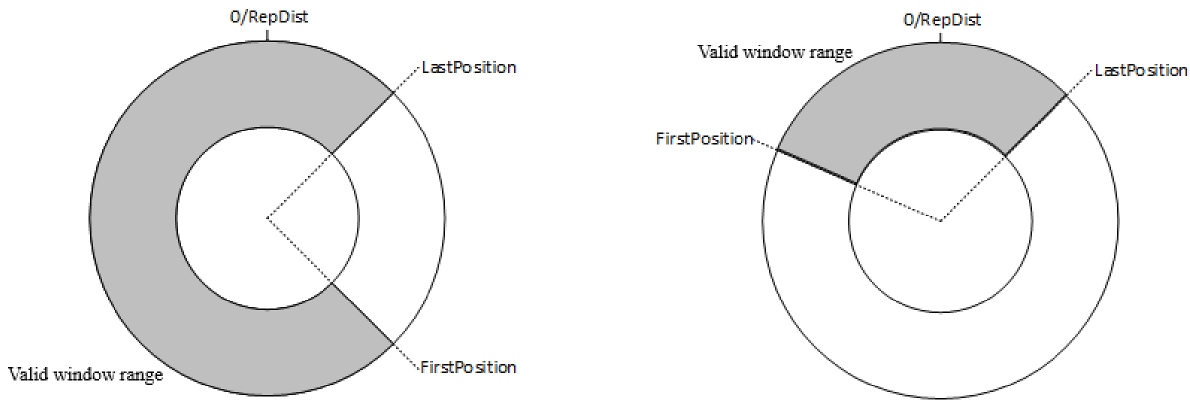
MC_TRIGGER_REF Data Structure

Member	Description	Default Value	Scope	Data Type

5.25.2 Functions

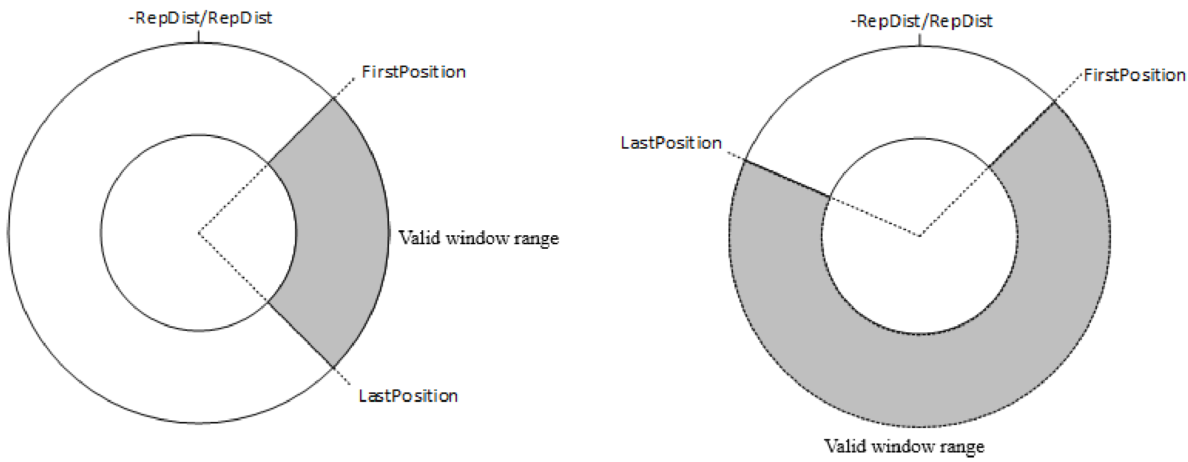
e: FirstPosition ≤ Window Range ≤ LastPosition, when the input parameter

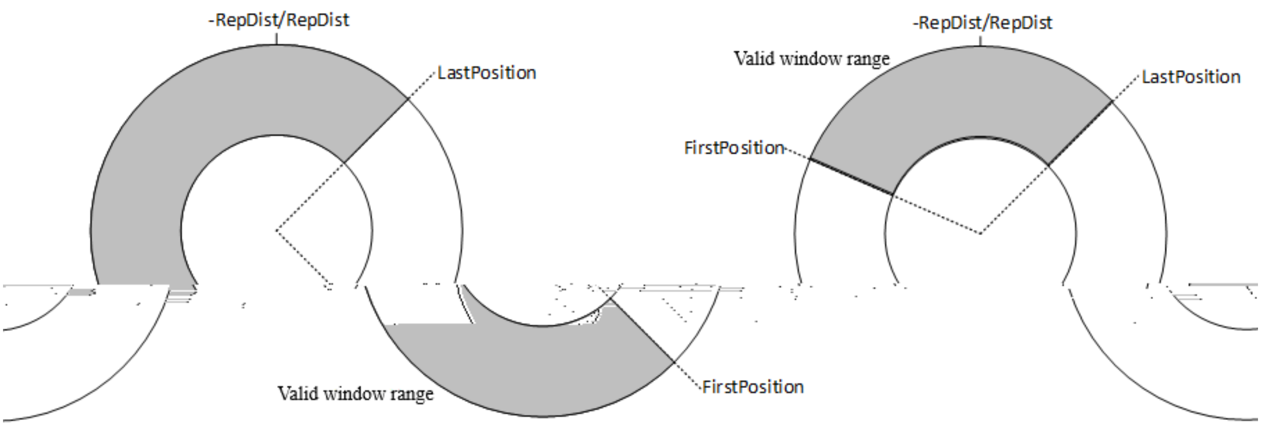
Both FirstPosition ≤ LastPosition and FirstPosition > LastPosition during cyclic travel

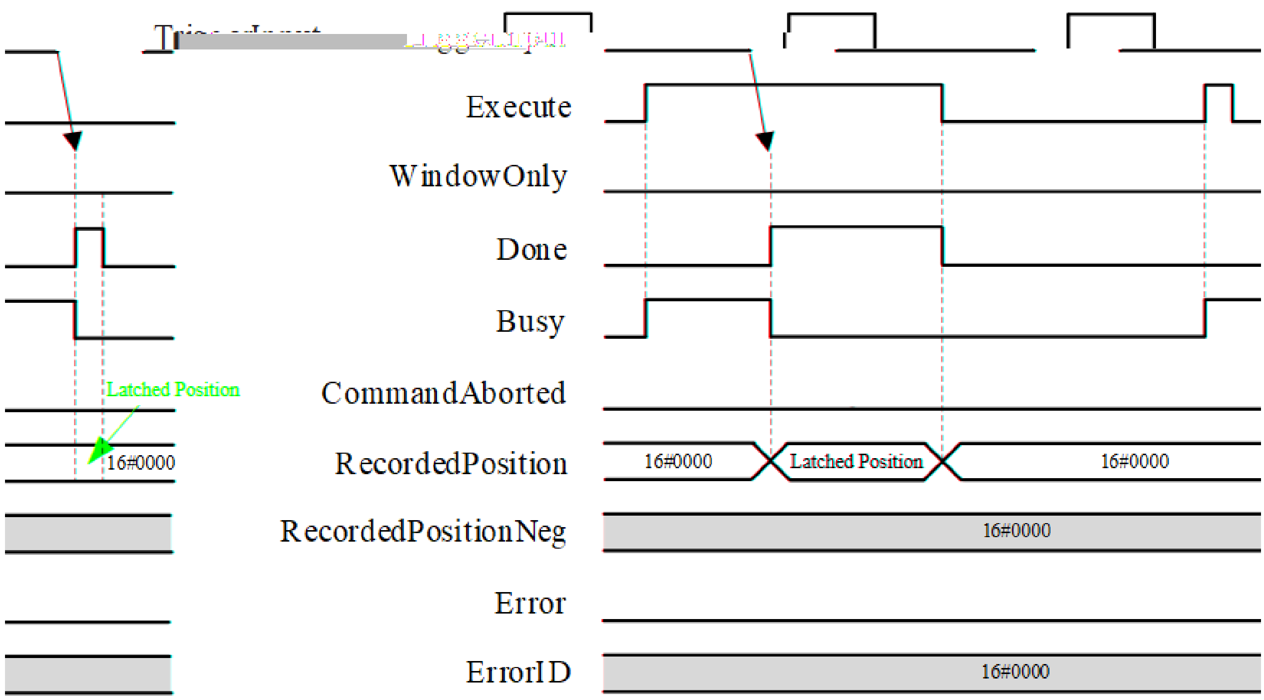


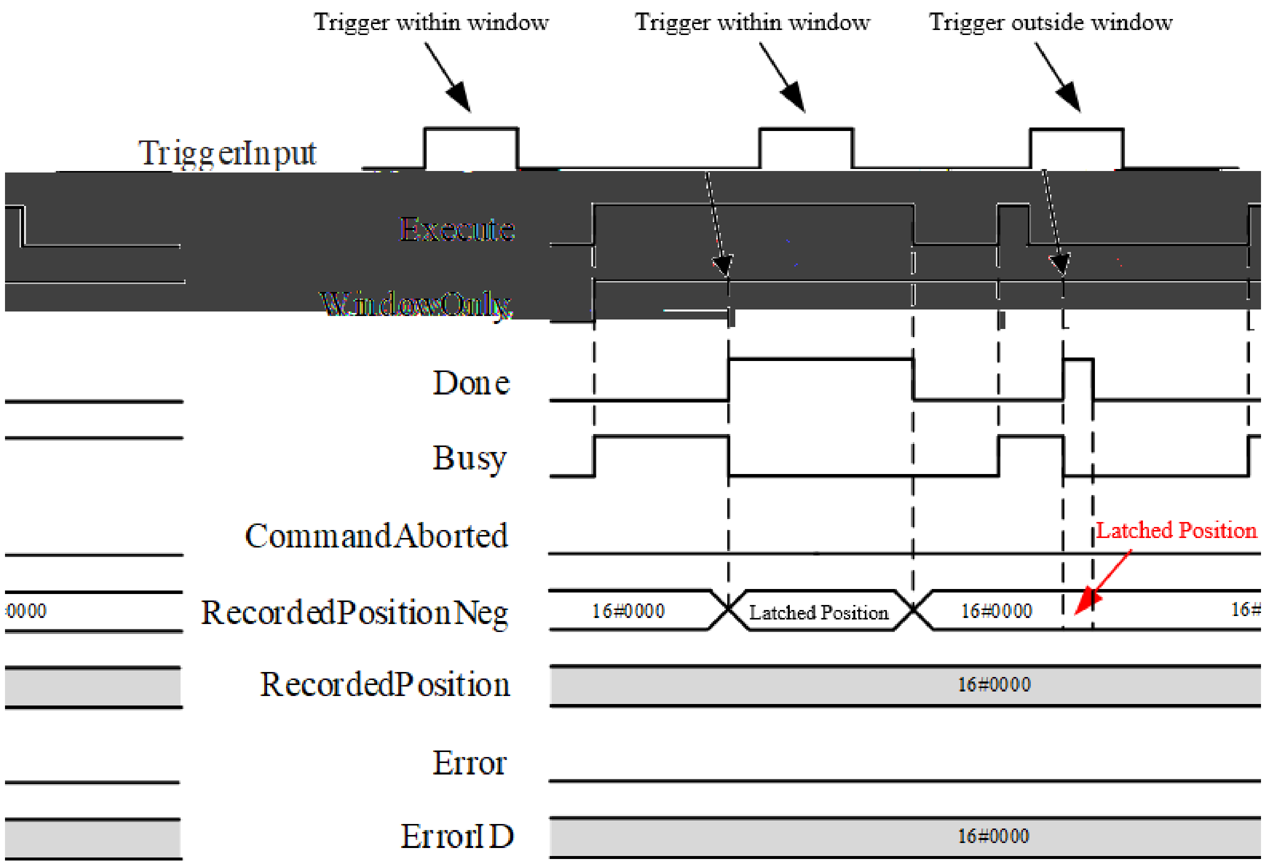
□

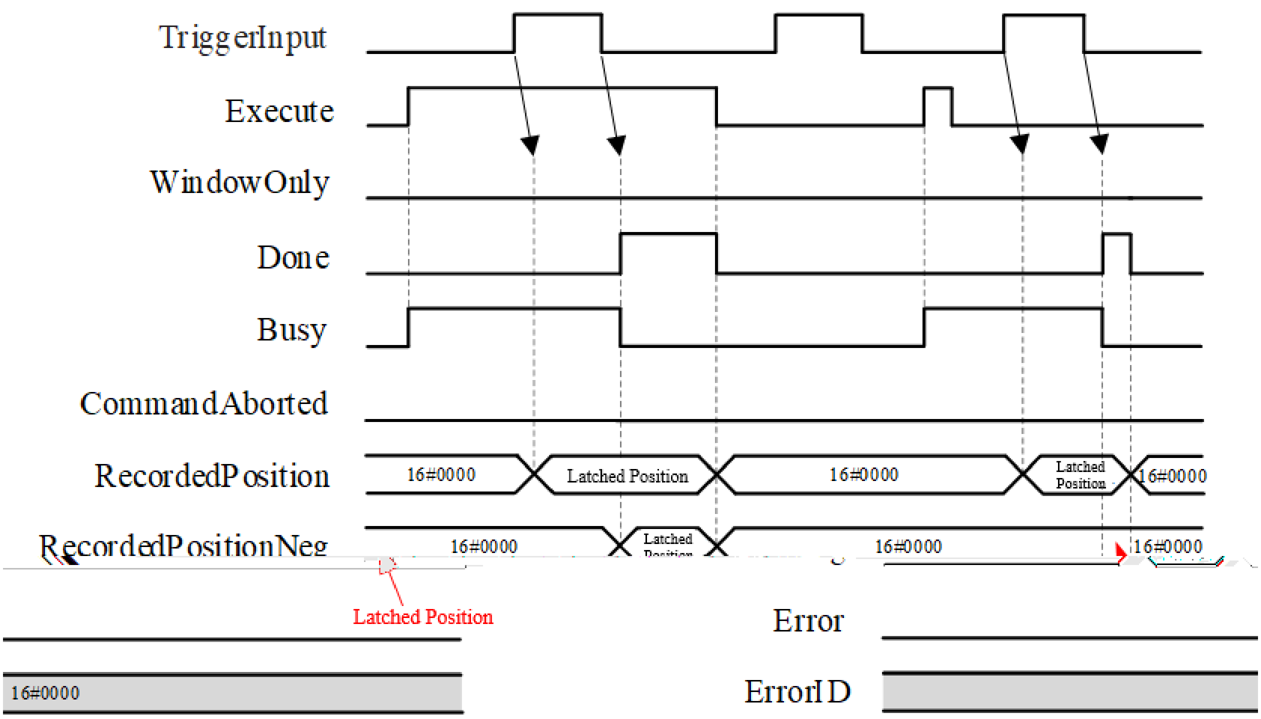
When FirstPosition ≤ LastPosition, as shown in the following figure:

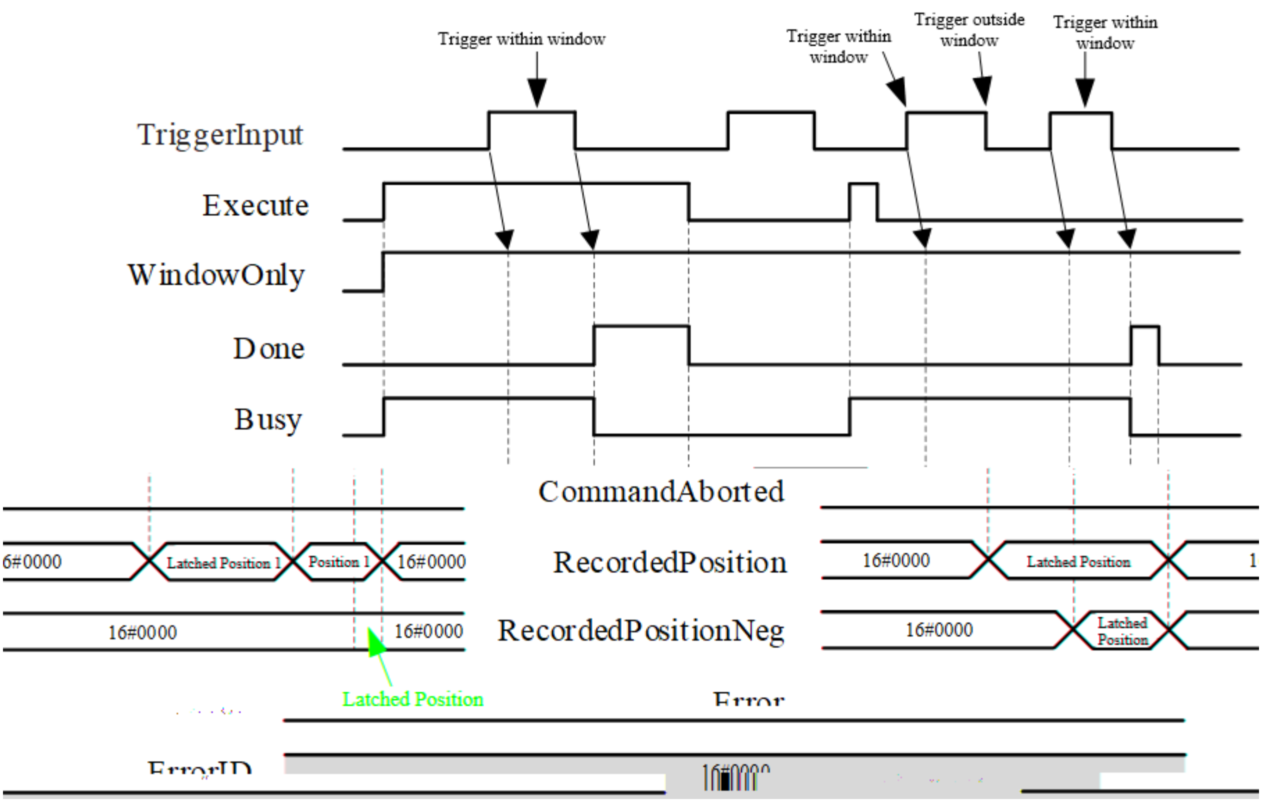


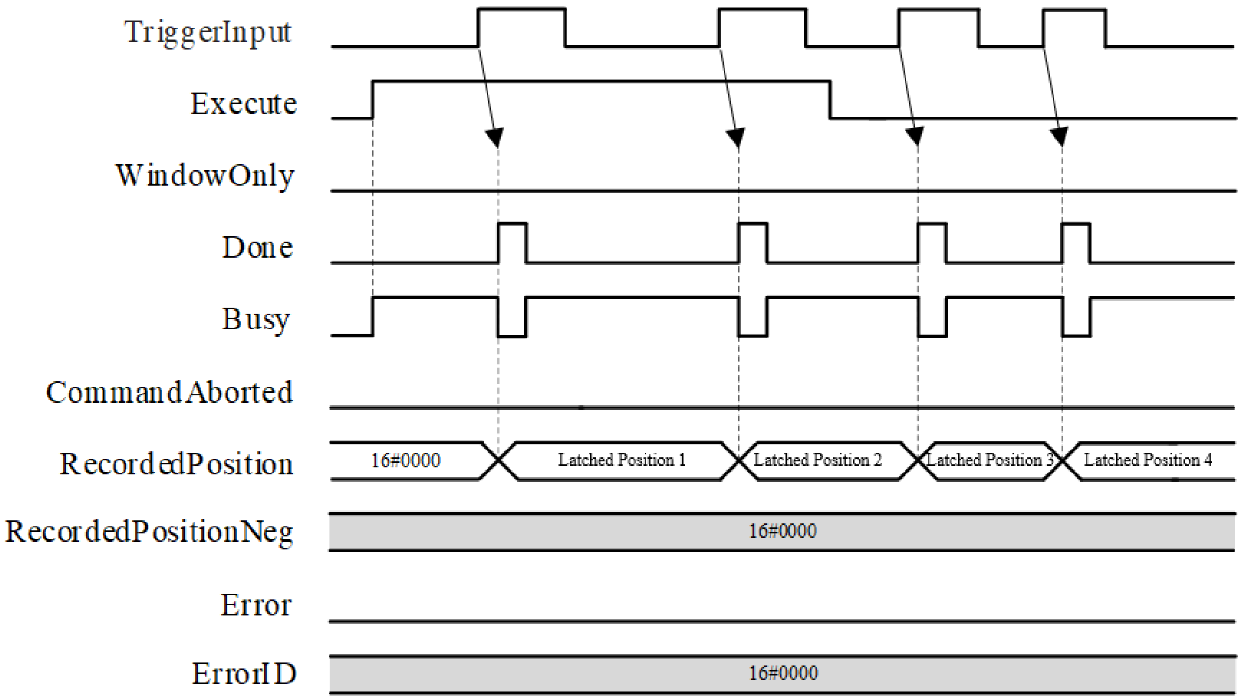


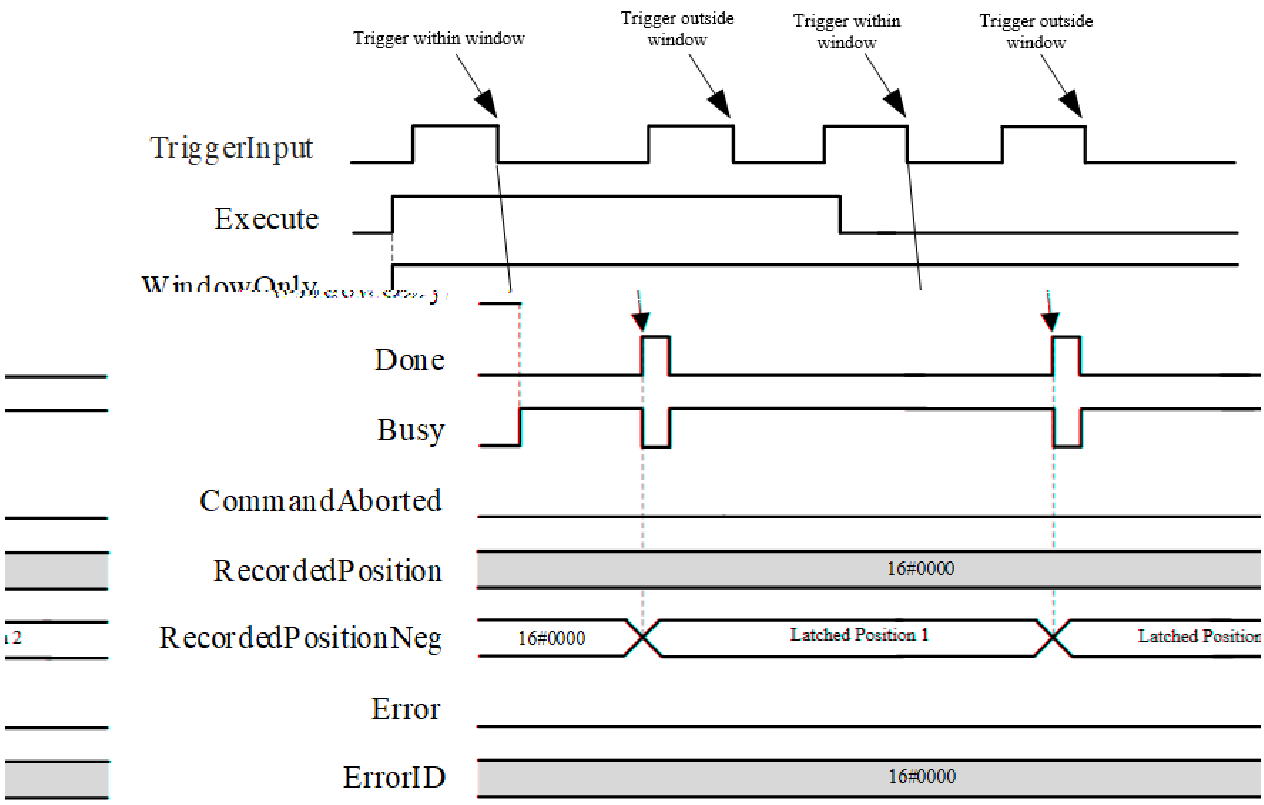

Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPosition
RecordedPositionNeg
Error
ErrorID
Latched Position
16#0000

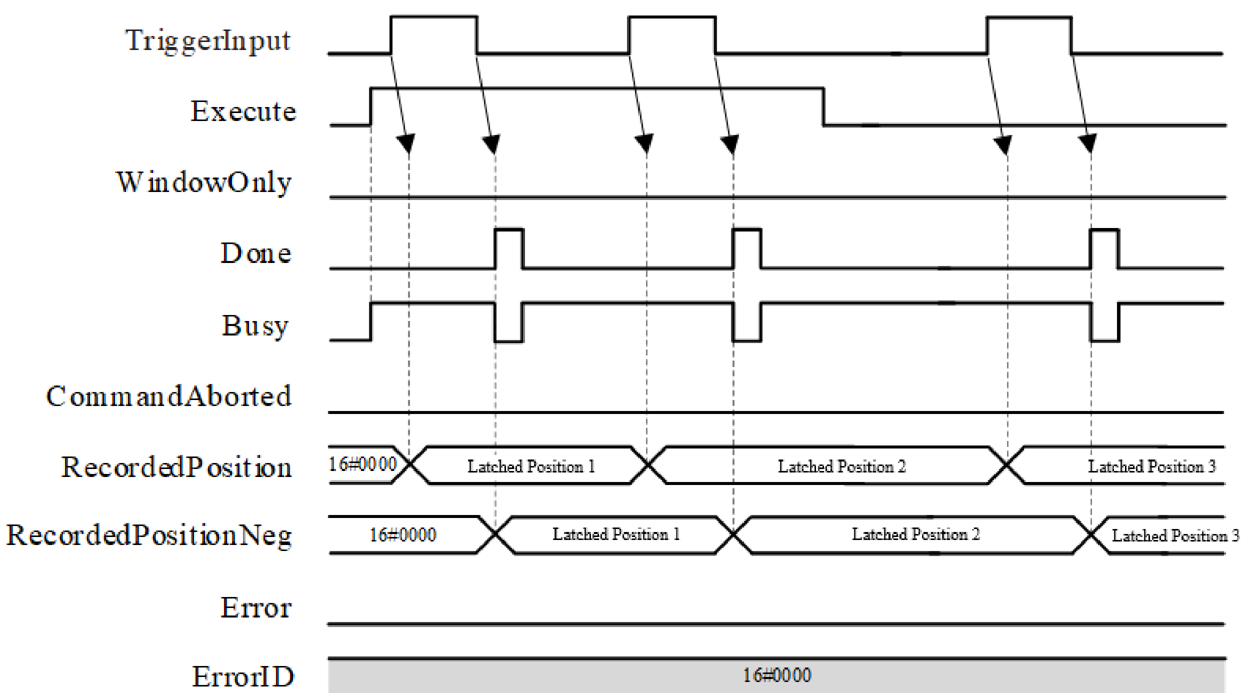

Trigger within window
Trigger within window
Trigger outside window
TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPositionNeg
RecordedPosition
Error
ErrorID
16#0000
Latched Position
16#0000
Latched Position
16#0000
16#0000

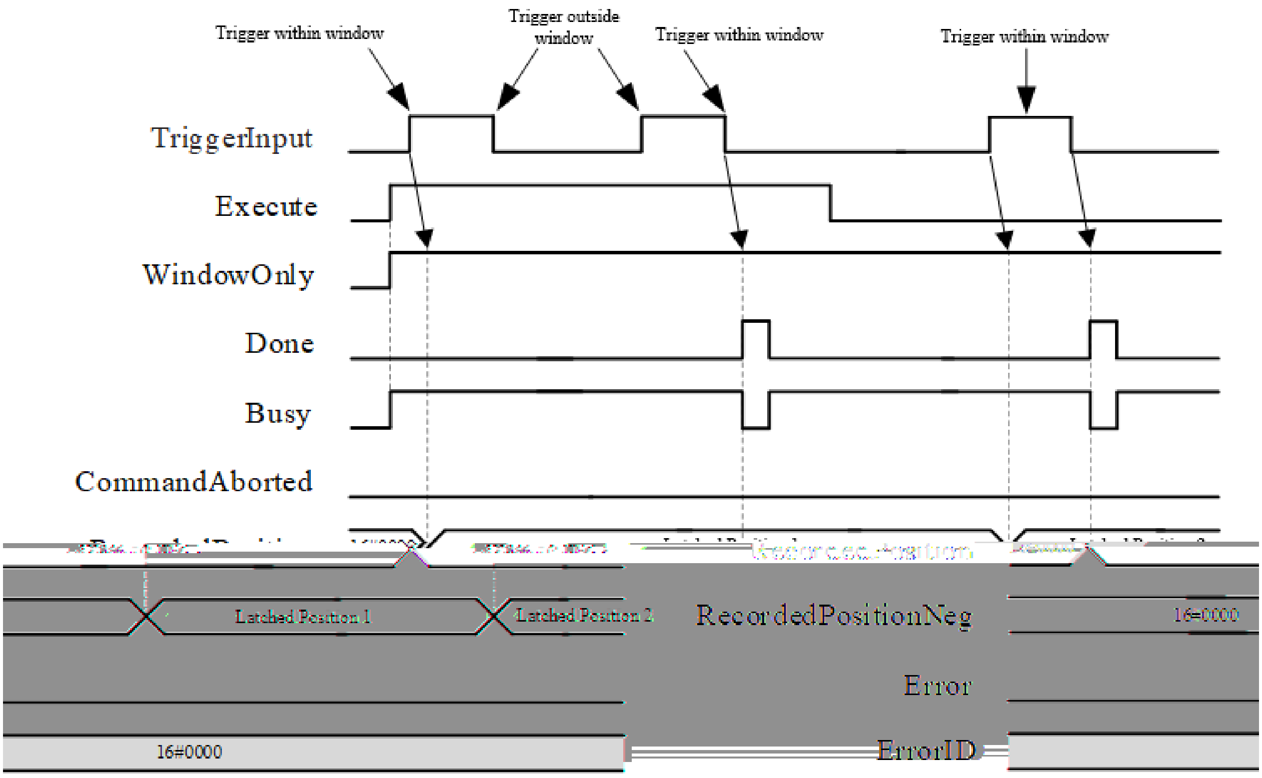

TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPosition
16#0000
Latched Position
16#0000
Latched Position
16#0000
RecordedPositionNeg
16#0000
16#0000
16#0000
Latched Position
Error
ErrorID
16#0000


Trigger within window
Trigger within window
Trigger outside window
Trigger within window
TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPosition
16#0000
Latched Position 1
Position 1
16#0000
16#0000
Latched Position
RecordedPositionNeg
16#0000
16#0000
16#0000
Latched Position
Latched Position
Error
ErrorID

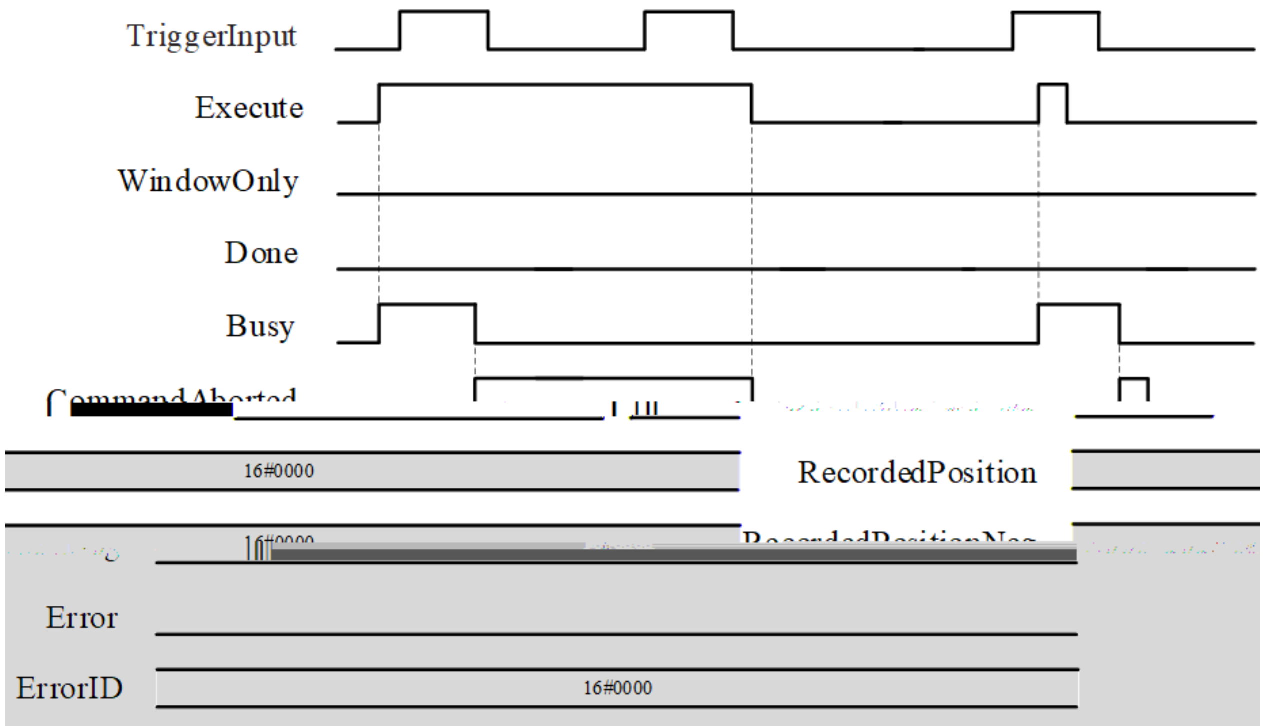

TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPosition
16#0000
Latched Position 1
Latched Position 2
Latched Position 3
Latched Position 4
RecordedPositionNeg
16#0000
Error
ErrorID
16#0000


Trigger within window
Trigger outside window
Trigger within window
Trigger outside window
TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPosition
16#0000
RecordedPositionNeg
16#0000
Latched Position 1
Error
ErrorID
16#0000

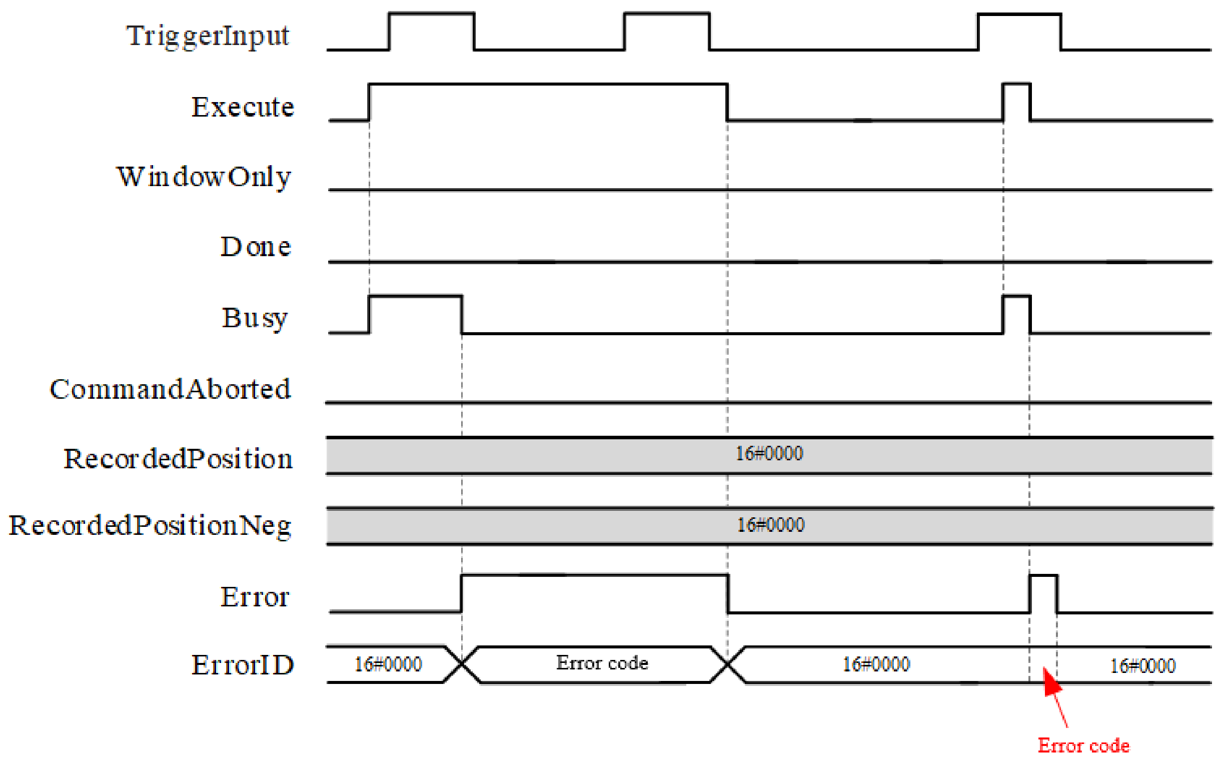

TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
RecordedPosition
16#0000
Latched Position 1
Latched Position 2
Latched Position 3
RecordedPositionNeg
16#0000
Latched Position 1
Latched Position 2
Latched Position 3
Error
ErrorID
16#0000



Trigger within window
Trigger outside window
Trigger within window
Trigger within window
TriggerInput
Execute
WindowOnly
Done
Busy
CommandAborted
Latched Position 1
Latched Position 2
RecordedPositionNeg
16#0000
Error
ErrorID
16#0000

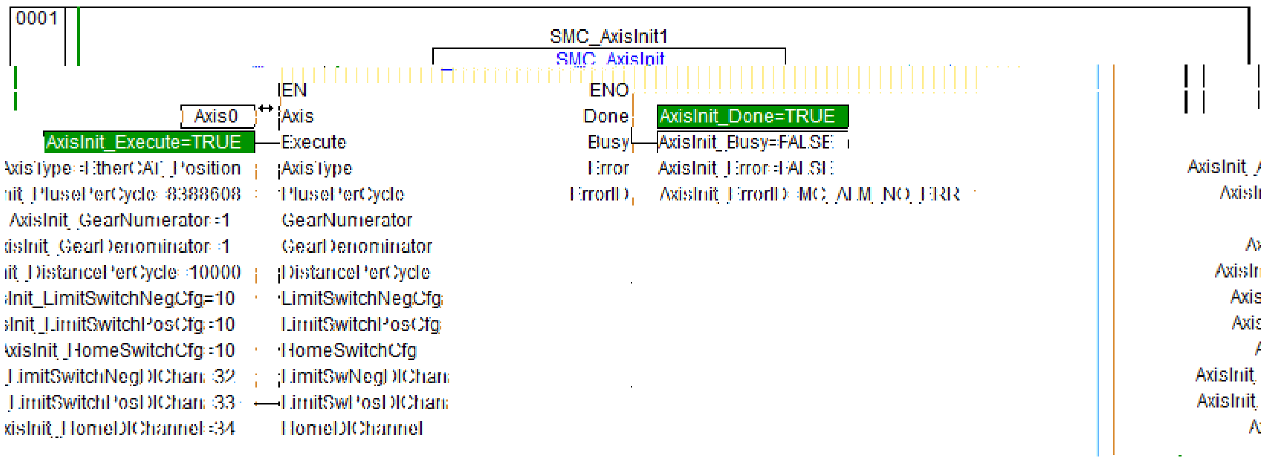


TriggerInput
Execute
WindowOnly
Done
Busy
RecordedPosition
16#0000
Error
ErrorID
16#0000

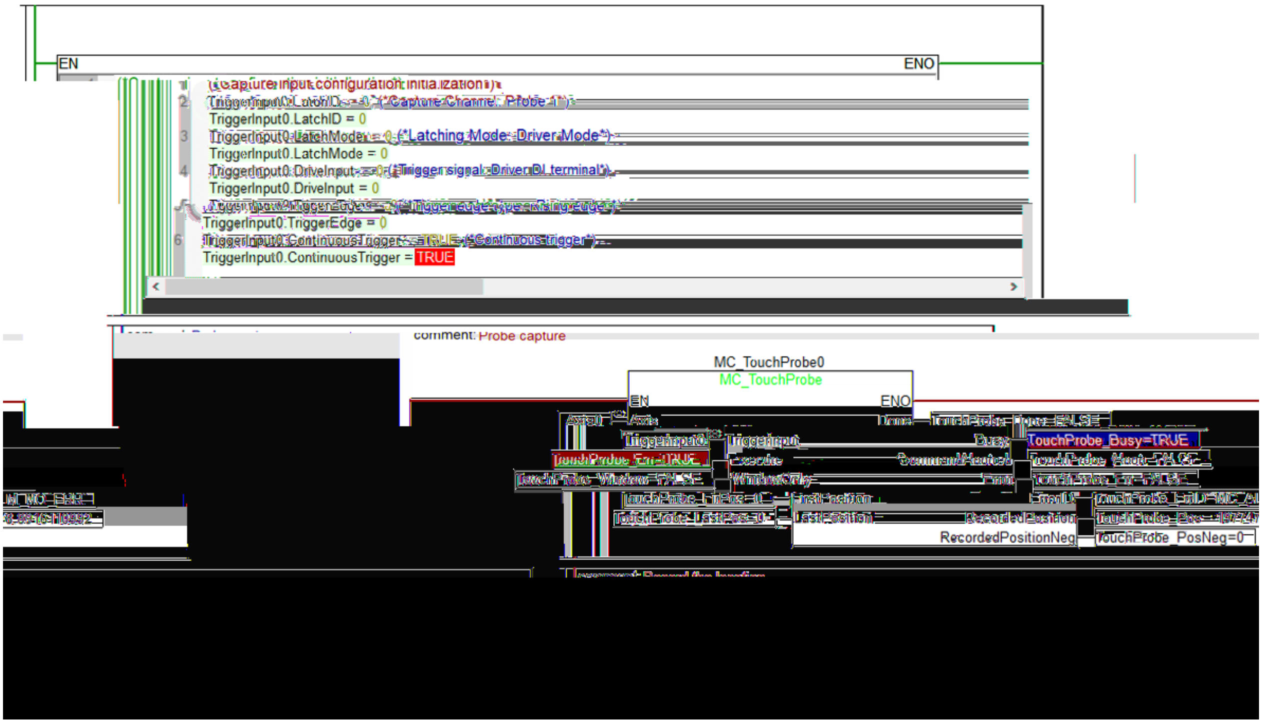


5.25.3 Examples

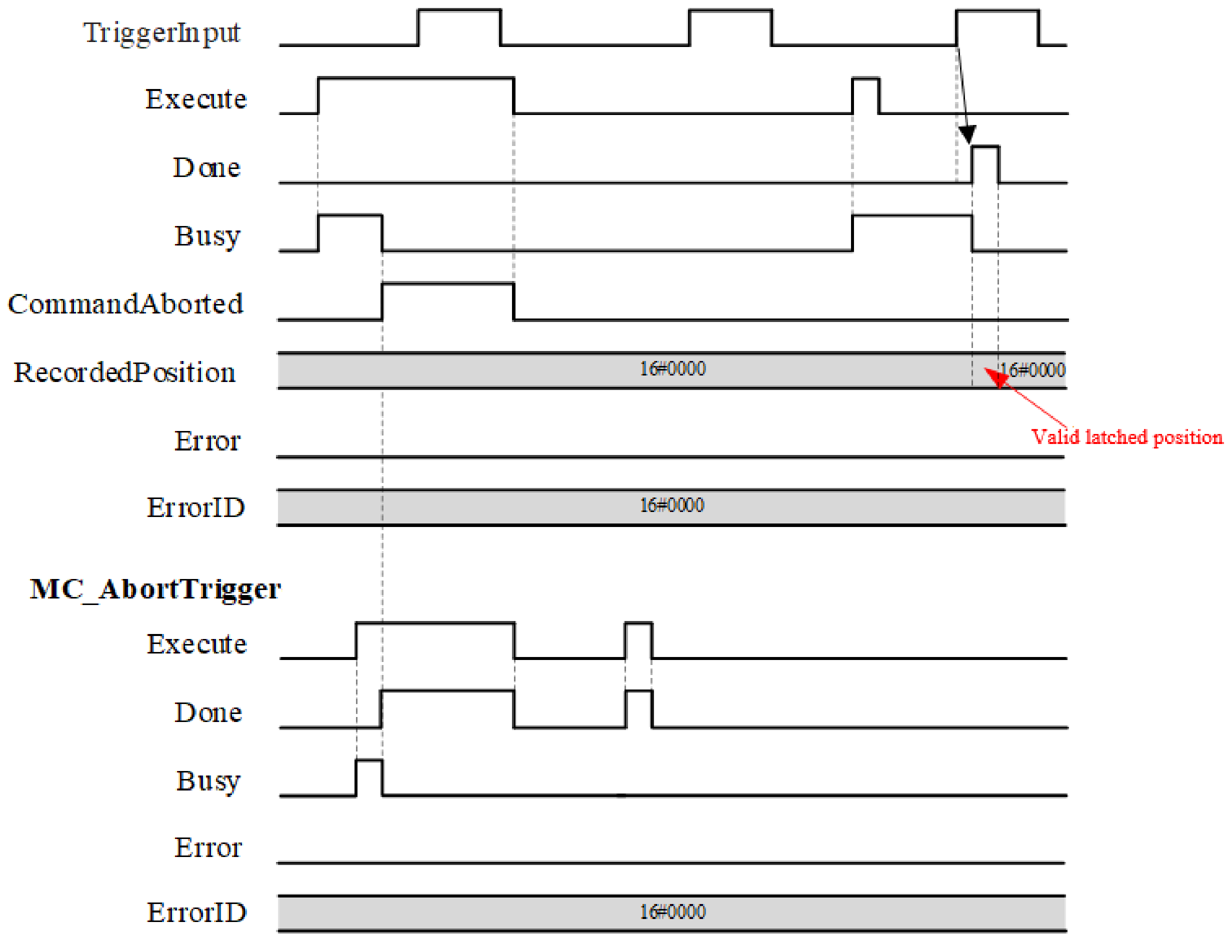
No.	Variable Name	Variable Type	Initial Value	

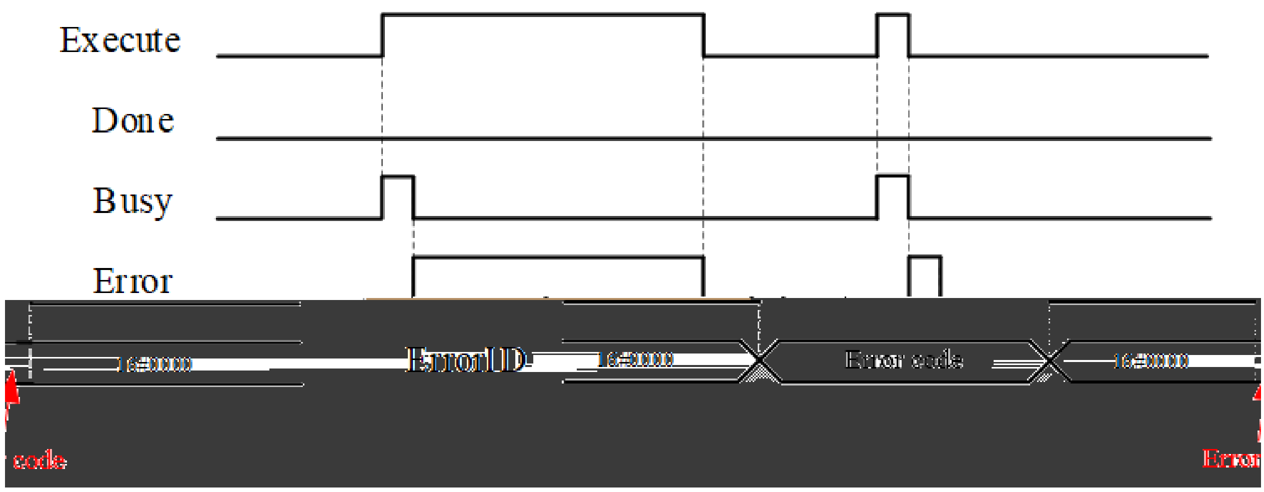


0001
SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
AxisInit_Done=TRUE
AxisInit_Execute=TRUE
Execute
Busy
AxisInit_Busy=FALSE
AxisType
Error
PluselPerCycle
ErrorID
GearNumerator
GearDenominator
DistancePerCycle
LimitSwitchNegCfg
LimitSwitchPosCfg
HomeSwitchCfg
HomeDIChannel


EN
ENO
TriggerInput0.LatchID = 0
TriggerInput0.LatchMode = 0
TriggerInput0.DriveInput = 0
TriggerInput0.TriggerEdge = 0
TriggerInput0.ContinuousTrigger = TRUE
comment: Probe capture
MC_TouchProbe0
MC_TouchProbe
EN
ENO
TouchProbe_Busy=TRUE
RecordedPositionNeg
TouchProbe_PosNeg=0

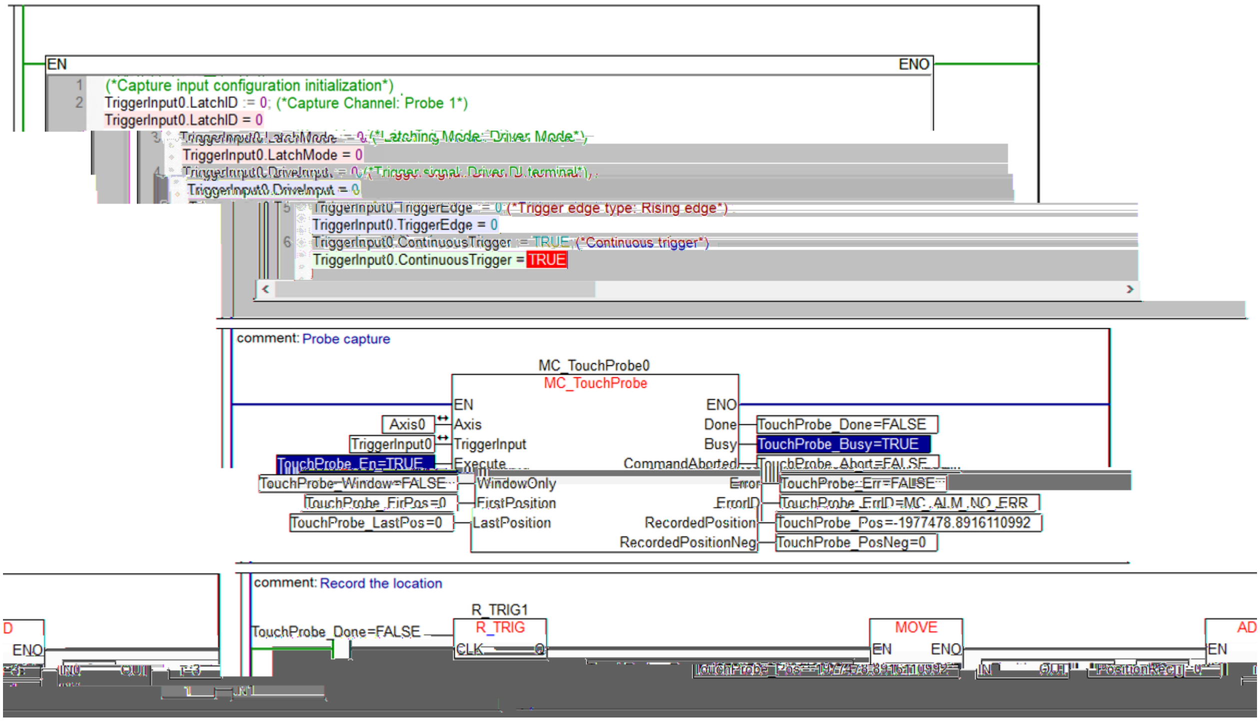
5.26.2 Functions

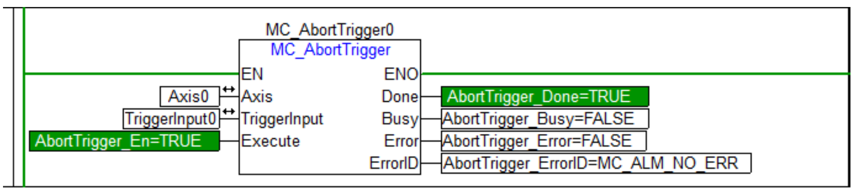




5.26.3 Examples

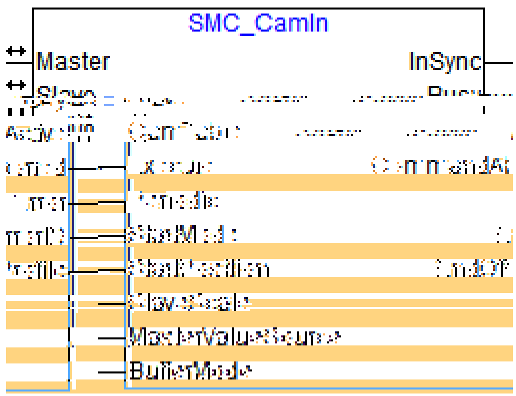
No.	Variable Name	Variable Type	Initial Value	Variable Description
				[redacted]


(*Capture input configuration initialization*)
TriggerInput0.LatchID := 0; (*Capture Channel: Probe 1*)
TriggerInput0.LatchMode := 0; (*Latching Mode: Driver Mode*)
TriggerInput0.DriveInput := 0; (*Trigger signal: Driver DI terminal*)
TriggerInput0.TriggerEdge := 0; (*Trigger edge type: Rising edge*)
TriggerInput0.ContinuousTrigger := TRUE; (*Continuous trigger*)
comment: Probe capture
MC_TouchProbe0
MC_TouchProbe
comment: Record the location
R_TRIG1
R_TRIG
MOVE


MC_AbortTrigger0
MC_AbortTrigger
Axis0
TriggerInput0
AbortTrigger_En=TRUE
AbortTrigger_Done=TRUE
AbortTrigger_Busy=FALSE
AbortTrigger_Error=FALSE
AbortTrigger_ErrorID=MC_ALM_NO_ERR

Chapter 6　Synchronous Motion Instructions

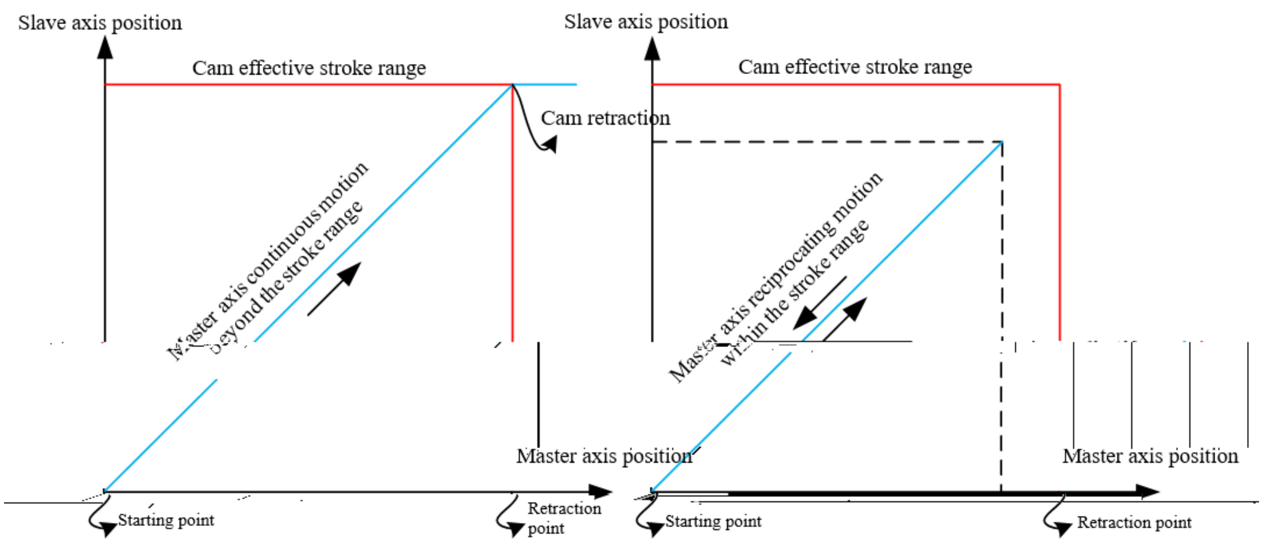
6.1　SMC_CamIn (Electronic CAM)



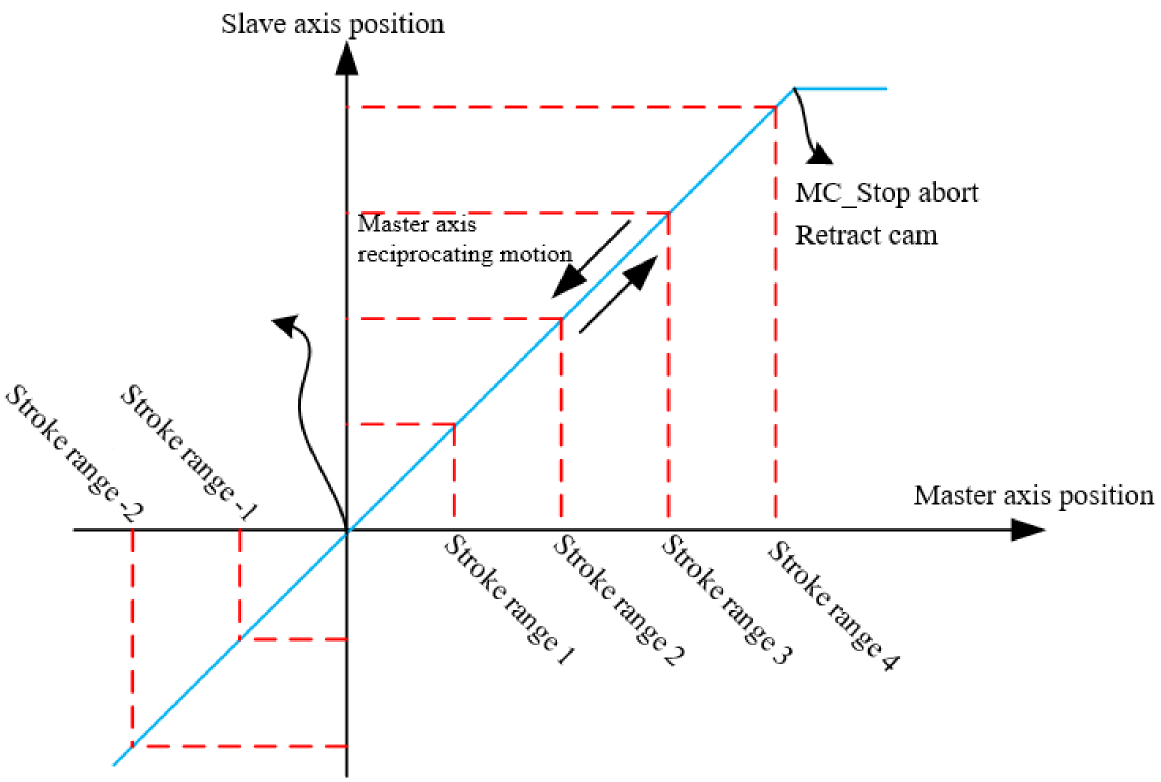
6.1.1 Parameter

Command Parameters

Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type



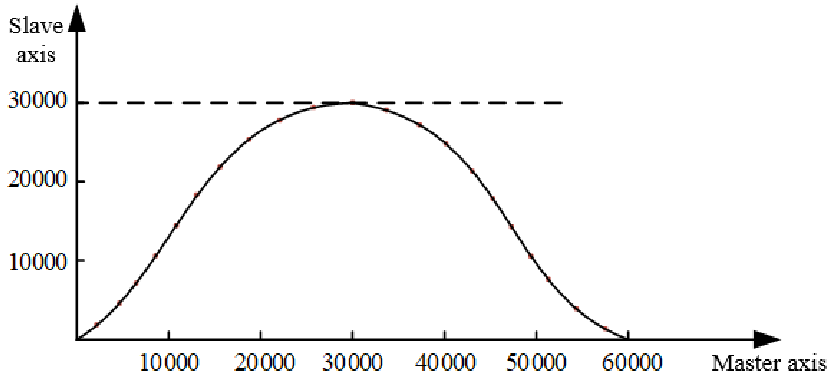
Cyclic immediate start of cam-synchronized master and slave axis motion trajectory



Cyclic immediate start of cam-synchronized Master and slave axis motion trajectory

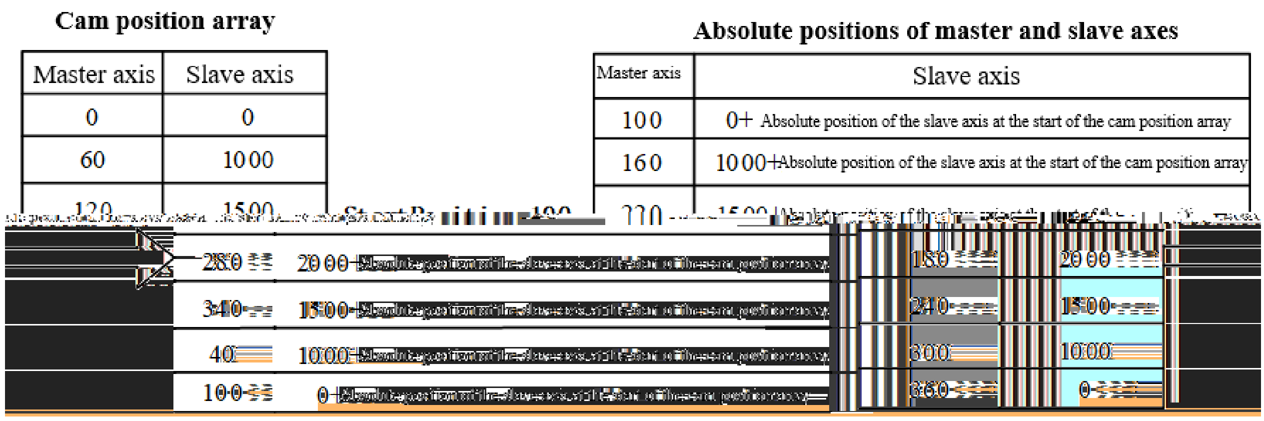
Cam table

Master axis	Slave axis
0	0
10000	12000
20000	21000
30000	30000
40000	25000
50000	11000
60000	0



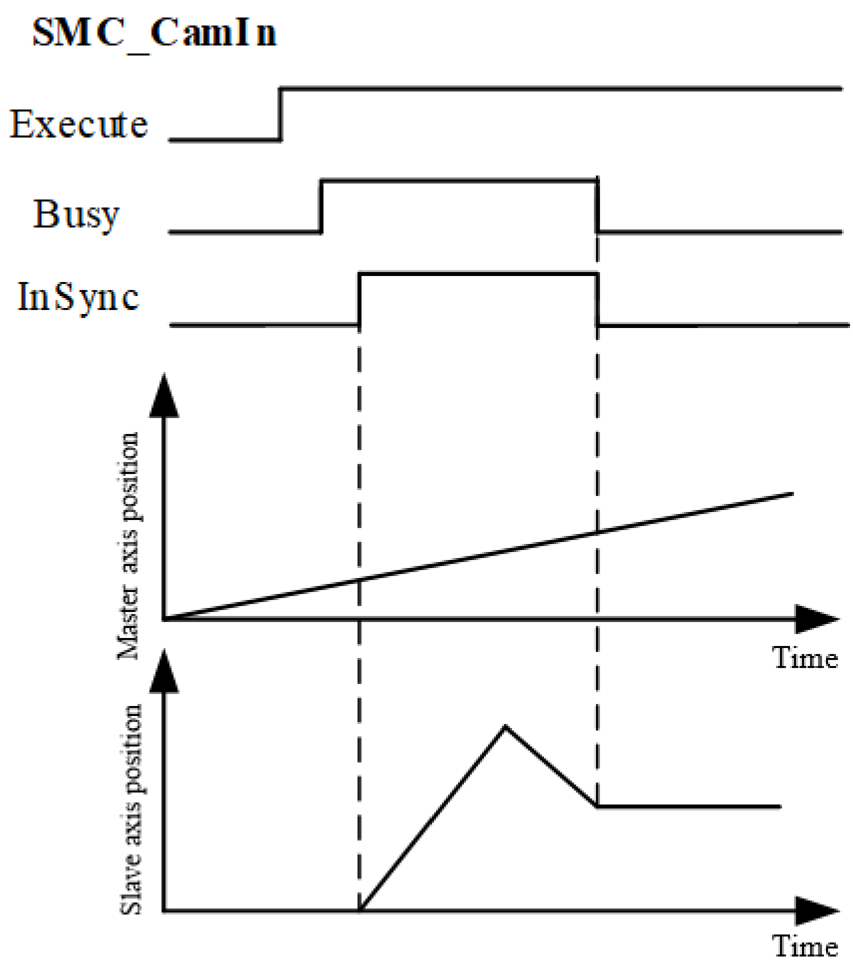
□

Cam activation mode is 0: start at fixed position.

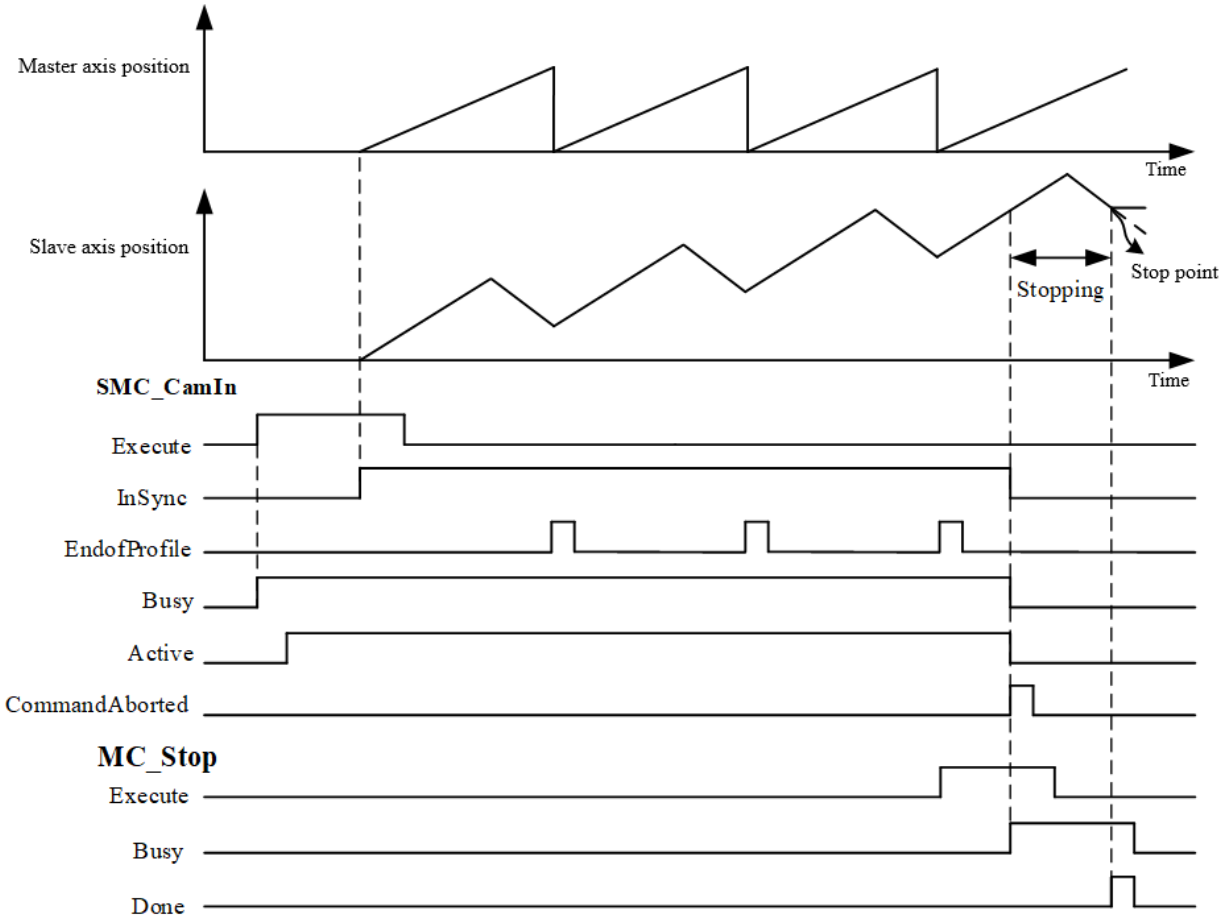


□

The cam start mode is 10: immediate start



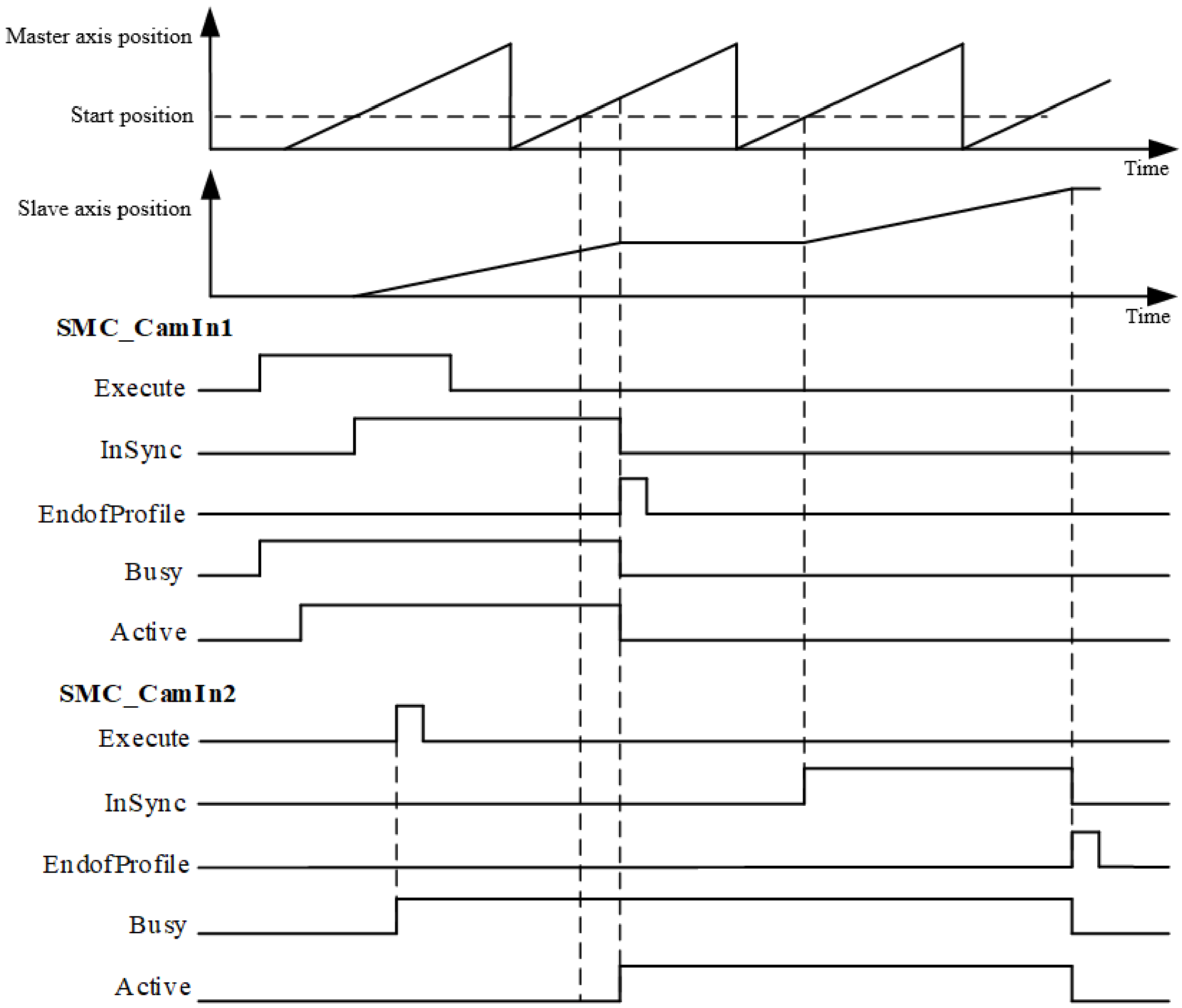
□

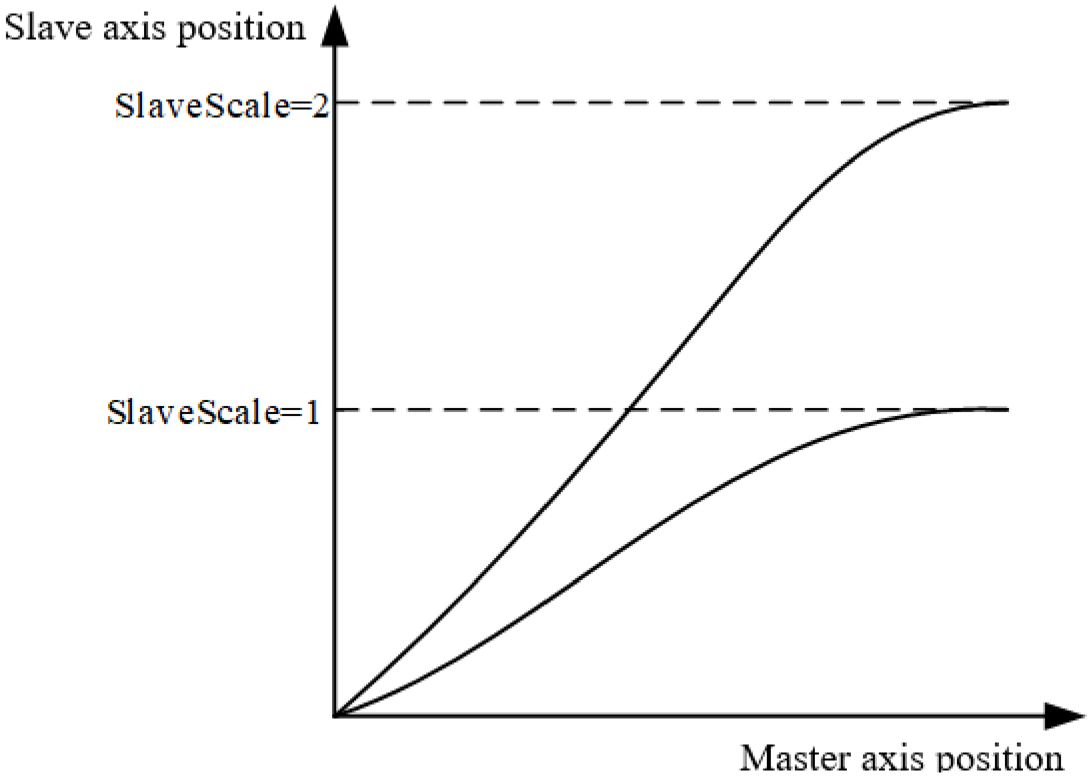


Master axis position
Time
Slave axis position
Stopping
Stop point
Time
SMC_CamIn
Execute
InSync
EndofProfile
Busy
Active
CommandAborted
MC_Stop
Execute
Busy
Done

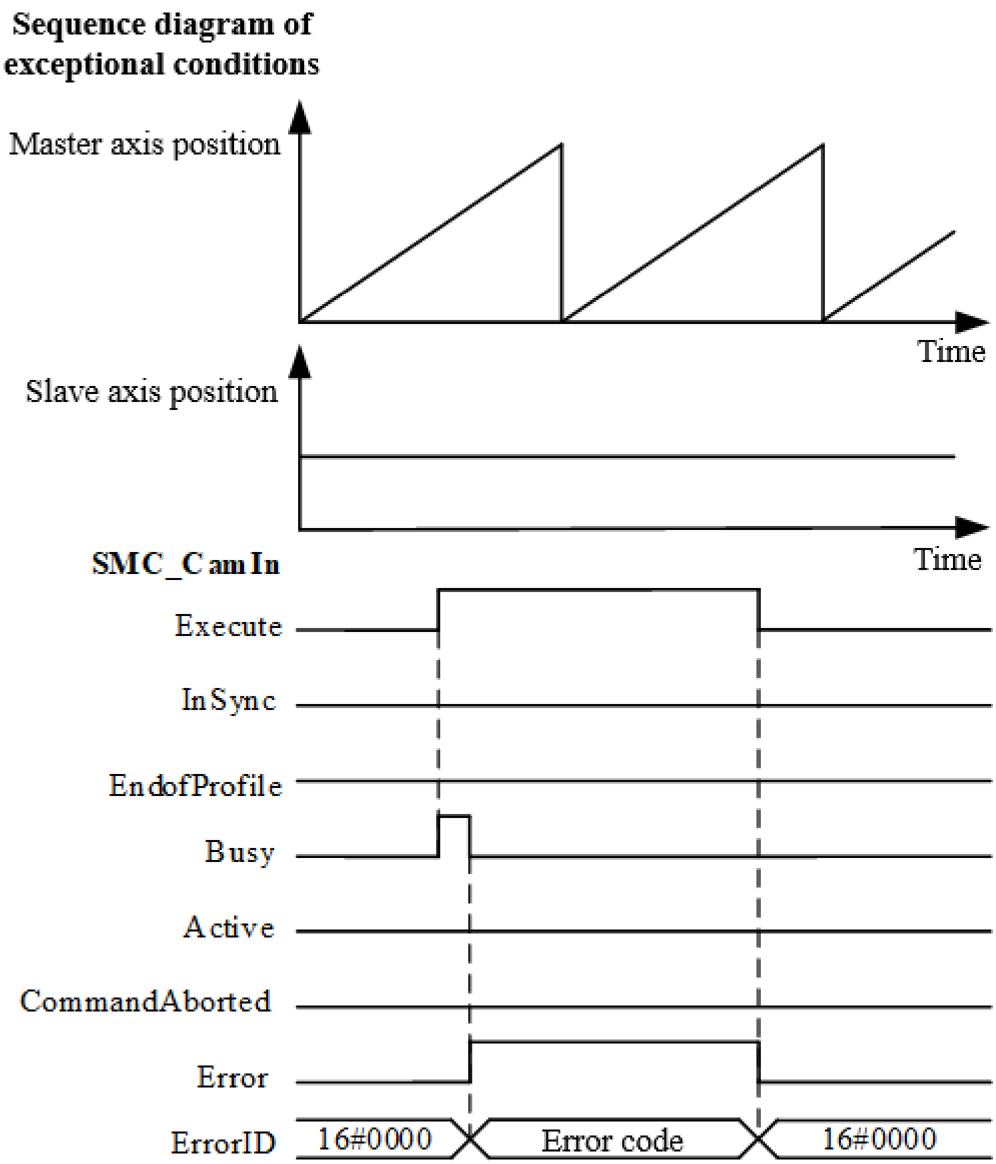
□

□


Master axis position
Start position
Time
Slave axis position
Time
SMC_CamIn1
Execute
InSync
EndofProfile
Busy
Active
SMC_CamIn2
Execute
InSync
EndofProfile
Busy
Active

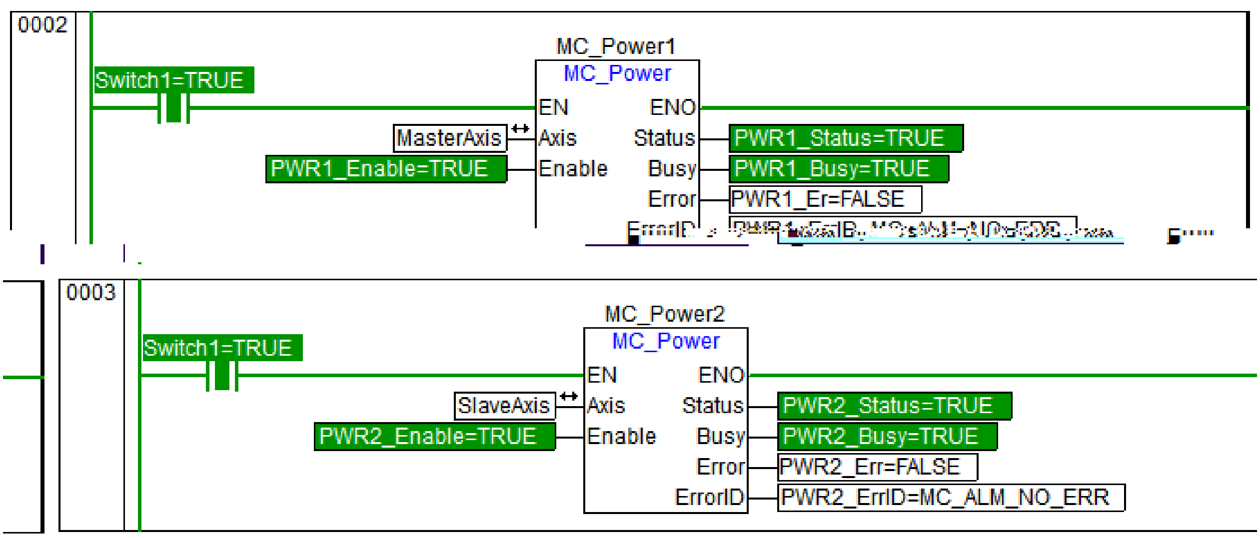


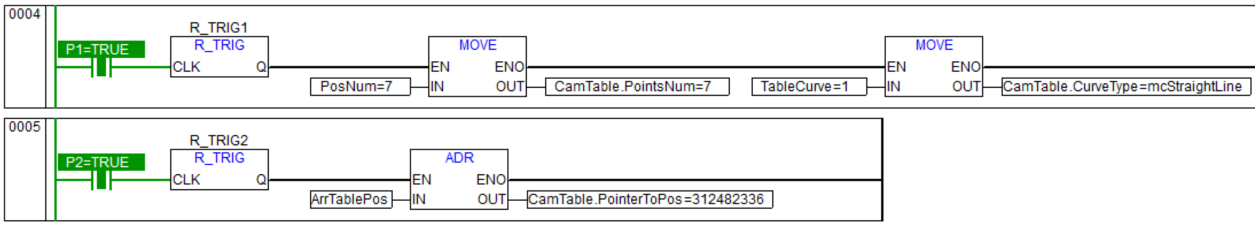
Slave camshaft position data scale factor (SlaveScale)

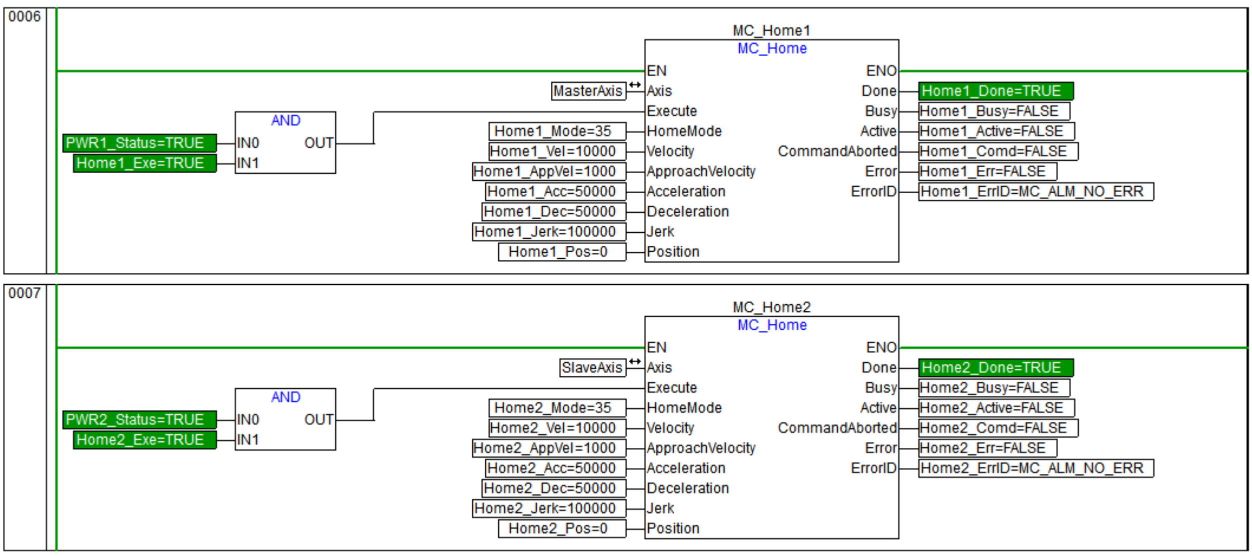

Sequence diagram of exceptional conditions
Master axis position
Time
Slave axis position
Time
SMC_CamIn
Execute
InSync
EndofProfile
Busy
Active
CommandAborted
Error
ErrorID
16#0000
Error code
16#0000

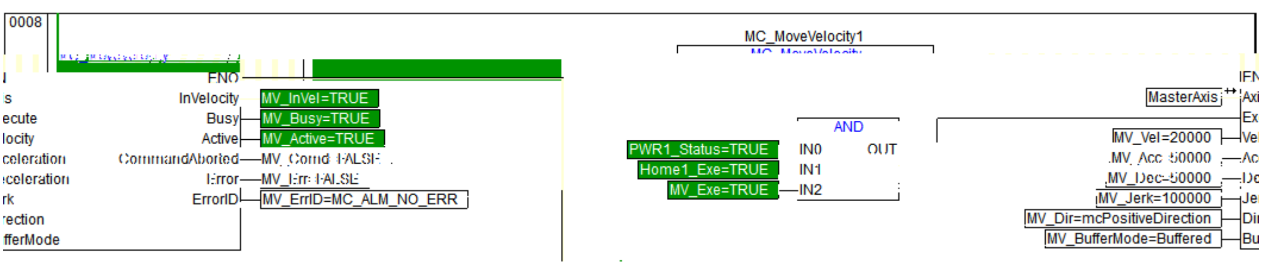
6.1.3 Example

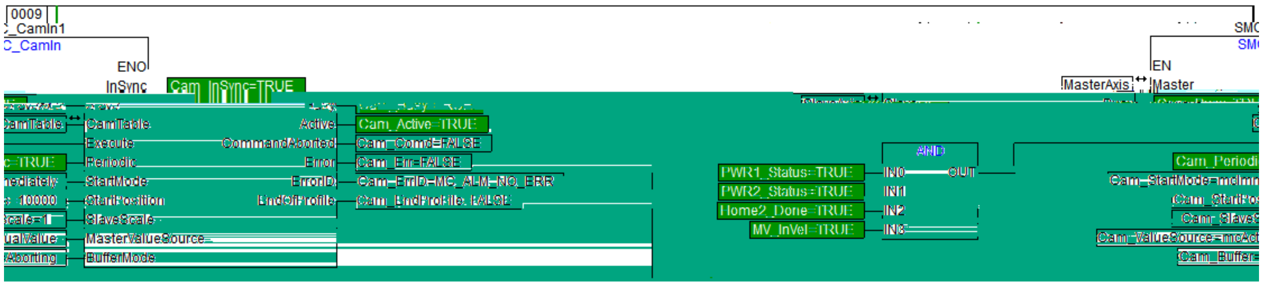
Variable Name	Variable Type	Initial Value	Notes

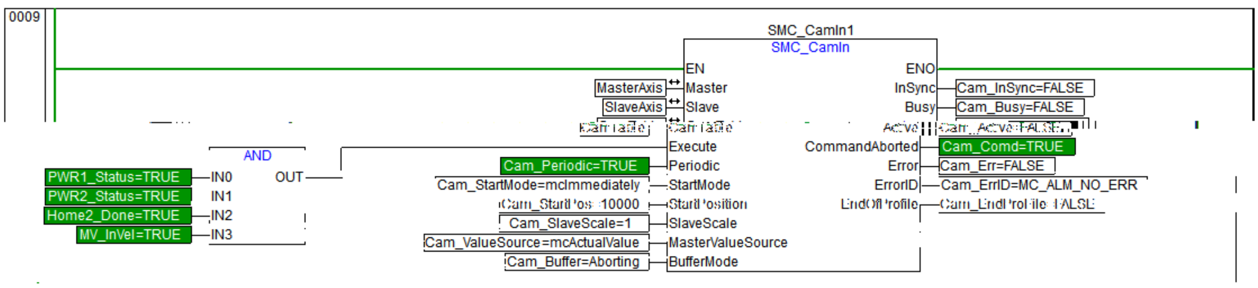


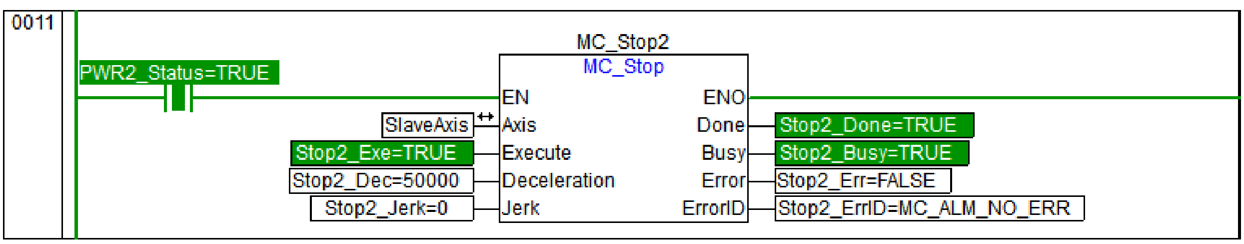

0004
R_TRIG1
R_TRIG
P1=TRUE
CLK
Q
MOVE
EN
ENO
PosNum=7
IN
OUT
CamTable.PointsNum=7
MOVE
EN
ENO
TableCurve=1
IN
OUT
CamTable.CurveType=mcStraightLine
0005
R_TRIG2
R_TRIG
P2=TRUE
CLK
Q
ADR
EN
ENO
ArrTablePos
IN
OUT
CamTable.PointerToPos=312482336

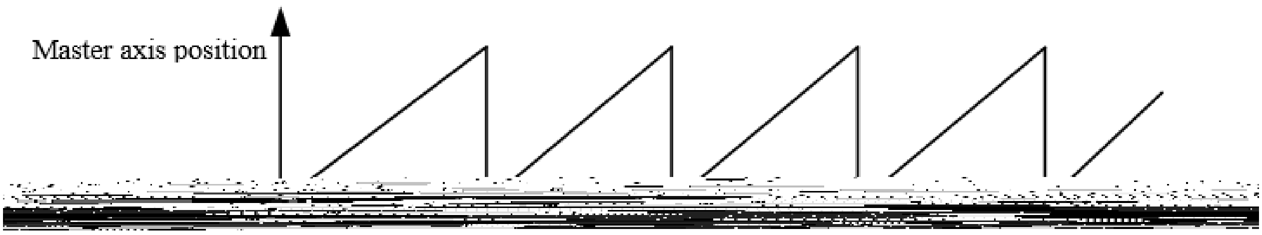

0006
MC_Home1
MC_Home
EN
ENO
MasterAxis
Axis
Done
Home1_Done=TRUE
AND
Execute
Busy
Home1_Busy=FALSE
PWR1_Status=TRUE
IN0
OUT
Home1_Mode=35
HomeMode
Active
Home1_Active=FALSE
Home1_Exe=TRUE
IN1
Home1_Vel=10000
Velocity
CommandAborted
Home1_Comd=FALSE
Home1_AppVel=1000
ApproachVelocity
Error
Home1_Err=FALSE
Home1_Acc=50000
Acceleration
ErrorID
Home1_ErrID=MC_ALM_NO_ERR
Home1_Dec=50000
Deceleration
Home1_Jerk=100000
Jerk
Home1_Pos=0
Position
0007
MC_Home2
MC_Home
EN
ENO
SlaveAxis
Axis
Done
Home2_Done=TRUE
AND
Execute
Busy
Home2_Busy=FALSE
PWR2_Status=TRUE
IN0
OUT
Home2_Mode=35
HomeMode
Active
Home2_Active=FALSE
Home2_Exe=TRUE
IN1
Home2_Vel=10000
Velocity
CommandAborted
Home2_Comd=FALSE
Home2_AppVel=1000
ApproachVelocity
Error
Home2_Err=FALSE
Home2_Acc=50000
Acceleration
ErrorID
Home2_ErrID=MC_ALM_NO_ERR
Home2_Dec=50000
Deceleration
Home2_Jerk=100000
Jerk
Home2_Pos=0
Position

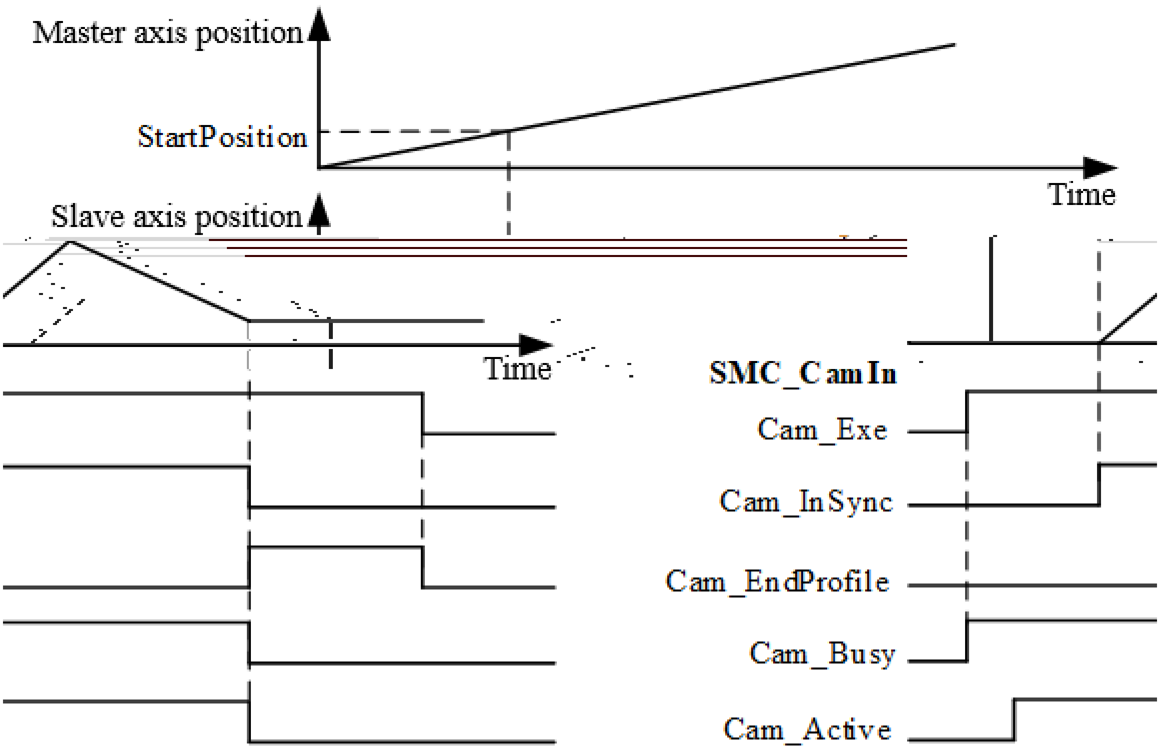

0008
MC_MoveVelocity1
ENO
InVelocity
MV_InVel=TRUE
Busy
MV_Busy=TRUE
Active
MV_Active=TRUE
CommandAborted
Error
ErrorID
MV_ErrID=MC_ALM_NO_ERR
MasterAxis
AND
PWR1_Status=TRUE
IN0
OUT
Home1_Exe=TRUE
IN1
MV_Exe=TRUE
IN2
MV_Vel=20000
MV_Jerk=100000
MV_Dir=mcPositiveDirection
MV_BufferMode=Buffered




0009
SMC_CamIn1
SMC_CamIn
EN
ENO
MasterAxis
Master
InSync
Cam_InSync=FALSE
SlaveAxis
Slave
Busy
Cam_Busy=FALSE
Execute
CommandAborted
Cam_Comd=TRUE
Cam_Periodic=TRUE
Periodic
Error
Cam_Err=FALSE
Cam_StartMode=mcImmediately
StartMode
ErrorID
Cam_ErrID=MC_ALM_NO_ERR
Cam_SlaveScale=1
SlaveScale
Cam_ValueSource=mcActualValue
MasterValueSource
Cam_Buffer=Aborting
BufferMode
AND
PWR1_Status=TRUE
IN0
OUT
PWR2_Status=TRUE
IN1
Home2_Done=TRUE
IN2
MV_InVel=TRUE
IN3

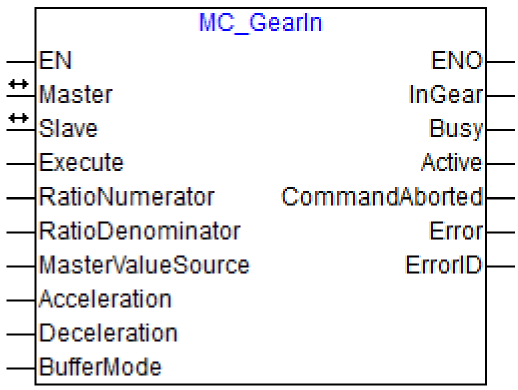

0011
MC_Stop2
MC_Stop
PWR2_Status=TRUE
EN
ENO
SlaveAxis
Axis
Done
Stop2_Done=TRUE
Stop2_Exe=TRUE
Execute
Busy
Stop2_Busy=TRUE
Stop2_Dec=50000
Deceleration
Error
Stop2_Err=FALSE
Stop2_Jerk=0
Jerk
ErrorID
Stop2_ErrID=MC_ALM_NO_ERR


Master axis position



6.1.4 Precautions

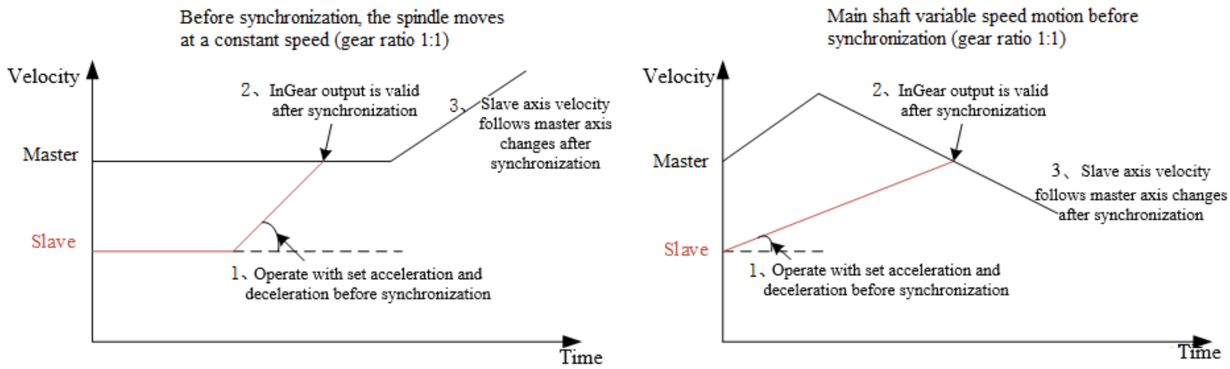
6.2 MC_GearIn (Electronic Gear)

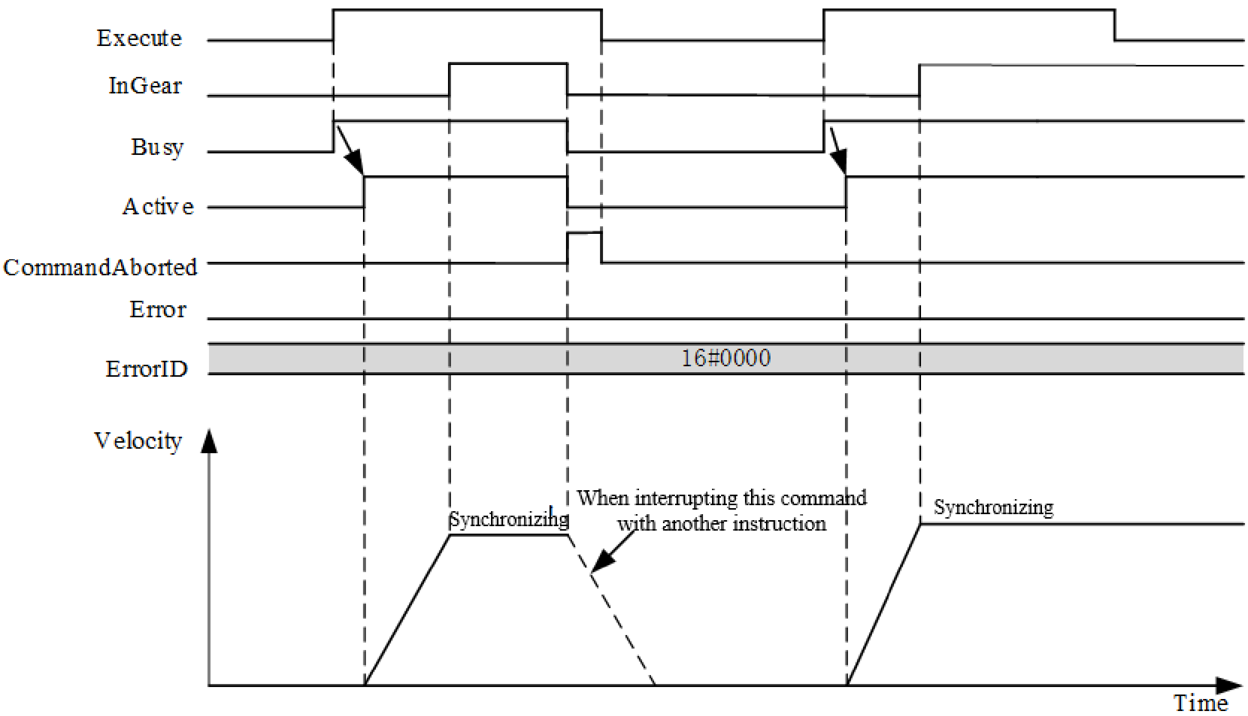


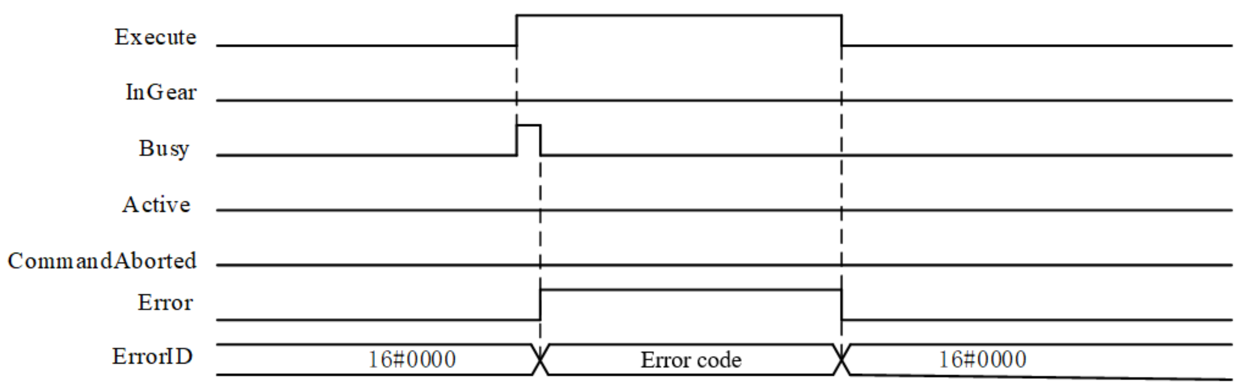
6.2.1 Parameter

Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

6.2.2 Functions

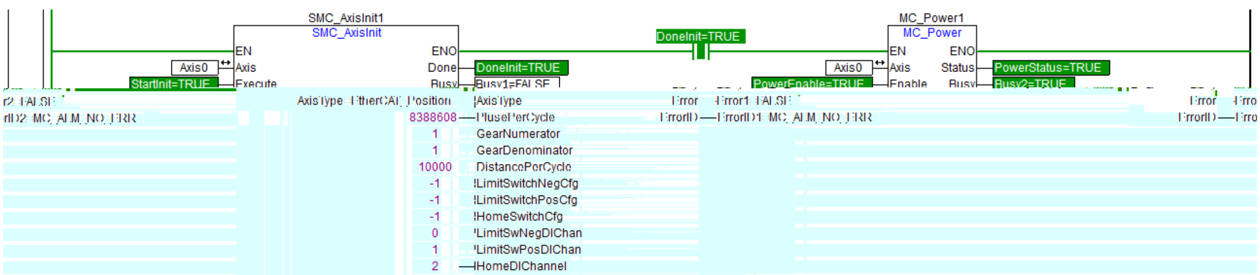


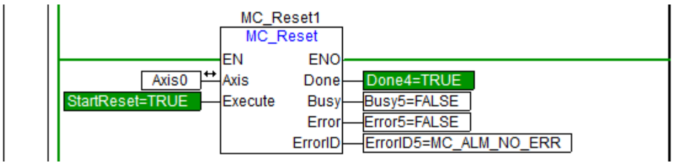




6.2.3 Examples

Name	Data Type	Initial Value	Notes

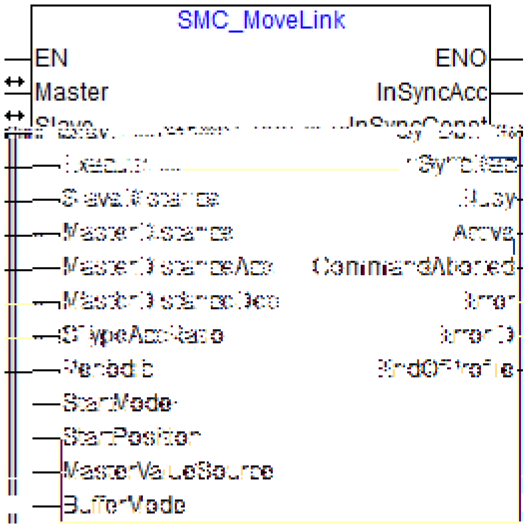

SMC_AxisInit1
SMC_AxisInit
EN
ENO
Axis0
Axis
Done
DoneInit=TRUE
StartInit=TRUE
Execute
Busy
Busy1=FALSE
AxisType
8388608
PlusePerCycle
1
GearNumerator
1
GearDenominator
10000
DistancePerCycle
-1
LimitSwitchNegCfg
-1
LimitSwitchPosCfg
-1
HomeSwitchCfg
0
LimitSwNegDIChan
1
LimitSwPosDIChan
2
HomeDIChannel
Error
ErrorID
DoneInit=TRUE
MC_Power1
MC_Power
EN
ENO
Axis0
Axis
Status
PowerStatus=TRUE
PowerEnable=TRUE
Enable
Busy
Busy2=TRUE
Error
ErrorID


MC_Reset1
MC_Reset
EN
ENO
Axis0
Axis
Done
Done4=TRUE
StartReset=TRUE
Execute
Busy
Busy5=FALSE
Error
Error5=FALSE
ErrorID
ErrorID5=MC_ALM_NO_ERR

6.2.4 Precautions

6.2.5 Reference

6.3 SMC_MoveLink (Flying Shear)



6.3.1 Parameter

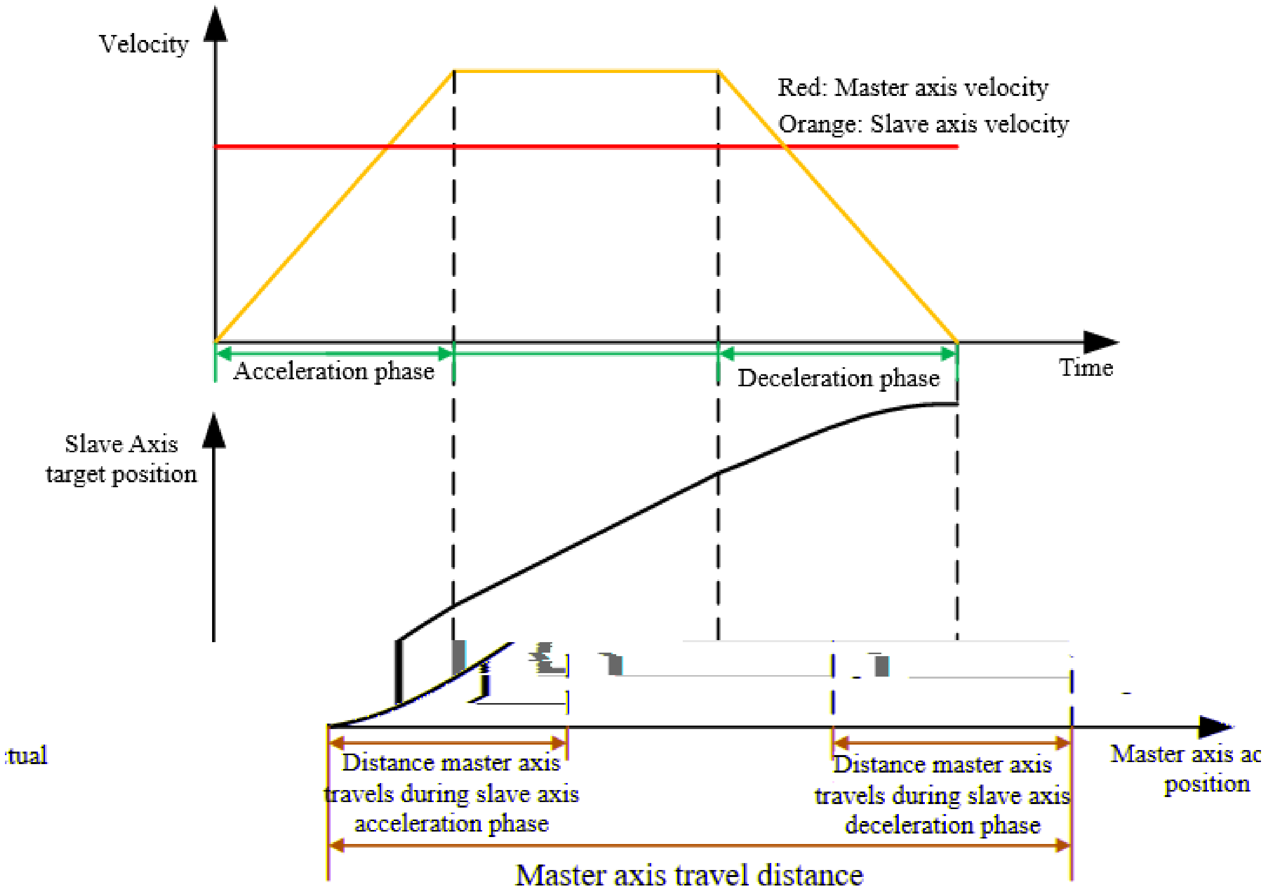
Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

6.3.2 Functions

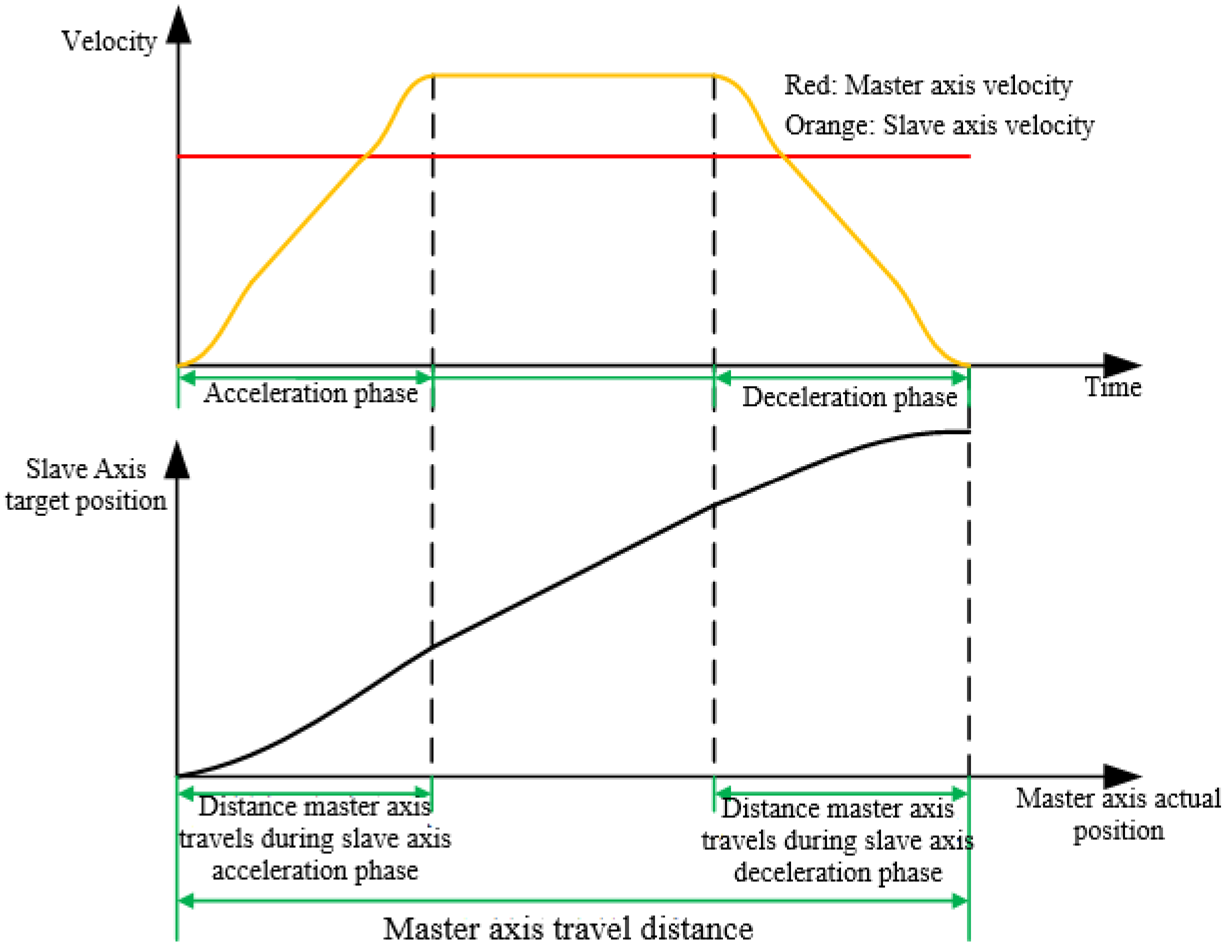
The command start mode is 0: start at fixed position.

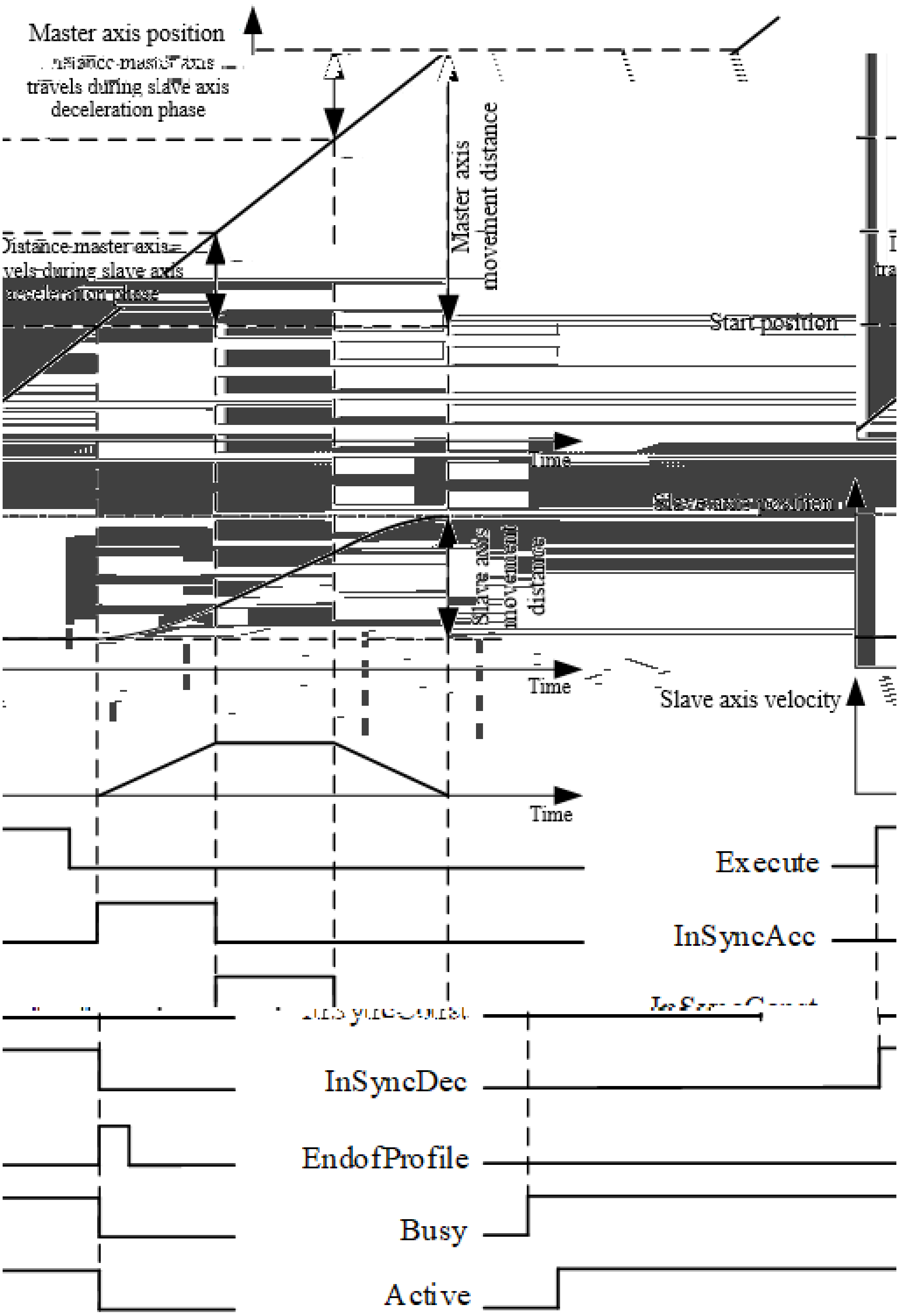
The command start mode is 10: immediate start.

The command start mode is 11: DI trigger start.

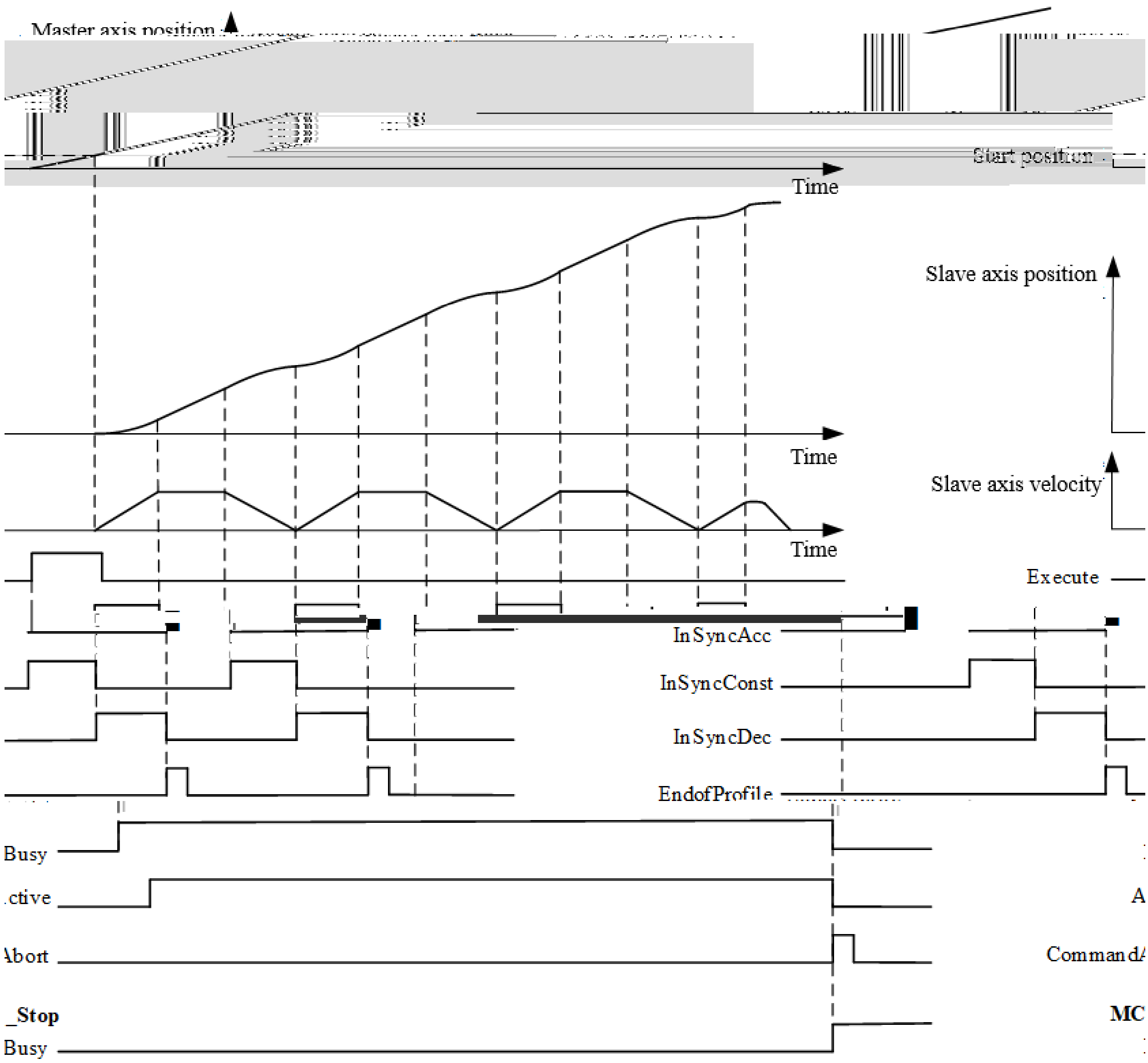


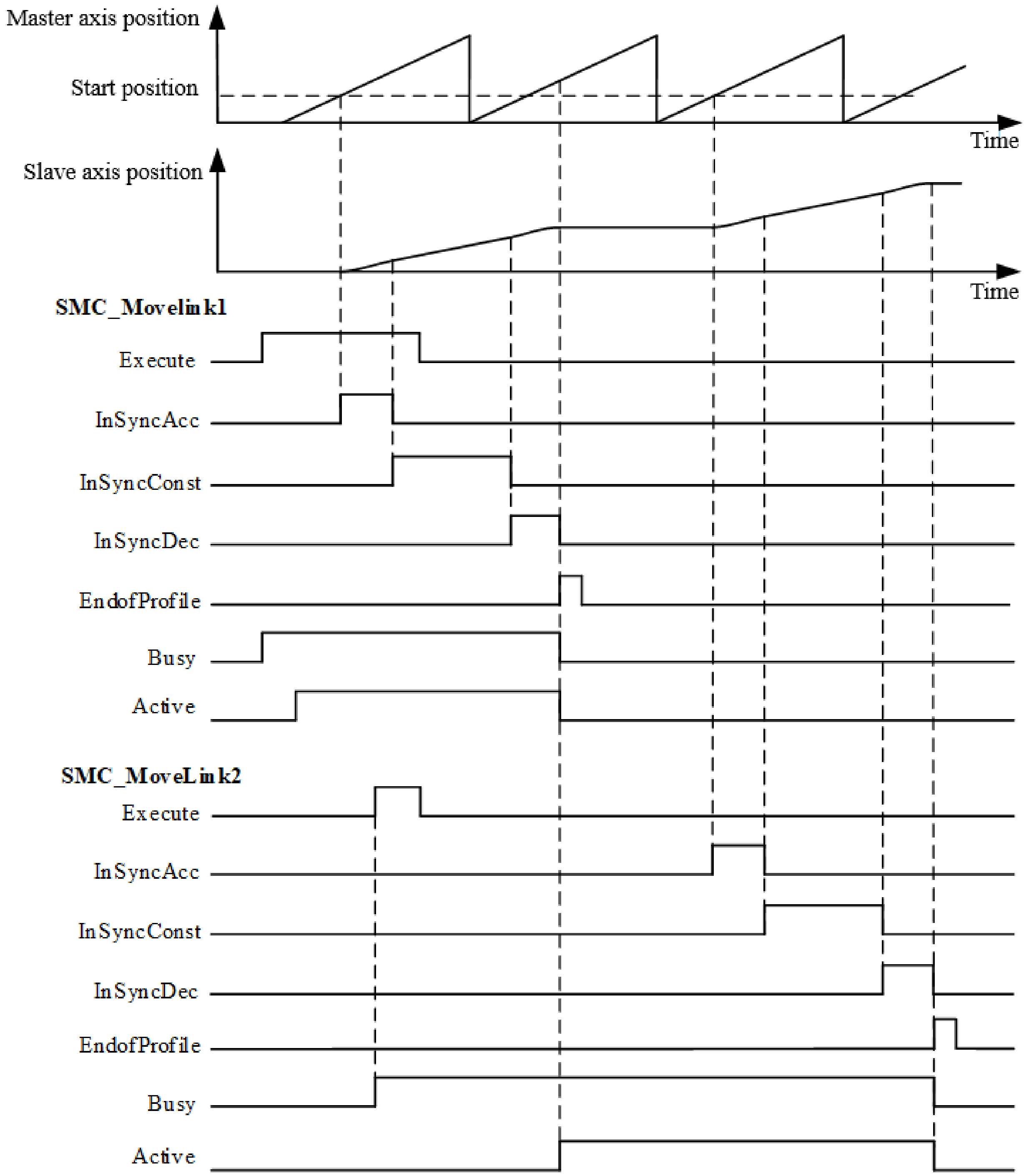
Velocity
Red: Master axis velocity
Orange: Slave axis velocity
Acceleration phase
Deceleration phase
Time
Slave Axis
target position
tual
Distance master axis
travels during slave axis
acceleration phase
Distance master axis
travels during slave axis
deceleration phase
Master axis ac
position
Master axis travel distance


Velocity
Red: Master axis velocity
Orange: Slave axis velocity
Acceleration phase
Deceleration phase
Time
Slave Axis target position
Distance master axis travels during slave axis acceleration phase
Distance master axis travels during slave axis deceleration phase
Master axis actual position
Master axis travel distance

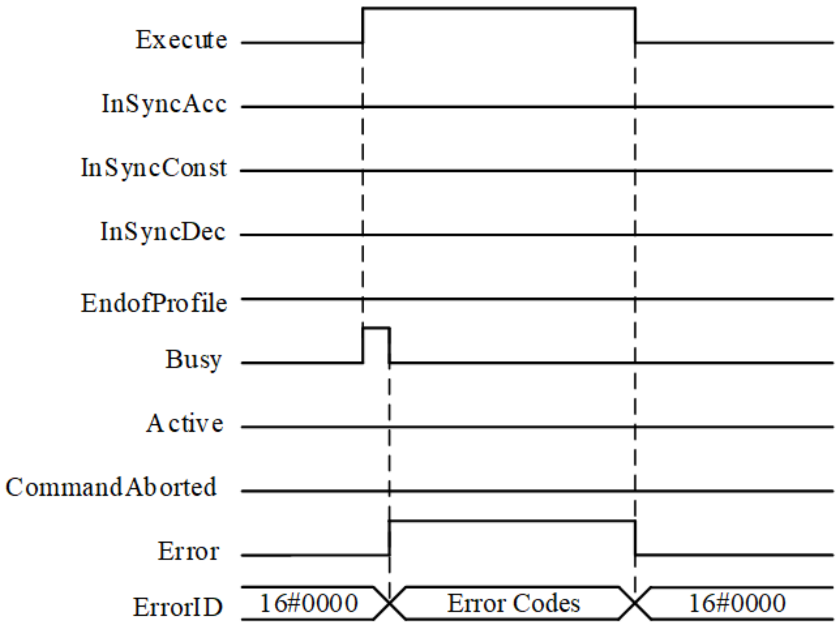

Master axis position
Distance master axis travels during slave axis deceleration phase
Master axis movement distance
Start position
Time
Slave axis position
Slave axis movement distance
Time
Slave axis velocity
Time
Execute
InSyncAcc
InSyncConst
InSyncDec
EndofProfile
Busy
Active

SMC_MoveLink




Master axis position
Start position
Time
Slave axis position
Time
SMC_Movelink1
Execute
InSyncAcc
InSyncConst
InSyncDec
EndofProfile
Busy
Active
SMC_MoveLink2
Execute
InSyncAcc
InSyncConst
InSyncDec
EndofProfile
Busy
Active

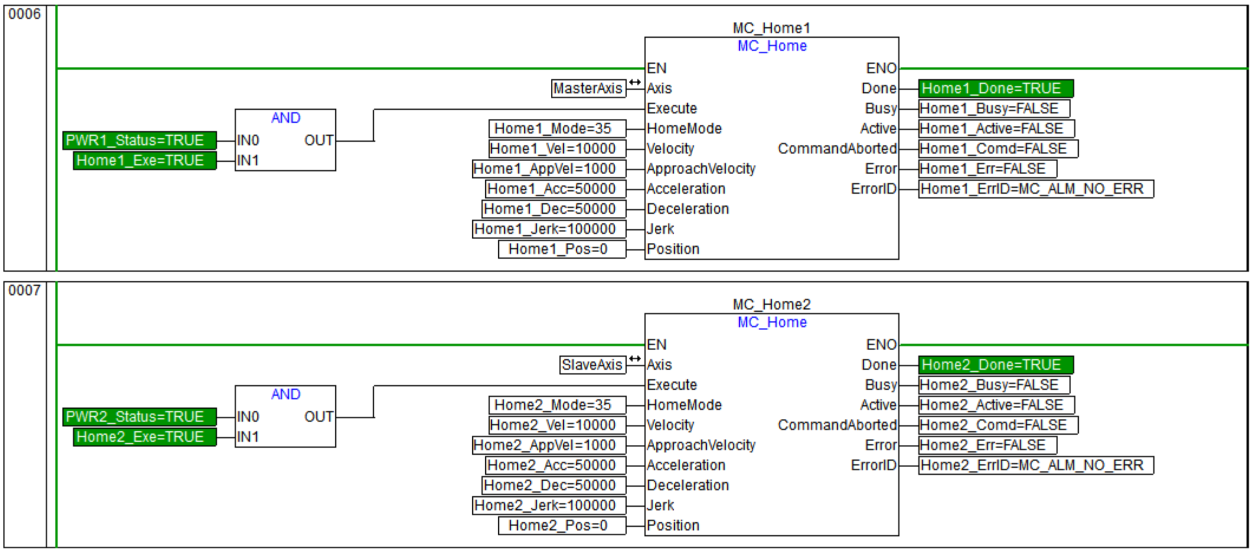
SMC_MoveLink abnormal situation sequence diagram

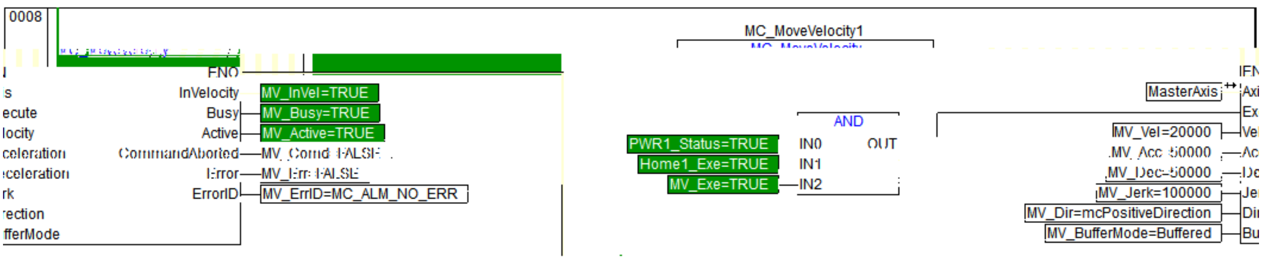


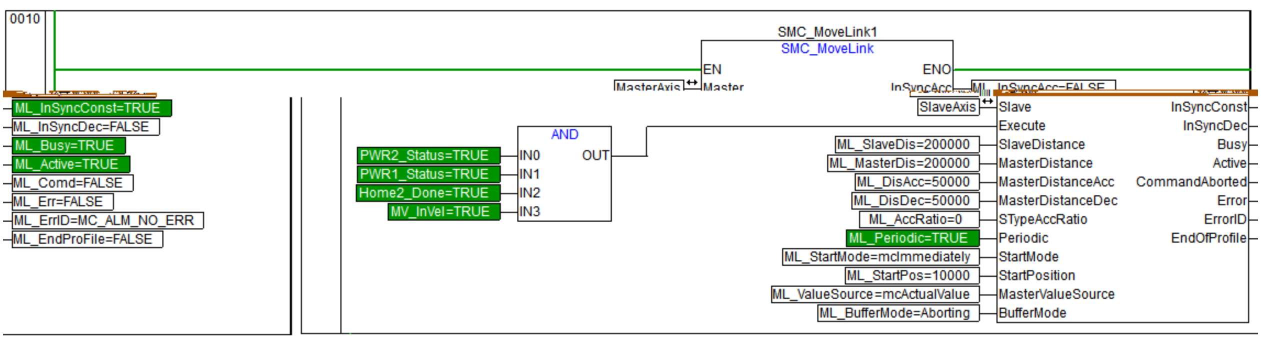
6.3.3 Examples

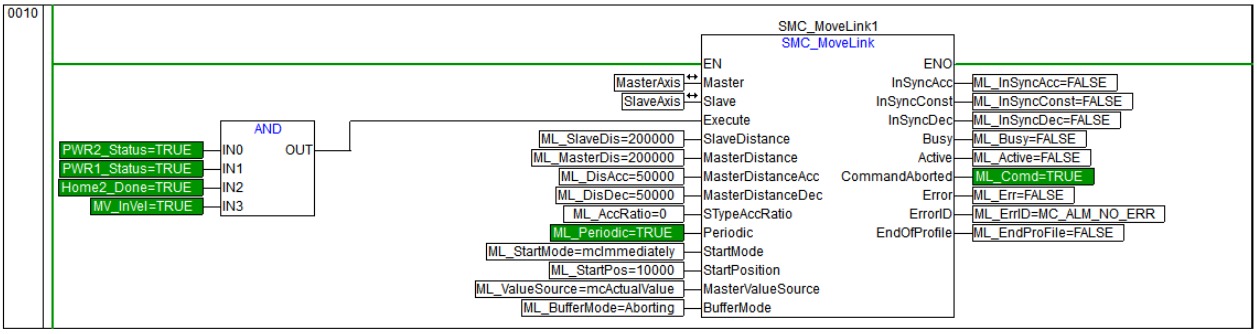
Example Program Primary Variables

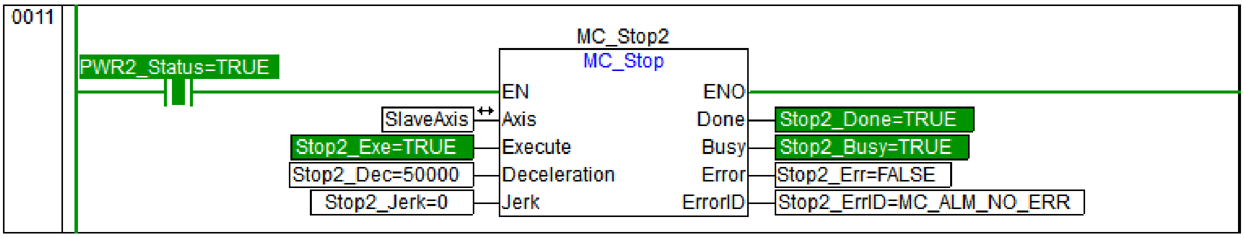
Variable Name	Variable Type	Initial Value	Notes

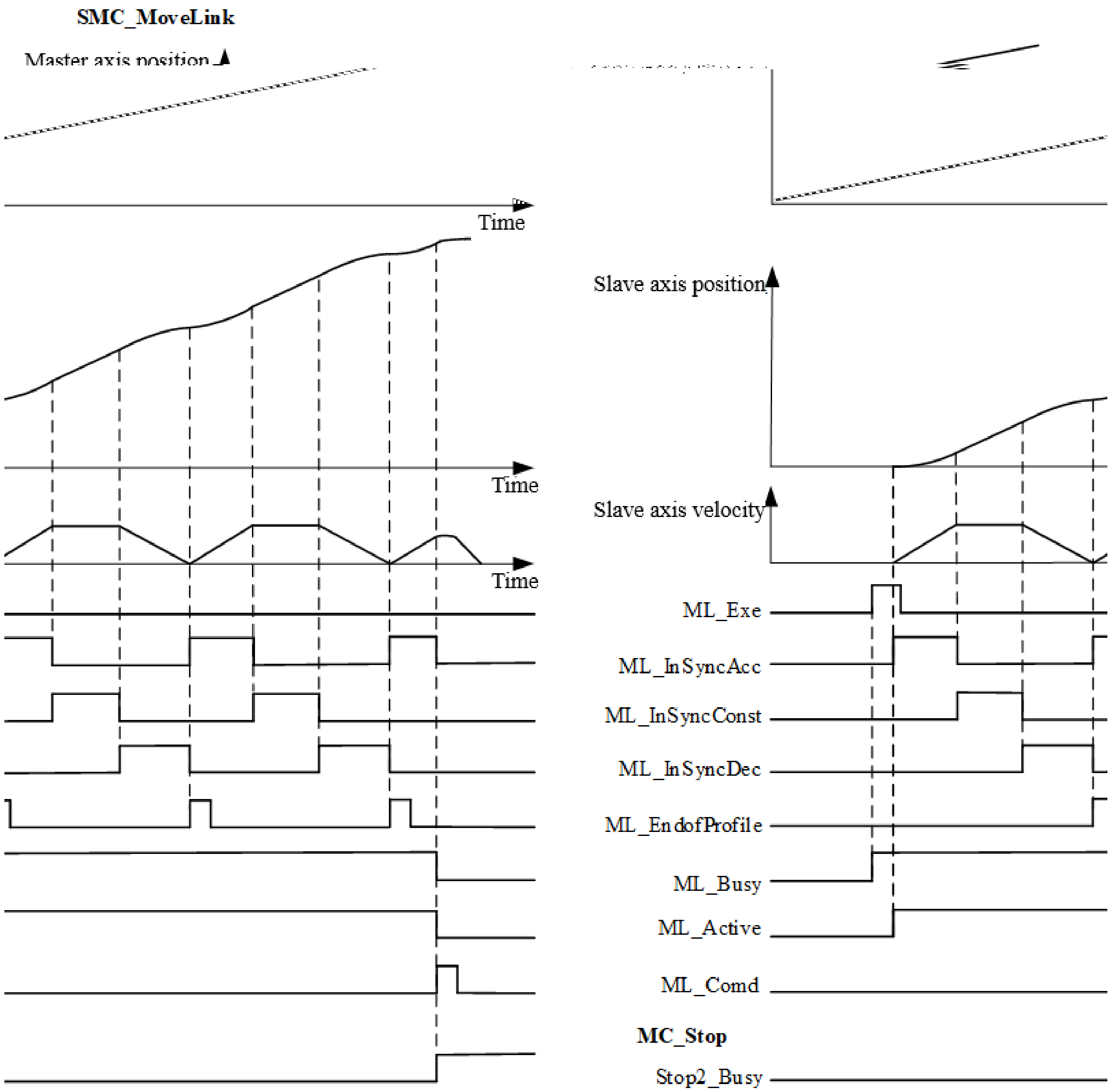

0006
MC_Home1
MC_Home
AND
PWR1_Status=TRUE
Home1_Exe=TRUE
IN0
IN1
OUT
MasterAxis
Home1_Mode=35
Home1_Vel=10000
Home1_AppVel=1000
Home1_Acc=50000
Home1_Dec=50000
Home1_Jerk=100000
Home1_Pos=0
EN
Axis
Execute
HomeMode
Velocity
ApproachVelocity
Acceleration
Deceleration
Jerk
Position
ENO
Done
Busy
Active
CommandAborted
Error
ErrorID
Home1_Done=TRUE
Home1_Busy=FALSE
Home1_Active=FALSE
Home1_Comd=FALSE
Home1_Err=FALSE
Home1_ErrID=MC_ALM_NO_ERR
0007
MC_Home2
MC_Home
AND
PWR2_Status=TRUE
Home2_Exe=TRUE
IN0
IN1
OUT
SlaveAxis
Home2_Mode=35
Home2_Vel=10000
Home2_AppVel=1000
Home2_Acc=50000
Home2_Dec=50000
Home2_Jerk=100000
Home2_Pos=0
EN
Axis
Execute
HomeMode
Velocity
ApproachVelocity
Acceleration
Deceleration
Jerk
Position
ENO
Done
Busy
Active
CommandAborted
Error
ErrorID
Home2_Done=TRUE
Home2_Busy=FALSE
Home2_Active=FALSE
Home2_Comd=FALSE
Home2_Err=FALSE
Home2_ErrID=MC_ALM_NO_ERR


0008
MC_MoveVelocity1
ENO
InVelocity
Busy
Active
CommandAborted
Error
ErrorID
MV_InVel=TRUE
MV_Busy=TRUE
MV_Active=TRUE
MV_ErrID=MC_ALM_NO_ERR
AND
PWR1_Status=TRUE
Home1_Exe=TRUE
MV_Exe=TRUE
IN0
IN1
IN2
OUT
MasterAxis
MV_Vel=20000
MV_Jerk=100000
MV_Dir=mcPositiveDirection
MV_BufferMode=Buffered


0010
SMC_MoveLink1
SMC_MoveLink
EN
ENO
MasterAxis
Master
SlaveAxis
ML_InSyncConst=TRUE
ML_InSyncDec=FALSE
ML_Busy=TRUE
ML_Active=TRUE
ML_Comd=FALSE
ML_Err=FALSE
ML_ErrID=MC_ALM_NO_ERR
ML_EndProFile=FALSE
AND
PWR2_Status=TRUE
PWR1_Status=TRUE
Home2_Done=TRUE
MV_InVel=TRUE
IN0
IN1
IN2
IN3
OUT
ML_SlaveDis=200000
ML_MasterDis=200000
ML_DisAcc=50000
ML_DisDec=50000
ML_AccRatio=0
ML_Periodic=TRUE
ML_StartMode=mcImmediately
ML_StartPos=10000
ML_ValueSource=mcActualValue
ML_BufferMode=Aborting
Slave
Execute
SlaveDistance
MasterDistance
MasterDistanceAcc
MasterDistanceDec
STypeAccRatio
Periodic
StartMode
StartPosition
MasterValueSource
BufferMode
InSyncConst
InSyncDec
Busy
Active
CommandAborted
Error
ErrorID
EndOfProfile

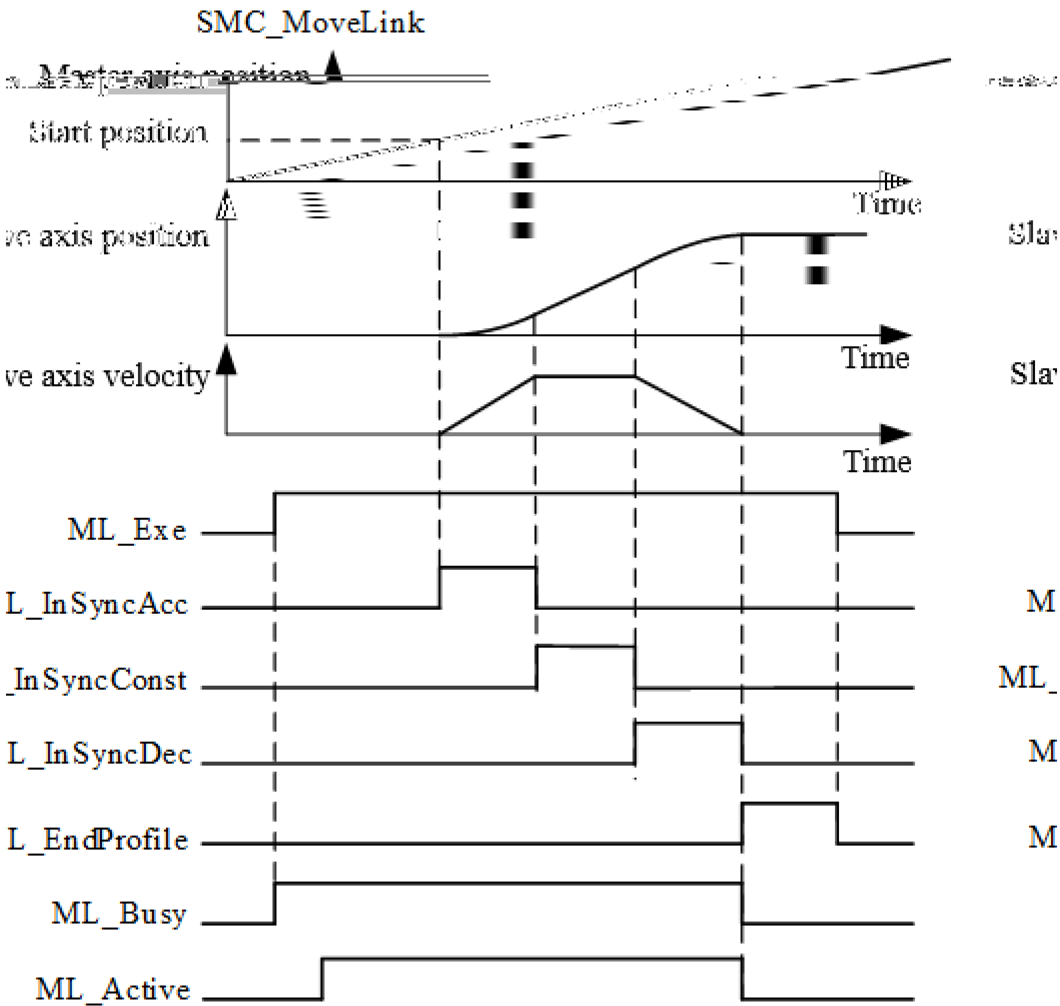

0010
SMC_MoveLink1
SMC_MoveLink
AND
PWR2_Status=TRUE
PWR1_Status=TRUE
Home2_Done=TRUE
MV_InVel=TRUE
IN0
IN1
IN2
IN3
OUT
MasterAxis
SlaveAxis
ML_SlaveDis=200000
ML_MasterDis=200000
ML_DisAcc=50000
ML_DisDec=50000
ML_AccRatio=0
ML_Periodic=TRUE
ML_StartMode=mcImmediately
ML_StartPos=10000
ML_ValueSource=mcActualValue
ML_BufferMode=Aborting
EN
Master
Slave
Execute
SlaveDistance
MasterDistance
MasterDistanceAcc
MasterDistanceDec
STypeAccRatio
Periodic
StartMode
StartPosition
MasterValueSource
BufferMode
ENO
InSyncAcc
InSyncConst
InSyncDec
Busy
Active
CommandAborted
Error
ErrorID
EndOfProfile
ML_InSyncAcc=FALSE
ML_InSyncConst=FALSE
ML_InSyncDec=FALSE
ML_Busy=FALSE
ML_Active=FALSE
ML_Comd=TRUE
ML_Err=FALSE
ML_ErrID=MC_ALM_NO_ERR
ML_EndProFile=FALSE


0011
MC_Stop2
MC_Stop
PWR2_Status=TRUE
SlaveAxis
Stop2_Exe=TRUE
Stop2_Dec=50000
Stop2_Jerk=0
EN
Axis
Execute
Deceleration
Jerk
ENO
Done
Busy
Error
ErrorID
Stop2_Done=TRUE
Stop2_Busy=TRUE
Stop2_Err=FALSE
Stop2_ErrID=MC_ALM_NO_ERR



Primary Variables

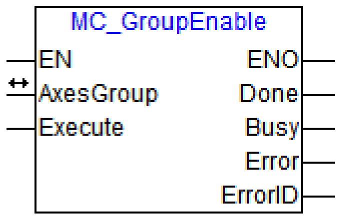
Variable Name	Variable Type	Initial Value	Notes



6.3.4 Precautions

Chapter 7 Axis Group Motion Instruction

7.1 MC_GroupEnable (Enable Axes Group)



7.1.1 Parameter

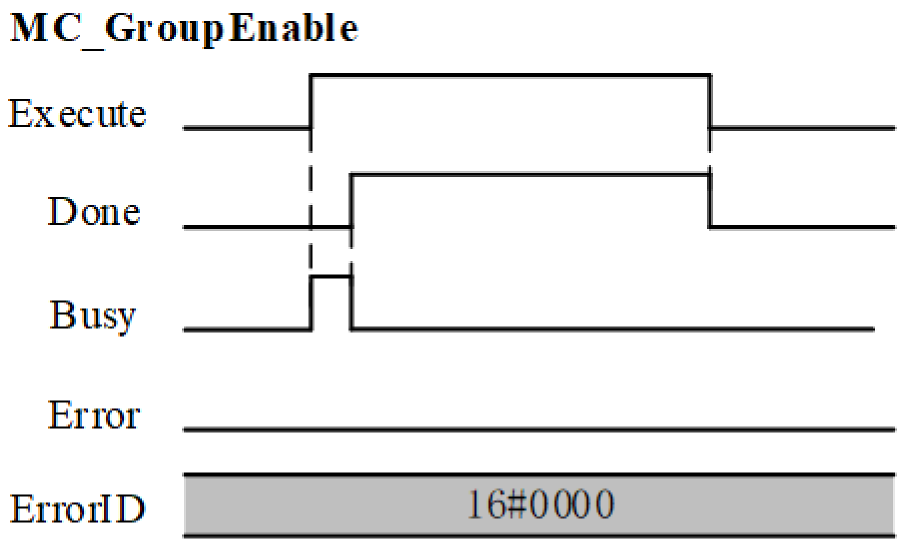
Pin Parameter Description

Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type

AXES_GROUP_REF data structure

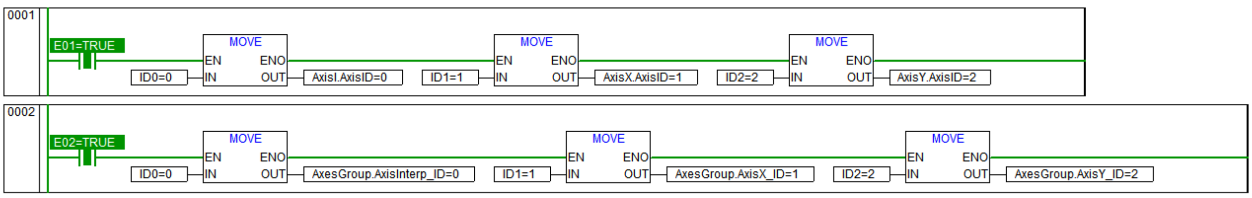
Member	Meaning	Default Value	Scope	Data Type

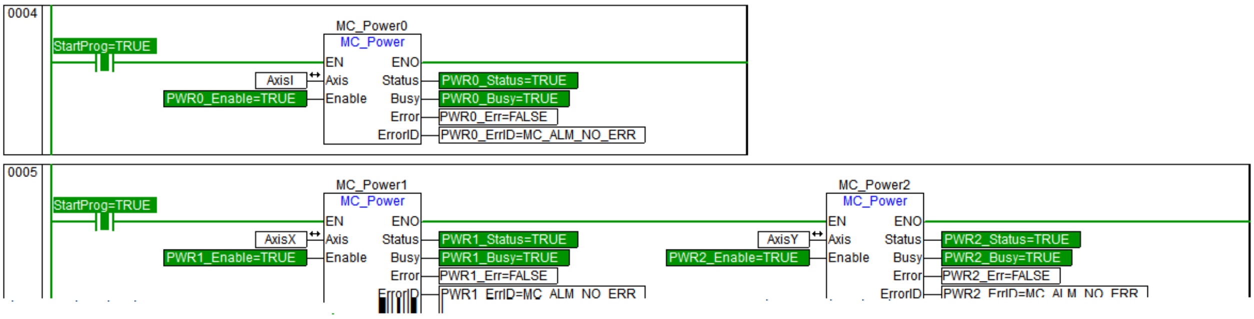
7.1.2 Functions

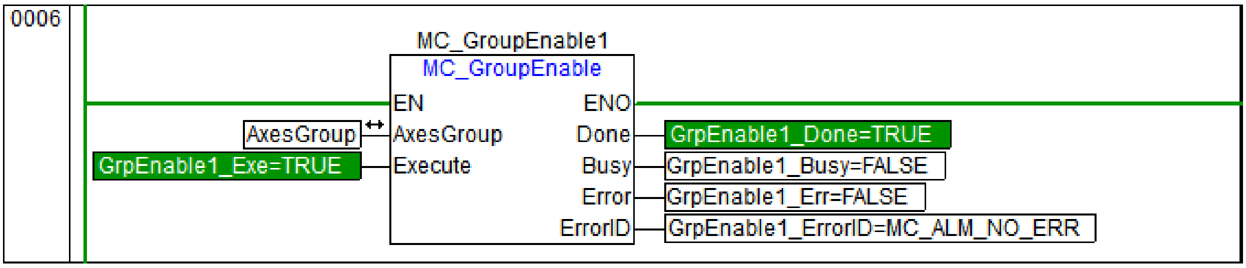

MC_GroupEnable
Execute
Done
Busy
Error
ErrorID
16#0000

Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



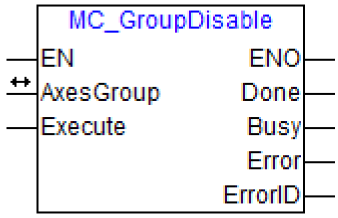




Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes

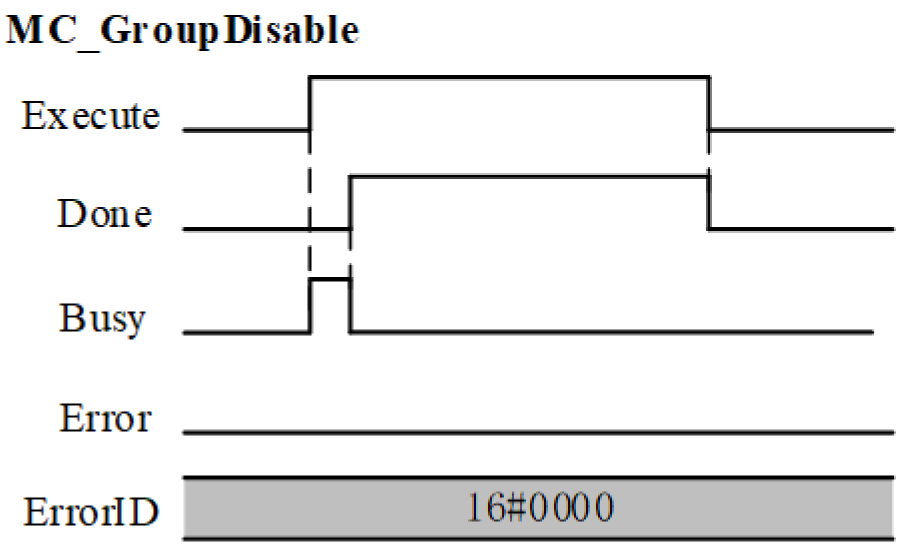
7.2 MC_GroupDisable (Disable Axes Group)

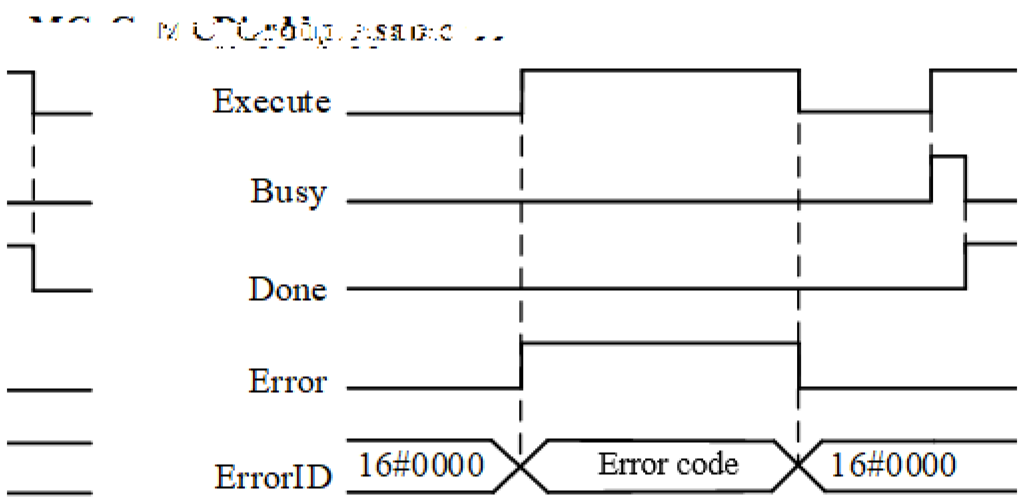


7.2.1 Parameter

Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

7.2.2 Functions





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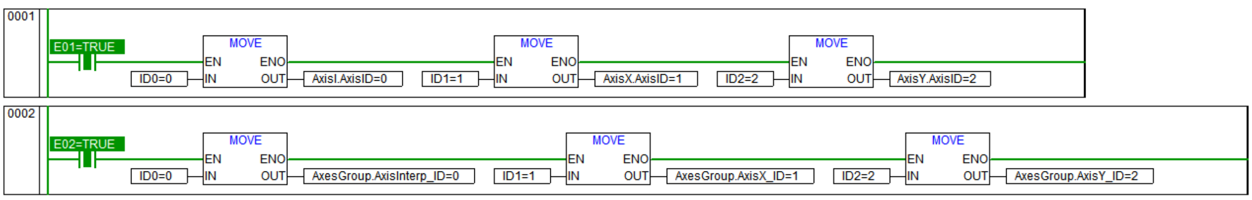
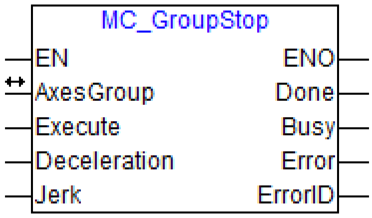
7.2.3 Examples

Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



7.3 MC_GroupStop (AxesGroup Motion Stop)

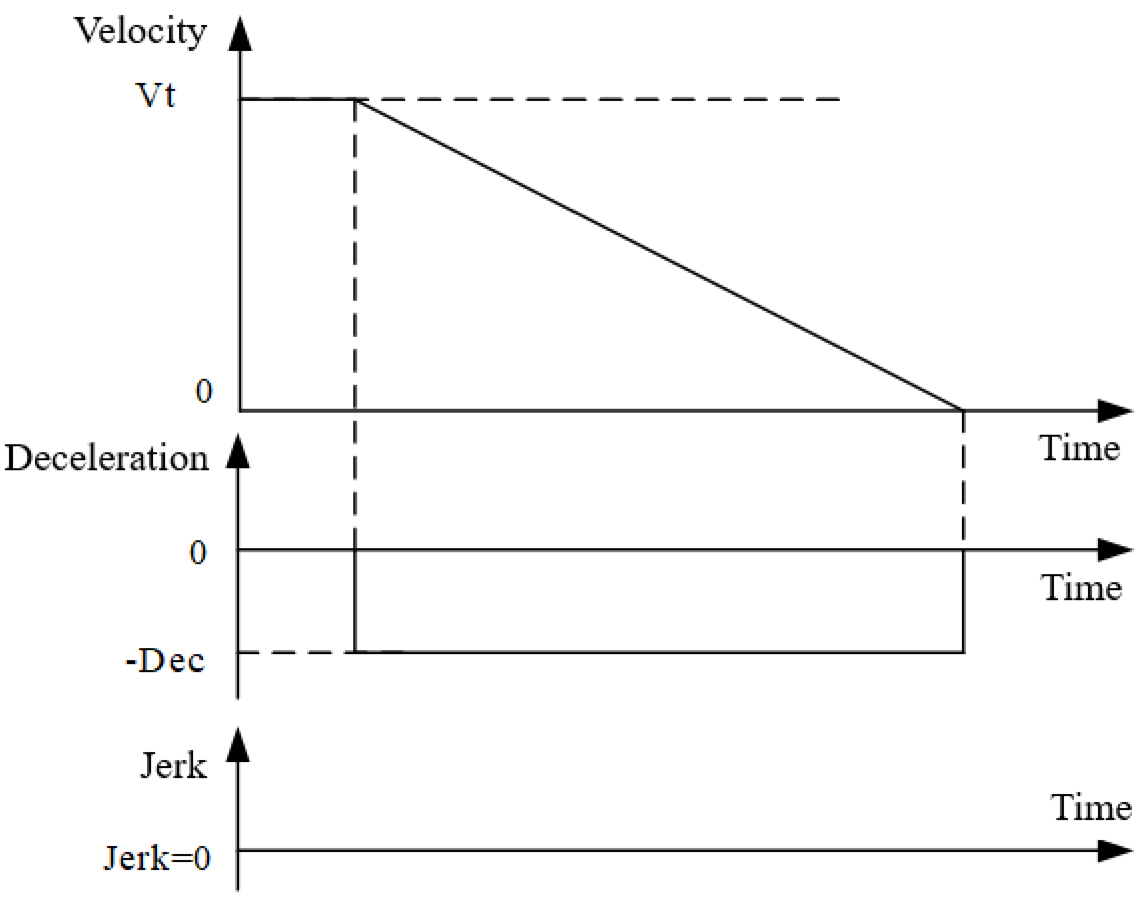


7.3.1 Parameter

Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type

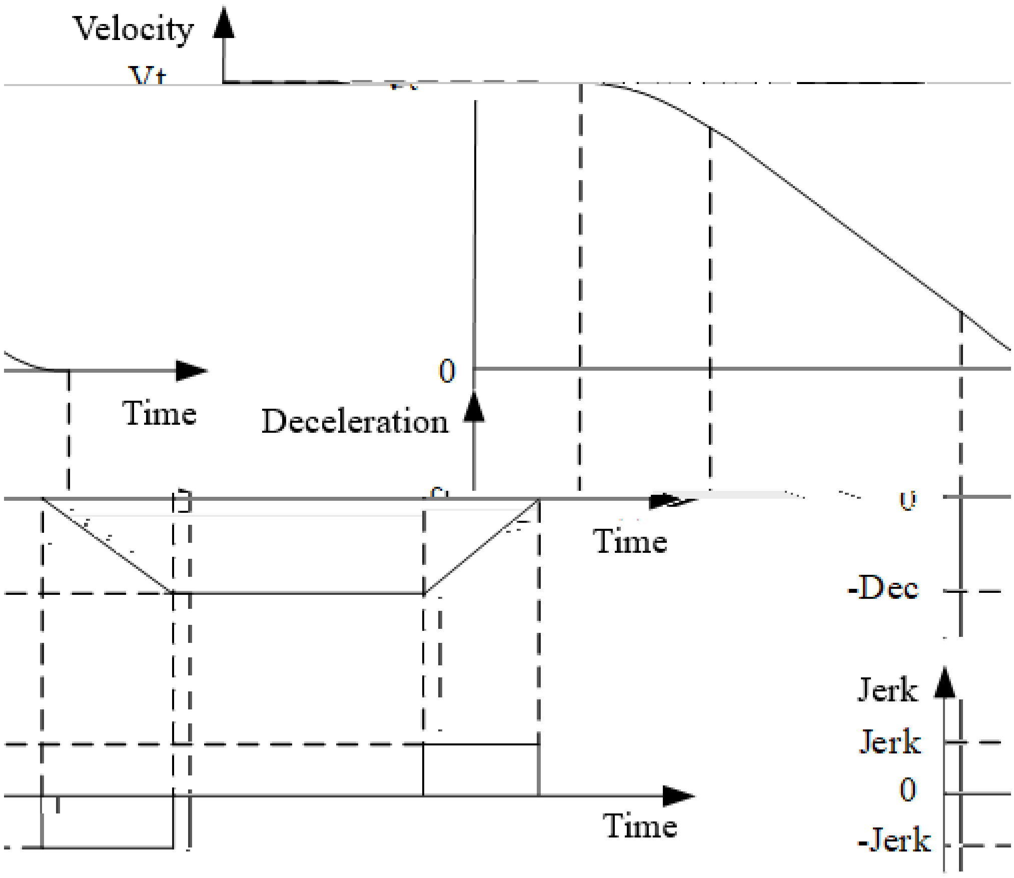
[redacted]

□

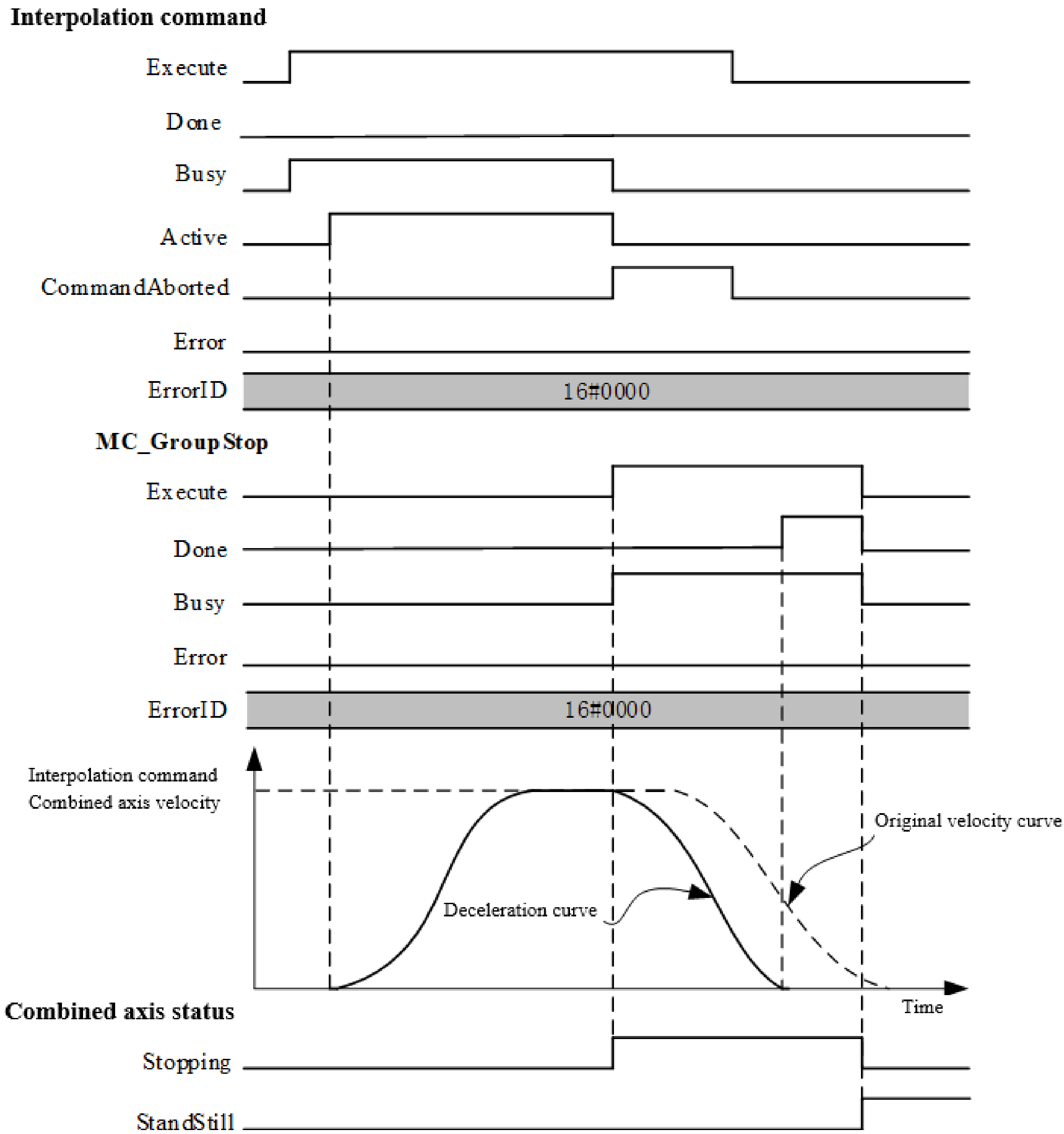


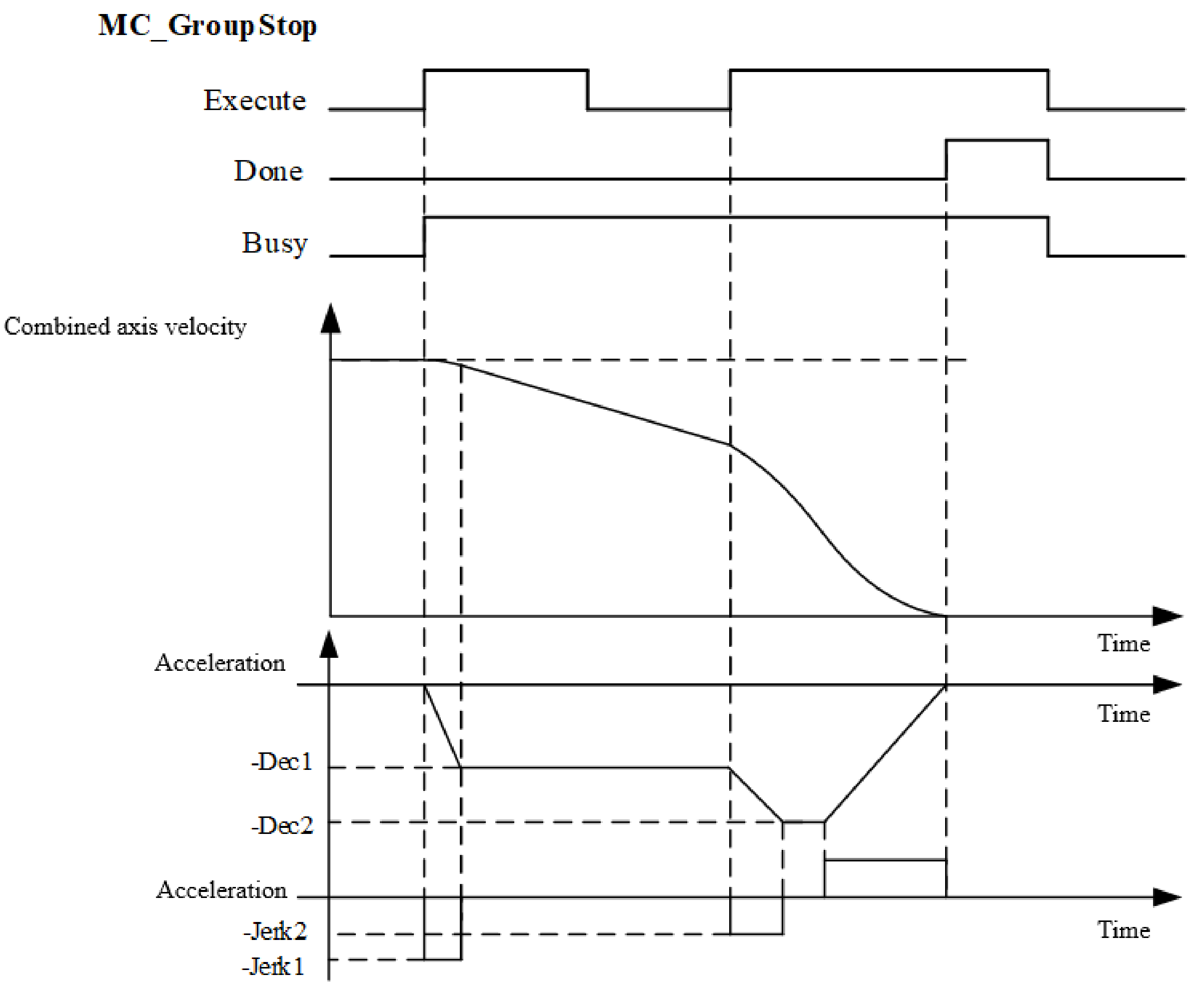
Vt: speed when deceleration starts, Dec: set value of deceleration, Jerk: set value of jerk

□



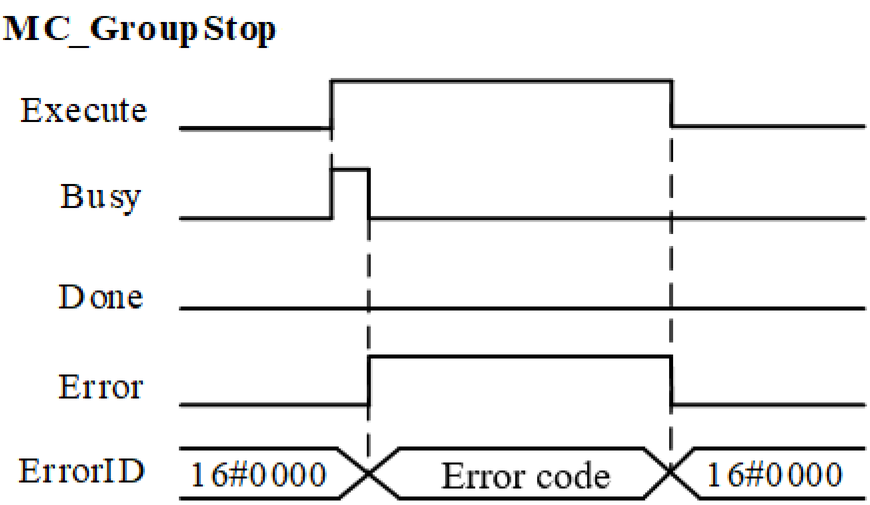
Vt: speed when deceleration starts, Dec: set value of deceleration, Jerk: set value of jerk


Interpolation command
Execute
Done
Busy
Active
CommandAborted
Error
ErrorID
16#0000
MC_GroupStop
Execute
Done
Busy
Error
ErrorID
16#0000
Interpolation command
Combined axis velocity
Original velocity curve
Deceleration curve
Time
Combined axis status
Stopping
StandStill



Dec1: deceleration commanded at first delivery, Dec2: deceleration at second delivery

Jerk 1: JERK of the first delivery command, Jerk 2: Jerk at the second delivery



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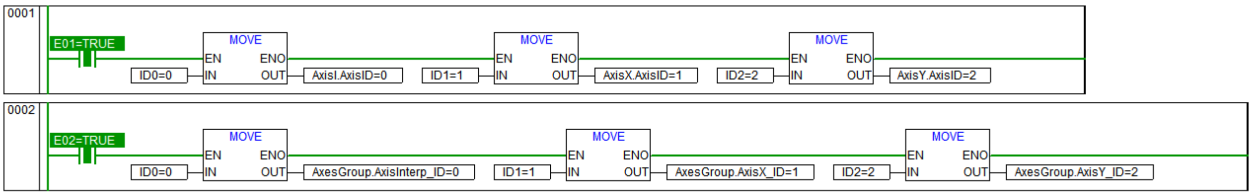
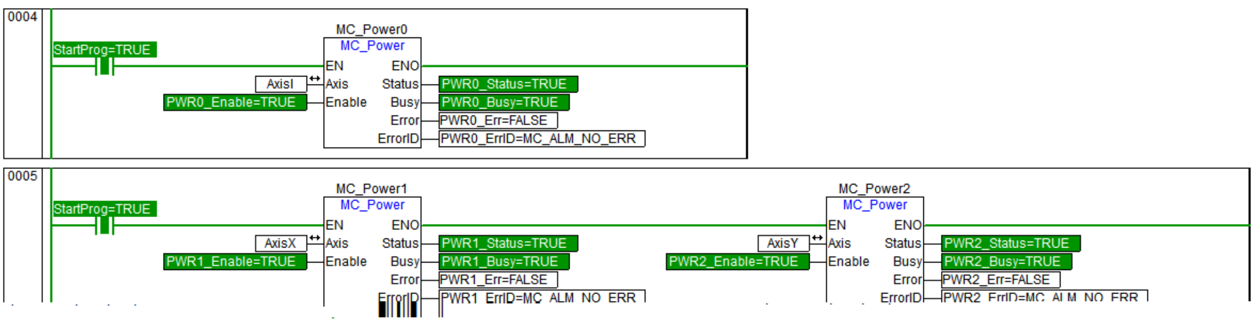
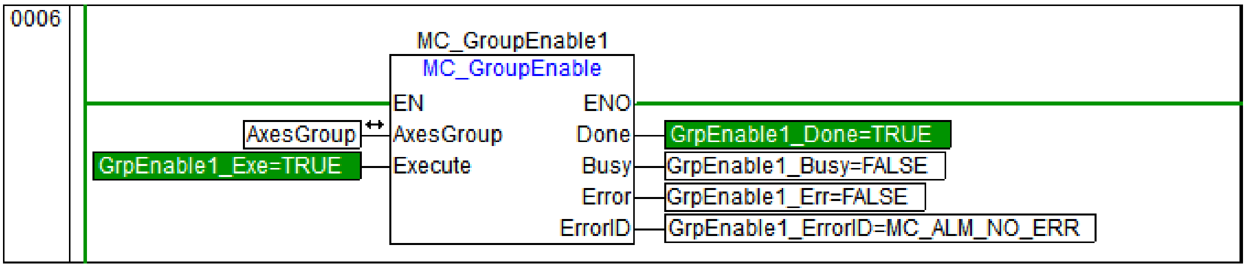
7.3.3 Examples

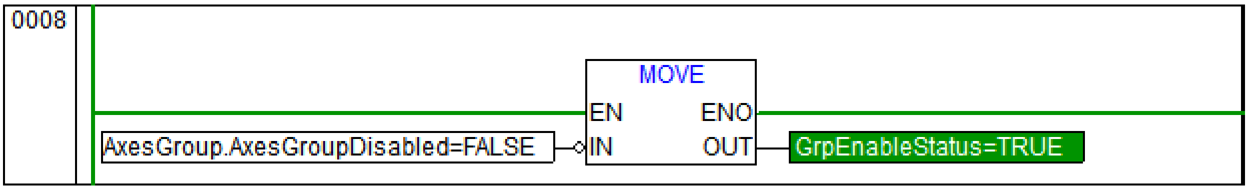
Description of Primary Variables

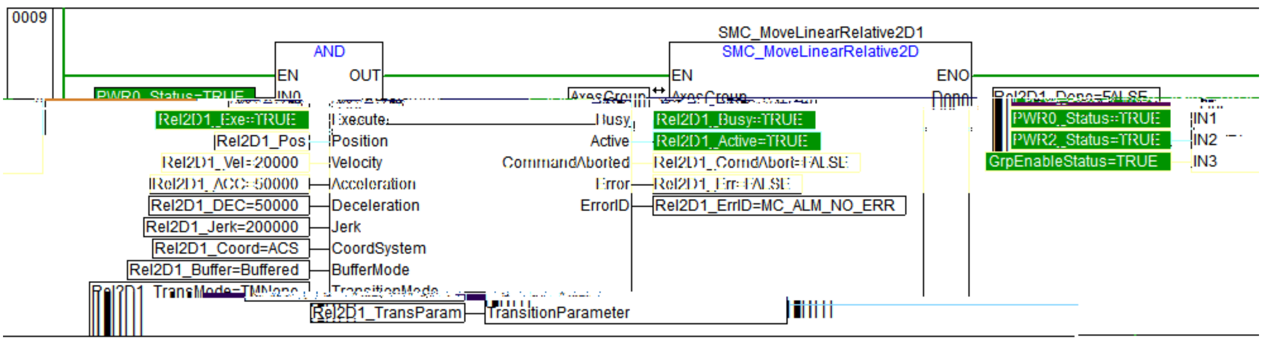
Variable Name	Variable Type	Initial Value	Notes

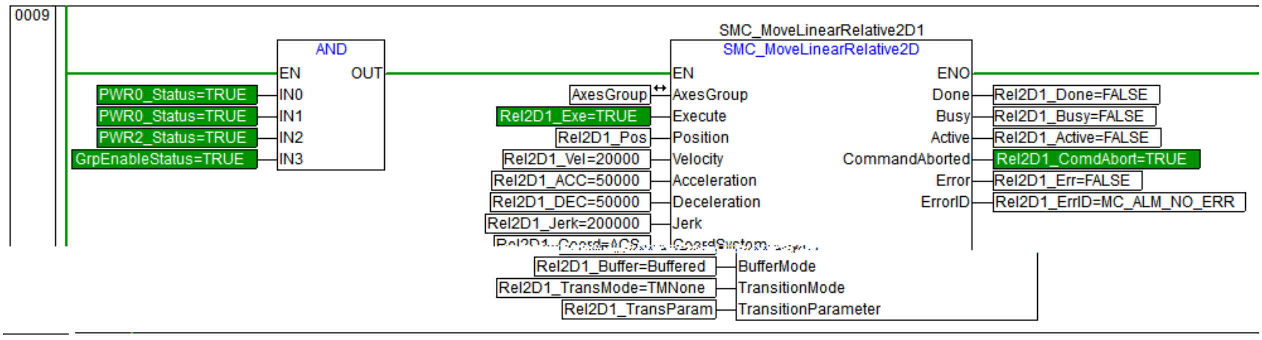

0001
E01=TRUE
MOVE
EN ENO
ID0=0 IN OUT AxisI.AxisID=0
MOVE
ID1=1 IN OUT AxisX.AxisID=1
MOVE
ID2=2 IN OUT AxisY.AxisID=2
0002
E02=TRUE
MOVE
ID0=0 IN OUT AxesGroup.AxisInterp_ID=0
MOVE
ID1=1 IN OUT AxesGroup.AxisX_ID=1
MOVE
ID2=2 IN OUT AxesGroup.AxisY_ID=2

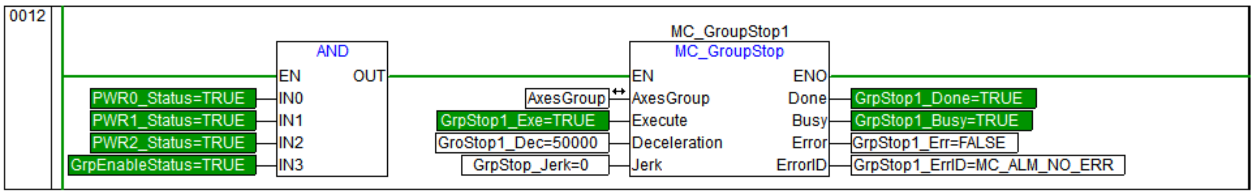

0004
StartProg=TRUE
MC_Power0
MC_Power
EN ENO
AxisI Axis Status PWR0_Status=TRUE
PWR0_Enable=TRUE Enable Busy PWR0_Busy=TRUE
Error PWR0_Err=FALSE
ErrorID PWR0_ErrID=MC_ALM_NO_ERR
0005
StartProg=TRUE
MC_Power1
MC_Power
AxisX Axis Status PWR1_Status=TRUE
PWR1_Enable=TRUE Enable Busy PWR1_Busy=TRUE
Error PWR1_Err=FALSE
MC_Power2
MC_Power
AxisY Axis Status PWR2_Status=TRUE
PWR2_Enable=TRUE Enable Busy PWR2_Busy=TRUE
Error PWR2_Err=FALSE

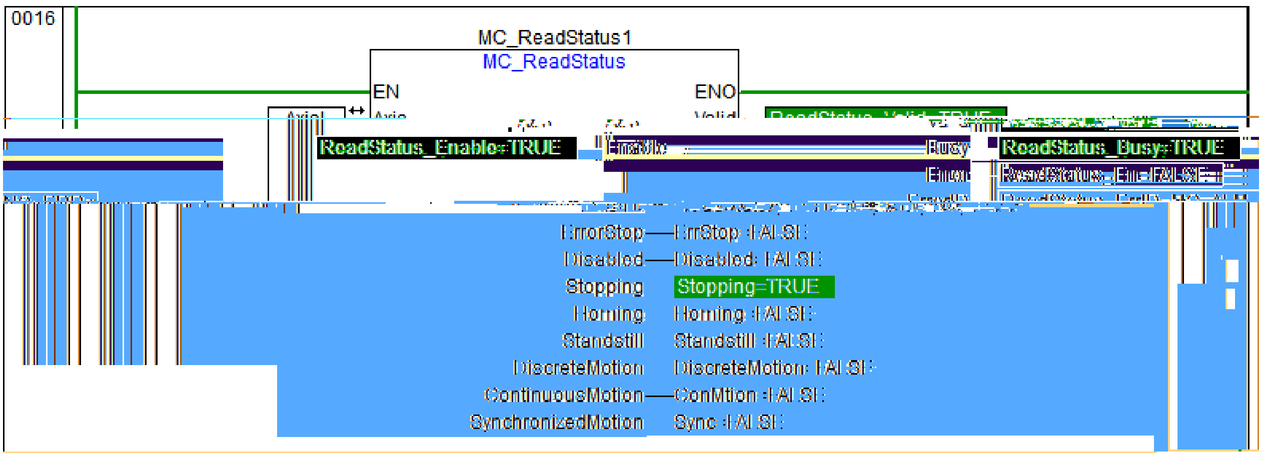

0006
MC_GroupEnable1
MC_GroupEnable
EN
ENO
AxesGroup
AxesGroup
Done
GrpEnable1_Done=TRUE
GrpEnable1_Exe=TRUE
Execute
Busy
GrpEnable1_Busy=FALSE
Error
GrpEnable1_Err=FALSE
ErrorID
GrpEnable1_ErrorID=MC_ALM_NO_ERR


0008
MOVE
EN
ENO
AxesGroup.AxesGroupDisabled=FALSE
IN
OUT
GrpEnableStatus=TRUE


0009
AND
EN
OUT
SMC_MoveLinearRelative2D1
SMC_MoveLinearRelative2D
EN
ENO
Rel2D1_Exe=TRUE
Execute
Rel2D1_Busy=TRUE
Rel2D1_Pos
Position
Active
Rel2D1_Active=TRUE
Rel2D1_Vel=20000
Velocity
CommandAborted
Acceleration
Error
Rel2D1_DEC=50000
Deceleration
ErrorID
Rel2D1_ErrID=MC_ALM_NO_ERR
Rel2D1_Jerk=200000
Jerk
Rel2D1_Coord=ACS
CoordSystem
Rel2D1_Buffer=Buffered
BufferMode
Rel2D1_TransParam
TransitionParameter
PWR0_Status=TRUE
PWR2_Status=TRUE
GrpEnableStatus=TRUE
IN1
IN2
IN3

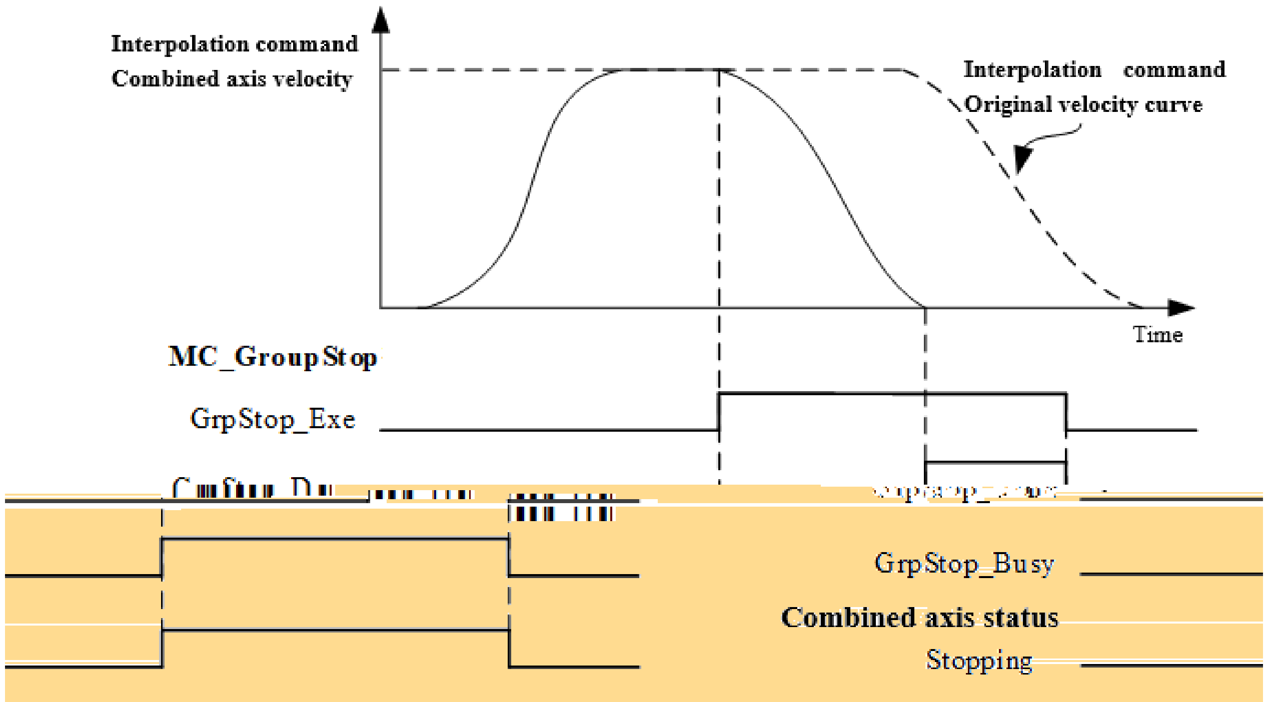






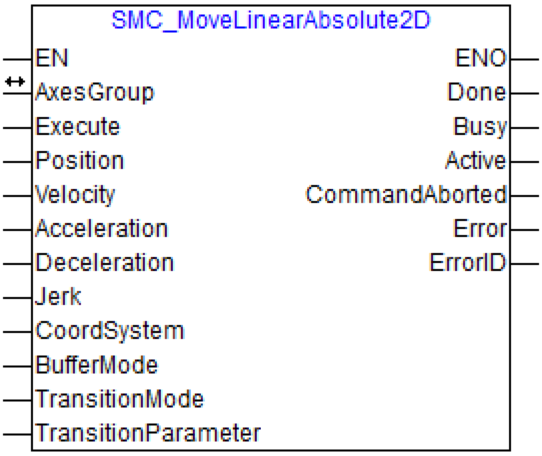
Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



7.3.4 Precautions

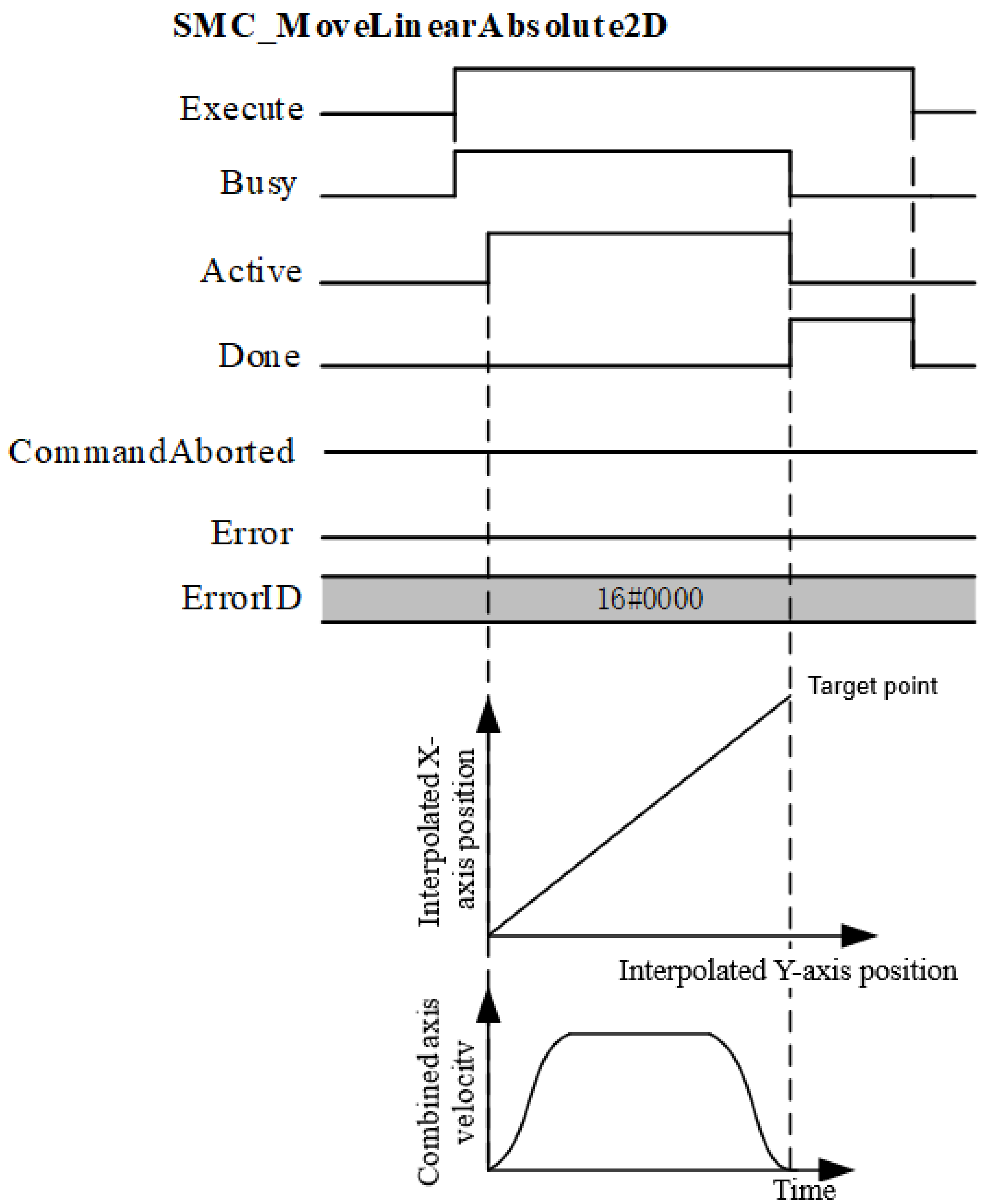
7.4 SMC_MoveLinearAbsolute2D (Absolute Linear Interpolation on Two Axes)

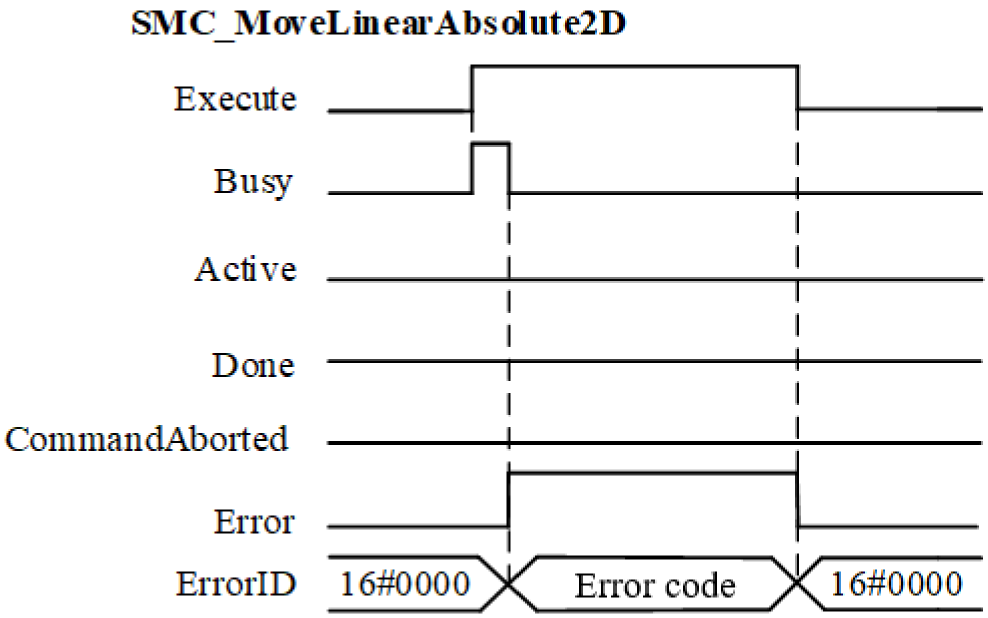


7.4.1 Parameter

Parameter type	TITLE	DESCRIPTION	Empty or not	Default value	SCOPE	Data type

7.4.2 Functions


SMC_MoveLinearAbsolute2D
Execute
Busy
Active
Done
CommandAborted
Error
ErrorID
16#0000
Target point
Interpolated X-axis position
Interpolated Y-axis position
Combined axis velocity
Time



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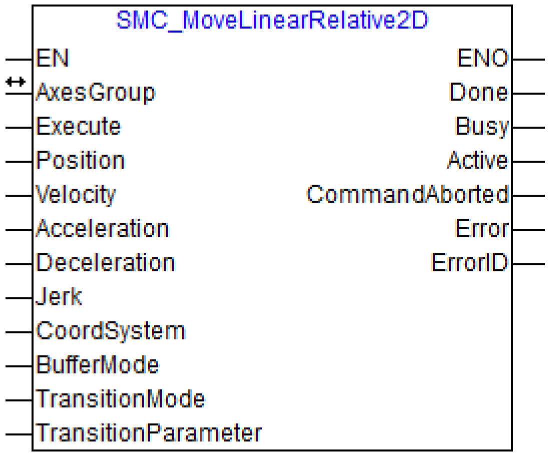
7.4.3 Examples

7.4.4 Precautions

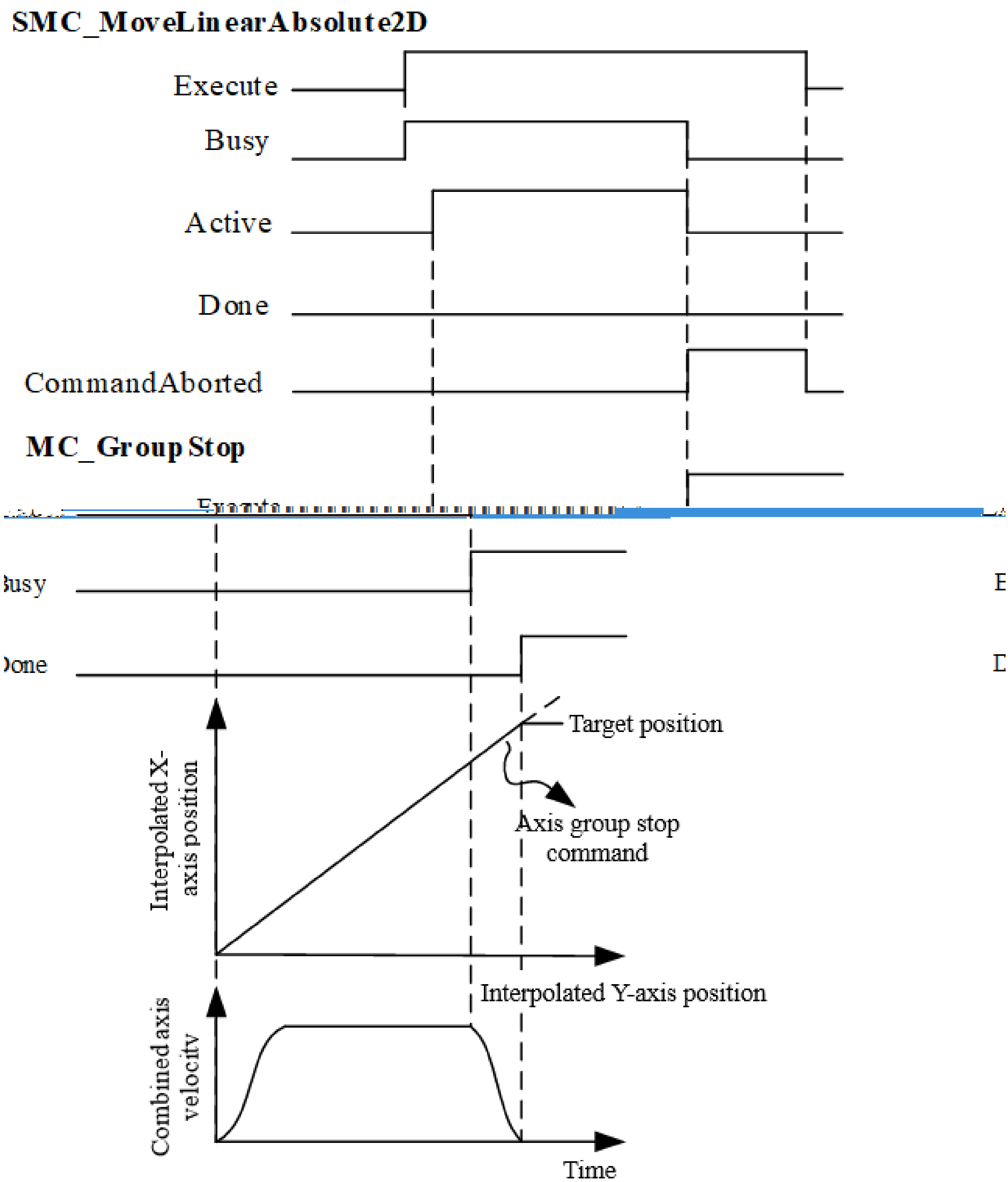
7.5 SMC_MoveLinearRelative2D (Relative Linear Interpolation on Two Axes)

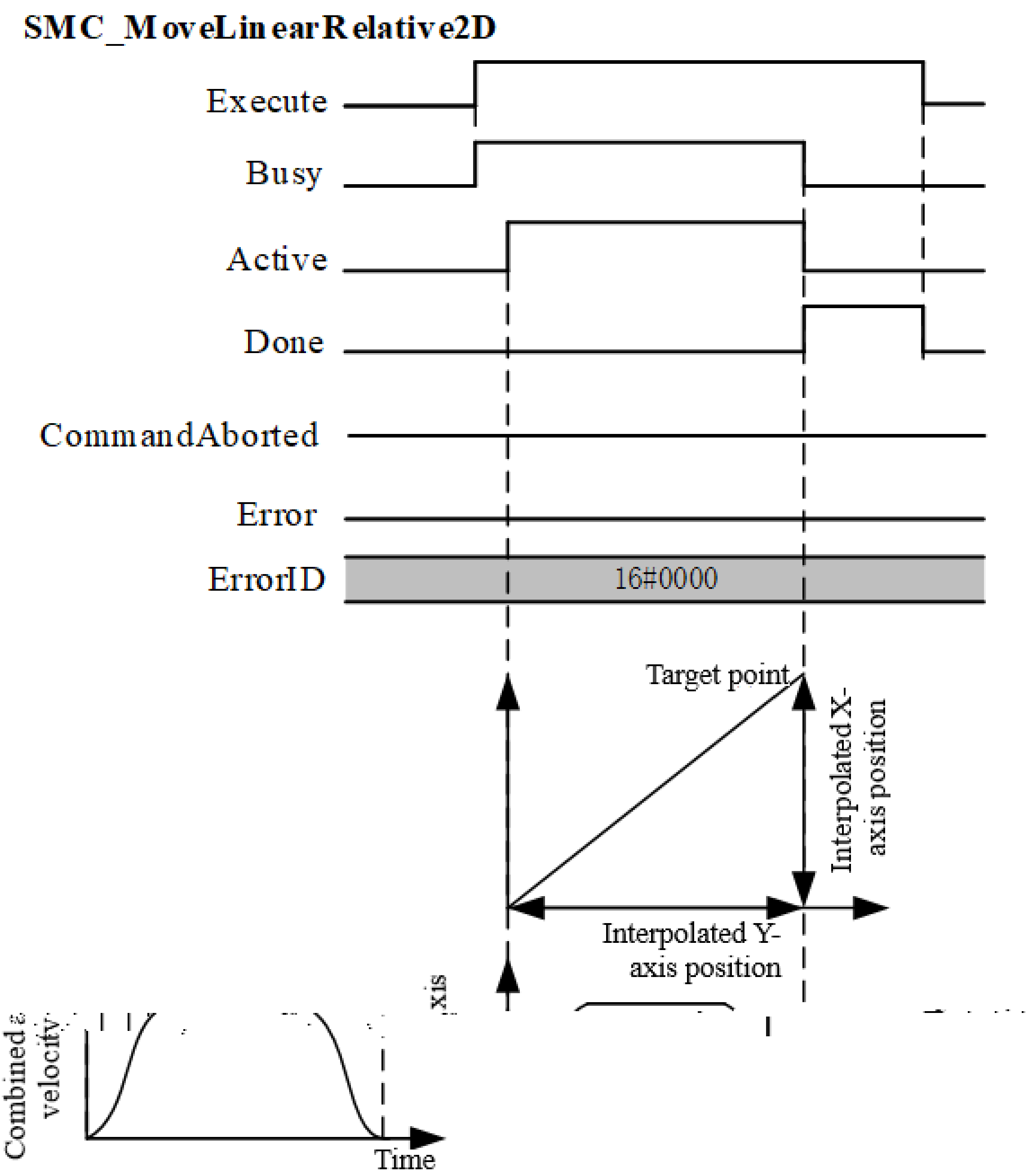


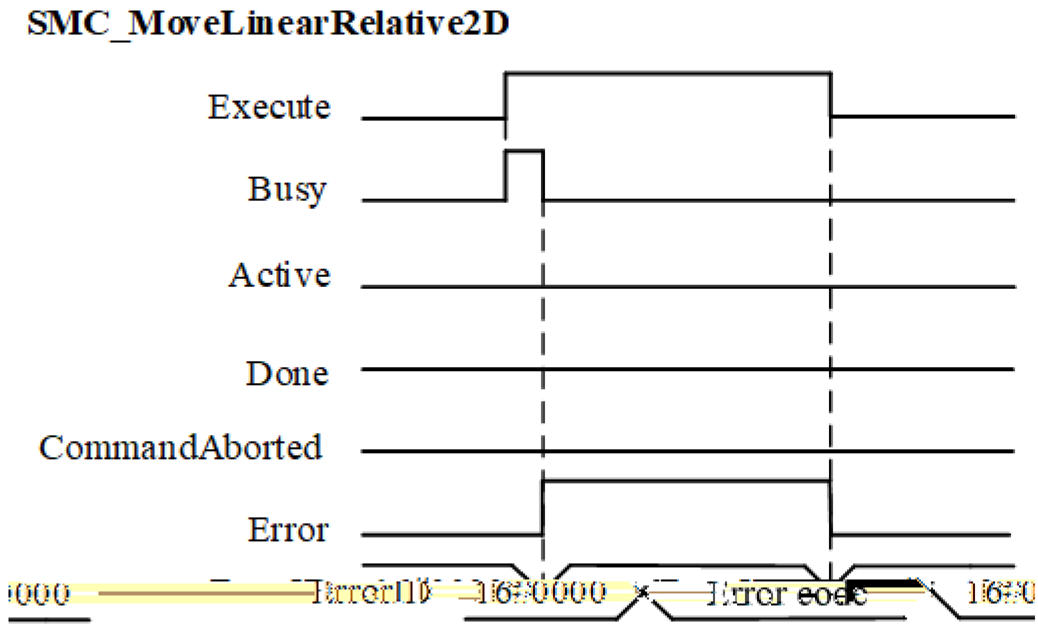
7.5.1 Parameter

Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

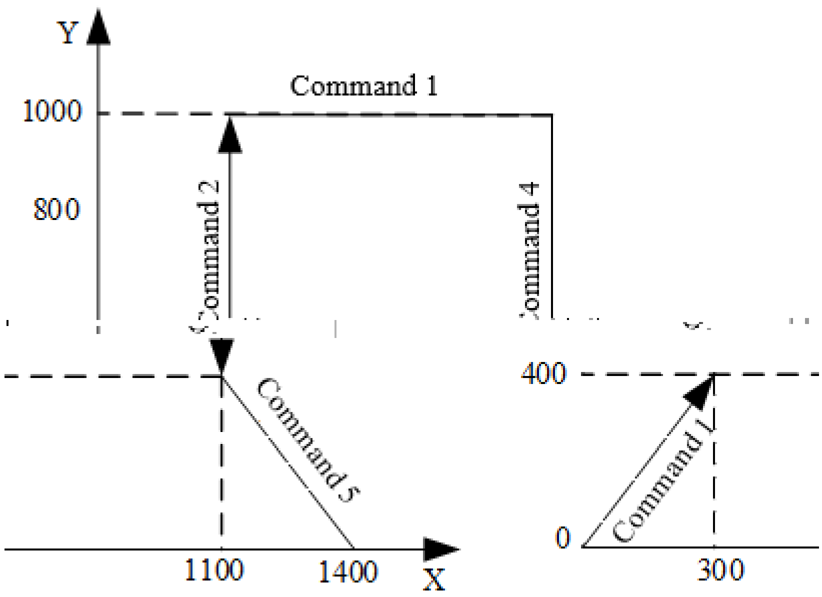
7.5.2 Functions


SMC_MoveLinearAbsolute2D
Execute
Busy
Active
Done
CommandAborted
MC_GroupStop
Target position
Axis group stop
command
Interpolated X-axis position
Interpolated Y-axis position
Combined axis velocity
Time


SMC_MoveLinearRelative2D
Execute
Busy
Active
Done
CommandAborted
Error
ErrorID
16#0000
Target point
Interpolated X-axis position
Interpolated Y-axis position
Combined velocity
Time

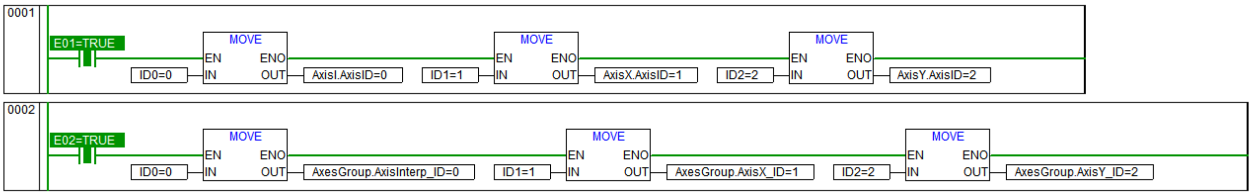


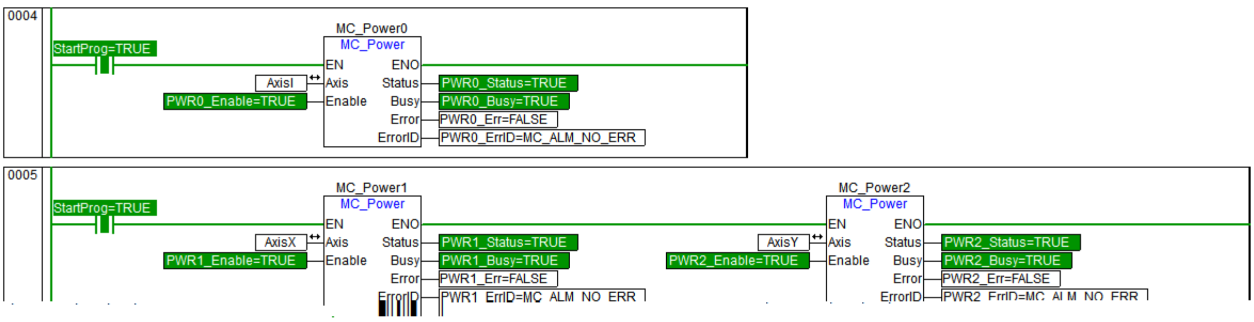
7.5.3 Examples

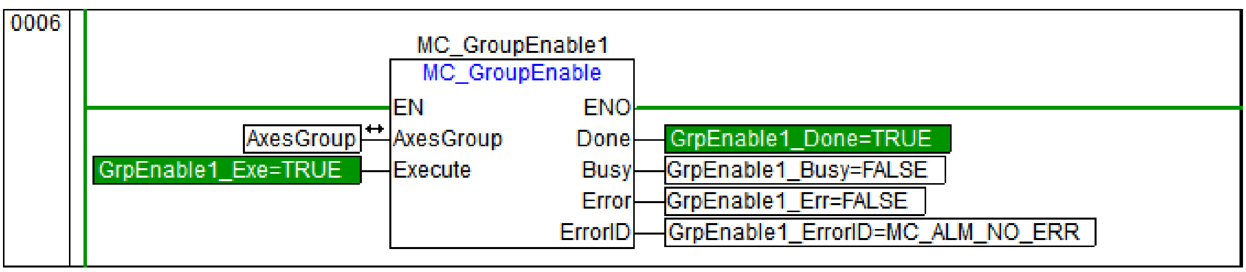


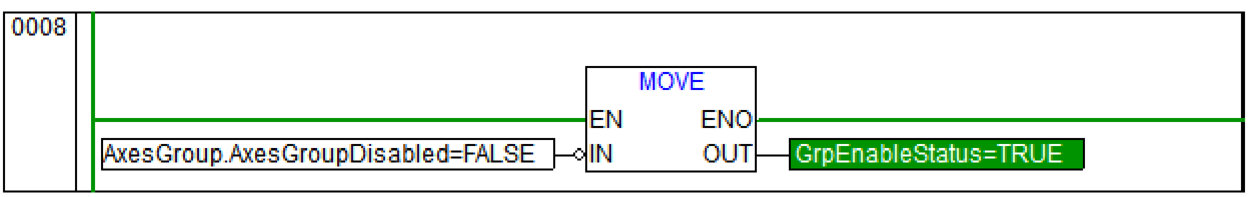
Description of Primary Variables

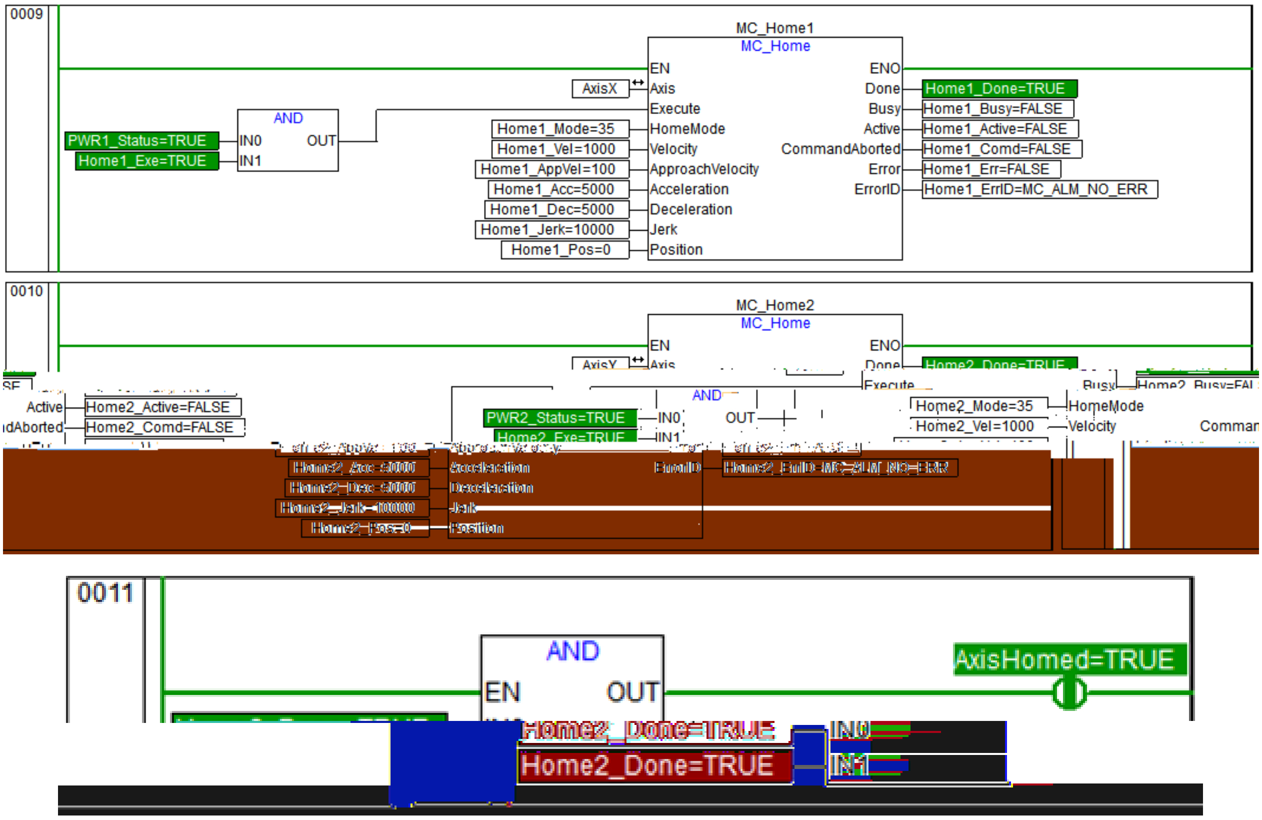
Variable name	Variable type	Initial value	Notes

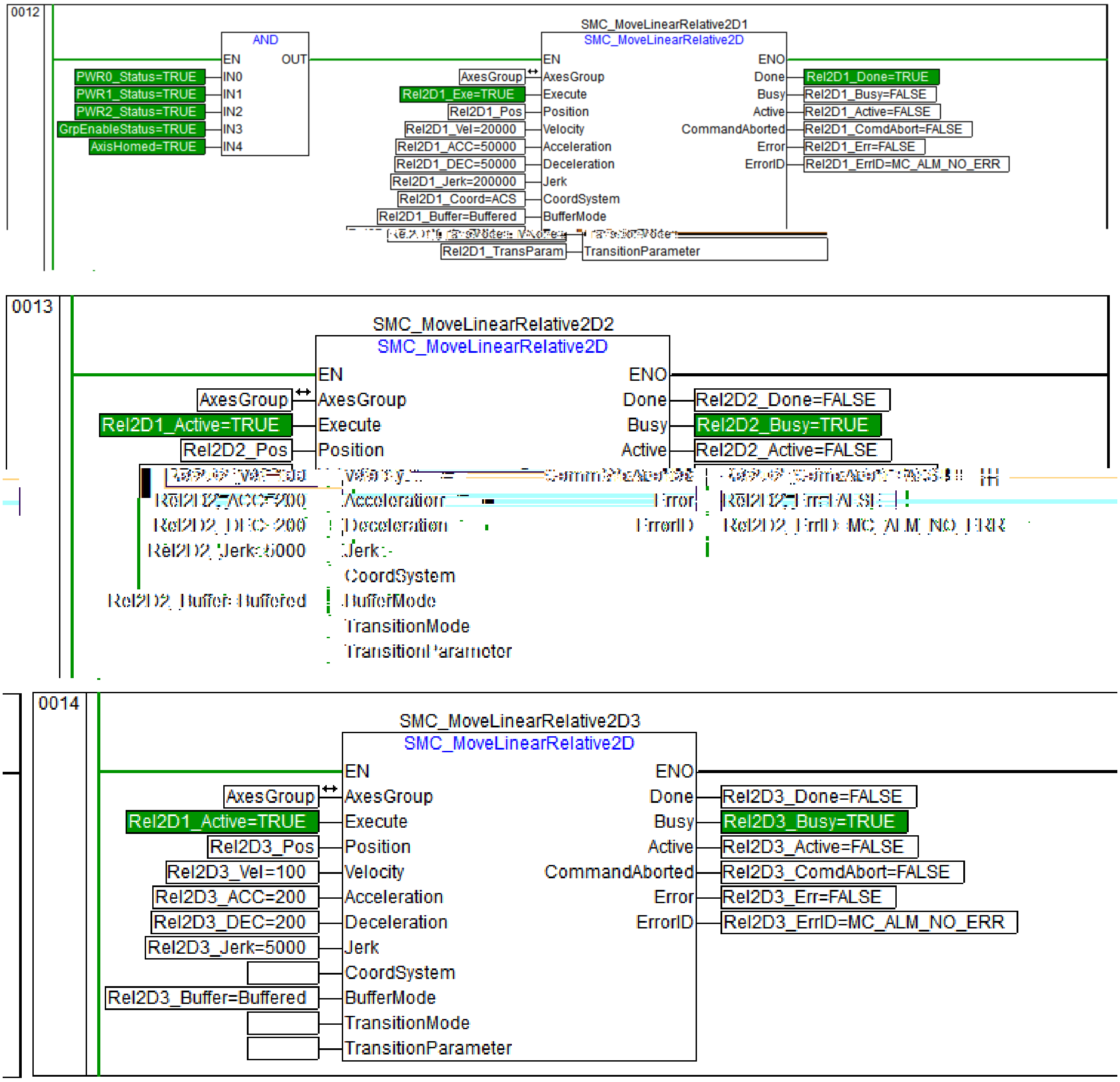

0001
E01=TRUE
MOVE
EN ENO
IN OUT
ID0=0
AxisI.AxisID=0
ID1=1
AxisX.AxisID=1
ID2=2
AxisY.AxisID=2
0002
E02=TRUE
AxesGroup.AxisInterp_ID=0
AxesGroup.AxisX_ID=1
AxesGroup.AxisY_ID=2

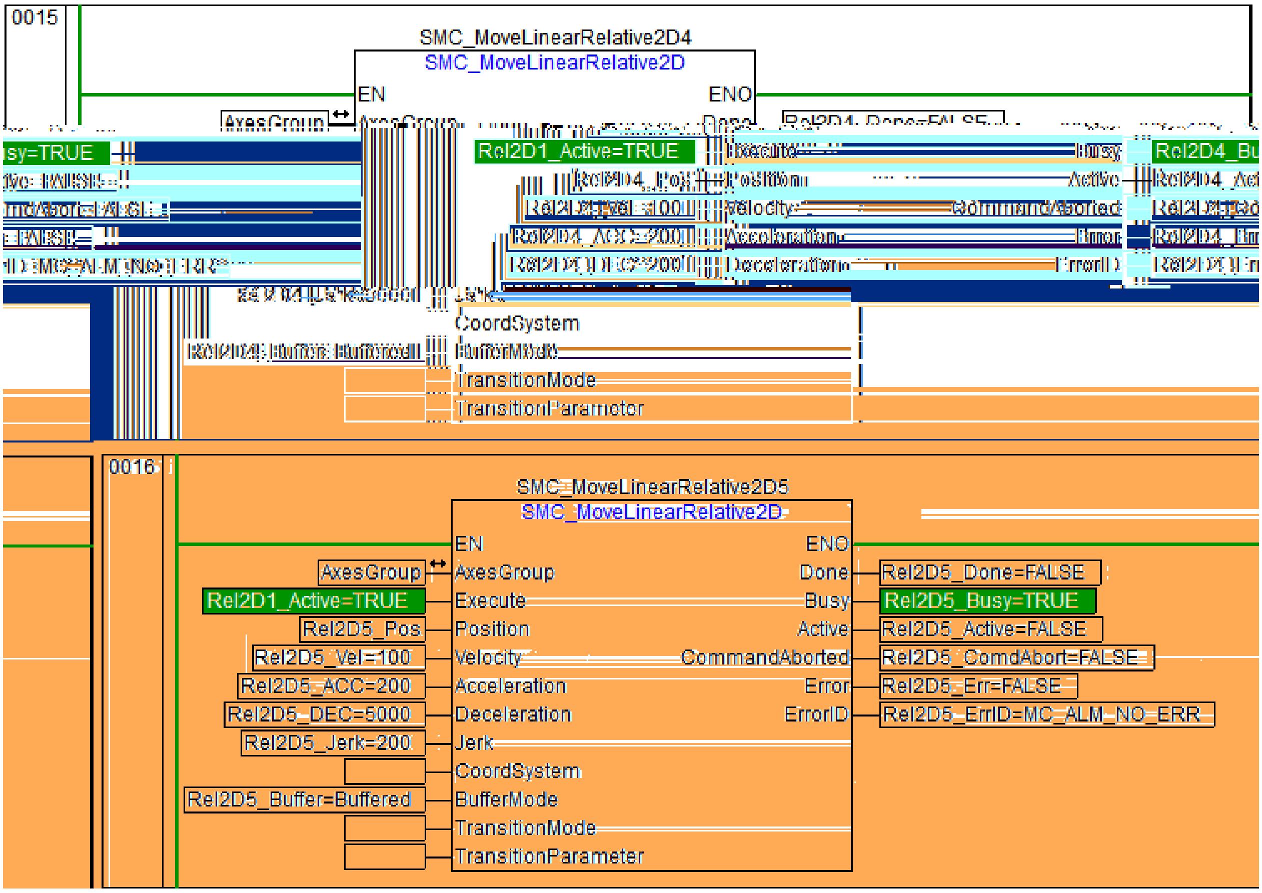

0004
StartProg=TRUE
MC_Power0
MC_Power
EN ENO
Axis Status
Enable Busy
Error
ErrorID
AxisI
PWR0_Enable=TRUE
PWR0_Status=TRUE
PWR0_Busy=TRUE
PWR0_Err=FALSE
PWR0_ErrID=MC_ALM_NO_ERR
0005
MC_Power1
AxisX
PWR1_Enable=TRUE
PWR1_Status=TRUE
PWR1_Busy=TRUE
PWR1_Err=FALSE
MC_Power2
AxisY
PWR2_Enable=TRUE
PWR2_Status=TRUE
PWR2_Busy=TRUE
PWR2_Err=FALSE


0006
MC_GroupEnable1
MC_GroupEnable
EN ENO
AxesGroup Done
Execute Busy
Error
ErrorID
AxesGroup
GrpEnable1_Exe=TRUE
GrpEnable1_Done=TRUE
GrpEnable1_Busy=FALSE
GrpEnable1_Err=FALSE
GrpEnable1_ErrorID=MC_ALM_NO_ERR


0008
MOVE
EN ENO
IN OUT
AxesGroup.AxesGroupDisabled=FALSE
GrpEnableStatus=TRUE


0009
MC_Home1
MC_Home
EN
ENO
AxisX
Axis
Done
Home1_Done=TRUE
AND
Execute
Busy
Home1_Busy=FALSE
PWR1_Status=TRUE
IN0
OUT
Home1_Mode=35
HomeMode
Active
Home1_Active=FALSE
Home1_Exe=TRUE
IN1
Home1_Vel=1000
Velocity
CommandAborted
Home1_Comd=FALSE
Home1_AppVel=100
ApproachVelocity
Error
Home1_Err=FALSE
Home1_Acc=5000
Acceleration
ErrorID
Home1_ErrID=MC_ALM_NO_ERR
Home1_Dec=5000
Deceleration
Home1_Jerk=10000
Jerk
Home1_Pos=0
Position
0010
MC_Home2
MC_Home
EN
ENO
Active
Home2_Active=FALSE
Home2_Comd=FALSE
AND
PWR2_Status=TRUE
IN0
OUT
IN1
Execute
Home2_Mode=35
HomeMode
Home2_Vel=1000
Velocity
0011
AND
EN
OUT
AxisHomed=TRUE
Home2_Done=TRUE
IN0
IN1


0012
AND
EN
OUT
PWR0_Status=TRUE
IN0
PWR1_Status=TRUE
IN1
PWR2_Status=TRUE
IN2
GrpEnableStatus=TRUE
IN3
AxisHomed=TRUE
IN4
SMC_MoveLinearRelative2D1
SMC_MoveLinearRelative2D
EN
ENO
AxesGroup
Rel2D1_Exe=TRUE
Execute
Rel2D1_Pos
Position
Rel2D1_Vel=20000
Velocity
Rel2D1_ACC=50000
Acceleration
Rel2D1_DEC=50000
Deceleration
Rel2D1_Jerk=200000
Jerk
Rel2D1_Coord=ACS
CoordSystem
Rel2D1_Buffer=Buffered
BufferMode
Rel2D1_TransParam
TransitionParameter
Done
Rel2D1_Done=TRUE
Busy
Rel2D1_Busy=FALSE
Active
Rel2D1_Active=FALSE
CommandAborted
Rel2D1_ComdAbort=FALSE
Error
Rel2D1_Err=FALSE
ErrorID
Rel2D1_ErrID=MC_ALM_NO_ERR
0013
SMC_MoveLinearRelative2D2
SMC_MoveLinearRelative2D
EN
ENO
AxesGroup
Rel2D1_Active=TRUE
Execute
Rel2D2_Pos
Position
Acceleration
Deceleration
Rel2D2_Jerk=5000
Jerk
CoordSystem
Rel2D2_Buffer=Buffered
BufferMode
TransitionMode
TransitionParameter
Done
Rel2D2_Done=FALSE
Busy
Rel2D2_Busy=TRUE
Active
Rel2D2_Active=FALSE
0014
SMC_MoveLinearRelative2D3
SMC_MoveLinearRelative2D
EN
ENO
AxesGroup
Rel2D1_Active=TRUE
Execute
Rel2D3_Pos
Position
Rel2D3_Vel=100
Velocity
Rel2D3_ACC=200
Acceleration
Rel2D3_DEC=200
Deceleration
Rel2D3_Jerk=5000
Jerk
CoordSystem
Rel2D3_Buffer=Buffered
BufferMode
TransitionMode
TransitionParameter
Done
Rel2D3_Done=FALSE
Busy
Rel2D3_Busy=TRUE
Active
Rel2D3_Active=FALSE
CommandAborted
Rel2D3_ComdAbort=FALSE
Error
Rel2D3_Err=FALSE
ErrorID
Rel2D3_ErrID=MC_ALM_NO_ERR

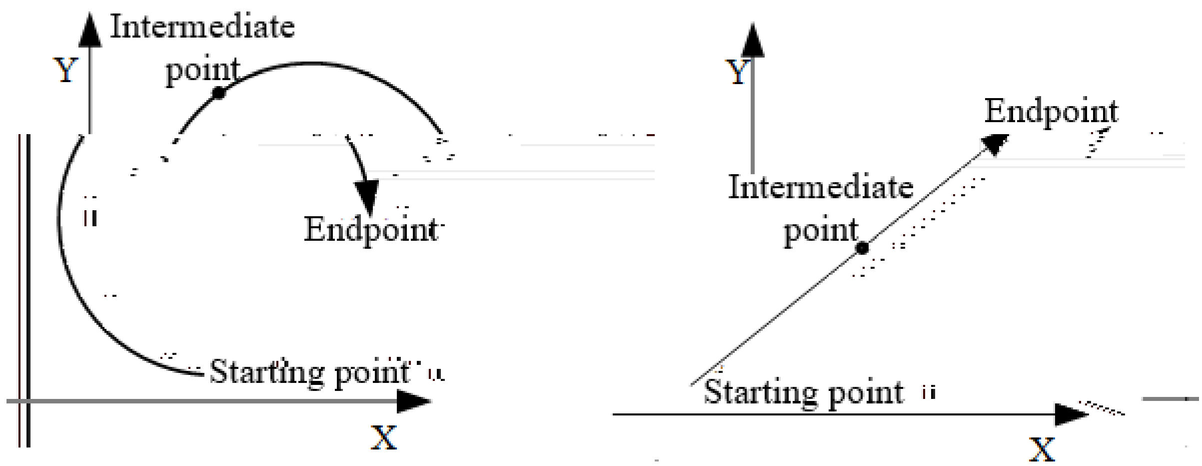


Description of Primary Variables

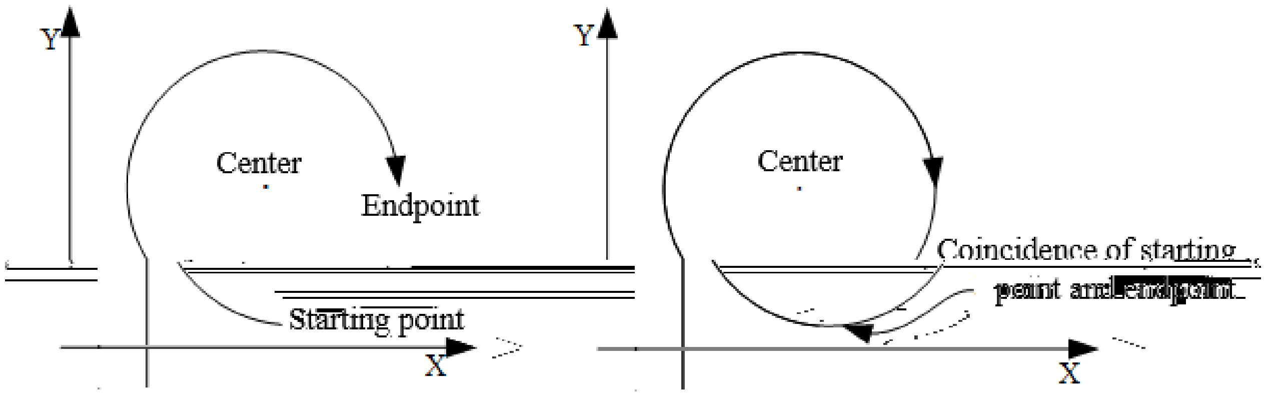
Variable name	Variable type	Initial value	Notes

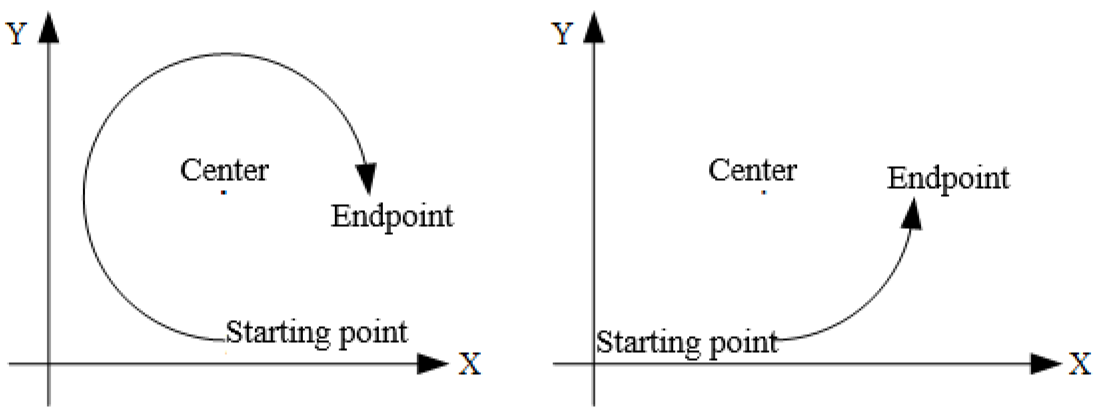
7.5.4 Precautions

7.6 SM.3 ((l)9y)-1388612.2 (g.(6)T0:)-13.2-13.64 T(l)2.2 (g.(6)T0



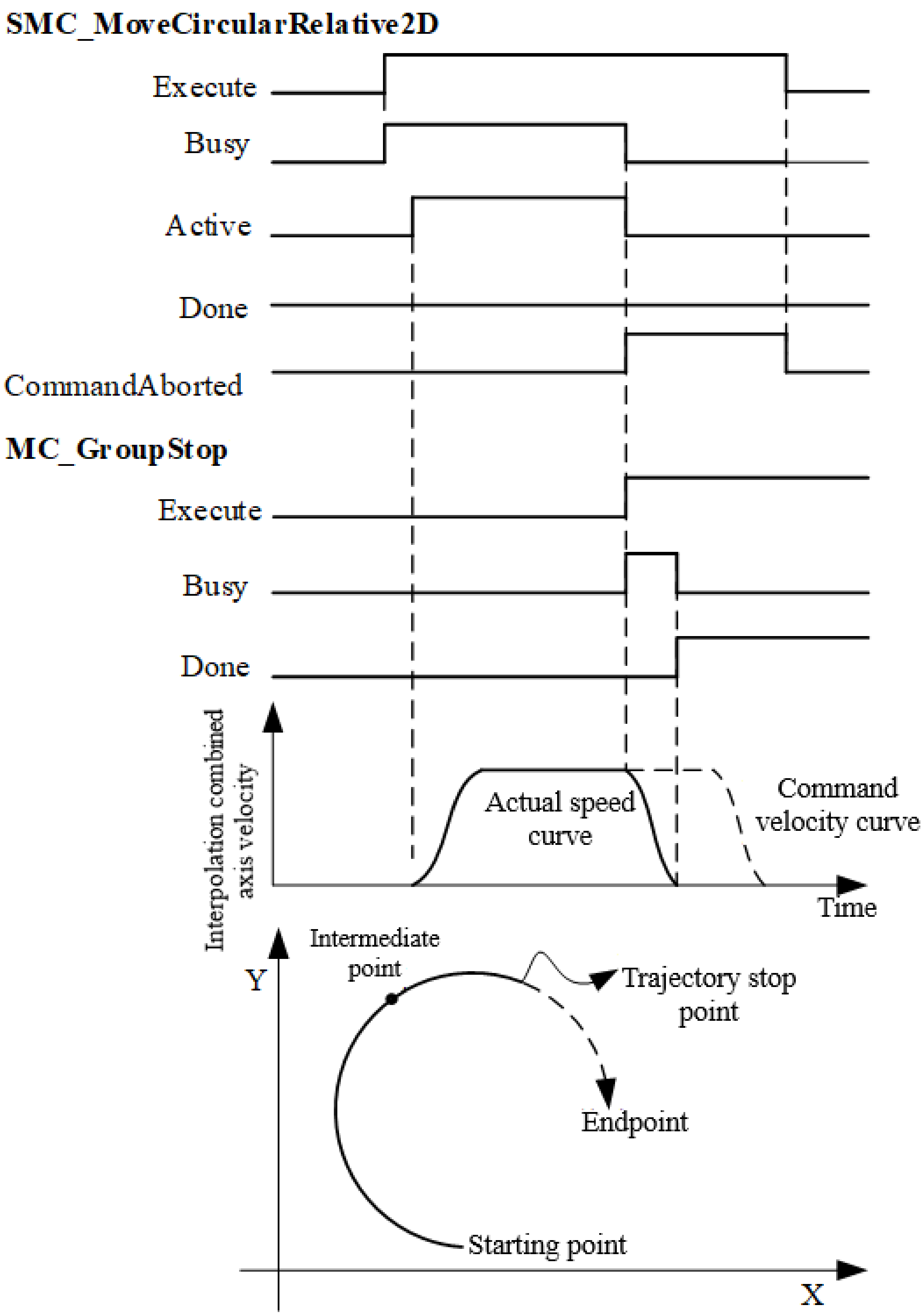
Intermediate
point
Y
Endpoint
Starting point
X
Y
Endpoint
Intermediate
point
Starting point
X

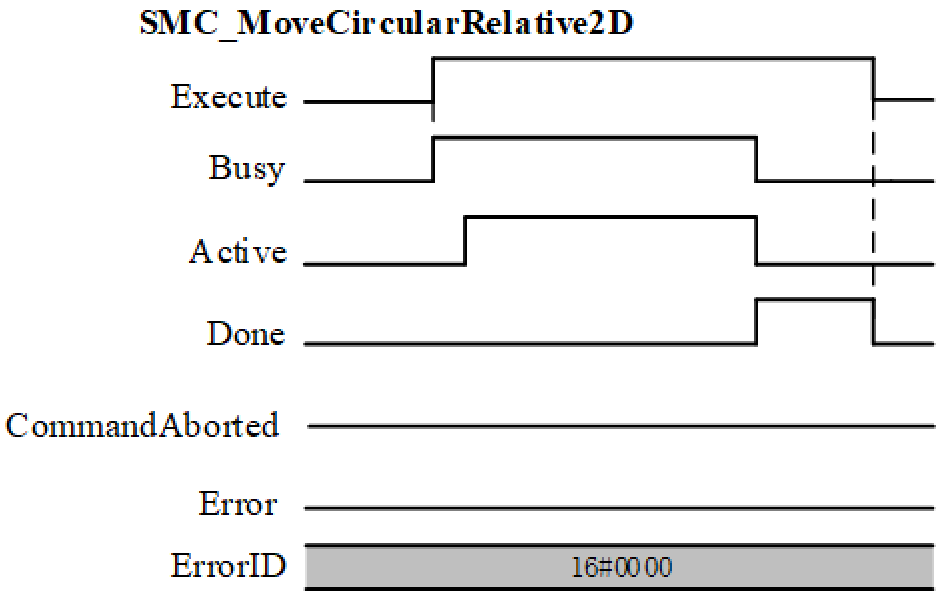


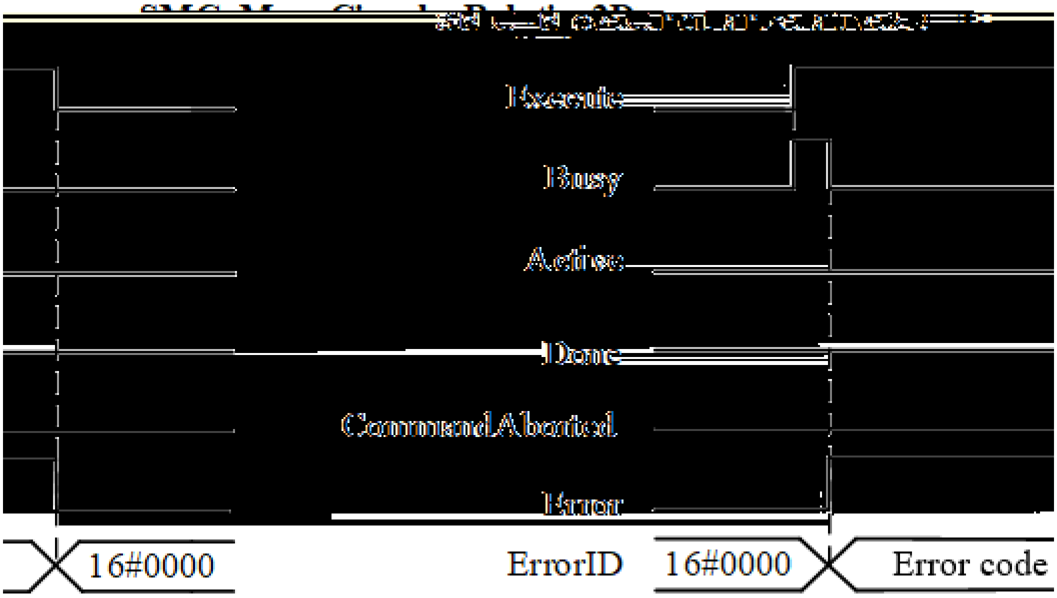


PathChoice= CLOCKWISE

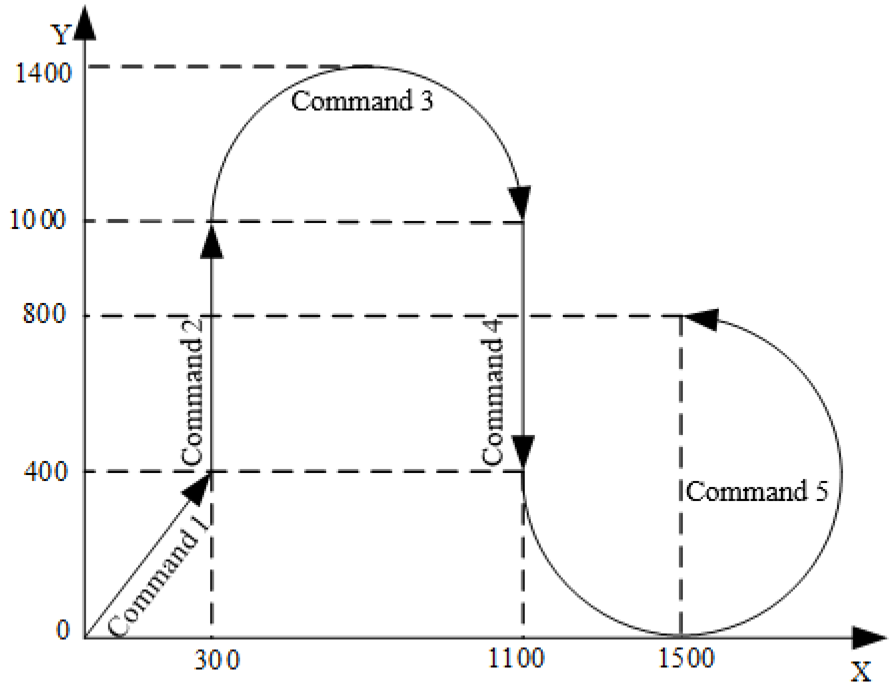
PathChoice= COUNTERCLOCKWISE


SMC_MoveCircularRelative2D
Execute
Busy
Active
Done
CommandAborted
MC_GroupStop
Execute
Busy
Done
Interpolation combined axis velocity
Actual speed curve
Command velocity curve
Time
Intermediate point
Y
Trajectory stop point
Endpoint
Starting point
X


SMC_MoveCircularRelative2D
Execute
Busy
Active
Done
CommandAborted
Error
ErrorID
16#0000

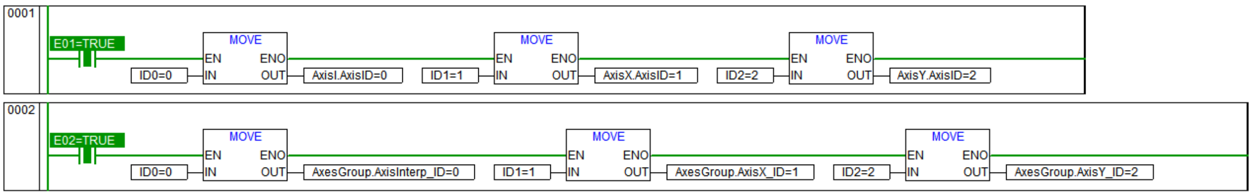


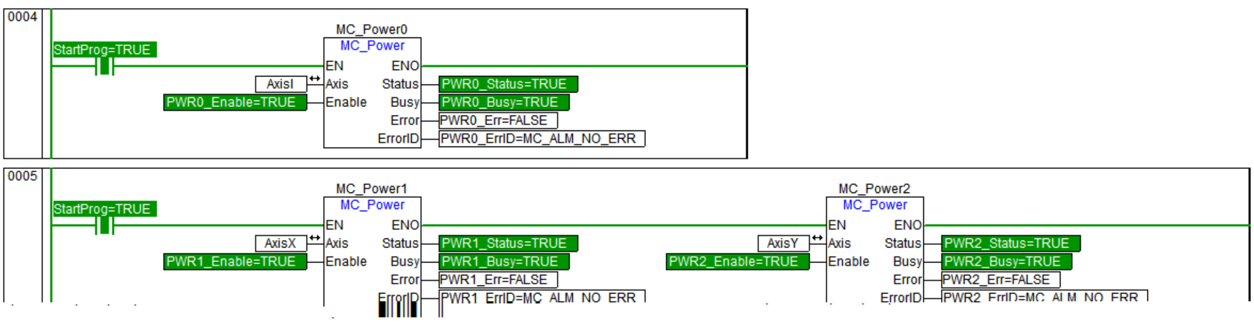
7.6.3 Examples

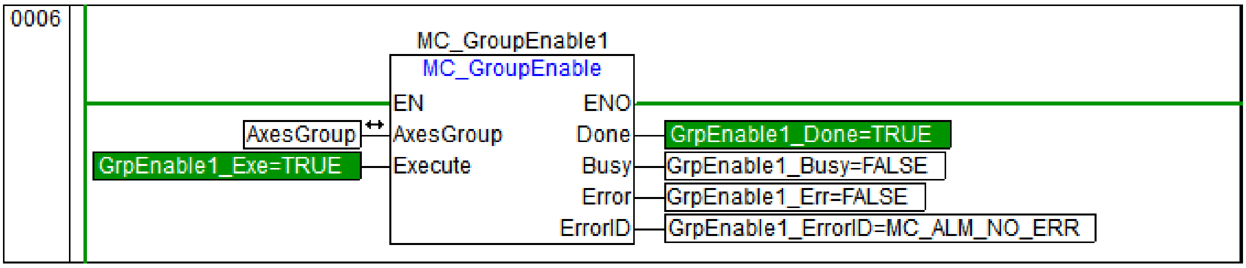


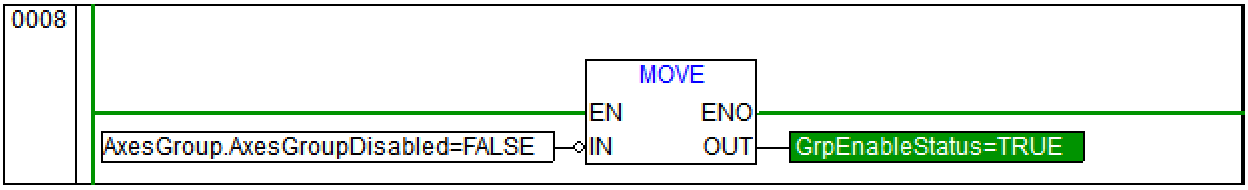
Description of Primary Variables

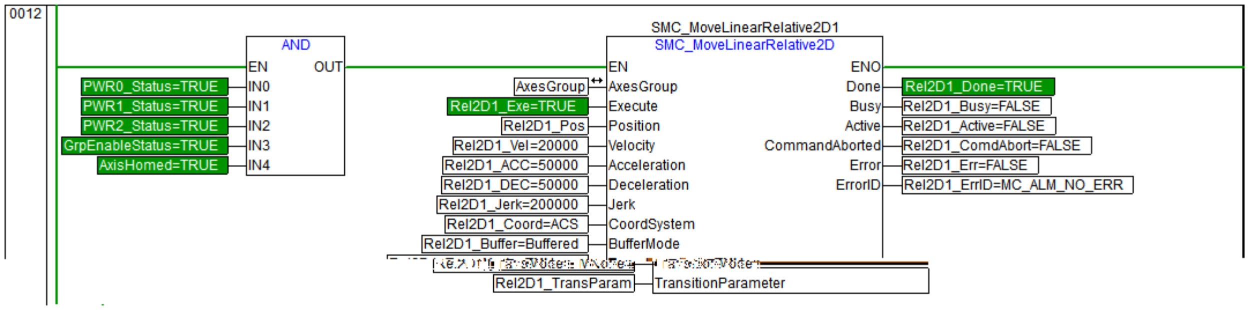
Variable Name	

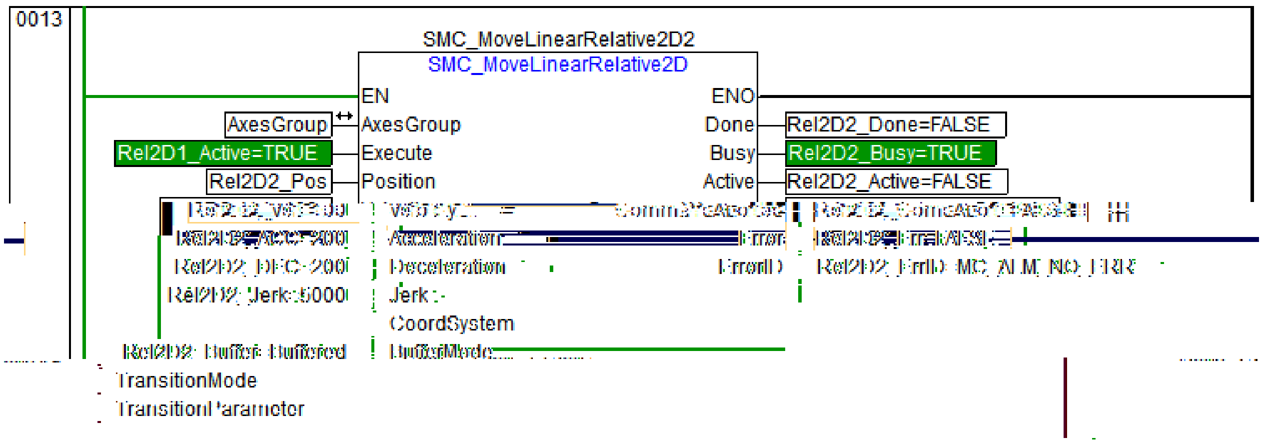

0001
E01=TRUE
MOVE
EN
ENO
ID0=0
IN
OUT
AxisI.AxisID=0
MOVE
EN
ENO
ID1=1
IN
OUT
AxisX.AxisID=1
MOVE
EN
ENO
ID2=2
IN
OUT
AxisY.AxisID=2
0002
E02=TRUE
MOVE
EN
ENO
ID0=0
IN
OUT
AxesGroup.AxisInterp_ID=0
MOVE
EN
ENO
ID1=1
IN
OUT
AxesGroup.AxisX_ID=1
MOVE
EN
ENO
ID2=2
IN
OUT
AxesGroup.AxisY_ID=2

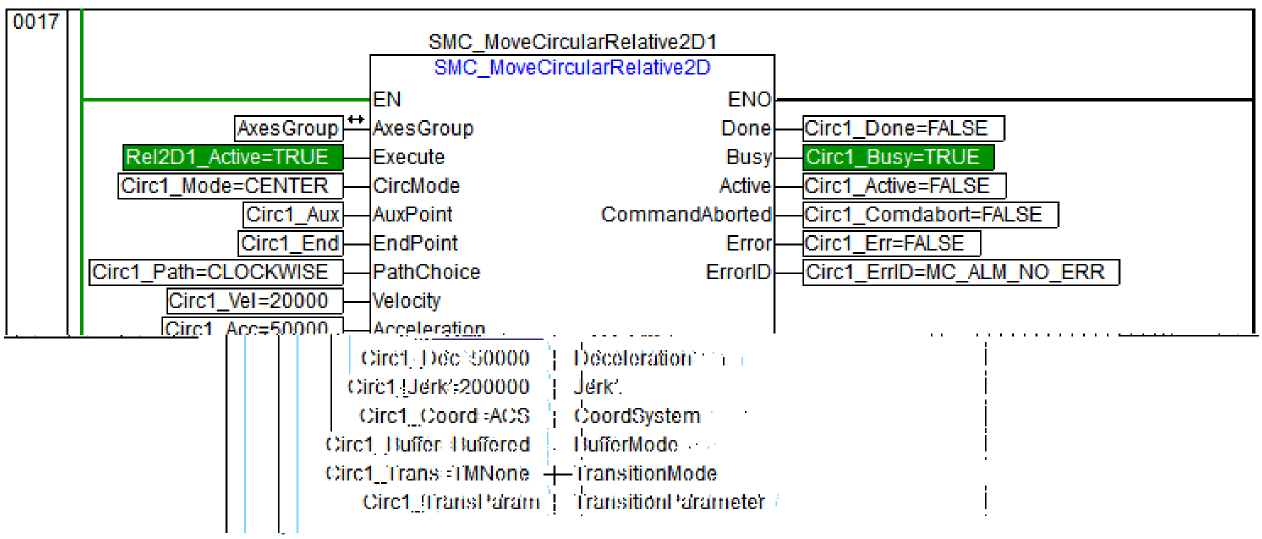

0004
StartProg=TRUE
MC_Power0
MC_Power
EN
ENO
AxisI
Axis
Status
PWR0_Status=TRUE
PWR0_Enable=TRUE
Enable
Busy
PWR0_Busy=TRUE
Error
PWR0_Err=FALSE
ErrorID
PWR0_ErrID=MC_ALM_NO_ERR
0005
StartProg=TRUE
MC_Power1
MC_Power
EN
ENO
AxisX
Axis
Status
PWR1_Status=TRUE
PWR1_Enable=TRUE
Enable
Busy
PWR1_Busy=TRUE
Error
PWR1_Err=FALSE
MC_Power2
MC_Power
EN
ENO
AxisY
Axis
Status
PWR2_Status=TRUE
PWR2_Enable=TRUE
Enable
Busy
PWR2_Busy=TRUE
Error
PWR2_Err=FALSE

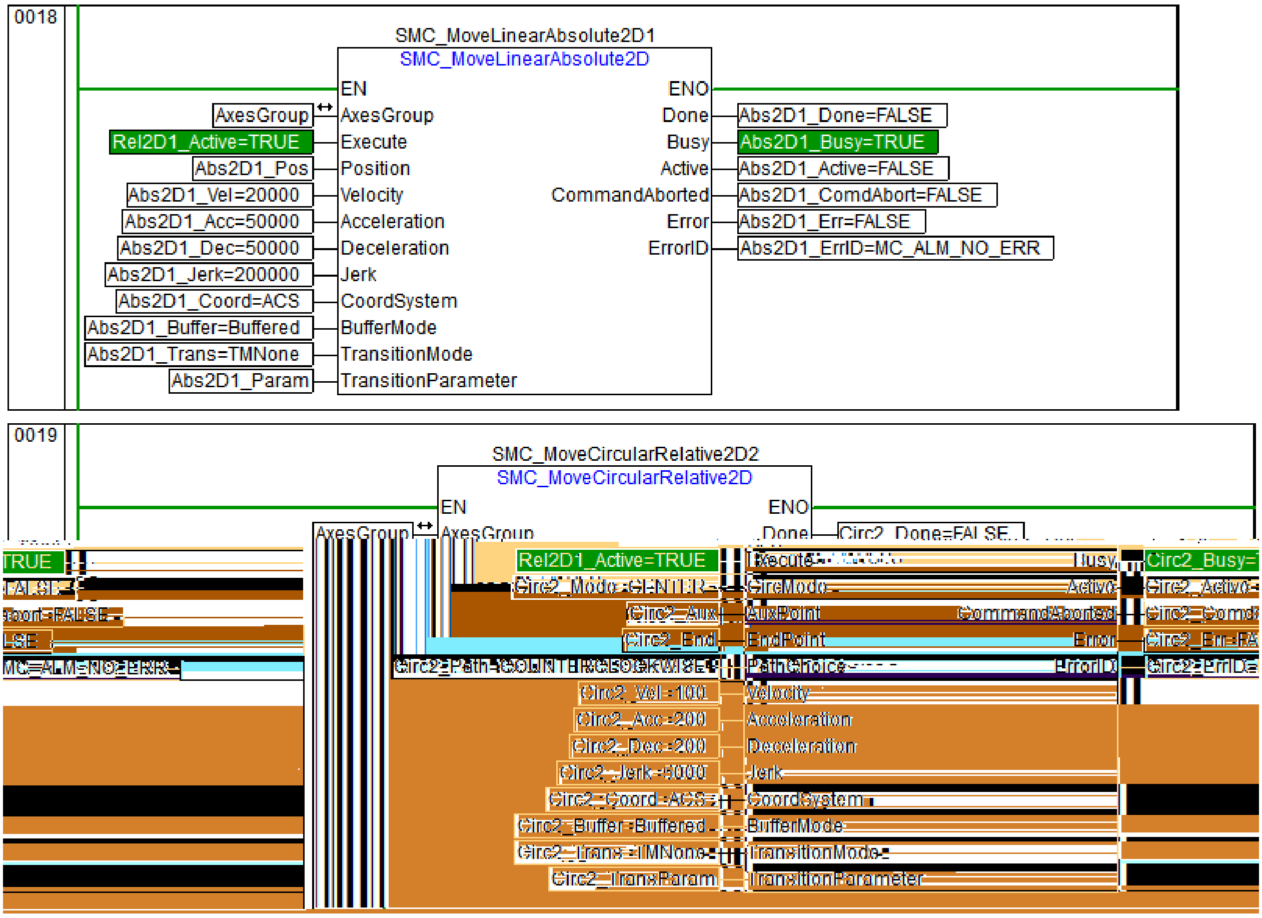

0006
MC_GroupEnable1
MC_GroupEnable
EN
ENO
AxesGroup
AxesGroup
Done
GrpEnable1_Done=TRUE
GrpEnable1_Exe=TRUE
Execute
Busy
GrpEnable1_Busy=FALSE
Error
GrpEnable1_Err=FALSE
ErrorID
GrpEnable1_ErrorID=MC_ALM_NO_ERR


0008
MOVE
EN
ENO
AxesGroup.AxesGroupDisabled=FALSE
IN
OUT
GrpEnableStatus=TRUE

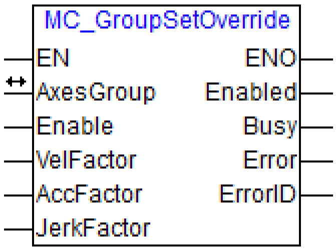

0012
AND
EN
OUT
PWR0_Status=TRUE
PWR1_Status=TRUE
PWR2_Status=TRUE
GrpEnableStatus=TRUE
AxisHomed=TRUE
IN0
IN1
IN2
IN3
IN4
SMC_MoveLinearRelative2D1
SMC_MoveLinearRelative2D
AxesGroup
Rel2D1_Exe=TRUE
Rel2D1_Pos
Rel2D1_Vel=20000
Rel2D1_ACC=50000
Rel2D1_DEC=50000
Rel2D1_Jerk=200000
Rel2D1_Coord=ACS
Rel2D1_Buffer=Buffered
Rel2D1_TransParam
EN
AxesGroup
Execute
Position
Velocity
Acceleration
Deceleration
Jerk
CoordSystem
BufferMode
TransitionParameter
ENO
Done
Busy
Active
CommandAborted
Error
ErrorID
Rel2D1_Done=TRUE
Rel2D1_Busy=FALSE
Rel2D1_Active=FALSE
Rel2D1_ComdAbort=FALSE
Rel2D1_Err=FALSE
Rel2D1_ErrID=MC_ALM_NO_ERR


0013
SMC_MoveLinearRelative2D2
SMC_MoveLinearRelative2D
AxesGroup
Rel2D1_Active=TRUE
Rel2D2_Pos
EN
AxesGroup
Execute
Position
Acceleration
Deceleration
Jerk
CoordSystem
TransitionMode
TransitionParameter
ENO
Done
Busy
Active
ErrorID
Rel2D2_Done=FALSE
Rel2D2_Busy=TRUE
Rel2D2_Active=FALSE


0017
SMC_MoveCircularRelative2D1
SMC_MoveCircularRelative2D
AxesGroup
Rel2D1_Active=TRUE
Circ1_Mode=CENTER
Circ1_Aux
Circ1_End
Circ1_Path=CLOCKWISE
Circ1_Vel=20000
Circ1_Jerk=200000
Circ1_Coord=ACS
Circ1_Trans=TMNone
Circ1_TransParam
EN
AxesGroup
Execute
CircMode
AuxPoint
EndPoint
PathChoice
Velocity
Acceleration
Deceleration
Jerk
CoordSystem
BufferMode
TransitionMode
TransitionParameter
ENO
Done
Busy
Active
CommandAborted
Error
ErrorID
Circ1_Done=FALSE
Circ1_Busy=TRUE
Circ1_Active=FALSE
Circ1_Comdabort=FALSE
Circ1_Err=FALSE
Circ1_ErrID=MC_ALM_NO_ERR



Description of Primary Variables



7.7.1 Parameter

Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

7.7.2 Functions

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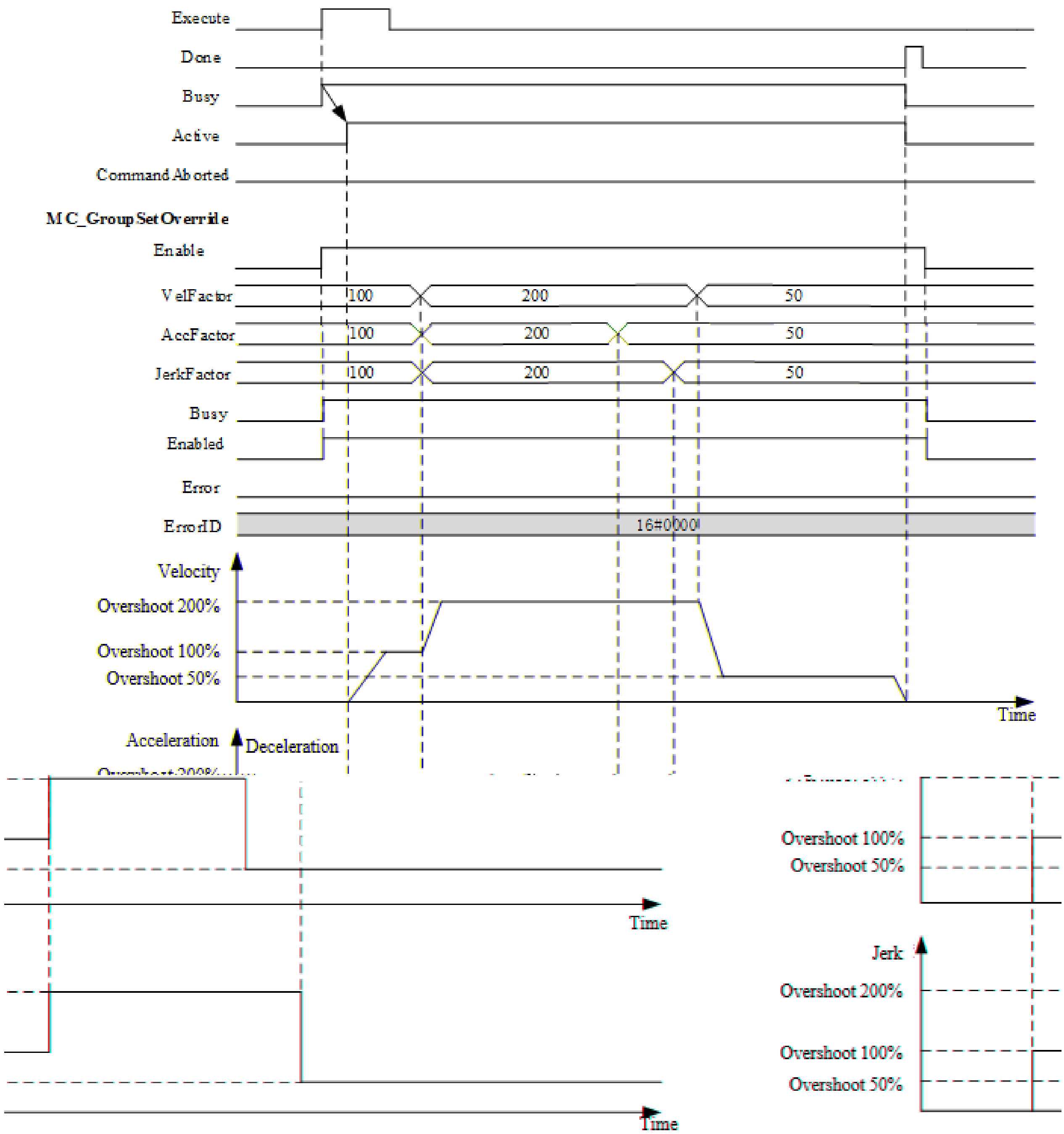
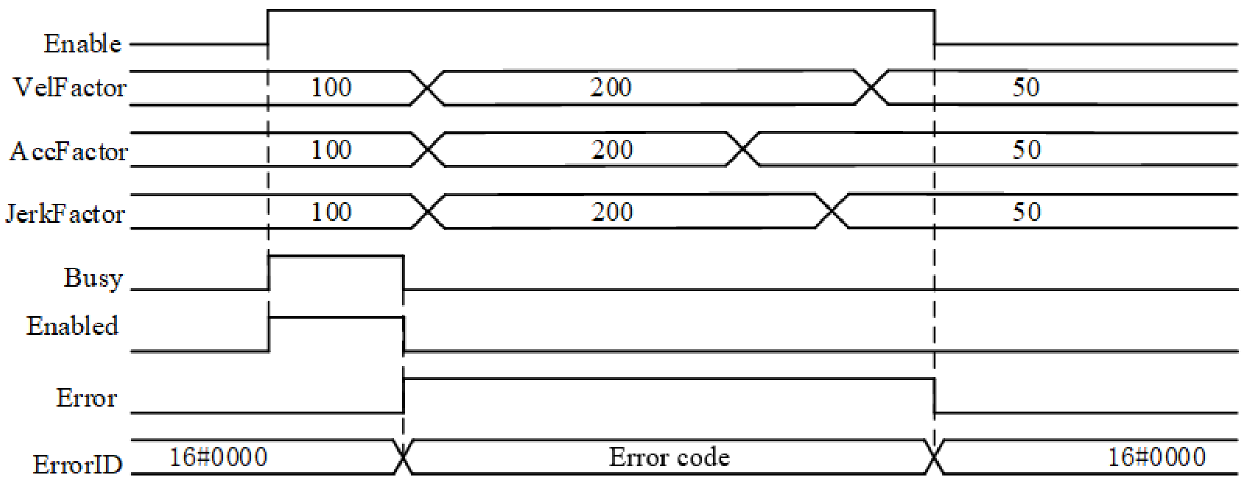
SMC_MoveLinearAbsolute2D

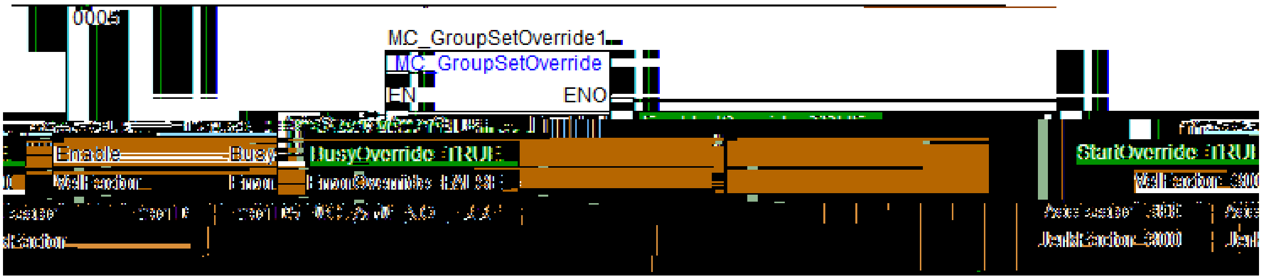




7.7.3 Examples

Description of Primary Variables

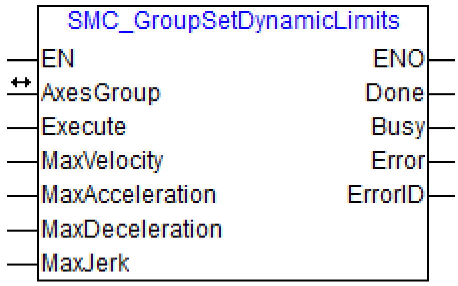
Title	Data Type	Initial Value	Notes



7.7.4 Precautions

7.7.5 Reference

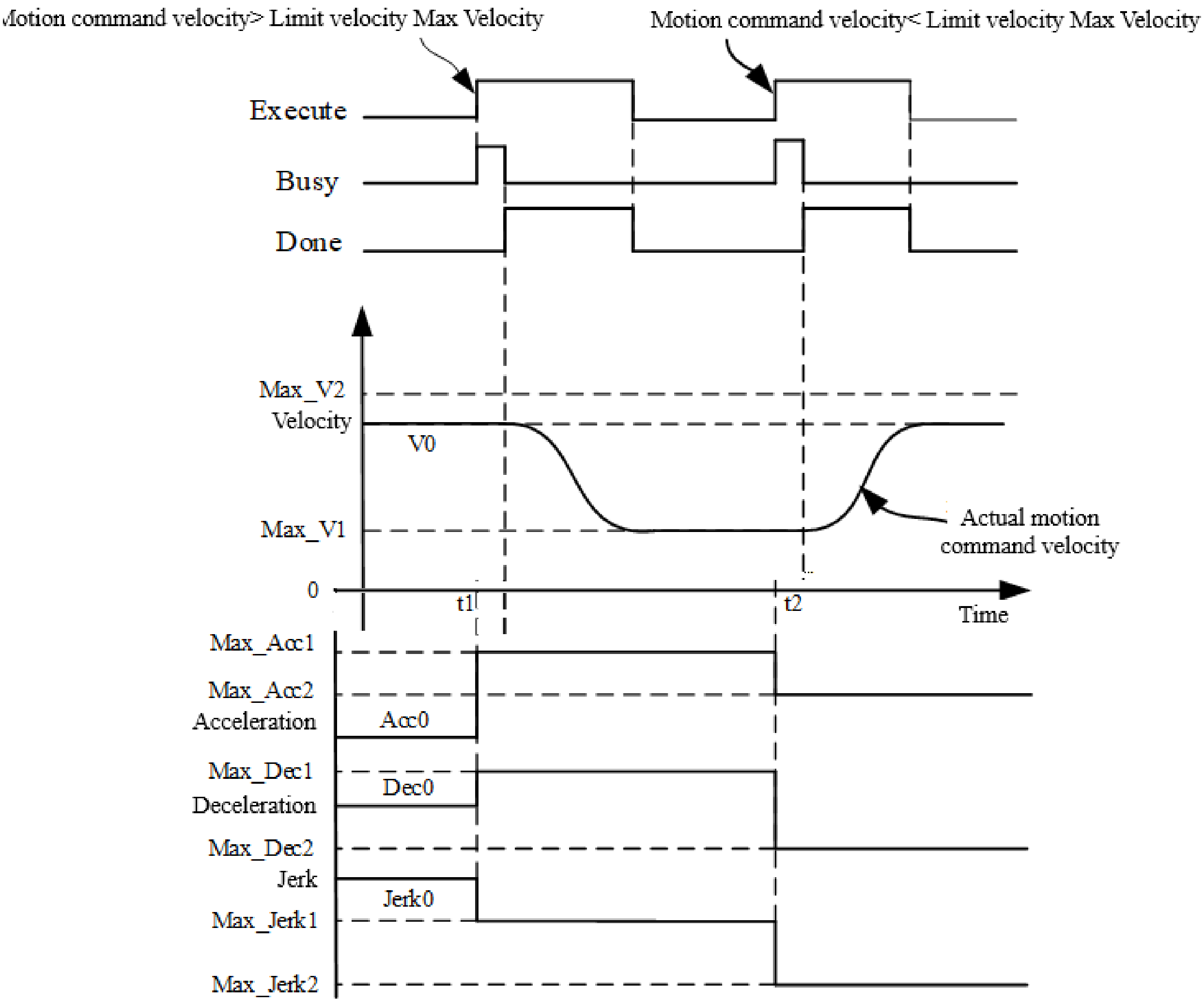
7.8 SMC_GroupSetDynamicLimits (Set Axes Group Dynamic Parameter Limits)



7.8.1 Parameter

Parameter Type	Name	Description	Empty or Not	Default Value	Scope	Data Type

7.8.2 Functions

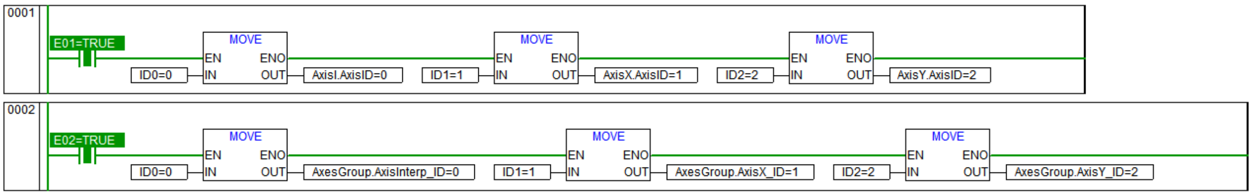


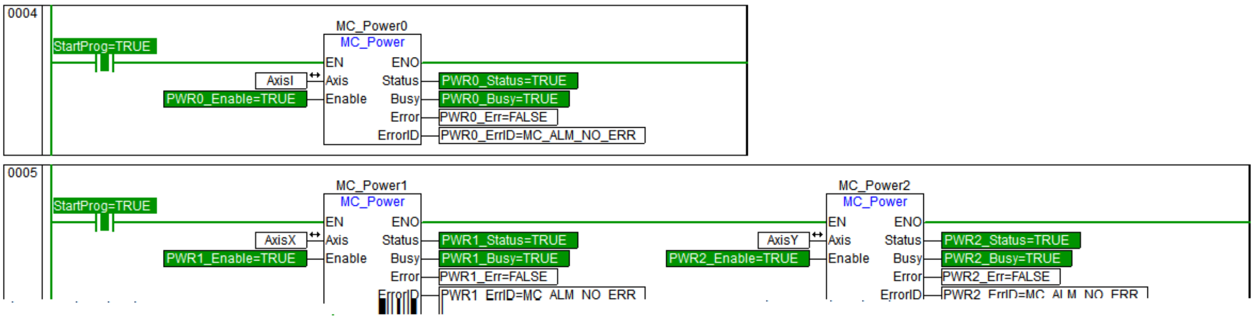
Motion command velocity> Limit velocity Max Velocity
Motion command velocity< Limit velocity Max Velocity
Execute
Busy
Done
Max_V2
Velocity
V0
Max_V1
Actual motion command velocity
0
t1
t2
Time
Max_Acc1
Max_Acc2
Acceleration
Acc0
Max_Dec1
Dec0
Deceleration
Max_Dec2
Jerk
Jerk0
Max_Jerk1
Max_Jerk2

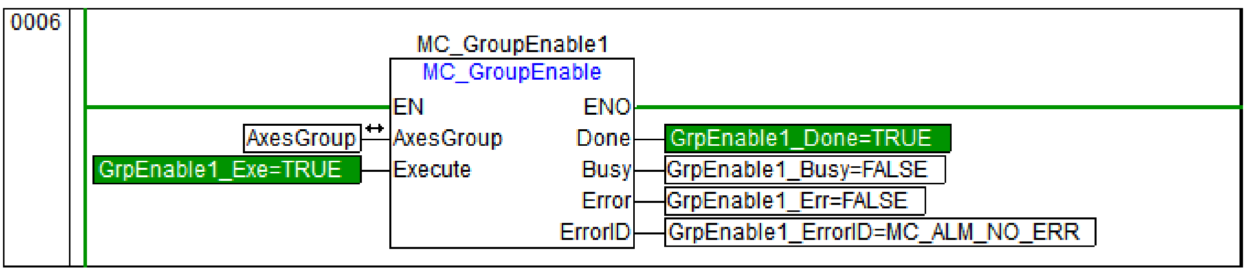
7.8.3 Examples

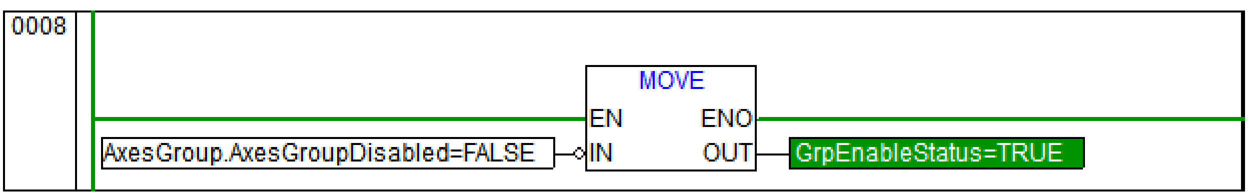
Examples of Primary Variables

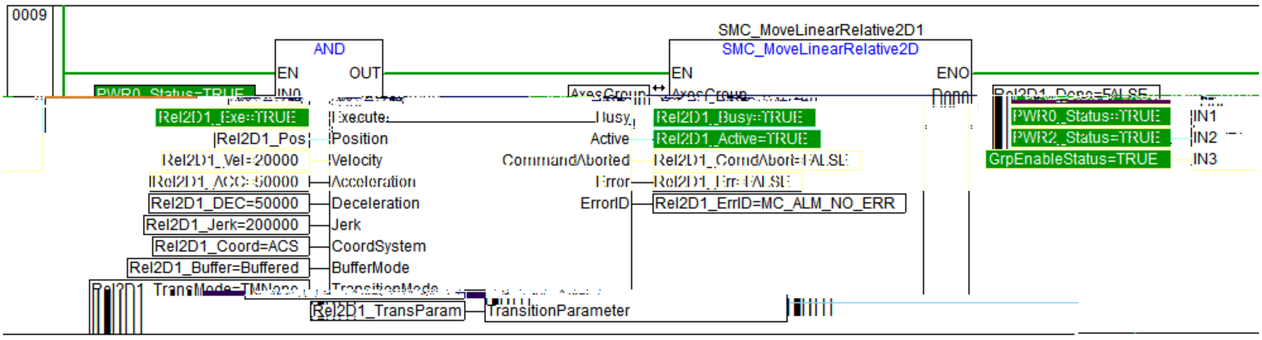
Variable Name	Variable Type	Initial Value	Notes

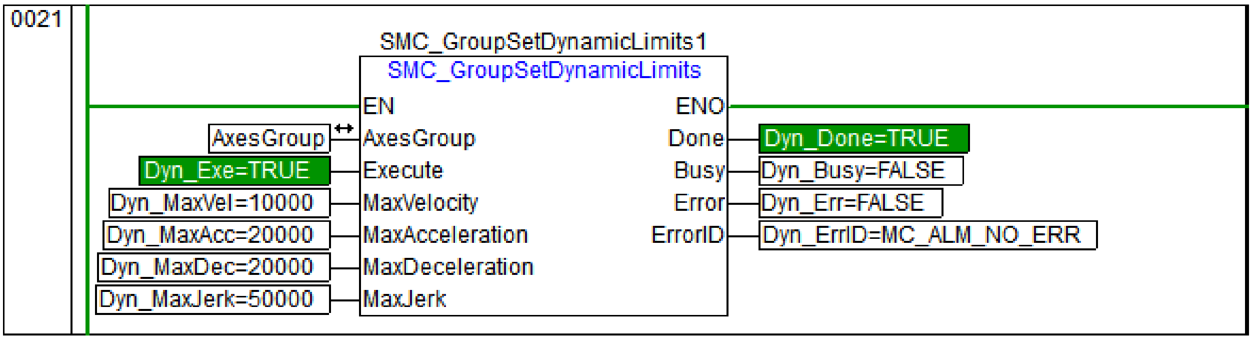

0001
E01=TRUE
MOVE
EN ENO
IN OUT
ID0=0
AxisI.AxisID=0
ID1=1
AxisX.AxisID=1
ID2=2
AxisY.AxisID=2
0002
E02=TRUE
AxesGroup.AxisInterp_ID=0
AxesGroup.AxisX_ID=1
AxesGroup.AxisY_ID=2


0004
StartProg=TRUE
MC_Power0
MC_Power
EN ENO
Axis Status
Enable Busy
Error
ErrorID
AxisI
PWR0_Enable=TRUE
PWR0_Status=TRUE
PWR0_Busy=TRUE
PWR0_Err=FALSE
PWR0_ErrID=MC_ALM_NO_ERR
0005
MC_Power1
MC_Power2
AxisX
AxisY
PWR1_Enable=TRUE
PWR1_Status=TRUE
PWR1_Busy=TRUE
PWR1_Err=FALSE
PWR2_Enable=TRUE
PWR2_Status=TRUE
PWR2_Busy=TRUE
PWR2_Err=FALSE


0006
MC_GroupEnable1
MC_GroupEnable
EN ENO
AxesGroup Done
Execute Busy
Error
ErrorID
AxesGroup
GrpEnable1_Exe=TRUE
GrpEnable1_Done=TRUE
GrpEnable1_Busy=FALSE
GrpEnable1_Err=FALSE
GrpEnable1_ErrorID=MC_ALM_NO_ERR

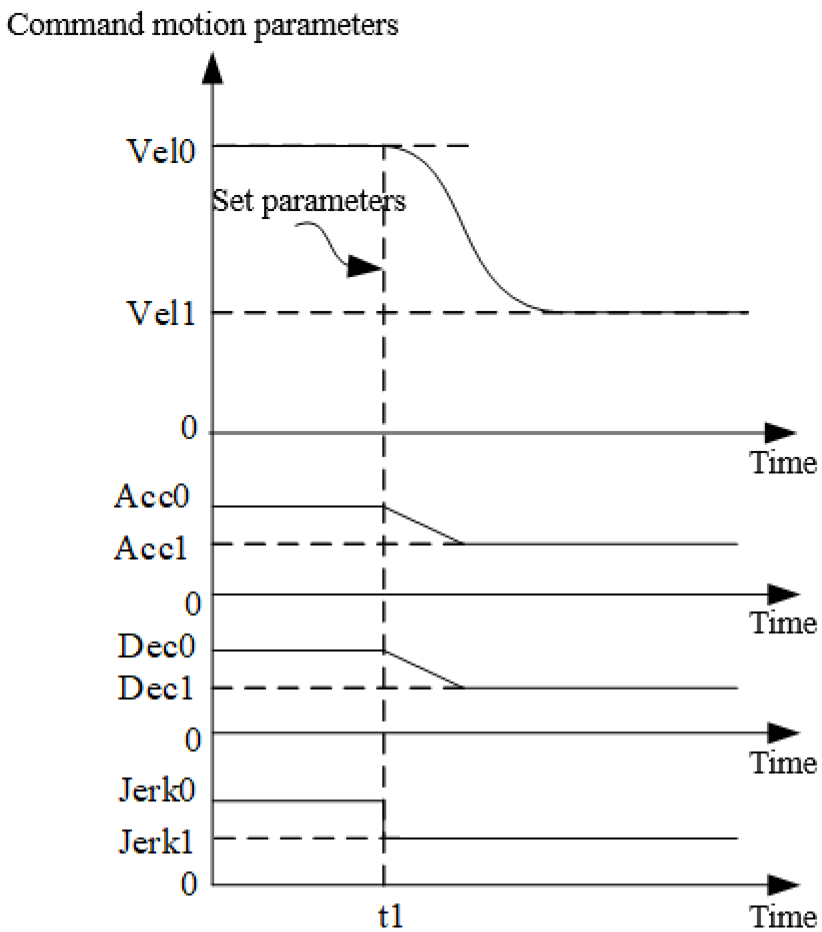

0008
MOVE
EN ENO
IN OUT
AxesGroup.AxesGroupDisabled=FALSE
GrpEnableStatus=TRUE





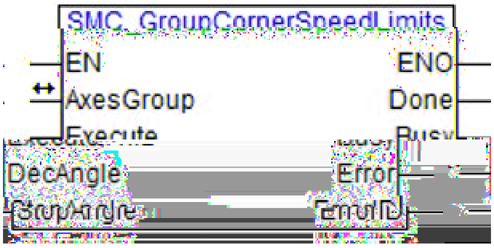
Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



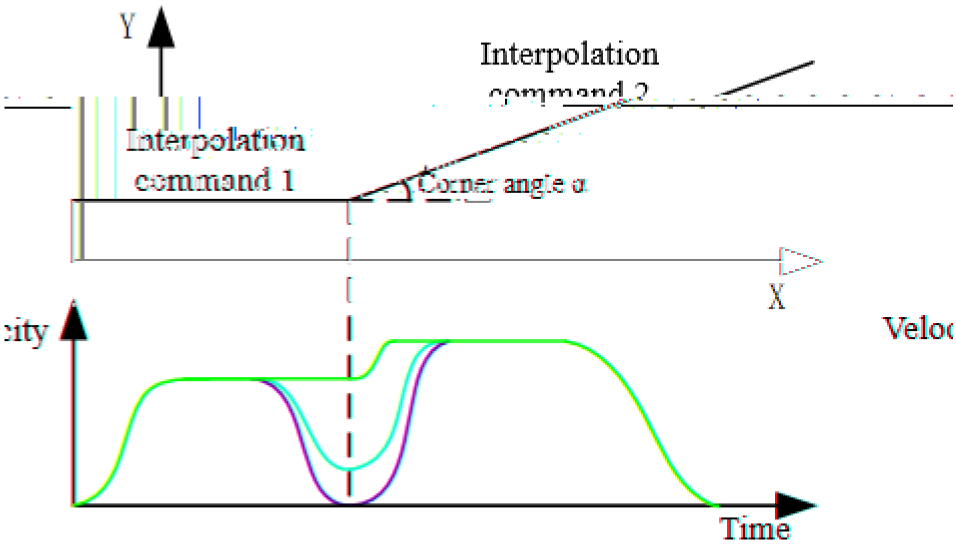
Vel0, Acc0, Dec0 and Jerk0 are the command speed, acceleration, deceleration and jerk of the interpolation command resn r9.96 - (a)5.8 (ti)-4.6 (k)5.8e9.96 4141(o)0.c(m)-10.6

7.9 SMC_GroupCornerSpeedLimits (Set Axes Group Corner Speed Limits)



7.9.1 Parameter

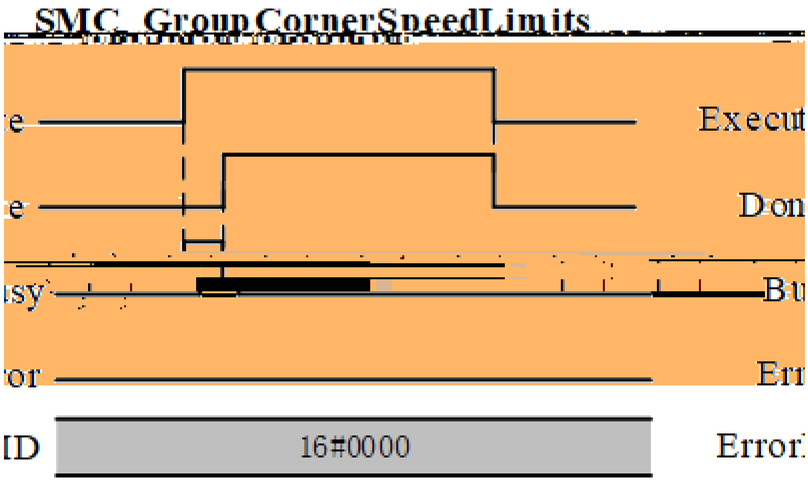
Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

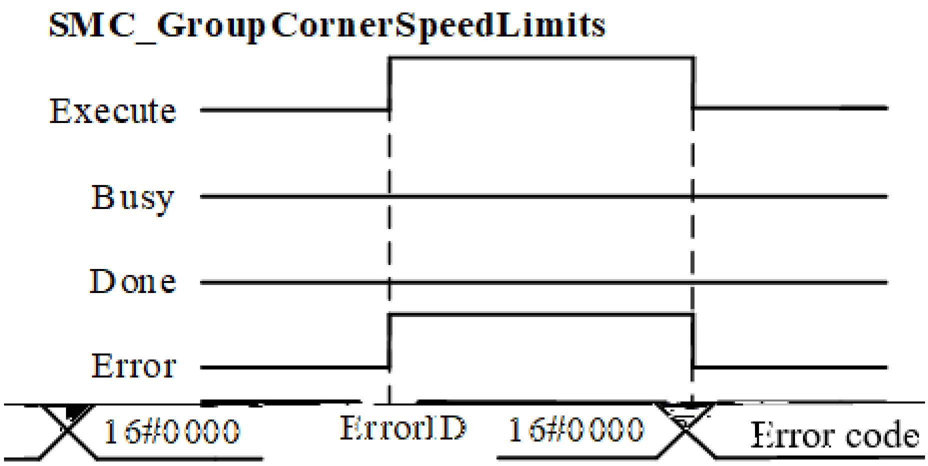


ɑ

ɑ between the two commands, and
the critical stop angle is greater than the turning angle ɑ between the two commands, the connection

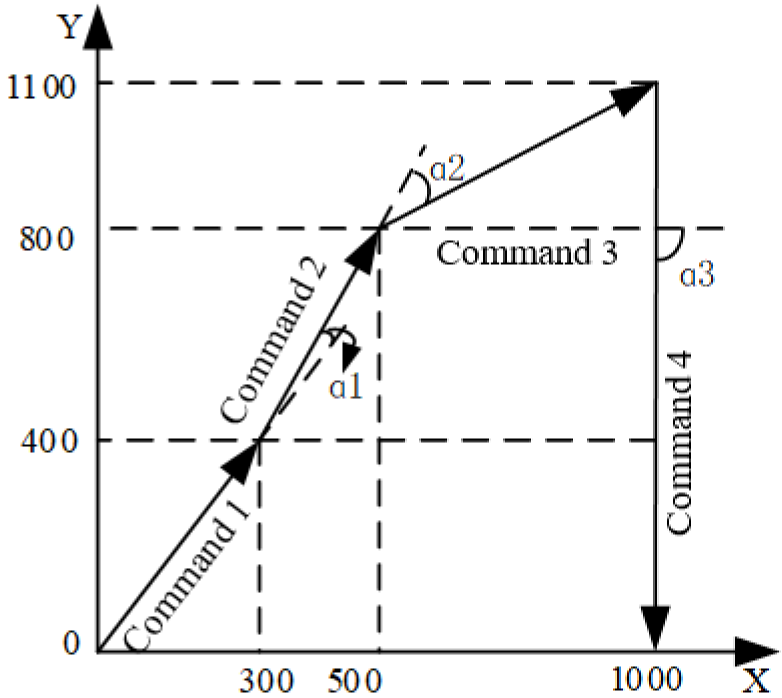
ɑ





7.9.3 Examples

■ Schematic Diagram of Action

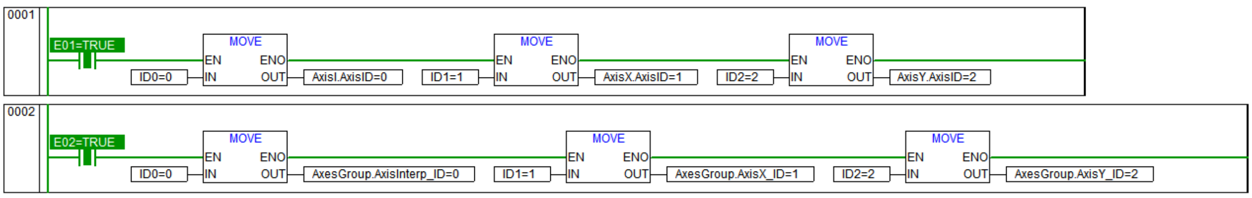


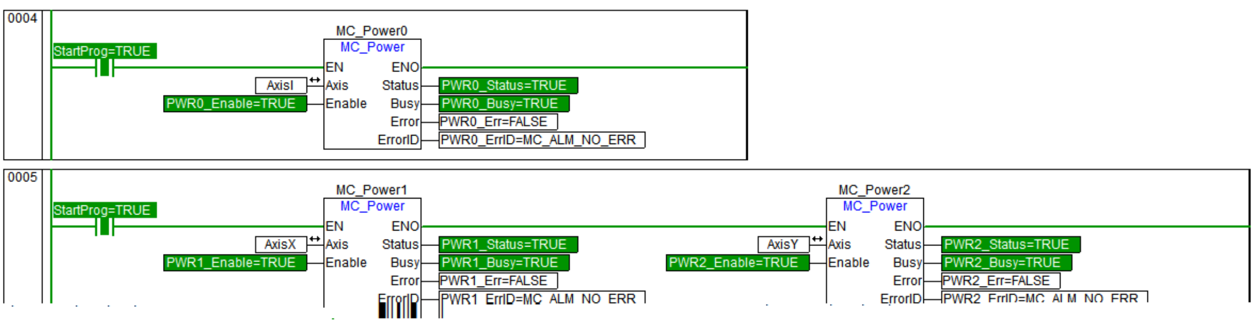
α1 of interpolation command 1 and 2 is about 10°, the break angle of interpolation command 2 and 3 is 32°, and the break angle of interpolation command 3 and 4 is 121°.

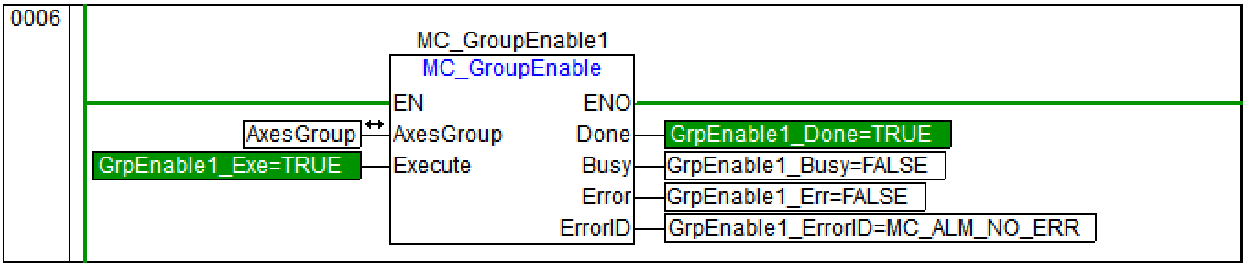
the deceleration angle DecAngle to 20° and the stop angle StopAngle to 60°.

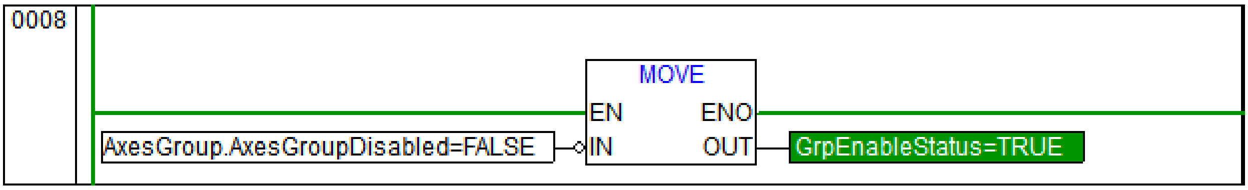
Description of Primary Variables

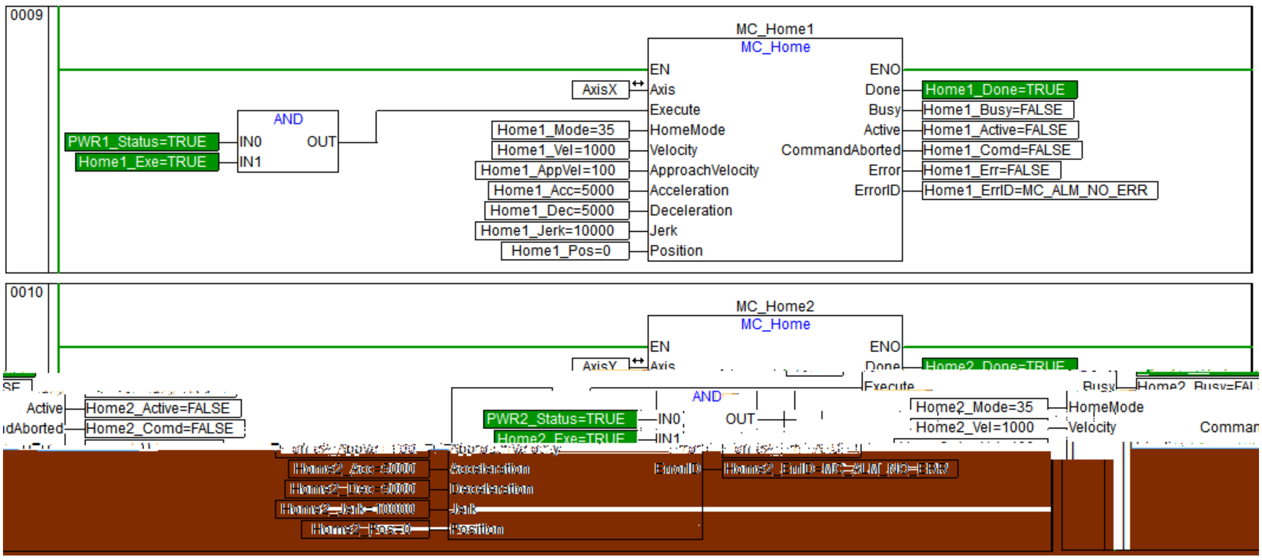
Variable Name	Variable Type	Initial Value	Notes

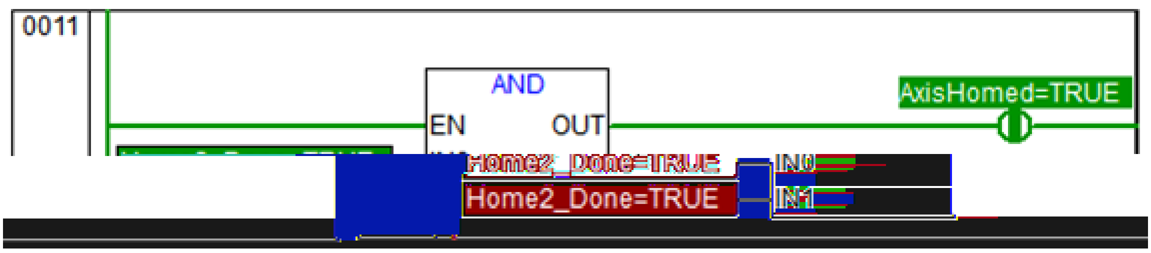

0001
E01=TRUE
MOVE
EN ENO
IN OUT
ID0=0
AxisI.AxisID=0
ID1=1
AxisX.AxisID=1
ID2=2
AxisY.AxisID=2
0002
E02=TRUE
AxesGroup.AxisInterp_ID=0
AxesGroup.AxisX_ID=1
AxesGroup.AxisY_ID=2

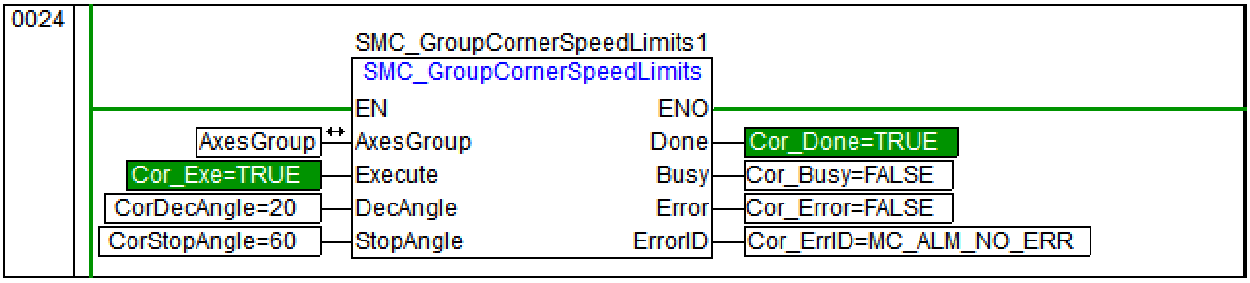

0004
StartProg=TRUE
MC_Power0
MC_Power
EN ENO
Axis Status
Enable Busy
Error
ErrorID
AxisI
PWR0_Enable=TRUE
PWR0_Status=TRUE
PWR0_Busy=TRUE
PWR0_Err=FALSE
PWR0_ErrID=MC_ALM_NO_ERR
0005
MC_Power1
AxisX
PWR1_Enable=TRUE
PWR1_Status=TRUE
PWR1_Busy=TRUE
PWR1_Err=FALSE
MC_Power2
AxisY
PWR2_Enable=TRUE
PWR2_Status=TRUE
PWR2_Busy=TRUE
PWR2_Err=FALSE

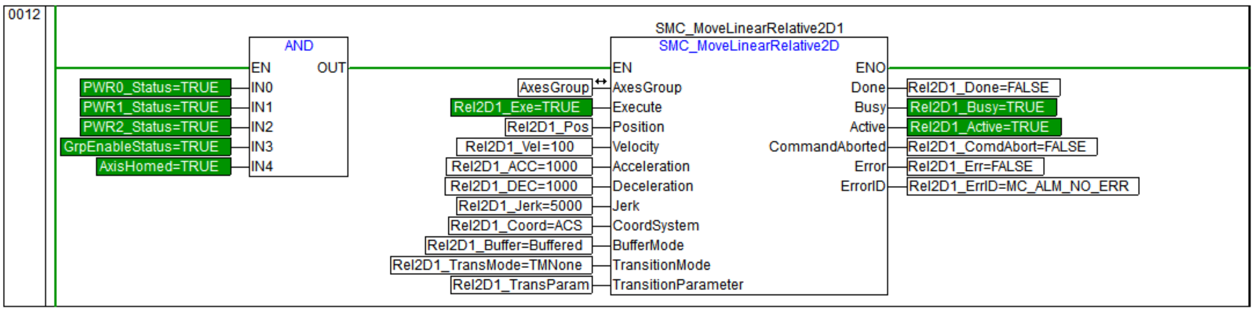

0006
MC_GroupEnable1
MC_GroupEnable
EN
ENO
AxesGroup
AxesGroup
Done
GrpEnable1_Done=TRUE
GrpEnable1_Exe=TRUE
Execute
Busy
GrpEnable1_Busy=FALSE
Error
GrpEnable1_Err=FALSE
ErrorID
GrpEnable1_ErrorID=MC_ALM_NO_ERR

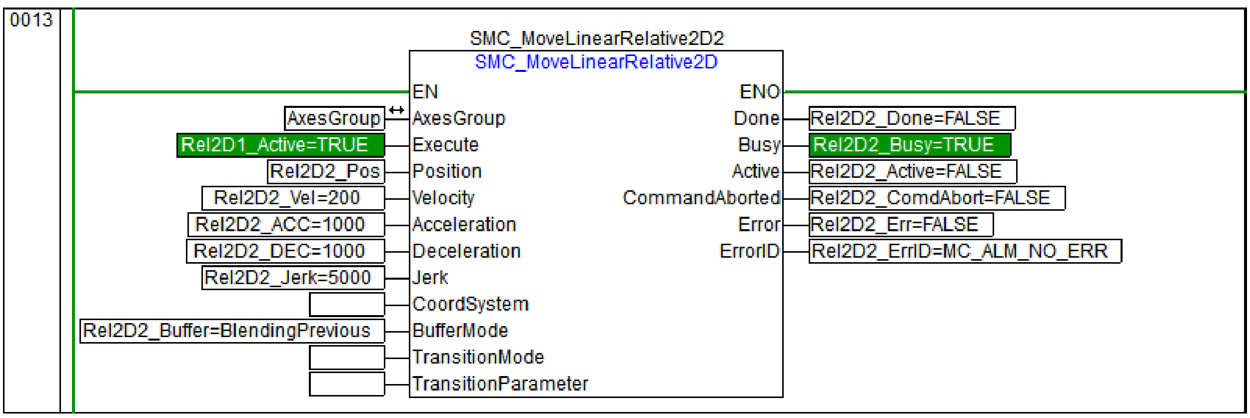

0008
MOVE
EN
ENO
AxesGroup.AxesGroupDisabled=FALSE
IN
OUT
GrpEnableStatus=TRUE

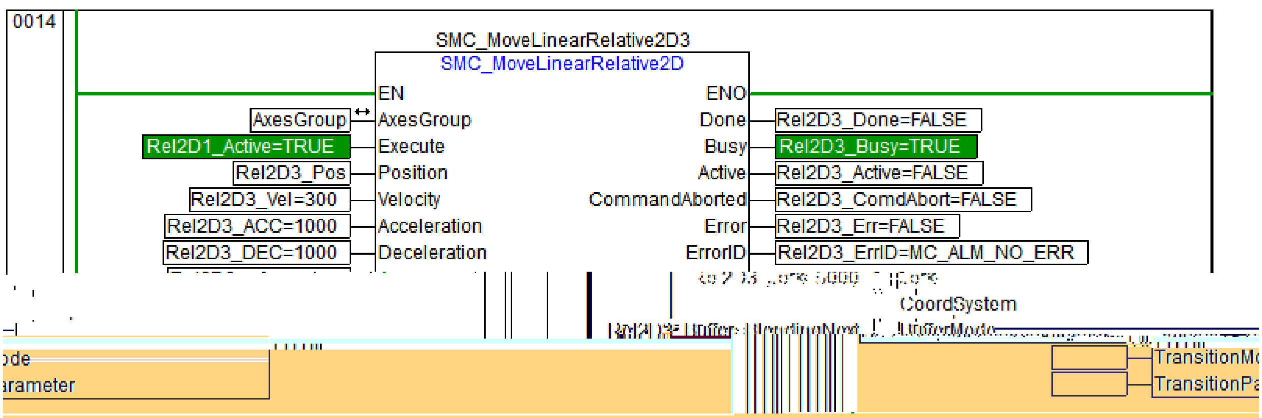

0009
MC_Home1
MC_Home
AND
PWR1_Status=TRUE
Home1_Exe=TRUE
IN0
IN1
OUT
AxisX
Home1_Mode=35
Home1_Vel=1000
Home1_AppVel=100
Home1_Acc=5000
Home1_Dec=5000
Home1_Jerk=10000
Home1_Pos=0
EN
Axis
Execute
HomeMode
Velocity
ApproachVelocity
Acceleration
Deceleration
Jerk
Position
ENO
Done
Busy
Active
CommandAborted
Error
ErrorID
Home1_Done=TRUE
Home1_Busy=FALSE
Home1_Active=FALSE
Home1_Comd=FALSE
Home1_Err=FALSE
Home1_ErrID=MC_ALM_NO_ERR
0010
MC_Home2
MC_Home
EN
ENO
Active
Home2_Active=FALSE
Home2_Comd=FALSE
AND
PWR2_Status=TRUE
IN0
OUT
IN1
Home2_Mode=35
HomeMode
Home2_Vel=1000
Velocity

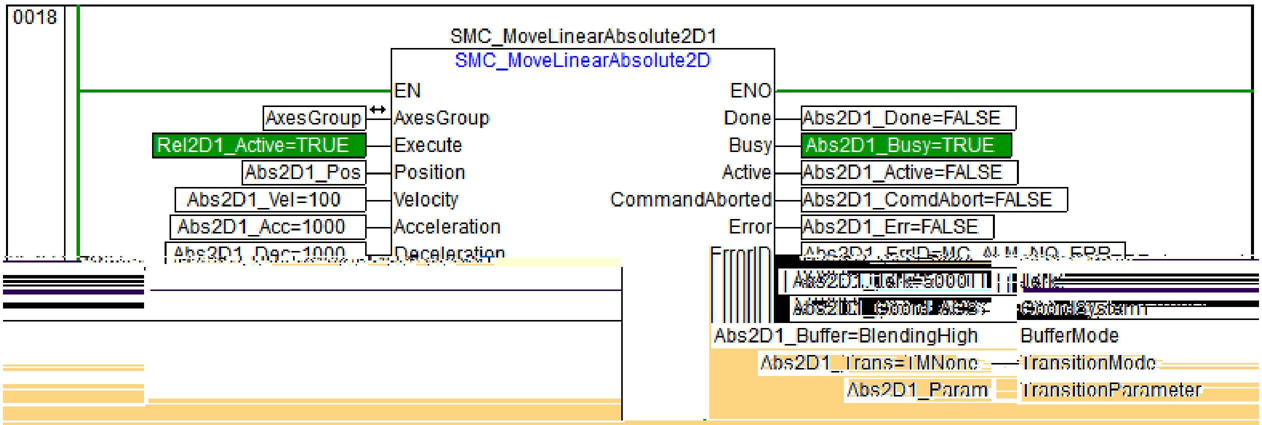

0011
AND
EN
OUT
AxisHomed=TRUE
Home2_Done=TRUE
IN0
IN1


0024
SMC_GroupCornerSpeedLimits1
SMC_GroupCornerSpeedLimits
EN
ENO
AxesGroup
AxesGroup
Done
Cor_Done=TRUE
Cor_Exe=TRUE
Execute
Busy
Cor_Busy=FALSE
CorDecAngle=20
DecAngle
Error
Cor_Error=FALSE
CorStopAngle=60
StopAngle
ErrorID
Cor_ErrID=MC_ALM_NO_ERR


0012
AND
EN
OUT
PWR0_Status=TRUE
IN0
PWR1_Status=TRUE
IN1
PWR2_Status=TRUE
IN2
GrpEnableStatus=TRUE
IN3
AxisHomed=TRUE
IN4
SMC_MoveLinearRelative2D1
SMC_MoveLinearRelative2D
EN
ENO
AxesGroup
AxesGroup
Done
Rel2D1_Done=FALSE
Rel2D1_Exe=TRUE
Execute
Busy
Rel2D1_Busy=TRUE
Rel2D1_Pos
Position
Active
Rel2D1_Active=TRUE
Rel2D1_Vel=100
Velocity
CommandAborted
Rel2D1_ComdAbort=FALSE
Rel2D1_ACC=1000
Acceleration
Error
Rel2D1_Err=FALSE
Rel2D1_DEC=1000
Deceleration
ErrorID
Rel2D1_ErrID=MC_ALM_NO_ERR
Rel2D1_Jerk=5000
Jerk
Rel2D1_Coord=ACS
CoordSystem
Rel2D1_Buffer=Buffered
BufferMode
Rel2D1_TransMode=TMNone
TransitionMode
Rel2D1_TransParam
TransitionParameter


0013
SMC_MoveLinearRelative2D2
SMC_MoveLinearRelative2D
EN
ENO
AxesGroup
AxesGroup
Done
Rel2D2_Done=FALSE
Rel2D1_Active=TRUE
Execute
Busy
Rel2D2_Busy=TRUE
Rel2D2_Pos
Position
Active
Rel2D2_Active=FALSE
Rel2D2_Vel=200
Velocity
CommandAborted
Rel2D2_ComdAbort=FALSE
Rel2D2_ACC=1000
Acceleration
Error
Rel2D2_Err=FALSE
Rel2D2_DEC=1000
Deceleration
ErrorID
Rel2D2_ErrID=MC_ALM_NO_ERR
Rel2D2_Jerk=5000
Jerk
CoordSystem
Rel2D2_Buffer=BlendingPrevious
BufferMode
TransitionMode
TransitionParameter

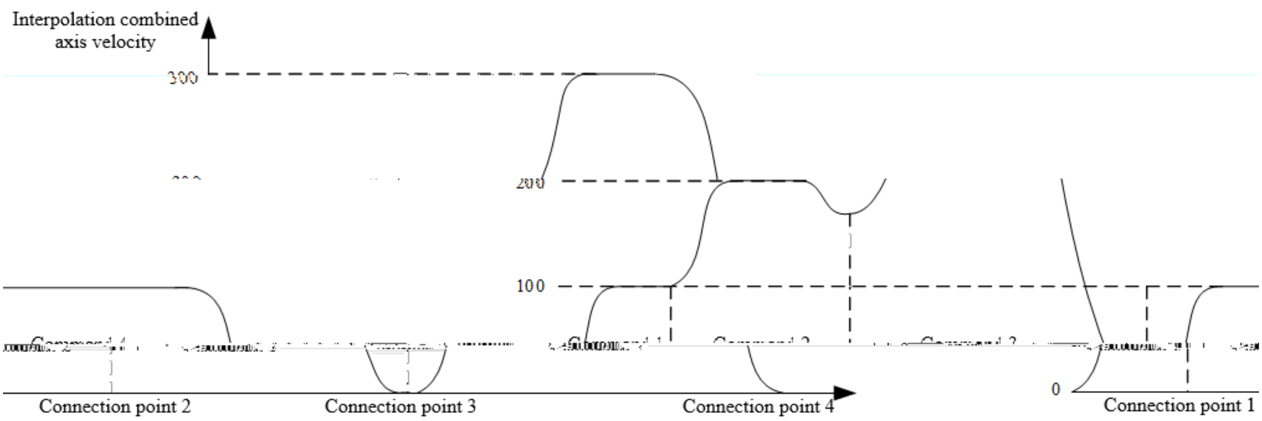

0014
SMC_MoveLinearRelative2D3
SMC_MoveLinearRelative2D
EN
ENO
AxesGroup
AxesGroup
Done
Rel2D3_Done=FALSE
Rel2D1_Active=TRUE
Execute
Busy
Rel2D3_Busy=TRUE
Rel2D3_Pos
Position
Active
Rel2D3_Active=FALSE
Rel2D3_Vel=300
Velocity
CommandAborted
Rel2D3_ComdAbort=FALSE
Rel2D3_ACC=1000
Acceleration
Error
Rel2D3_Err=FALSE
Rel2D3_DEC=1000
Deceleration
ErrorID
Rel2D3_ErrID=MC_ALM_NO_ERR
CoordSystem



Description of Primary Variables

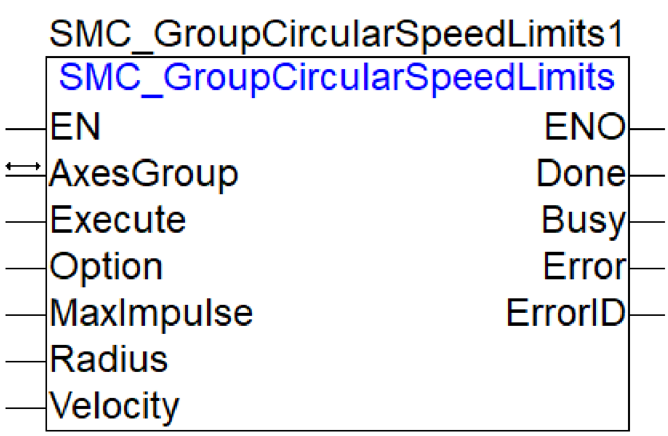
Variable Name	Variable Type	Initial Value	Notes

The set corner deceleration angle is 20° and the stop angle is 60°. The rotation angles of interpolation



7.9.4 Precautions

7.10 SMC_GroupCircularSpeedLimits (Set Axes Group Circular Speed Limits)



7.10.1 Parameter

Parameter Type	Title	Description	Empty or Not	Default Value	Scope	Data Type

7.10.2 Functions

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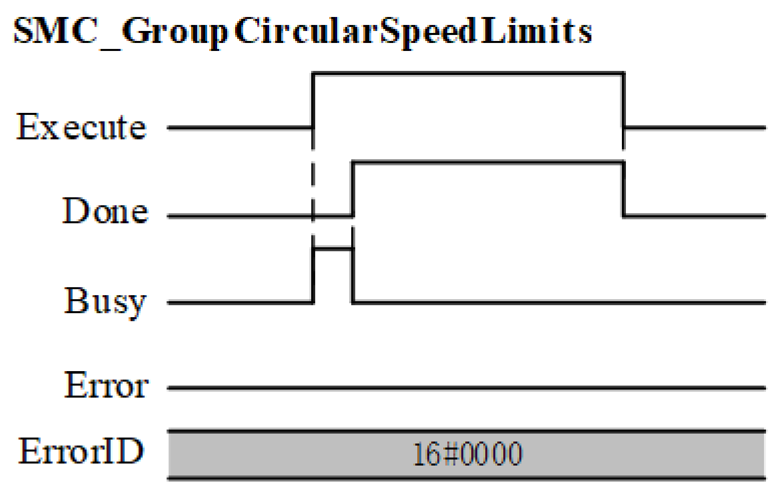
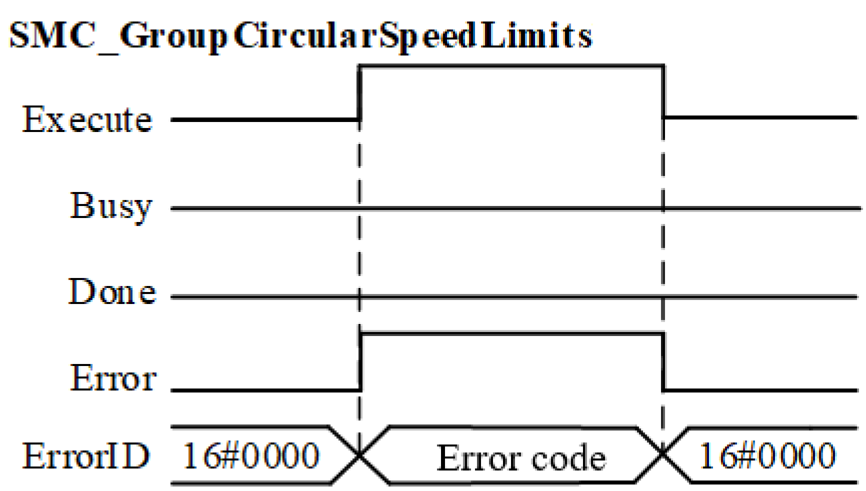

SMC_GroupCircularSpeedLimits
Execute
Done
Busy
Error
ErrorID
16#0000


SMC_GroupCircularSpeedLimits
Execute
Busy
Done
Error
ErrorID
16#0000
Error code
16#0000

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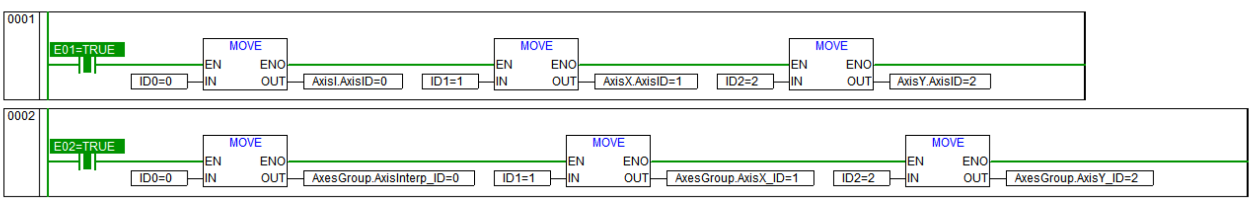
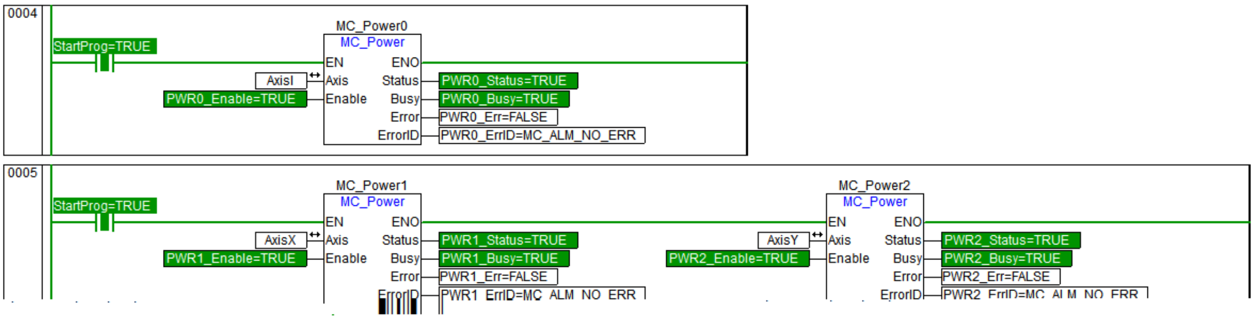
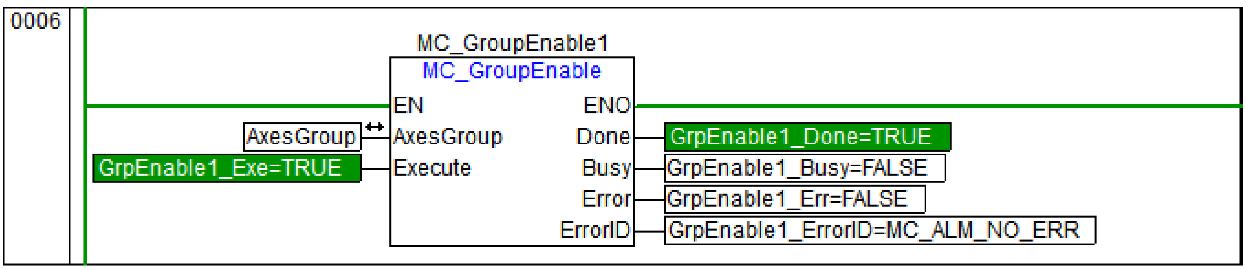
7.10.3 Examples

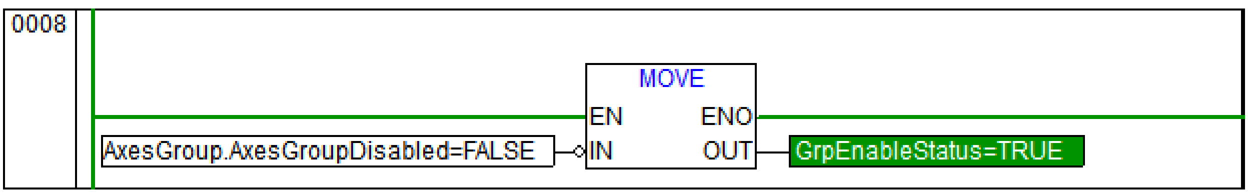
Description of Primary Variables

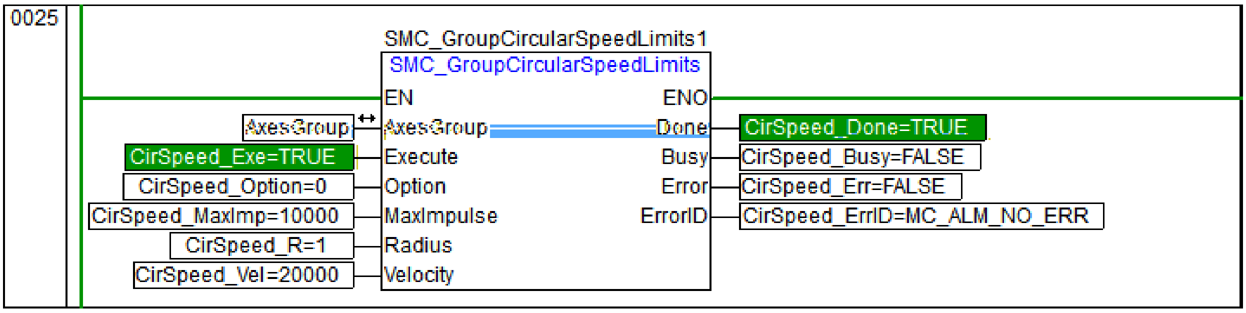
Variable Name	Variable Type	Initial Value	Notes

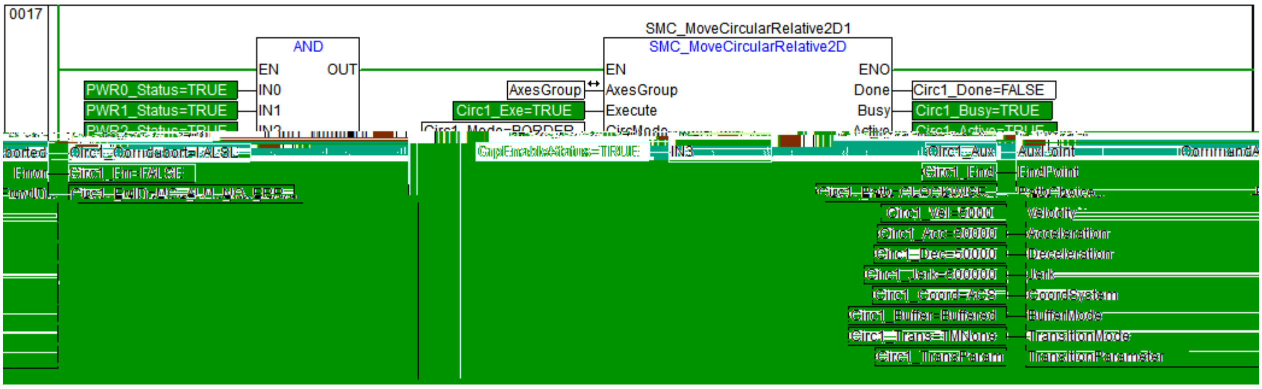


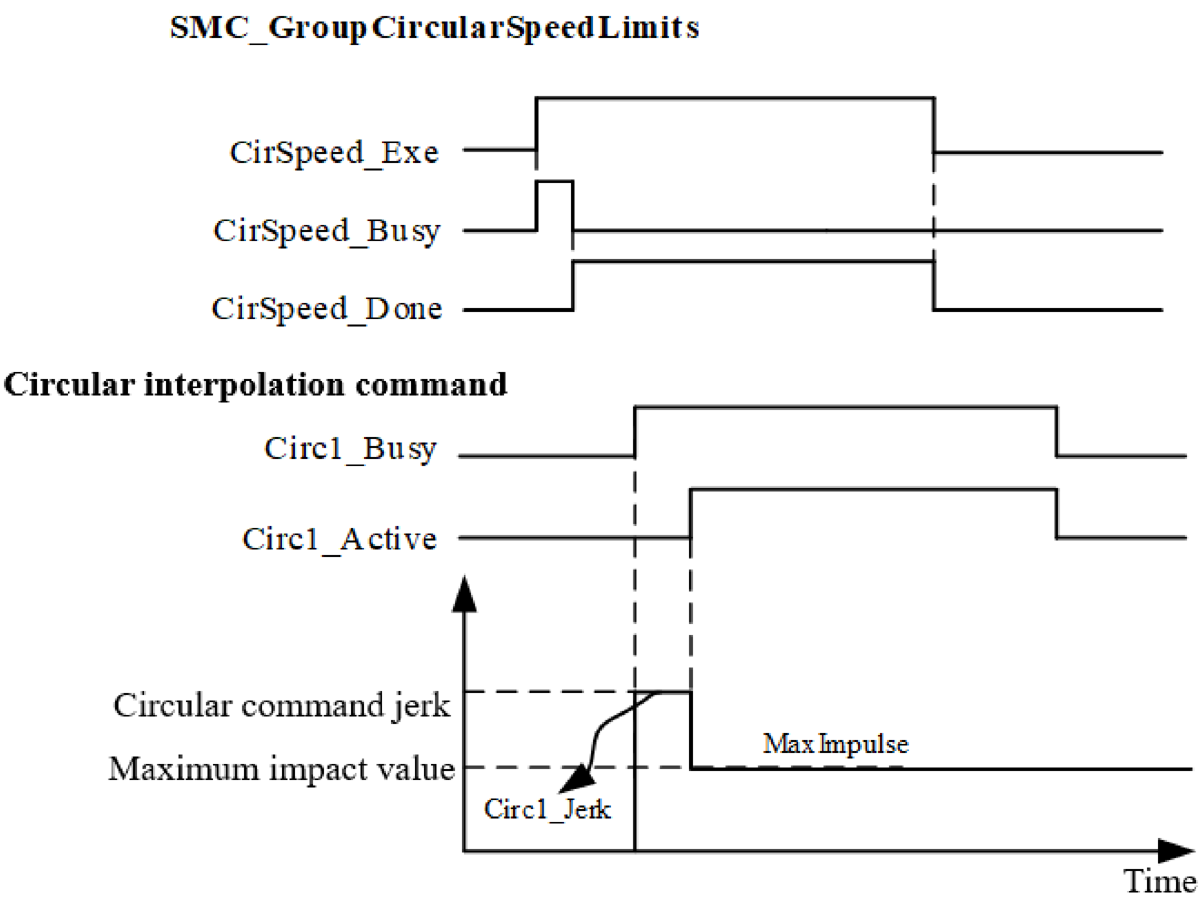

0004
StartProg=TRUE
MC_Power0
MC_Power
EN ENO
AxisI
Axis Status
PWR0_Status=TRUE
PWR0_Enable=TRUE
Enable Busy
PWR0_Busy=TRUE
Error
PWR0_Err=FALSE
ErrorID
PWR0_ErrID=MC_ALM_NO_ERR
0005
StartProg=TRUE
MC_Power1
MC_Power
AxisX
PWR1_Enable=TRUE
PWR1_Status=TRUE
PWR1_Busy=TRUE
PWR1_Err=FALSE
PWR1_ErrID=MC_ALM_NO_ERR
MC_Power2
MC_Power
AxisY
PWR2_Enable=TRUE
PWR2_Status=TRUE
PWR2_Busy=TRUE
PWR2_Err=FALSE
PWR2_ErrID=MC_ALM_NO_ERR


0006
MC_GroupEnable1
MC_GroupEnable
EN ENO
AxesGroup
AxesGroup Done
GrpEnable1_Done=TRUE
GrpEnable1_Exe=TRUE
Execute Busy
GrpEnable1_Busy=FALSE
Error
GrpEnable1_Err=FALSE
ErrorID
GrpEnable1_ErrorID=MC_ALM_NO_ERR


0008
MOVE
EN ENO
AxesGroup.AxesGroupDisabled=FALSE
IN OUT
GrpEnableStatus=TRUE

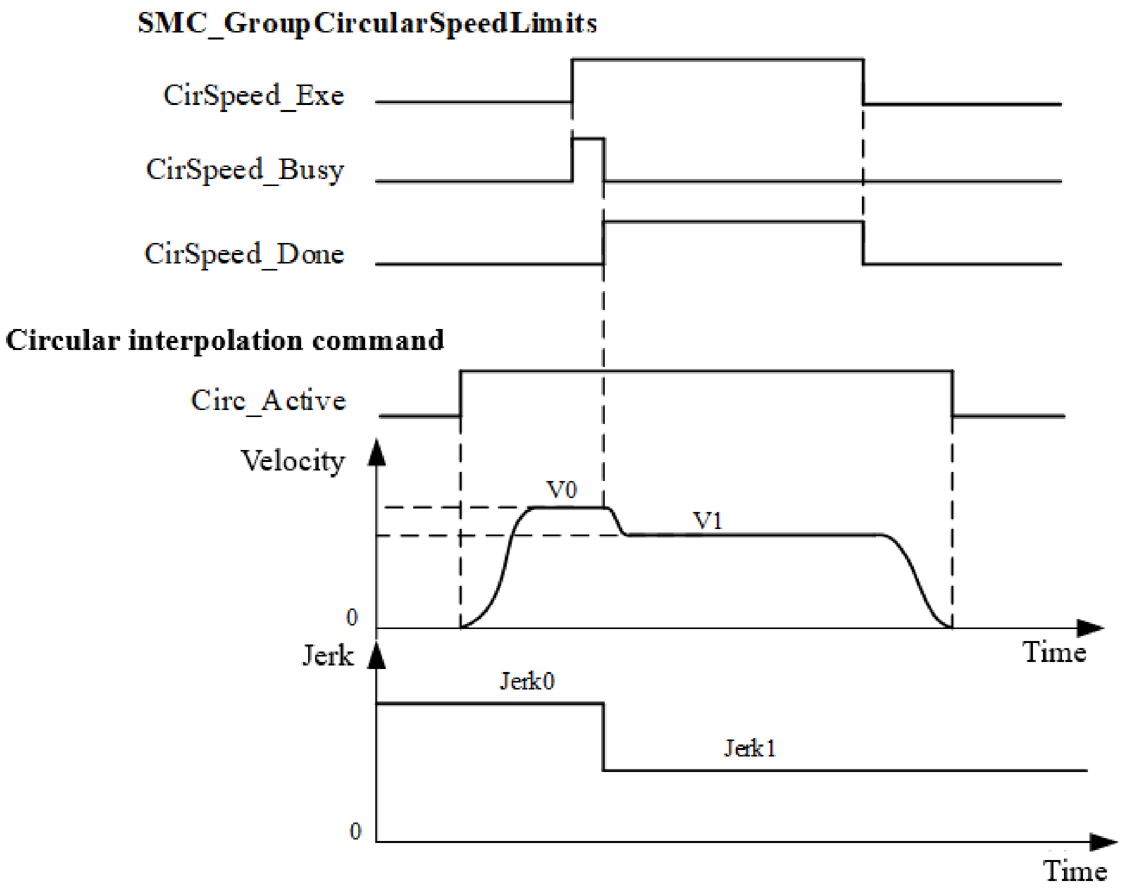

0025
SMC_GroupCircularSpeedLimits1
SMC_GroupCircularSpeedLimits
EN
ENO
AxesGroup
AxesGroup
Done
CirSpeed_Done=TRUE
CirSpeed_Exe=TRUE
Execute
Busy
CirSpeed_Busy=FALSE
CirSpeed_Option=0
Option
Error
CirSpeed_Err=FALSE
CirSpeed_MaxImp=10000
MaxImpulse
ErrorID
CirSpeed_ErrID=MC_ALM_NO_ERR
CirSpeed_R=1
Radius
CirSpeed_Vel=20000
Velocity


0017
AND
EN
OUT
PWR0_Status=TRUE
IN0
PWR1_Status=TRUE
IN1
SMC_MoveCircularRelative2D1
SMC_MoveCircularRelative2D
EN
ENO
AxesGroup
AxesGroup
Done
Circ1_Done=FALSE
Circ1_Exe=TRUE
Execute
Busy
Circ1_Busy=TRUE
EndPoint
Velocity
Acceleration
Deceleration
Jerk
CoordSystem
BufferMode
TransitionMode
Circ1_Vel=5000
Circ1_Dec=50000
Circ1_Buffer=Buffered
Circ1_Trans=TMNone



Description of Primary Variables

Variable Name	Variable Type	Initial Value	Notes



7.10.4 Precautions

Chapter 8 APPENDICES

8.1 Error Code Description

Function Block Error Code Description

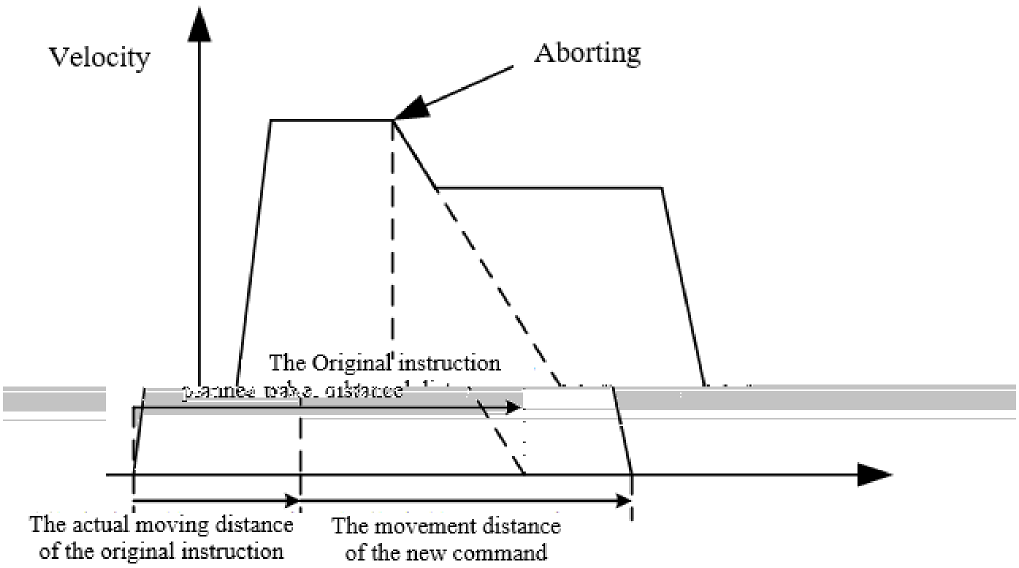
Error code	Error name	Error Description

[redacted]

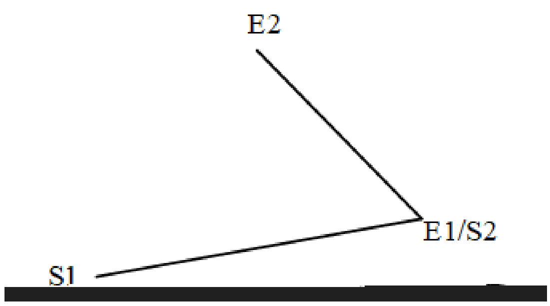
[redacted]

[redacted]

8.2.1.1 Interrupt



8.2.1.2 Buffer



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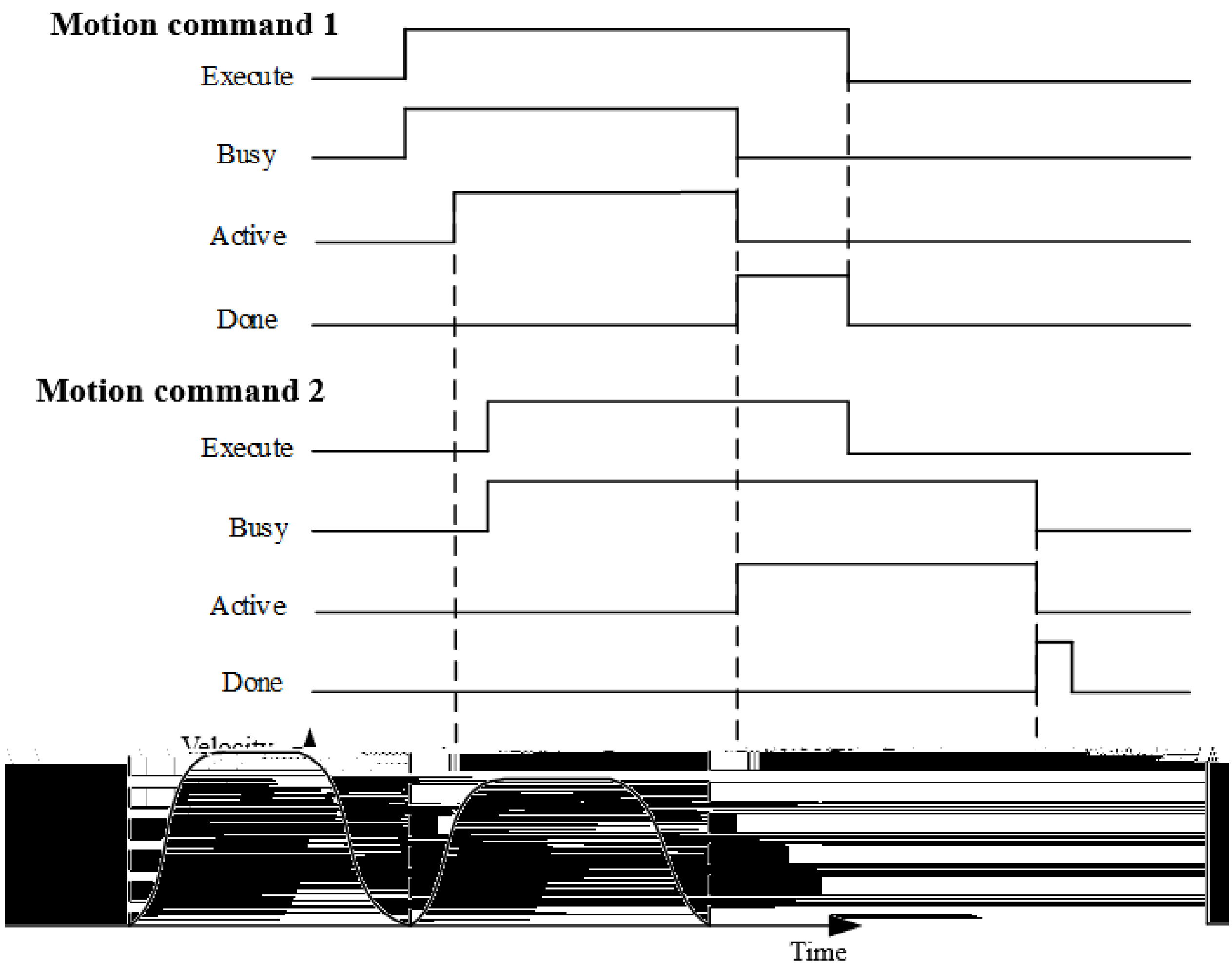
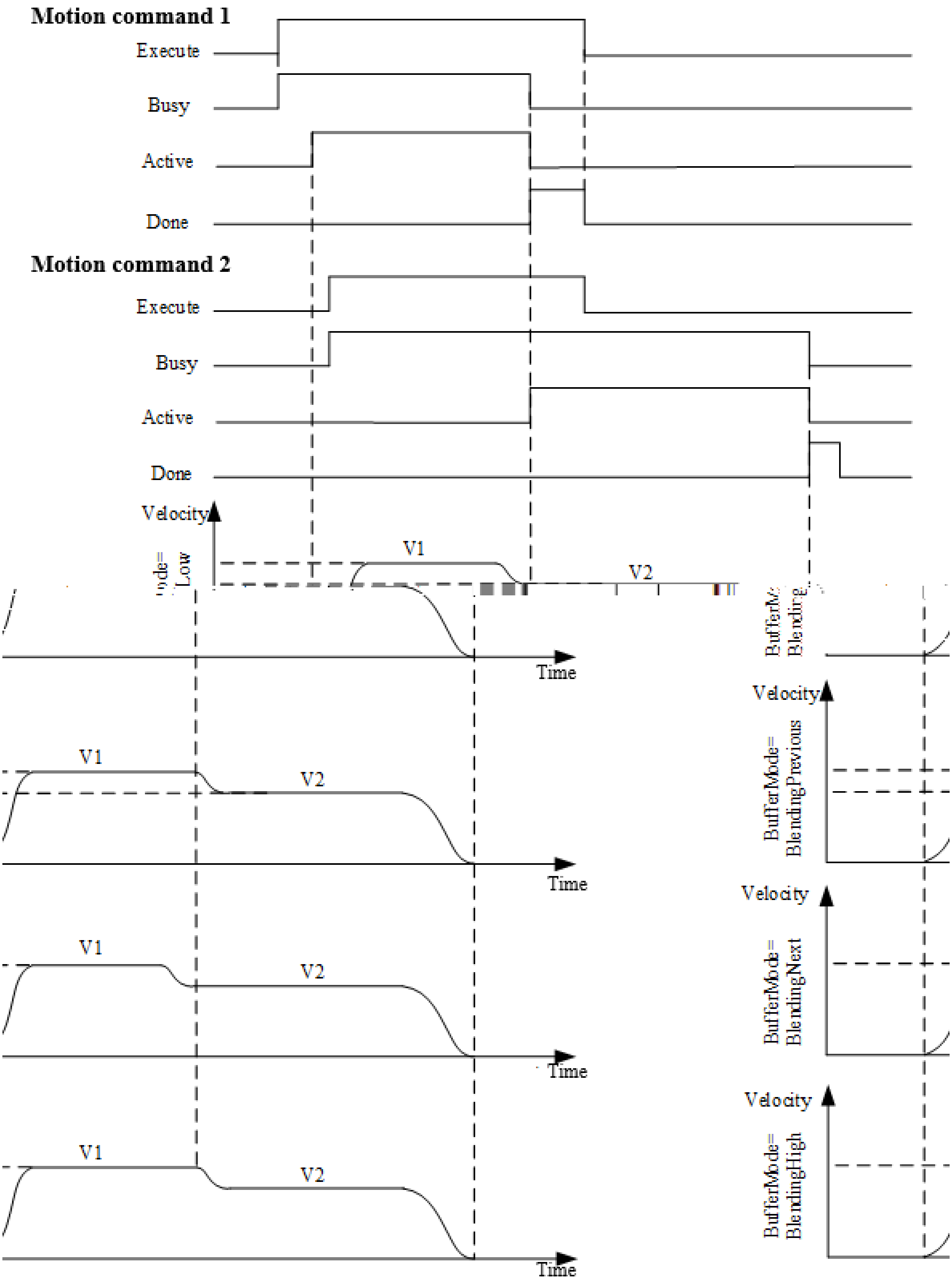

Motion command 1
Execute
Busy
Active
Done
Motion command 2
Execute
Busy
Active
Done
Time

8.2.1.3 Fusion


Motion command 1
Execute
Busy
Active
Done
Motion command 2
Execute
Busy
Active
Done
Velocity
V1
V2
Time
V1
V2
Time
V1
V2
Time
V1
V2
Time
Velocity
BufferMode=
BlendingPrevious
Velocity
BufferMode=
BlendingNext
Velocity
BufferMode=
BlendingHigh

Beijing HollySys Intelligent Technologies Co., Ltd..