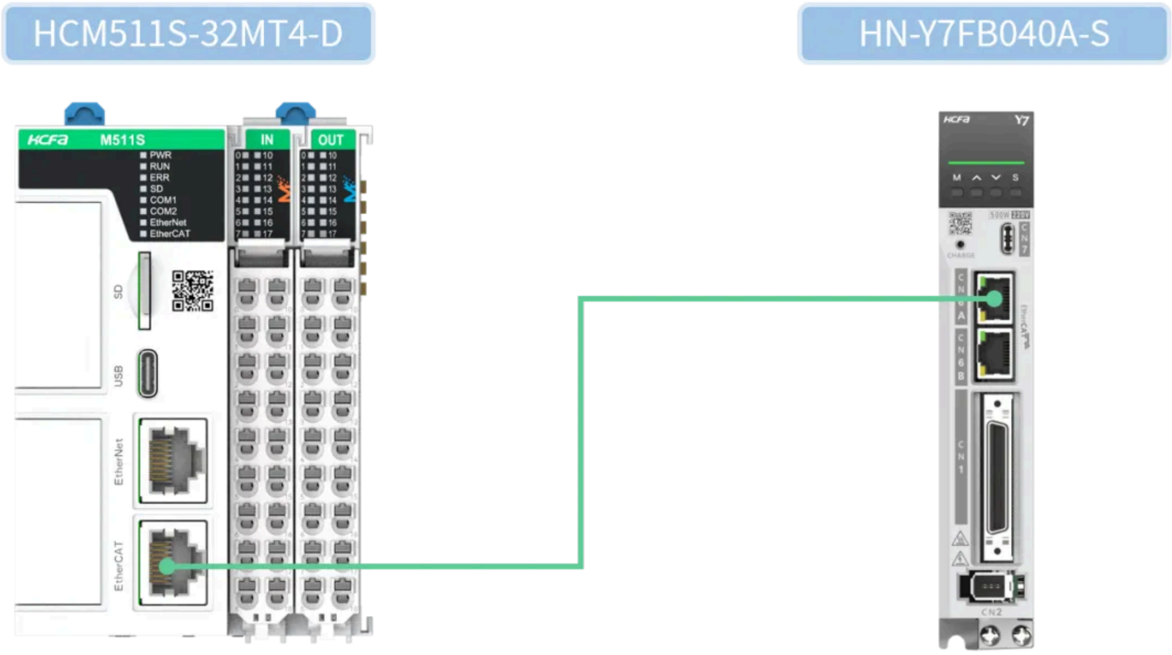
M Series Tutorial Speed Command Introduction

Communication connection

This tutorial uses the M controller HCM511S-32MT4-D and servo HN-Y7FB040A-S. The connection method is shown in the figure below.

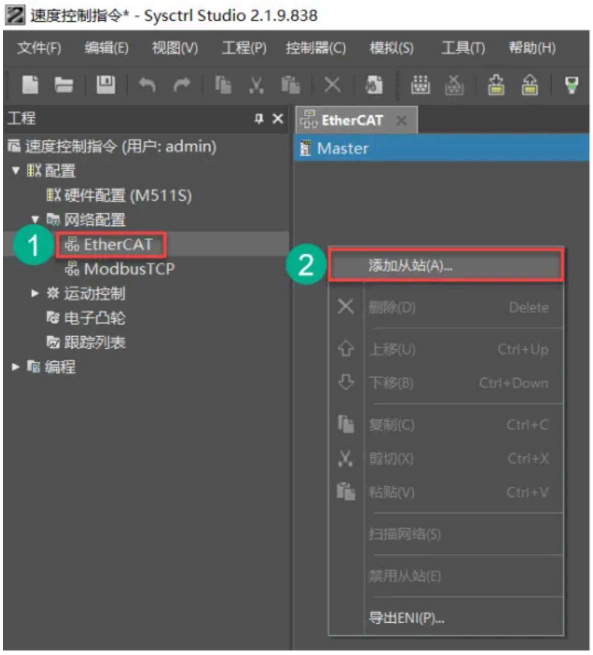

HCM511S-32MT4-D
HN-Y7FB040A-S
M511S
IN
OUT
SD
USB
EtherNet
EtherCAT
Y7

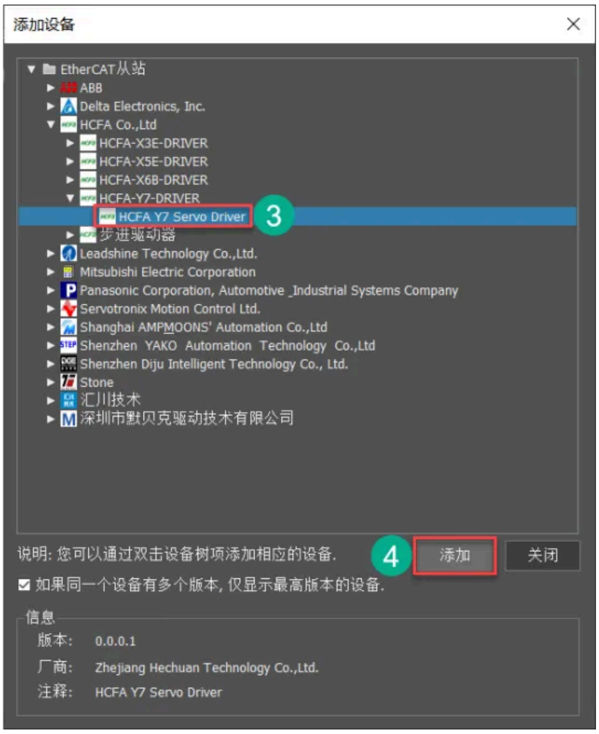
Sysctrl Studio project configuration

Basic Settings

Step 1: Add a slave

Double-click to open the Sysctrl Studio software and create a new project. Click [Network Settings] >> [EtherCAT] >> [Add Slave] >> Select the servo slave to be added >> [Add]


速度控制指令* - Sysctrl Studio 2.1.9.838
文件(F)
编辑(E)
视图(V)
工程(P)
控制器(C)
模拟(S)
工具(T)
帮助(H)
工程
速度控制指令 (用户: admin)
配置
硬件配置 (M511S)
网络配置
1
EtherCAT
ModbusTCP
运动控制
电子凸轮
跟踪列表
编程
EtherCAT
Master
2
添加从站(A)...
删除(D) Delete
上移(U) Ctrl+Up
下移(B) Ctrl+Down
复制(C) Ctrl+C
剪切(X) Ctrl+X
粘贴(V) Ctrl+V
扫描网络(S)
禁用从站(E)
导出ENI(P)...


添加设备
EtherCAT从站
ABB
Delta Electronics, Inc.
HCFA Co.,Ltd
HCFA-X3E-DRIVER
HCFA-X5E-DRIVER
HCFA-X6B-DRIVER
HCFA-Y7-DRIVER
HCFA Y7 Servo Driver
3
步进驱动器
Leadshine Technology Co.,Ltd.
Mitsubishi Electric Corporation
Panasonic Corporation, Automotive _Industrial Systems Company
Servotronix Motion Control Ltd.
Shanghai AMPMOONS' Automation Co.,Ltd
Shenzhen YAKO Automation Technology Co.,Ltd
Shenzhen Diju Intelligent Technology Co., Ltd.
Stone
汇川技术
深圳市默贝克驱动技术有限公司
4
添加
关闭
信息

说明: 您可以通过双击设备树项添加相应的设备.

☑ 如果同一个设备有多个版本, 仅显示最高版本的设备.

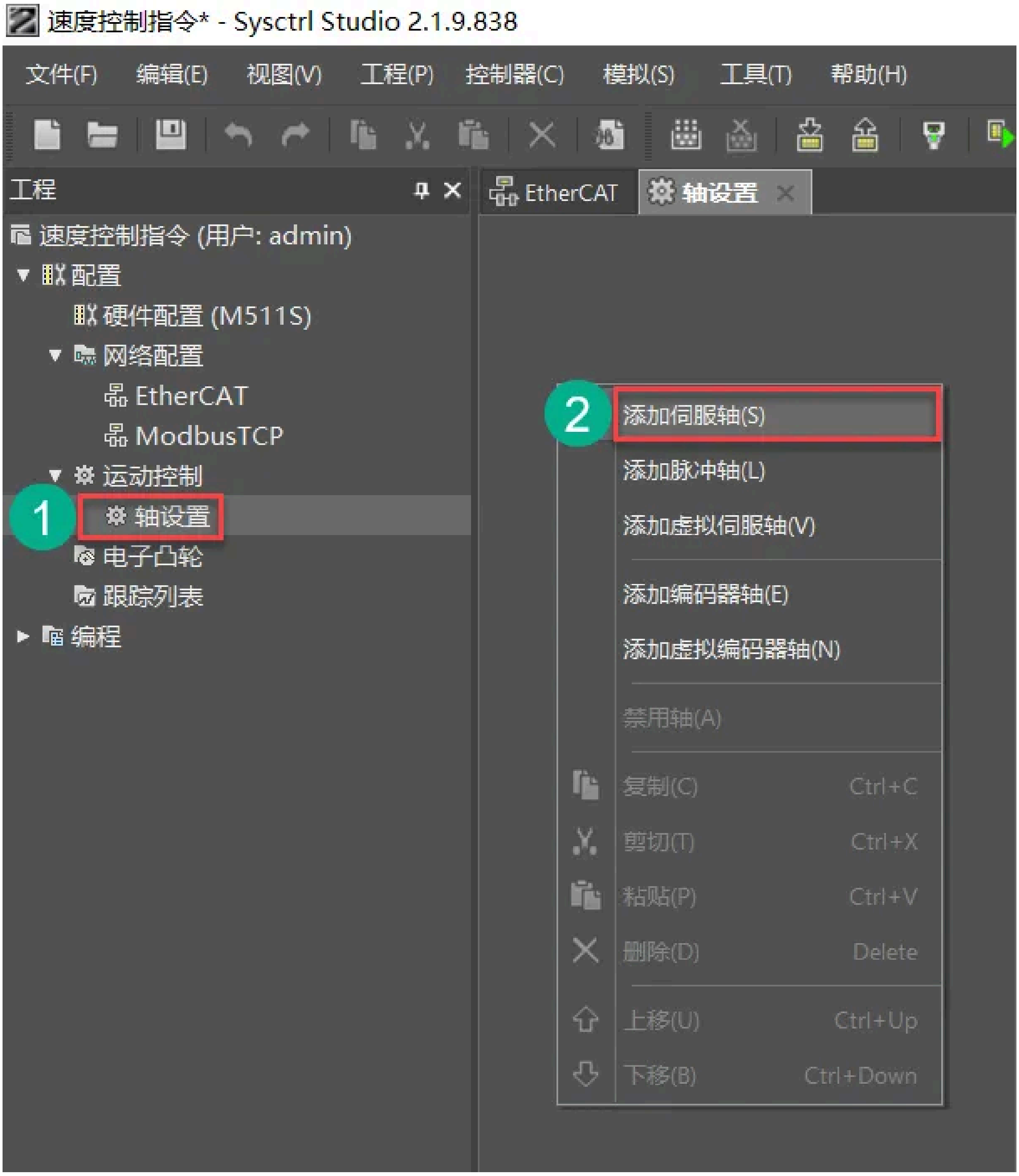
版本: 0.0.0.1

厂商: Zhejiang Hechuan Technology Co.,Ltd.

注释: HCFA Y7 Servo Driver

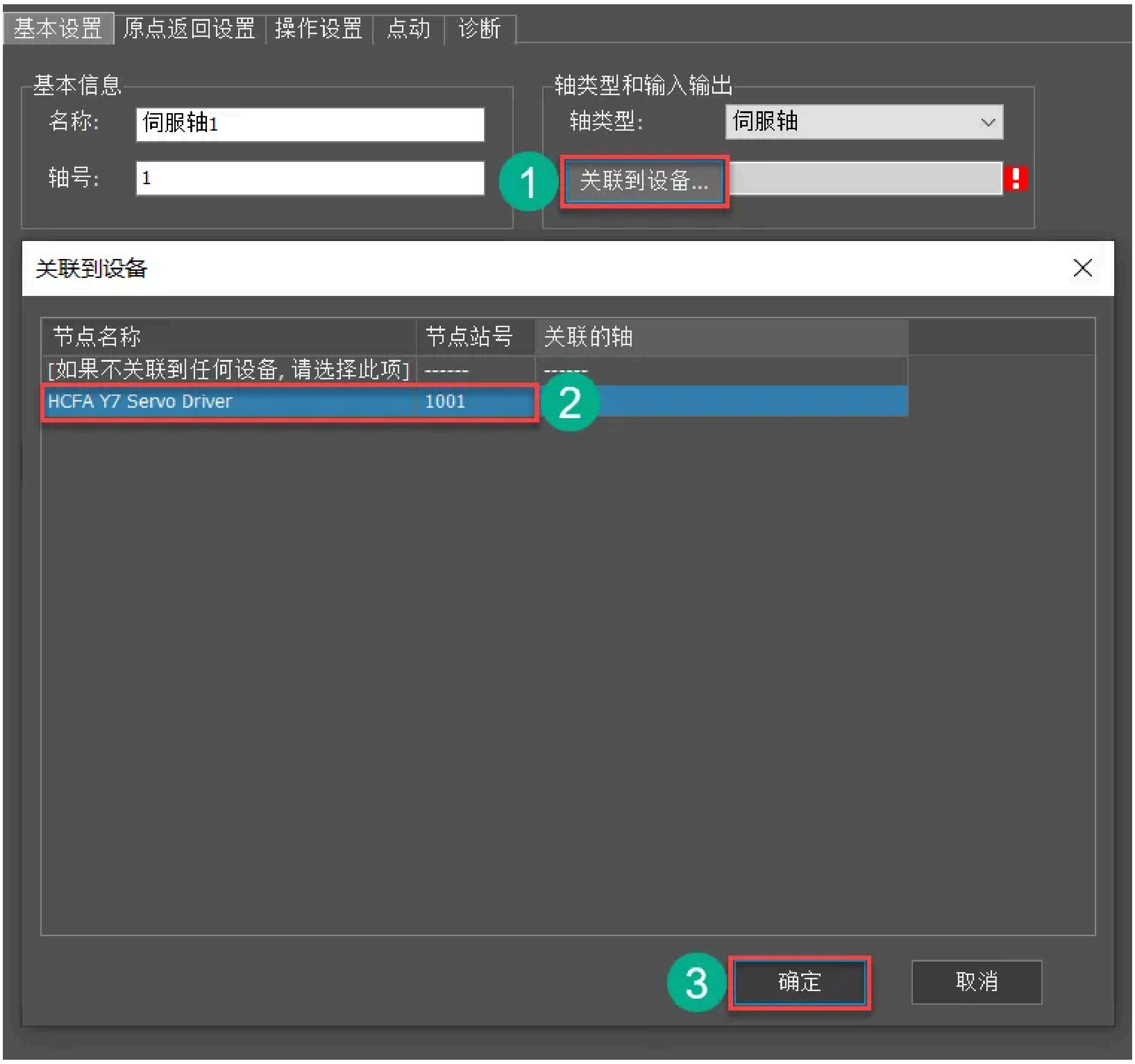
Step 2: Add Servo Axis

Click [Motion Control] >> [Axis Settings] >> right-click on the blank space and click [Add Servo Axis]


速度控制指令* - Sysctrl Studio 2.1.9.838
文件(F)
编辑(E)
视图(V)
工程(P)
控制器(C)
模拟(S)
工具(T)
帮助(H)
工程
EtherCAT
轴设置
速度控制指令 (用户: admin)
配置
硬件配置 (M511S)
网络配置
EtherCAT
ModbusTCP
运动控制
1
轴设置
电子凸轮
跟踪列表
编程
2
添加伺服轴(S)
添加脉冲轴(L)
添加虚拟伺服轴(V)
添加编码器轴(E)
添加虚拟编码器轴(N)
禁用轴(A)
复制(C) Ctrl+C
剪切(T) Ctrl+X
粘贴(P) Ctrl+V
删除(D) Delete
上移(U) Ctrl+Up
下移(B) Ctrl+Down

Step 3: Associate the device

Click [Associate to Device...], select the servo to be associated, and click [OK].


基本设置
原点返回设置
操作设置
点动
诊断
基本信息
名称: 伺服轴1
轴号: 1
轴类型和输入输出
轴类型: 伺服轴
1
关联到设备...
关联到设备
2
3
确定
取消

节点名称	节点站号	关联的轴
[如果不关联到任何设备，请选择此项]	------	------
HCFA Y7 Servo Driver	1001	

Step 4: Mechanism parameter configuration

[1] Number of pulses per motor revolution

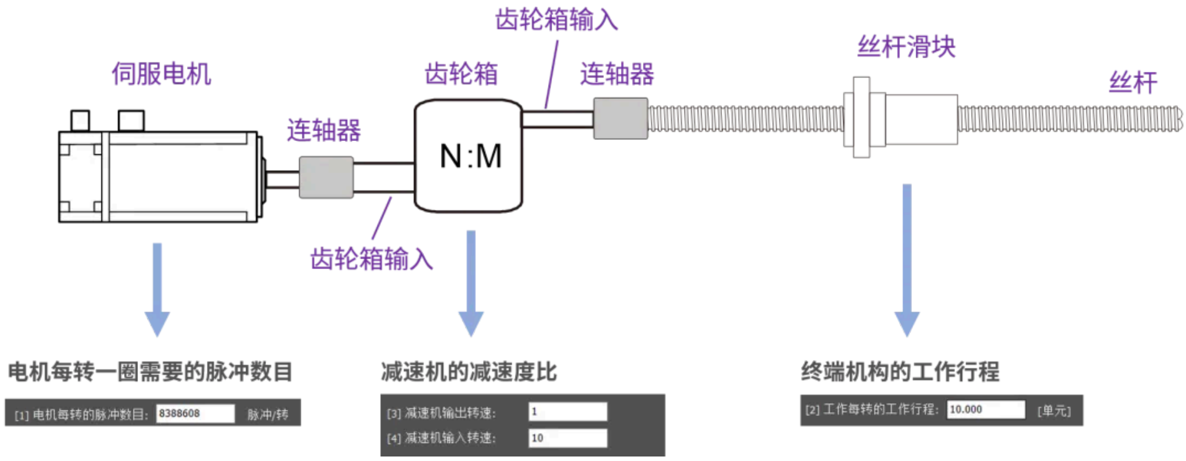
Determined by the motor encoder resolution

[2] Working distance per revolution

For example, if the screw pitch is 10mm, the mechanism lead is 10mm, and the unit is mm. In the motion instruction, the unit of the position parameter is mm, and the unit of the speed parameter is mm/s.

[3] Reducer output speed, [4] Reducer input speed

For example, if the speed ratio of the reducer is 10:1, the output speed is set to 1 and the input speed is set to 10.


齿轮箱输入
丝杆滑块
伺服电机
齿轮箱
连轴器
丝杆
连轴器
N:M
齿轮箱输入

电机每转一圈需要的脉冲数目

[1] 电机每转的脉冲数目: 8388608 脉冲/转

减速机的减速度比

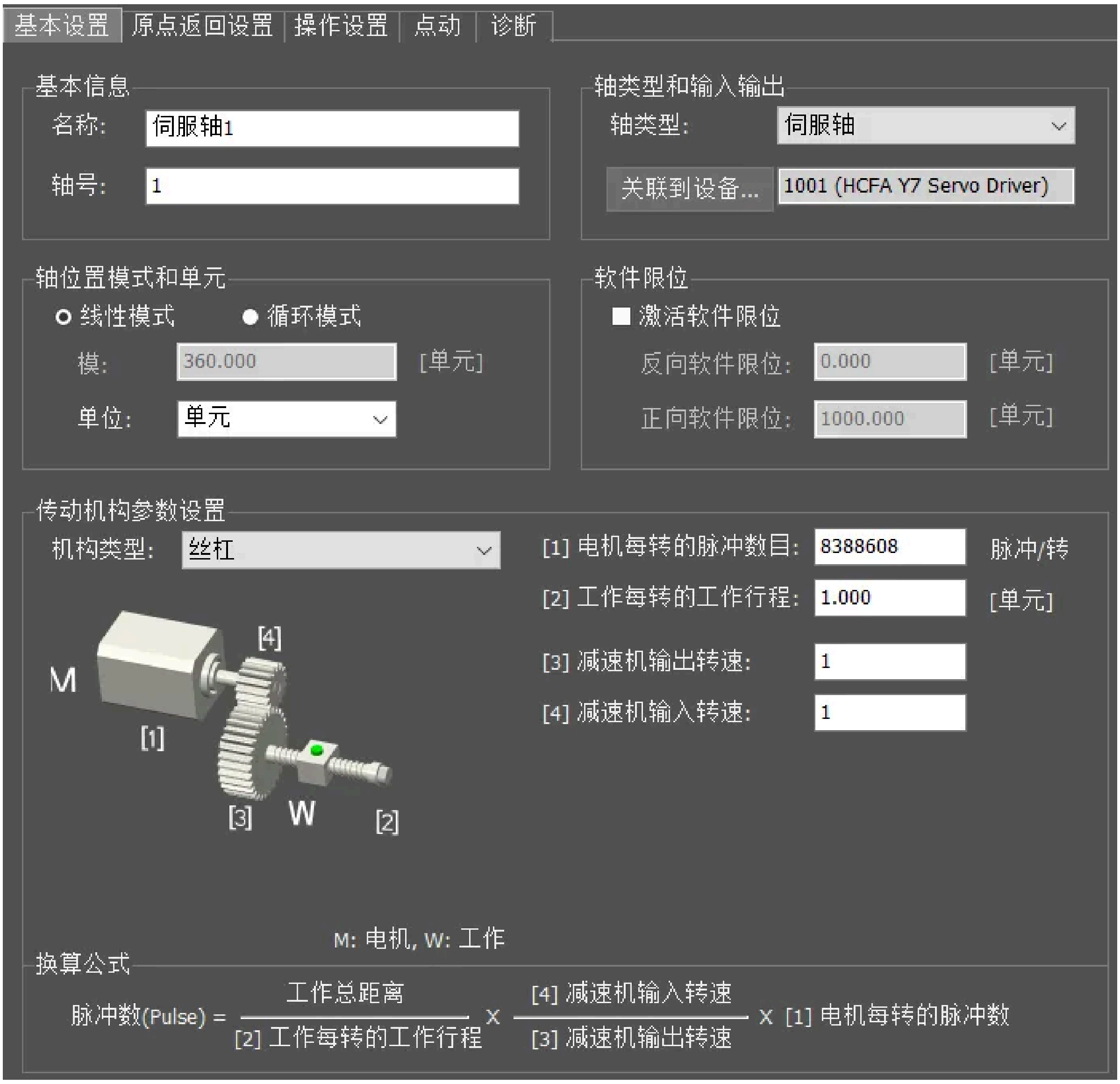
[3] 减速机输出转速: 1

[4] 减速机输入转速: 10

终端机构的工作行程

[2] 工作每转的工作行程: 10.000 [单元]

The parameter configuration completion interface is as follows


基本设置
原点返回设置
操作设置
点动
诊断
关联到设备...
M
W
[1]
[2]
[3]
[4]

基本信息

名称: 伺服轴1

轴号: 1

轴类型和输入输出

轴类型: 伺服轴

关联到设备... 1001 (HCFA Y7 Servo Driver)

轴位置模式和单元

○ 线性模式 ● 循环模式

模: 360.000 [单元]

单位: 单元

软件限位

□ 激活软件限位

反向软件限位: 0.000 [单元]

正向软件限位: 1000.000 [单元]

传动机构参数设置

机构类型: 丝杠

[1] 电机每转的脉冲数目: 8388608 脉冲/转

[2] 工作每转的工作行程: 1.000 [单元]

[3] 减速机输出转速: 1

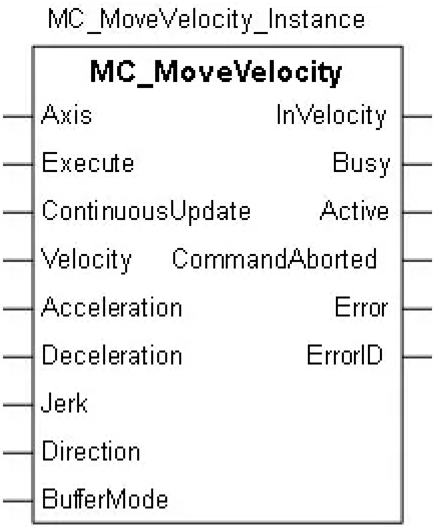
[4] 减速机输入转速: 1

M: 电机, W: 工作

换算公式

$$脉冲数(Pulse) = \frac{工作总距离}{[2]\ 工作每转的工作行程} \times \frac{[4]\ 减速机输入转速}{[3]\ 减速机输出转速} \times [1]\ 电机每转的脉冲数$$

MC_MoveVelocity (speed control instruction)

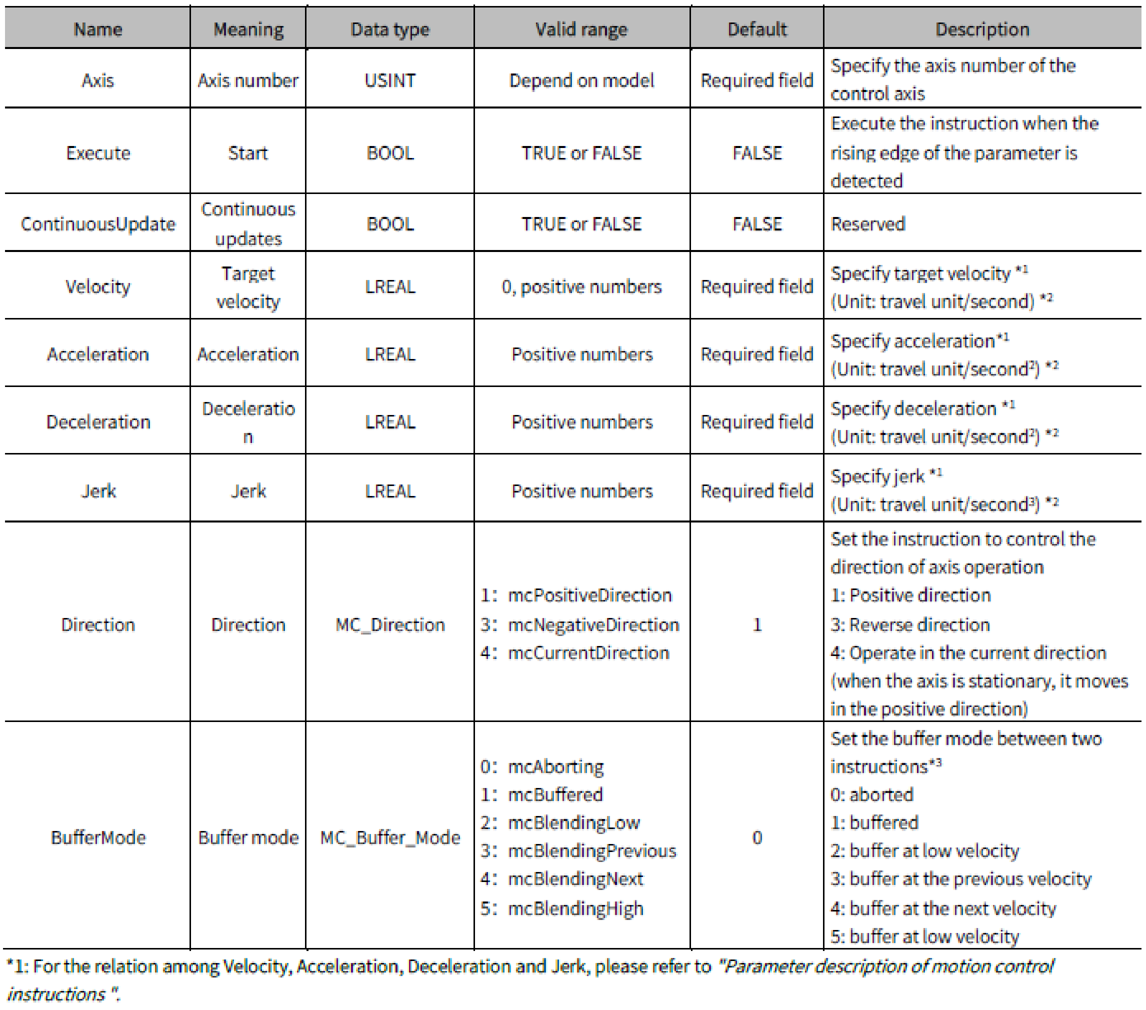

MC_MoveVelocity_Instance
MC_MoveVelocity
Axis
Execute
ContinuousUpdate
Velocity
Acceleration
Deceleration
Jerk
Direction
BufferMode
InVelocity
Busy
Active
CommandAborted
Error
ErrorID

(1) Instruction description

① Functional description

Control the axis to move continuously at the specified target speed and direction

②Pin Description



Name	Meaning	Data type	Valid range	Default	Description
Axis	Axis number	USINT	Depend on model	Required field	Specify the axis number of the control axis
Execute	Start	BOOL	TRUE or FALSE	FALSE	Execute the instruction when the rising edge of the parameter is detected
ContinuousUpdate	Continuous updates	BOOL	TRUE or FALSE	FALSE	Reserved
Velocity	Target velocity	LREAL	0, positive numbers	Required field	Specify target velocity *[1] (Unit: travel unit/second) *[2]
Acceleration	Acceleration	LREAL	Positive numbers	Required field	Specify acceleration*[1] (Unit: travel unit/second^2) *[2]
Deceleration	Deceleration	LREAL	Positive numbers	Required field	Specify deceleration *[1] (Unit: travel unit/second^2) *[2]
Jerk	Jerk	LREAL	Positive numbers	Required field	Specify jerk *[1] (Unit: travel unit/second^3) *[2]
Direction	Direction	MC_Direction	1: mcPositiveDirection 3: mcNegativeDirection 4: mcCurrentDirection	1	Set the instruction to control the direction of axis operation 1: Positive direction 3: Reverse direction 4: Operate in the current direction (when the axis is stationary, it moves in the positive direction)
BufferMode	Buffer mode	MC_Buffer_Mode	0: mcAborting 1: mcBuffered 2: mcBlendingLow 3: mcBlendingPrevious 4: mcBlendingNext 5: mcBlendingHigh	0	Set the buffer mode between two instructions*[3] 0: aborted 1: buffered 2: buffer at low velocity 3: buffer at the previous velocity 4: buffer at the next velocity 5: buffer at low velocity

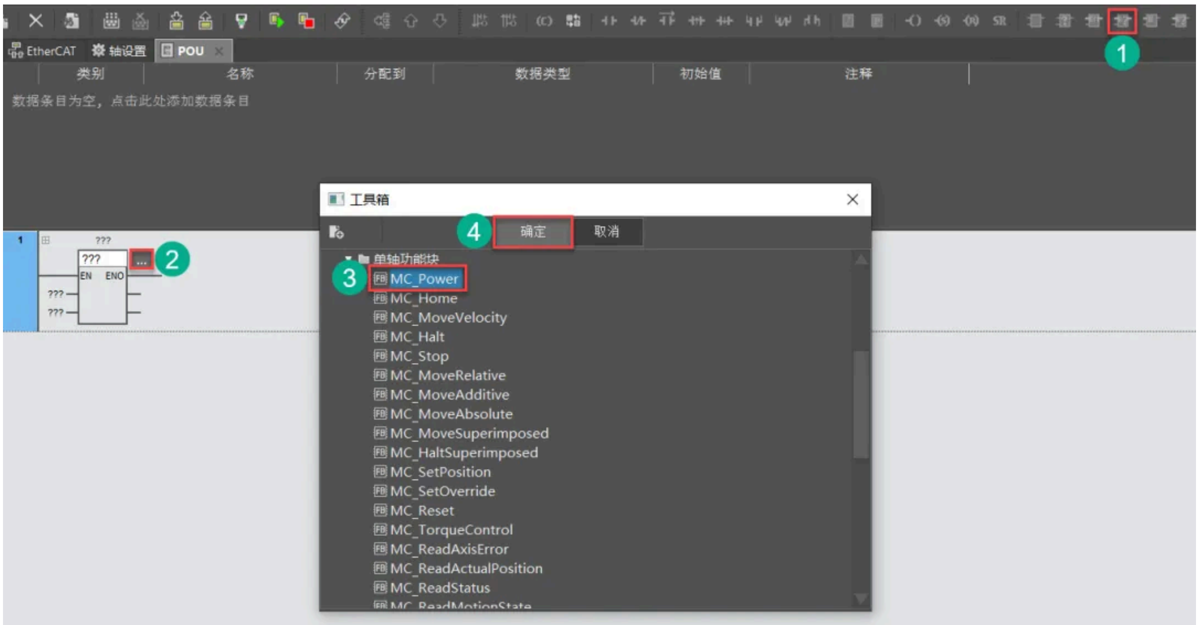
*[1]: For the relation among Velocity, Acceleration, Deceleration and Jerk, please refer to *"Parameter description of motion control instructions "*.

- **Output variable**

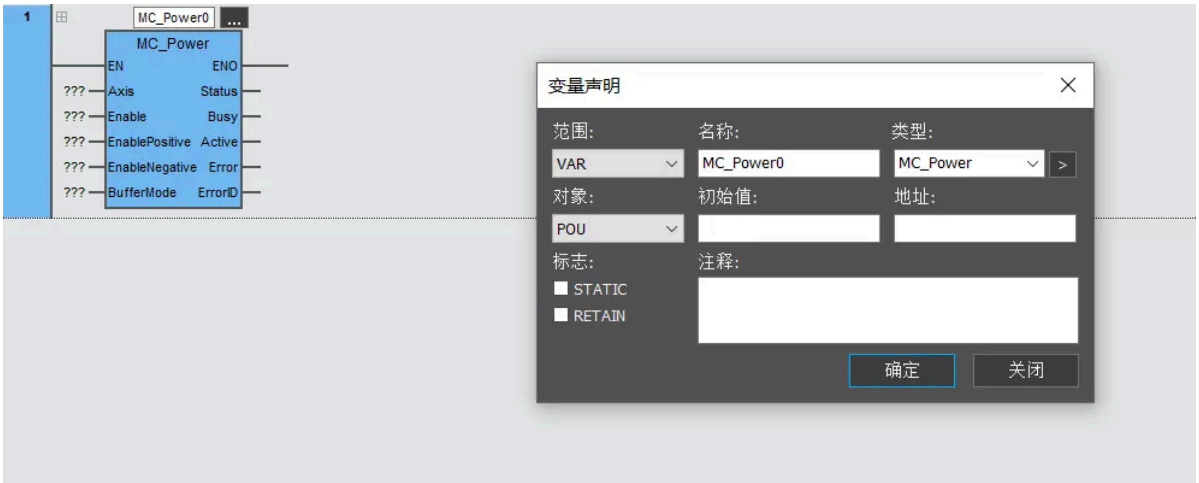
Name	Meaning	Data type	Valid range	Description
Invelocity	Target velocity reached	BOOL	TRUE or FALSE	TRUE when the axis instruction velocity reaches the target velocity
Busy	Executing	BOOL	TRUE or FALSE	TRUE when the instruction is executed
Active	Under control	BOOL	TRUE or FALSE	TRUE when the axis is under control
CommandAborted	Aborted	BOOL	TRUE or FALSE	TRUE when the instruction is aborted
Error	Error	BOOL	TRUE or FALSE	TRUE when there is an error
ErrorID	Error code	WORD	0~65535	Refer to "*instruction error code description*" for the meaning of the output error code value when an instruction execution error occurs.

(2) Instruction test

①Open the default POU and insert the MC_Power function block.

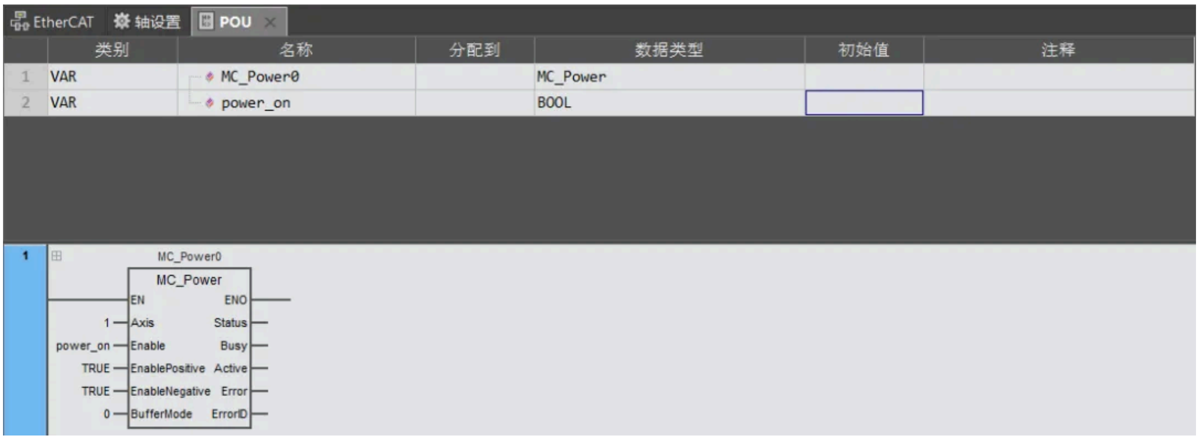

EtherCAT
轴设置
POU
类别
名称
分配到
数据类型
初始值
注释
数据条目为空，点击此处添加数据条目
1
2
???
EN
ENO
工具箱
4
确定
取消
3
单轴功能块
MC_Power
MC_Home
MC_MoveVelocity
MC_Halt
MC_Stop
MC_MoveRelative
MC_MoveAdditive
MC_MoveAbsolute
MC_MoveSuperimposed
MC_HaltSuperimposed
MC_SetPosition
MC_SetOverride
MC_Reset
MC_TorqueControl
MC_ReadAxisError
MC_ReadActualPosition
MC_ReadStatus
MC_ReadMotionState

The software will automatically instantiate the function block


1
MC_Power0
...
MC_Power
EN
ENO
Axis
Status
Enable
Busy
EnablePositive
Active
EnableNegative
Error
BufferMode
ErrorID
???
变量声明
确定
关闭

范围: VAR
名称: MC_Power0
类型: MC_Power
对象: POU
初始值:
地址:
标志:
☐ STATIC
☐ RETAIN
注释:

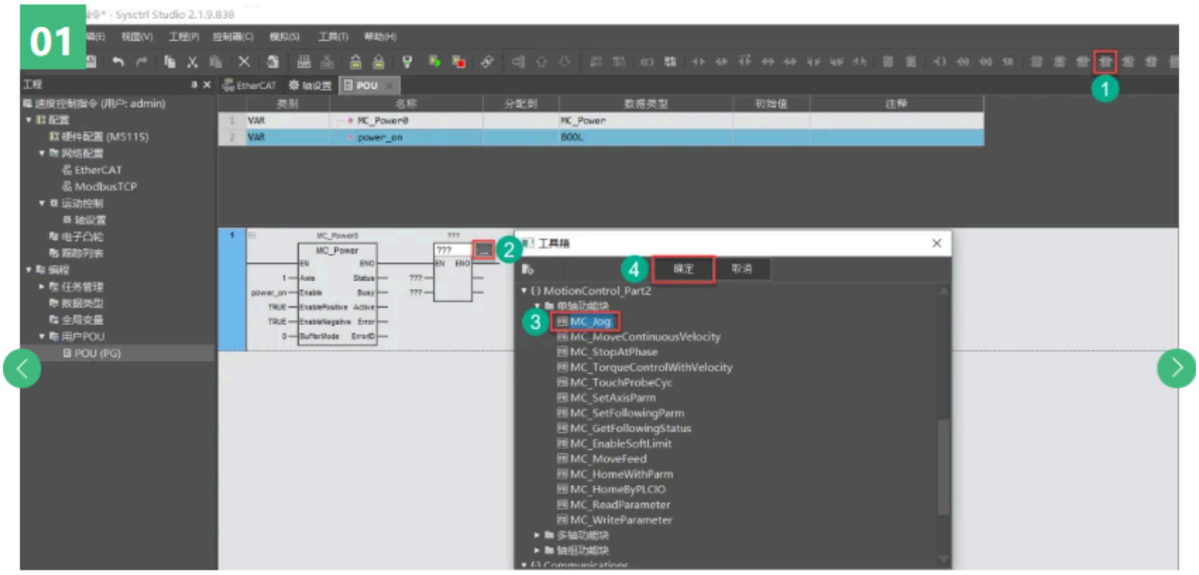
Set the MC_Power function block input pin



	类别	名称	分配到	数据类型	初始值	注释
1	VAR	MC_Power0		MC_Power		
2	VAR	power_on		BOOL		

EtherCAT
轴设置
POU
MC_Power0
MC_Power
EN
ENO
1
Axis
Status
power_on
Enable
Busy
TRUE
EnablePositive
Active
TRUE
EnableNegative
Error
0
BufferMode
ErrorID

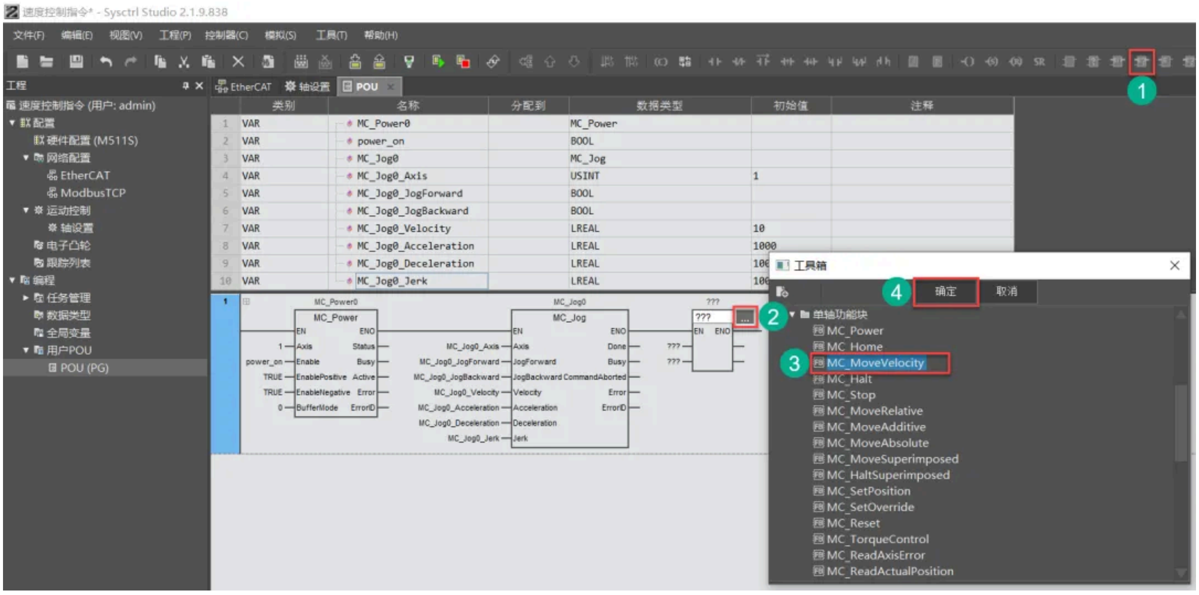
②Insert MC_JOG function block



	类别	名称	分配到	数据类型	初始值	注释
1	VAR	MC_Power0		MC_Power		
2	VAR	power_on		BOOL		

01
Sysctrl Studio 2.1.9.838
编辑(E)
视图(V)
工程(P)
控制器(C)
模拟(S)
工具(T)
帮助(H)
1
工程
速度控制指令 (用户: admin)
配置
硬件配置 (M511S)
网络配置
EtherCAT
ModbusTCP
运动控制
轴设置
电子凸轮
跟踪列表
编程
任务管理
数据类型
全局变量
用户POU
POU (PG)
MC_Power0
MC_Power
???
2
工具箱
4
确定
取消
() MotionControl_Part2
单轴功能块
3
MC_Jog
MC_MoveContinuousVelocity
MC_StopAtPhase
MC_TorqueControlWithVelocity
MC_TouchProbeCyc
MC_SetAxisParm
MC_SetFollowingParm
MC_GetFollowingStatus
MC_EnableSoftLimit
MC_MoveFeed
MC_HomeWithParm
MC_HomeByPLCIO
MC_ReadParameter
MC_WriteParameter
多轴功能块
轴组功能块
() Communications

③Insert the MC_MoveVelocity function block



	类别	名称	分配到	数据类型	初始值	注释
1	VAR	MC_Power0		MC_Power		
2	VAR	power_on		BOOL		
3	VAR	MC_Jog0		MC_Jog		
4	VAR	MC_Jog0_Axis		USINT	1	
5	VAR	MC_Jog0_JogForward		BOOL		
6	VAR	MC_Jog0_JogBackward		BOOL		
7	VAR	MC_Jog0_Velocity		LREAL	10	
8	VAR	MC_Jog0_Acceleration		LREAL	1000	
9	VAR	MC_Jog0_Deceleration		LREAL	10	
10	VAR	MC_Jog0_Jerk		LREAL	10	

速度控制指令* - Sysctrl Studio 2.1.9.838
文件(F)
编辑(E)
视图(V)
工程(P)
控制器(C)
模拟(S)
工具(T)
帮助(H)
1
工程
速度控制指令 (用户: admin)
配置
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网络配置
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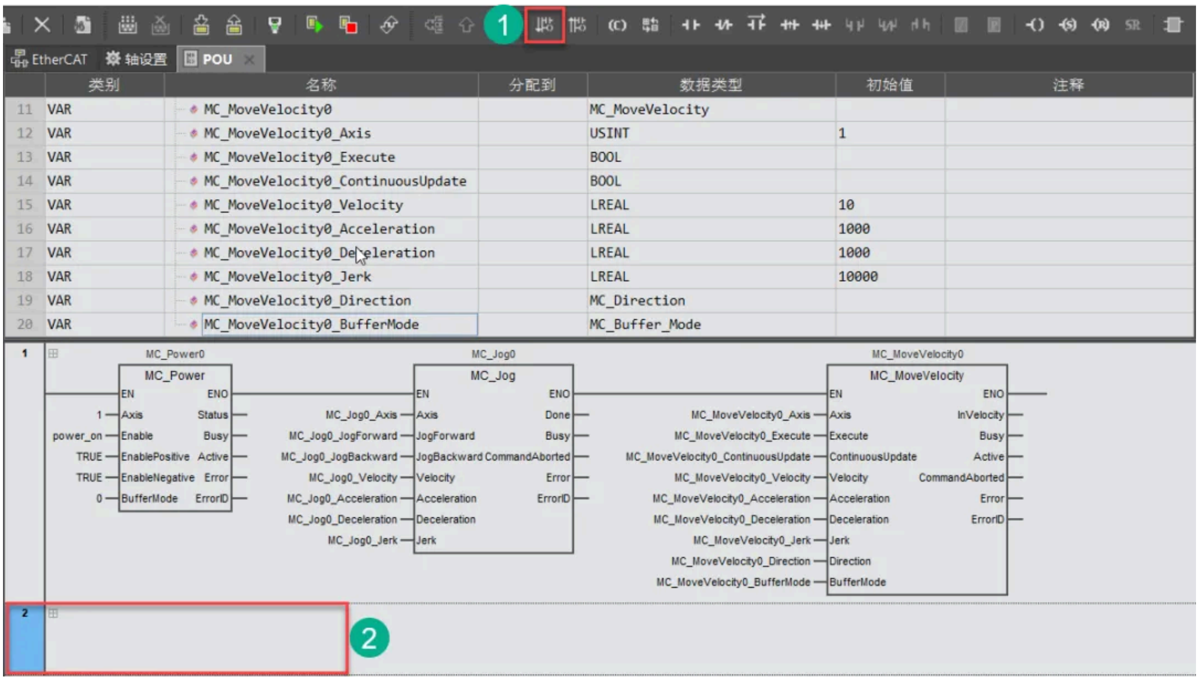
ModbusTCP
运动控制
轴设置
电子凸轮
跟踪列表
编程
任务管理
数据类型
全局变量
用户POU
POU (PG)
MC_Power0
MC_Power
MC_Jog0
MC_Jog
MC_Jog0_Axis
MC_Jog0_JogForward
MC_Jog0_JogBackward
MC_Jog0_Velocity
MC_Jog0_Acceleration
MC_Jog0_Deceleration
MC_Jog0_Jerk
Done
Busy
CommandAborted
Error
ErrorID
???
2
工具箱
4
确定
取消
单轴功能块
MC_Power
MC_Home
3
MC_MoveVelocity
MC_Halt
MC_Stop
MC_MoveRelative
MC_MoveAdditive
MC_MoveAbsolute
MC_MoveSuperimposed
MC_HaltSuperimposed
MC_SetPosition
MC_SetOverride
MC_Reset
MC_TorqueControl
MC_ReadAxisError
MC_ReadActualPosition

④Insert MC_Halt function block


1
EtherCAT
轴设置
POU
2

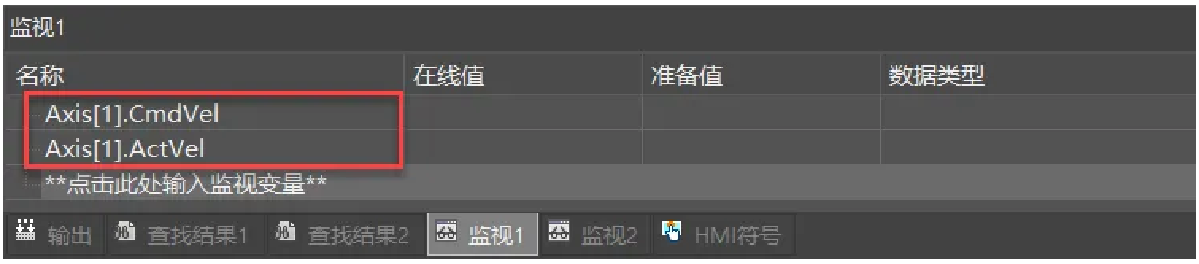
	类别	名称	分配到	数据类型	初始值	注释
11	VAR	MC_MoveVelocity0		MC_MoveVelocity		
12	VAR	MC_MoveVelocity0_Axis		USINT	1	
13	VAR	MC_MoveVelocity0_Execute		BOOL		
14	VAR	MC_MoveVelocity0_ContinuousUpdate		BOOL		
15	VAR	MC_MoveVelocity0_Velocity		LREAL	10	
16	VAR	MC_MoveVelocity0_Acceleration		LREAL	1000	
17	VAR	MC_MoveVelocity0_Deceleration		LREAL	1000	
18	VAR	MC_MoveVelocity0_Jerk		LREAL	10000	
19	VAR	MC_MoveVelocity0_Direction		MC_Direction		
20	VAR	MC_MoveVelocity0_BufferMode		MC_Buffer_Mode		

MC_Power0
MC_Power
EN ENO
1 Axis Status
power_on Enable Busy
TRUE EnablePositive Active
TRUE EnableNegative Error
0 BufferMode ErrorID
MC_Jog0
MC_Jog
EN ENO
MC_Jog0_Axis Axis Done
MC_Jog0_JogForward JogForward Busy
MC_Jog0_JogBackward JogBackward CommandAborted
MC_Jog0_Velocity Velocity Error
MC_Jog0_Acceleration Acceleration ErrorID
MC_Jog0_Deceleration Deceleration
MC_Jog0_Jerk Jerk
MC_MoveVelocity0
MC_MoveVelocity
EN ENO
MC_MoveVelocity0_Axis Axis InVelocity
MC_MoveVelocity0_Execute Execute Busy
MC_MoveVelocity0_ContinuousUpdate ContinuousUpdate Active
MC_MoveVelocity0_Velocity Velocity CommandAborted
MC_MoveVelocity0_Acceleration Acceleration Error
MC_MoveVelocity0_Deceleration Deceleration ErrorID
MC_MoveVelocity0_Jerk Jerk
MC_MoveVelocity0_Direction Direction
MC_MoveVelocity0_BufferMode BufferMode

After the settings are completed, download the project to the controller

⑤Perform MC_MoveVelocity function block test

For ease of display, command speed and feedback speed are added to the monitoring area.


监视1

名称	在线值	准备值	数据类型
Axis[1].CmdVel			
Axis[1].ActVel			
点击此处输入监视变量			

输出
查找结果1
查找结果2
监视1
监视2
HMI符号

>>How to modify the command speed and command direction

a. Enable the axis and trigger the MC_MoveVelocity function block.

Result: The shaft runs in the forward direction at a speed of 10

b. If you need to modify the parameters of the MC_MoveVelocity function block, you need to re-trigger the function block.

(The following are continuous steps . Each time the parameters are changed, the Execute pin of the function block must be re-triggered .)

• Velocity=20, Direction=mcCurrentDirection

Result: The shaft runs in the forward direction at a speed of 20

• Velocity=20, Direction=mcNegativeDirection

Result: The shaft runs in the reverse direction at a speed of 20

• Velocity=10, Direction= mcCurrentDirection

Result: The shaft runs in the reverse direction at a speed of 10

• Velocity=-10, Direction=mcPositiveDirection

Result: The shaft runs in the reverse direction at a speed of 10

• Velocity=-10, Direction= mcCurrentDirection

Result: The shaft runs in the forward direction at a speed of 10

Trigger the MC_Halt command to pause the axis

>> How to interrupt the command movement

First case:

Enable the axis and trigger the MC_JOG function block (Velocity=10, forward rotation)

Result: The shaft runs in the forward direction at a speed of 10

Trigger the MC_MoveVelocity function block

(Velocity=20, Direction= mcCurrentDirection)

Result: The shaft runs in the forward direction at a speed of 20

Second case:

Enable the axis and trigger the MC_JOG function block (Velocity=10, reverse)

Result: The shaft runs in the reverse direction at a speed of 10

Trigger the MC_MoveVelocity function block

(Velocity=20, Direction= mcCurrentDirection)

Result: The shaft runs in the reverse direction at a speed of 20

The third case:

Enable the axis

Result: The axis is at a standstill

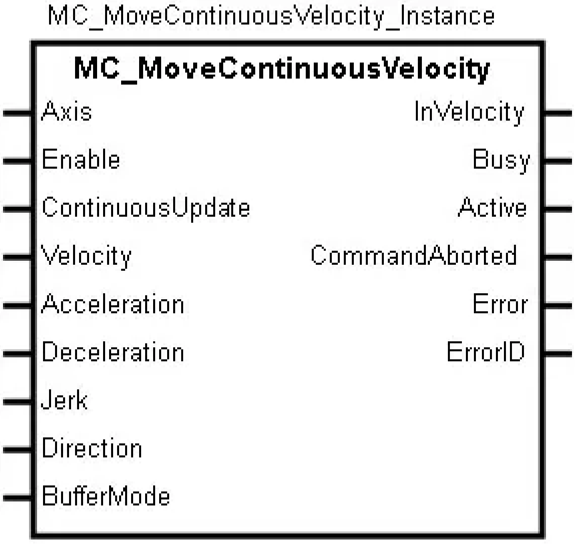
Trigger the MC_MoveVelocity function block

(Velocity=20, Direction= mcCurrentDirection)

Result: The shaft runs in the forward direction at a speed of 20

[Explanation] The value of Direction is "Run in current direction". If other instructions are controlling the axis to move in the positive direction, the speed instruction will interrupt other instructions and the axis will continue to move in the positive direction. If other instructions are controlling the axis to move in the negative direction, the speed instruction will interrupt other instructions and the axis will continue to move in the negative direction. If the axis is stopped, the axis will move in the positive direction.

MC_MoveContinuousVelocity (Continuously Variable Velocity Control)


MC_MoveContinuousVelocity_Instance
MC_MoveContinuousVelocity
Axis
Enable
ContinuousUpdate
Velocity
Acceleration
Deceleration
Jerk
Direction
BufferMode
InVelocity
Busy
Active
CommandAborted
Error
ErrorID

(1) Instruction description

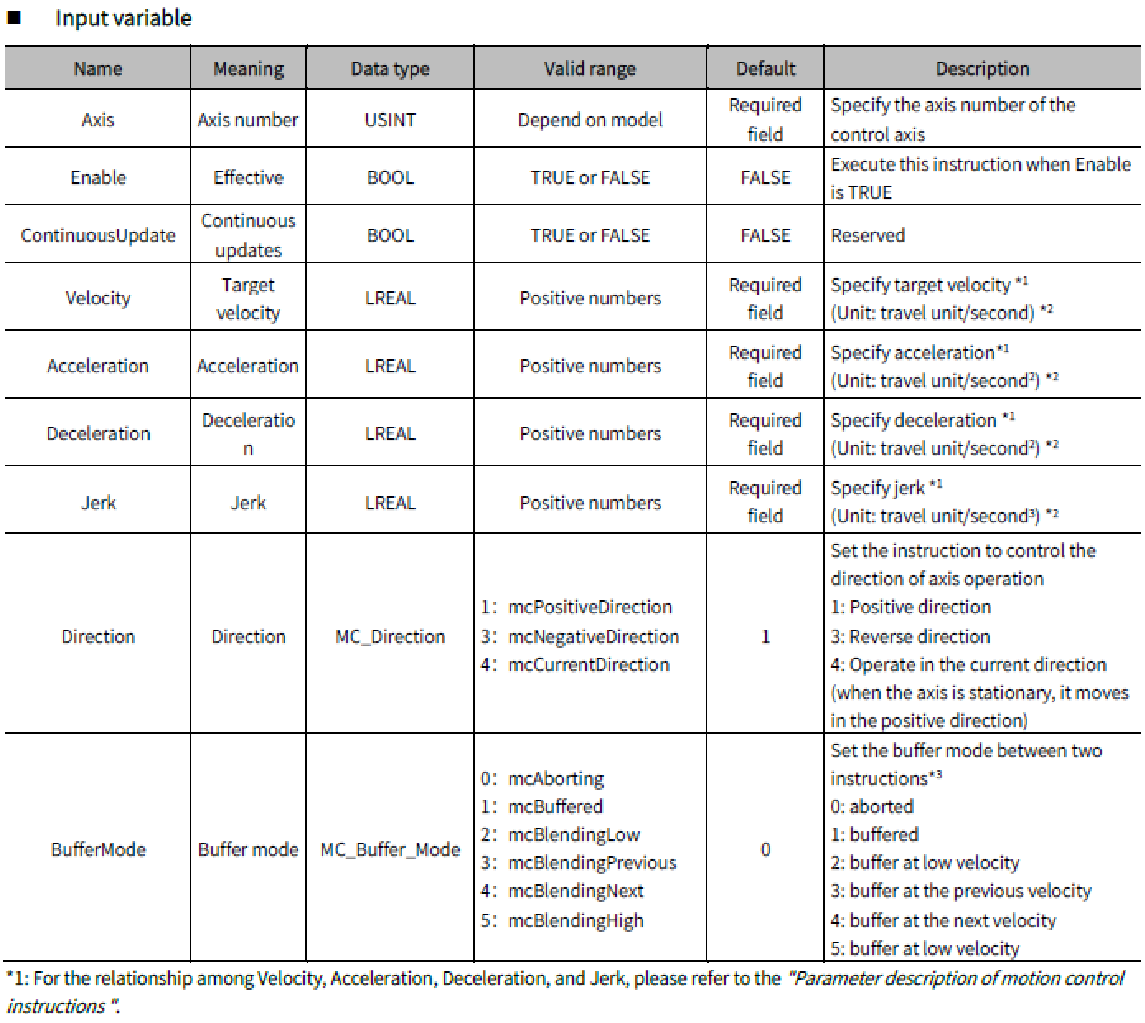
① Functional description

The control axis moves continuously at the specified target speed and direction.

②Instruction characteristics

Unlike MC_MoveVelocity, when the execution condition Enable is TRUE, changes in the input parameters Velocity, Acceleration, Deceleration, Jerk, and Direction take effect immediately.

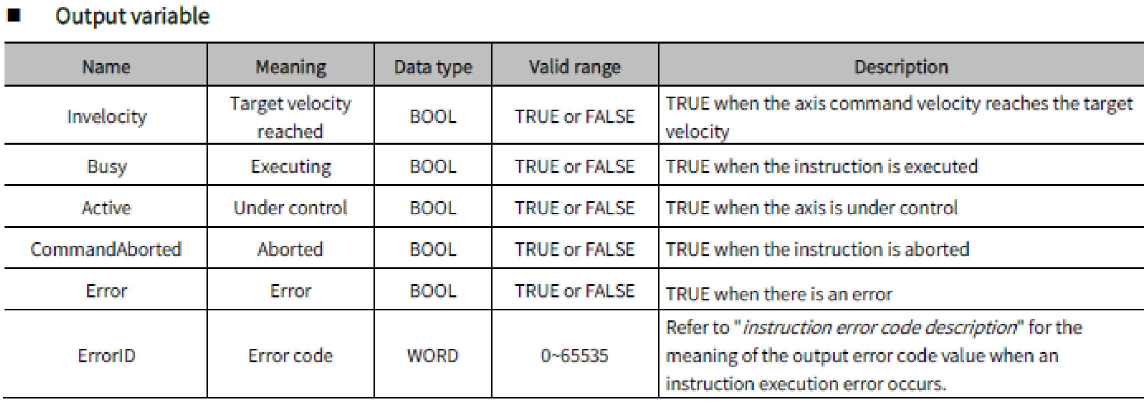
③Pin Description



- **Input variable**

Name	Meaning	Data type	Valid range	Default	Description
Axis	Axis number	USINT	Depend on model	Required field	Specify the axis number of the control axis
Enable	Effective	BOOL	TRUE or FALSE	FALSE	Execute this instruction when Enable is TRUE
ContinuousUpdate	Continuous updates	BOOL	TRUE or FALSE	FALSE	Reserved
Velocity	Target velocity	LREAL	Positive numbers	Required field	Specify target velocity [*1] (Unit: travel unit/second) [*2]
Acceleration	Acceleration	LREAL	Positive numbers	Required field	Specify acceleration[*1] (Unit: travel unit/second^2) [*2]
Deceleration	Deceleration	LREAL	Positive numbers	Required field	Specify deceleration [*1] (Unit: travel unit/second^2) [*2]
Jerk	Jerk	LREAL	Positive numbers	Required field	Specify jerk [*1] (Unit: travel unit/second^3) [*2]
Direction	Direction	MC_Direction	1: mcPositiveDirection 3: mcNegativeDirection 4: mcCurrentDirection	1	Set the instruction to control the direction of axis operation 1: Positive direction 3: Reverse direction 4: Operate in the current direction (when the axis is stationary, it moves in the positive direction)
BufferMode	Buffer mode	MC_Buffer_Mode	0: mcAborting 1: mcBuffered 2: mcBlendingLow 3: mcBlendingPrevious 4: mcBlendingNext 5: mcBlendingHigh	0	Set the buffer mode between two instructions[*3] 0: aborted 1: buffered 2: buffer at low velocity 3: buffer at the previous velocity 4: buffer at the next velocity 5: buffer at low velocity

*1: For the relationship among Velocity, Acceleration, Deceleration, and Jerk, please refer to the *"Parameter description of motion control instructions ".*

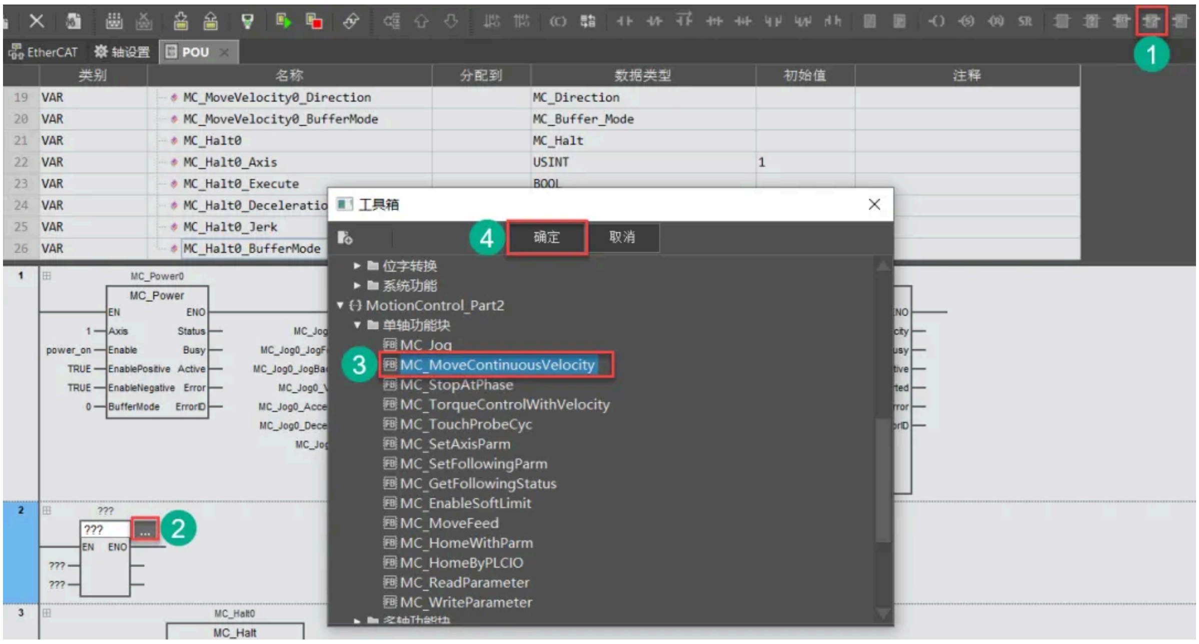


- **Output variable**

Name	Meaning	Data type	Valid range	Description
Invelocity	Target velocity reached	BOOL	TRUE or FALSE	TRUE when the axis command velocity reaches the target velocity
Busy	Executing	BOOL	TRUE or FALSE	TRUE when the instruction is executed
Active	Under control	BOOL	TRUE or FALSE	TRUE when the axis is under control
CommandAborted	Aborted	BOOL	TRUE or FALSE	TRUE when the instruction is aborted
Error	Error	BOOL	TRUE or FALSE	TRUE when there is an error
ErrorID	Error code	WORD	0~65535	Refer to "*instruction error code description*" for the meaning of the output error code value when an instruction execution error occurs.

(2) Instruction test

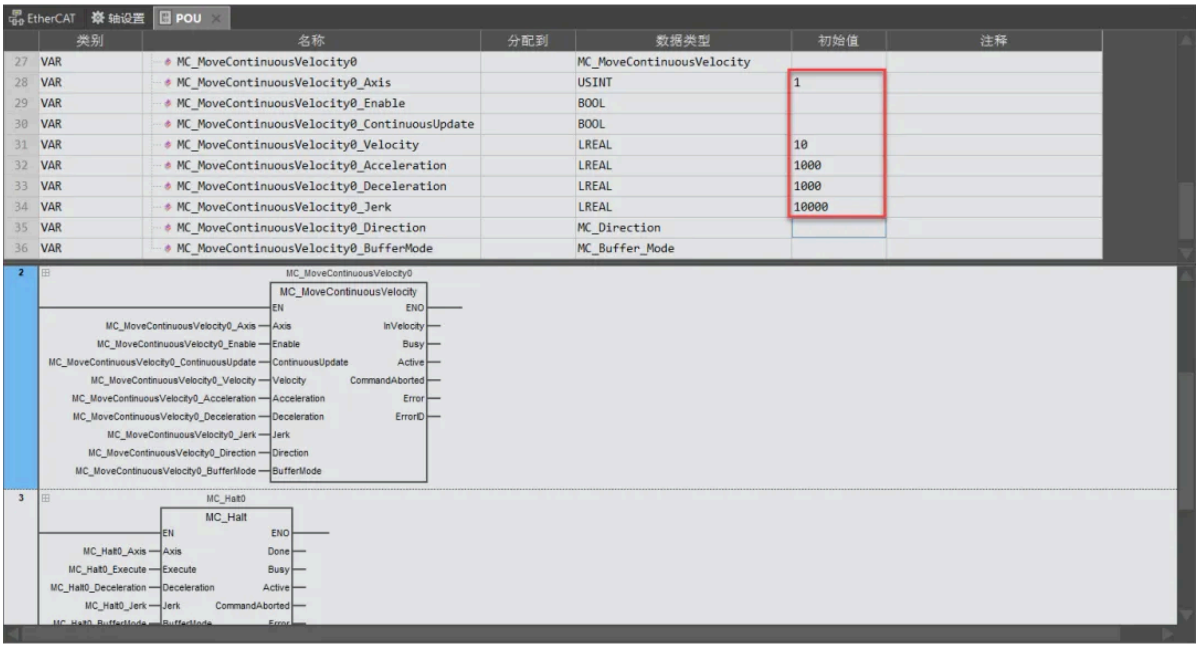
①Add a network and insert the MC_MoveContinuousVelocity function block



	类别	名称	分配到	数据类型	初始值	注释
19	VAR	MC_MoveVelocity0_Direction		MC_Direction		
20	VAR	MC_MoveVelocity0_BufferMode		MC_Buffer_Mode		
21	VAR	MC_Halt0		MC_Halt		
22	VAR	MC_Halt0_Axis		USINT	1	
23	VAR	MC_Halt0_Execute		BOOL		
24	VAR	MC_Halt0_Deceleratio				
25	VAR	MC_Halt0_Jerk				
26	VAR	MC_Halt0_BufferMode				

EtherCAT
轴设置
POU
1
工具箱
4
确定
取消
位字转换
系统功能
MotionControl_Part2
单轴功能块
MC_Jog
3
MC_MoveContinuousVelocity
MC_StopAtPhase
MC_TorqueControlWithVelocity
MC_TouchProbeCyc
MC_SetAxisParm
MC_SetFollowingParm
MC_GetFollowingStatus
MC_EnableSoftLimit
MC_MoveFeed
MC_HomeWithParm
MC_HomeByPLCIO
MC_ReadParameter
MC_WriteParameter
2
???
MC_Power0
MC_Power
MC_Halt0
MC_Halt

②Right-click and select [Automatically create input variables], and set the initial values of some variables



	类别	名称	分配到	数据类型	初始值	注释
27	VAR	MC_MoveContinuousVelocity0		MC_MoveContinuousVelocity		
28	VAR	MC_MoveContinuousVelocity0_Axis		USINT	1	
29	VAR	MC_MoveContinuousVelocity0_Enable		BOOL		
30	VAR	MC_MoveContinuousVelocity0_ContinuousUpdate		BOOL		
31	VAR	MC_MoveContinuousVelocity0_Velocity		LREAL	10	
32	VAR	MC_MoveContinuousVelocity0_Acceleration		LREAL	1000	
33	VAR	MC_MoveContinuousVelocity0_Deceleration		LREAL	1000	
34	VAR	MC_MoveContinuousVelocity0_Jerk		LREAL	10000	
35	VAR	MC_MoveContinuousVelocity0_Direction		MC_Direction		
36	VAR	MC_MoveContinuousVelocity0_BufferMode		MC_Buffer_Mode		

EtherCAT
轴设置
POU
MC_MoveContinuousVelocity0
MC_MoveContinuousVelocity
EN
ENO
Axis
InVelocity
Enable
Busy
ContinuousUpdate
Active
Velocity
CommandAborted
Acceleration
Error
Deceleration
ErrorID
Jerk
Direction
BufferMode
MC_Halt0
MC_Halt
Done
Execute
CommandAborted

After the settings are completed, download the project to the controller

③Perform MC_MoveContinuousVelocity function block test (the following are the consecutive steps)

a. Enable and trigger the MC_MoveContinuousVelocity function block

Result: The shaft runs in the forward direction at a speed of 10

b. MC_MoveContinuousVelocity function block does not need to be triggered repeatedly

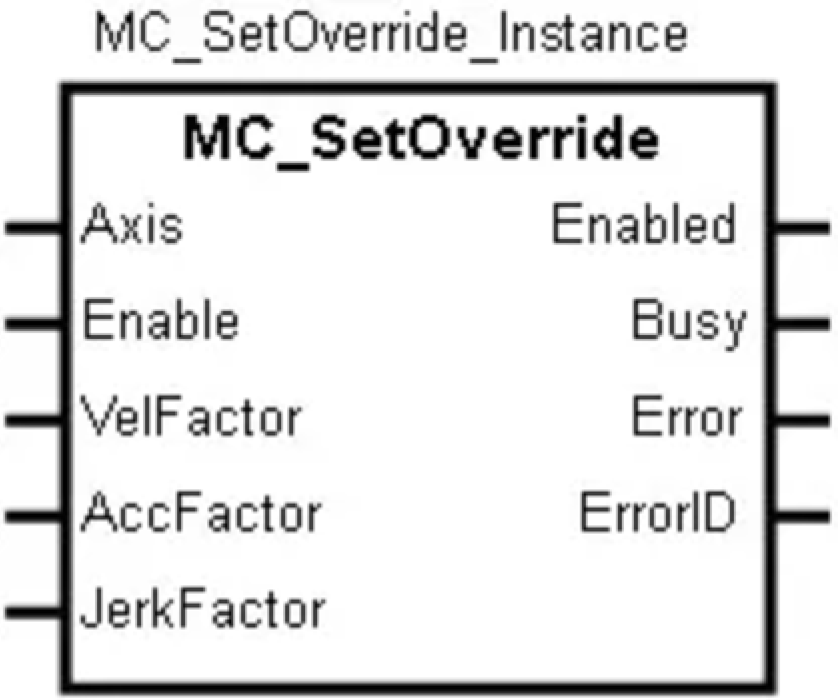
- Velocity = -10, Direction=mcPositiveDirection

Result: The shaft runs in the reverse direction at a speed of 10

- Velocity = -10, Direction=mcCurrentDirection

Result: The shaft runs in the forward direction at a speed of 10

MC_SetOverride (speed proportional adjustment instruction)



(1) Instruction description

① Functional description

It is used to proportionally change the target speed of the instruction in the global scope. The target speed after the change = the target speed of the currently executed instruction × the speed overshoot value.

②Speed overshoot value

a. The unit of VelFactor is %, and "100" means "100%". The valid range of VelFactor is 0 to 500. If it exceeds the valid range, the execution of the instruction will result in an error.

b. During the execution of the instruction, the value of VelFactor can be changed dynamically and the change will take effect immediately.

c. When the instruction stops executing, the speed overshoot value is 100%

d. The instruction will be executed continuously when Enable is TRUE.

③Controlled instructions

MC_MoveVelocity (velocity command)

MC_MoveRelative (Relative Movement Instruction)

MC_MoveAbsolute (absolute displacement instruction)

MC_MoveAdditive (additive displacement instruction)

MC_MoveSuperimposed (additional displacement instruction)

④Pin Description

- **Input variable**

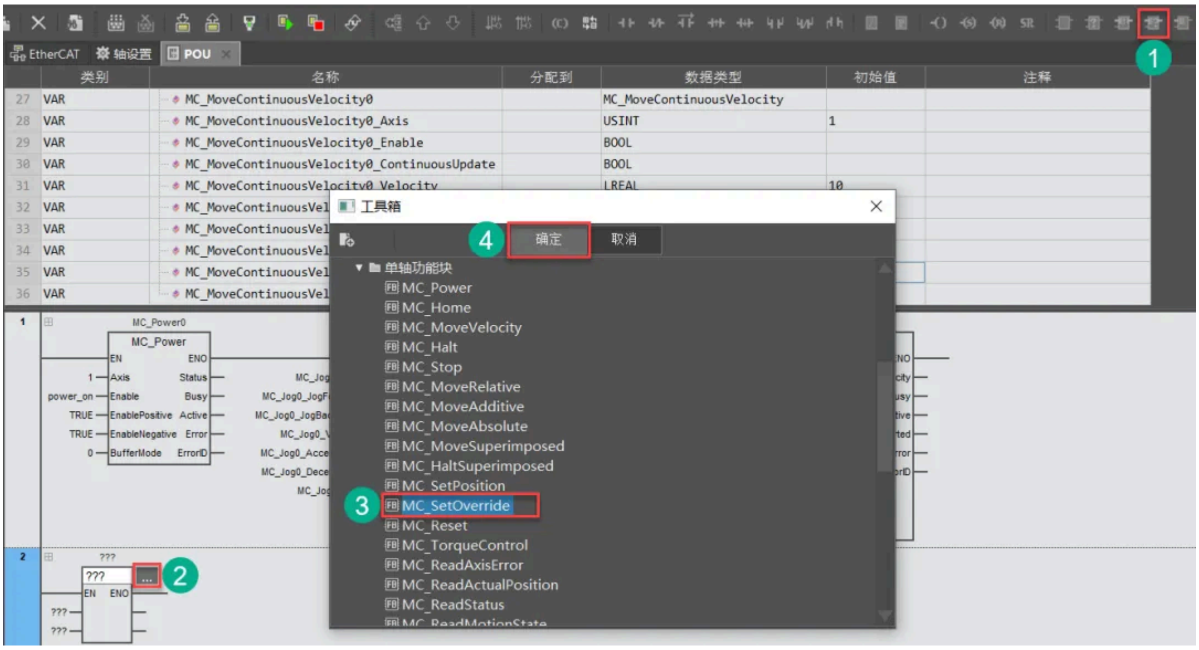
Name	Meaning	Data type	Valid range	Default	Description
Axis	Axis number	USINT	Depend on model	Required field	Specify the axis number of the control axis
Enable	Enable	BOOL	TRUE or FALSE	FALSE	TRUE: Factor in effect for target velocity FALSE: The factor of the target velocity becomes "100%".
VelFactor	Factor of target velocity	LREAL	0~500	100	Factor of target velocity (Unit: %)
AccFactor	Factor of acceleration	LREAL	Positive number	Required field	Reserved
JerkFactor	Factor of jerk	LREAL	Positive number	Required field	Reserved

- **Output variable**

Name	Meaning	Data type	Valid range	Description
Enabled	Enabled	BOOL	TRUE or FALSE	TRUE when the axis is under control.
Busy	Executing	BOOL	TRUE or FALSE	TRUE when the instruction is executed
Error	Error	BOOL	TRUE or FALSE	TRUE when there is an error
ErrorID	Error Code	WORD	0~65535	Refer to "instruction error code description" for the meaning of the output error code value when an instruction execution error occurs.

(2) Instruction test

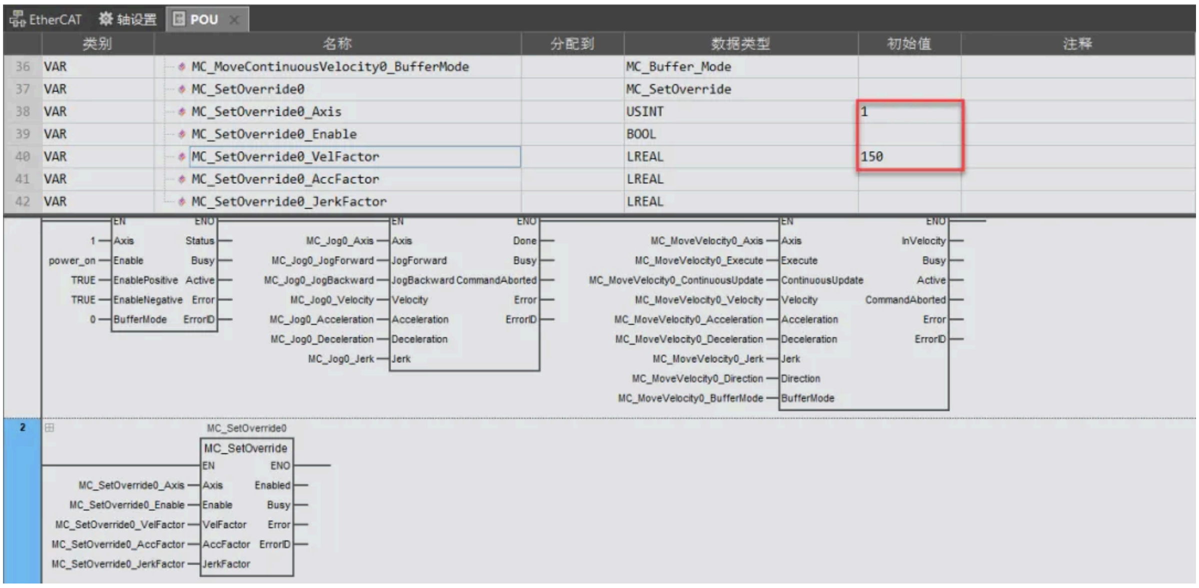
①Add a network and insert the MC_SetOverride function block



	类别	名称	分配到	数据类型	初始值	注释
27	VAR	MC_MoveContinuousVelocity0		MC_MoveContinuousVelocity		
28	VAR	MC_MoveContinuousVelocity0_Axis		USINT	1	
29	VAR	MC_MoveContinuousVelocity0_Enable		BOOL		
30	VAR	MC_MoveContinuousVelocity0_ContinuousUpdate		BOOL		
31	VAR	MC_MoveContinuousVelocity0_Velocity		LREAL	10	
32	VAR	MC_MoveContinuousVel				
33	VAR	MC_MoveContinuousVel				
34	VAR	MC_MoveContinuousVel				
35	VAR	MC_MoveContinuousVel				
36	VAR	MC_MoveContinuousVel				

EtherCAT
轴设置
POU
1
2
3
4
工具箱
确定
取消
单轴功能块
MC_Power
MC_Home
MC_MoveVelocity
MC_Halt
MC_Stop
MC_MoveRelative
MC_MoveAdditive
MC_MoveAbsolute
MC_MoveSuperimposed
MC_HaltSuperimposed
MC_SetPosition
MC_SetOverride
MC_Reset
MC_TorqueControl
MC_ReadAxisError
MC_ReadActualPosition
MC_ReadStatus
MC_ReadMotionState
MC_Power0
MC_Power
EN
ENO
Axis
Status
Enable
Busy
EnablePositive
Active
EnableNegative
Error
BufferMode
ErrorID
1
power_on
TRUE
TRUE
0
???

②Right-click and select [Automatically create input variables], and set the initial values of variables


EtherCAT
轴设置
POU
1 — Axis
power_on — Enable
TRUE — EnablePositive
TRUE — EnableNegative
0 — BufferMode
EN ENO Status Busy Active Error ErrorID
MC_Jog0_Axis — Axis
MC_Jog0_JogForward — JogForward
MC_Jog0_JogBackward — JogBackward
MC_Jog0_Velocity — Velocity
MC_Jog0_Acceleration — Acceleration
MC_Jog0_Deceleration — Deceleration
MC_Jog0_Jerk — Jerk
EN ENO Done Busy CommandAborted Error ErrorID
MC_MoveVelocity0_Axis — Axis
MC_MoveVelocity0_Execute — Execute
MC_MoveVelocity0_ContinuousUpdate — ContinuousUpdate
MC_MoveVelocity0_Velocity — Velocity
MC_MoveVelocity0_Acceleration — Acceleration
MC_MoveVelocity0_Deceleration — Deceleration
MC_MoveVelocity0_Jerk — Jerk
MC_MoveVelocity0_Direction — Direction
MC_MoveVelocity0_BufferMode — BufferMode
EN ENO InVelocity Busy Active CommandAborted Error ErrorID
2
MC_SetOverride0
MC_SetOverride
MC_SetOverride0_Axis — Axis
MC_SetOverride0_Enable — Enable
MC_SetOverride0_VelFactor — VelFactor
MC_SetOverride0_AccFactor — AccFactor
MC_SetOverride0_JerkFactor — JerkFactor
EN ENO Enabled Busy Error ErrorID

	类别	名称	分配到	数据类型	初始值	注释
36	VAR	MC_MoveContinuousVelocity0_BufferMode		MC_Buffer_Mode		
37	VAR	MC_SetOverride0		MC_SetOverride		
38	VAR	MC_SetOverride0_Axis		USINT	1	
39	VAR	MC_SetOverride0_Enable		BOOL		
40	VAR	MC_SetOverride0_VelFactor		LREAL	150	
41	VAR	MC_SetOverride0_AccFactor		LREAL		
42	VAR	MC_SetOverride0_JerkFactor		LREAL		

After the settings are completed, download the project to the controller

③ Test the MC_SetOverride function block (the following are the consecutive steps)

a. Enable and trigger the MC_MoveVelocity function block

(Velocity=10, Direction=mcPositiveDirection)

Result: The shaft runs in the forward direction at a speed of 10

b. Trigger mc_setOverride function block, VelFactor=150

Result: The axis runs in the forward direction at a speed of 15 (10 × 150% = 15)

Cancel triggering of mc_setOverride function block

Result: The shaft runs in the forward direction at a speed of 10

VelFactor =50

Result: The axis runs in the forward direction at a speed of 5 (10 × 50% = 5)

VelFactor = 200

Result: The axis runs in the forward direction at a speed of 20 (10 × 200% = 20)