# Studio5000环境下EtherNet/IP控制CMMT-MP 本文档适用于 CMMT-AS/CMMT-ST-MP



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#### 关键词:

Studio5000, AB PLC, EtherNet/IP, CMMT, 定位模式, 力模式

#### 摘要:

本文介绍了 AB CompactLogix PLC 通过 EtherNet/IP 通讯控制 CMMT-MP 驱动器, 通过 Festo 提供的 AOI 功能块可 实现寻零、点动、定位、参数读写、扩展报文、力控制等功能。

#### 目标群体:

本文仅针对有一定自动化设备调试基础的工程师,需要对 Festo CMMT 伺服以及 Rockwell Studio5000 有一定了解。

#### 声明:

本文档为技术工程师根据官方资料和测试结果编写,旨在指导用户快速上手使用 Festo 产品,如果发现描述与官方 正式出版物冲突,请以正式出版物为准。

我们尽量罗列了实验室测试的软、硬件环境,但现场设备型号可能不同,软件/固件版本可能有差异,请务必在理 解文档内容和确保安全的前提下执行测试。

我们会持续更正和更新文档内容, 恕不另行通知。

1	硬件/软件环境	4
2	Festo Automation Suite 软件中通讯参数设置(简称 FAS)	4
2.	1 设置通讯协议	4
2.	2   设置与 PLC 通讯的 IP 地址(X19)	5
2.	3	5
3	Studio5000 项目配置	5
3.	1 功能块、EDS 文件下载	5
3.	2 新项目文件	6
3.	3   安装 CMMT-AS EDS 文件	7
3.	4   组态 CMMT 模块	7
3.	5   导入 PTP 功能块	8
3.	6 PTP_Drives_Festo_EIP 功能块调用与配置	8
3.	7 编译及下载程序	10
3.	8 PTP_Drives_Festo_EIP 功能块说明	10
4	PLC 功能块基本控制	12
4.	1 使能驱动器	12
4.	2   设置 CancelTraversing 和 IntermediateStop	13
4.	<b>3</b> 软限位和硬限位激活	13
4.	4 实际速度反馈	13
4.	5 驱动器寻零(4)	13
4.	6 相对定位模式(1)和绝对定位模式(2)	14
4.	7 当前位置置零(5)	15
4.	<b>3</b> 记录表模式( <b>6</b> )	15
4.	9 点动模式( <b>7</b> )	16
4.	10 点动增量模式( <b>8</b> )	16
5	参数读写	16
5.	1 MSG 指令通过 PNU 号对参数进行访问	16
5.	<b>2</b> 读单个参数示例	17
5.	<b>3</b> 写单个参数示例	20
5.	<b>4</b> 参数掉电保持	22
5.	5   重启驱动器	23
6	冬点偏移保存	23
6.	1 使用 PTP_Drives_Festo_EIP 功能块完成回零操作	23
6.	2   通过 MSG 指令保存零点偏移	23
<b>6</b> .	3 MSG 多次执行零位保仔探作	24
í _	ƒ	24
7.	I FAS 软件中 EPD 组念	24
7.	2   Studio5000 中 LPD 组念	24 25
7.	5	25 25
7.	4   EPD	25
7.	5 AUI_EPD 功能伏定又八口地址	20
7.	5 EFU	20 22
7.	/	ס∠ דר
، / ، و	9	, 21 29
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# 1 硬件/软件环境

本文档适用于 AB Compact/ControlLogix 系列 PLC 在 RSLogix5000/Studio5000 环境下,通过 EtherNet/IP 控制 CMMT-MP 驱动器,系统构架如下:



#### 软件环境:

名称	版本号
CMMT-AS固件	V36.10.3.76_release
CMMT-AS插件	V2.9.0.978
Festo Automation Suite	V2.9.1.1
Studio5000	V34.11
1769-L24ER-QB1B固件	V34.011

# 2 Festo Automation Suite 软件中通讯参数设置(简称 FAS)

### 2.1 设置通讯协议

CMMT-MP 是多协议驱动器,需要选择 EtherNet/IP 通讯协议

	★ Q ⑦ CMMT-AS-C2-3A-M ×
PARAMETERIZATION	CONTROL DIAGNOSIS
CMMT-AS-C2-3A-MF CMMT-AS-C2-3A-MP- Path: 192.168.0.1 Disconnected	-s1 S1 Connect
Parameter Pages <	Configuration
Drive Configuration Device Settings Application Data	Prepared Values
✓ Fieldbus	Fieldbur Configuration
Configuration	
EtherCAT	RTE Configuration (user defined) EtherNet/IP - ModbusTCP (3)
PROFINET	RTE Configuration next Automatic (0)

#### 2.2 设置与 PLC 通讯的 IP 地址 (X19)

	PARAMETERIZAT	ION	CONTROL DI	IAGNOSIS			
-1	CMMT-AS-C2-3 CMMT-AS-C2-3/ Path: 192.168.0.1 Disconnected	<b>A-MP</b> -:	- <b>51</b> S1 Connect			<b>a</b> ()	
Para	meter Pages	<	EtherNet/IP - ModbusT	СР			
Dr	rive Configuration						
Device Settings Application Data					设置与PLC通讯的	设置与PLC通讯的IP地址,	
		Configuration		断电重启生效	断电重启生效。		
▼ Fie	eldbus			Activate DHCP	Active		
Configuration EtherCAT				IP address	192 . 168 . 0	. 10	
			X19	9			
	PROFINET			Subnet mask	255 . 255 . 255	5.0	-
	EtherNet/IP - Mo			Gateway address	0.0.0	. 0	
► Pr	ofiles						

#### 2.3 设置 Telegram111(定位模式)

PARAMETERIZATION	CONTROL	DIAGNOSIS			
CMMT-AS-C2-3A-MP-S CMMT-AS-C2-3A-MP-S Path: 192.168.0.1 Disconnected	- <b>S1</b> S1 Connect				
Parameter Pages <	Telegram				
Drive Configuration					
Device Settings			Telescone DDOFINIST		
Application Data					
▶ Fieldbus			PZD telegram selection	Telegram (1)	
✓ Profiles			Actual application class	Application class 1 (1)	
CiA 402					
▼ PROFIdrive					_
Factor Group			Telegram - EtherNet/IP - Modb	ousTCP	
Telegram			Telegram selection	Telegram (111)	L .
AC4 (PROFIN				Telegram (TTT)	
Extended Pro			Actual application class	Application class 1 (1)	
Digital I/O					

# 3 Studio5000 项目配置

# 3.1 功能块、EDS 文件下载

EDS 下载链接: <u>https://www.festo.com.cn/assets/attachment/zh-CN/665392/771522</u>

#### 设备描述文件 ~ Ethernet/IP EDS Supported systems: • servo drive CMMT-AS-...-11A-P3-... (5111189) • servo drive CMMT-AS-...-3A-... (5111184) • servo drive CMMT-AS-C12-11A-P3-MP-S1 (814316... More Version V351 (02.07.2024) More SHA-512 Ŧ đ V351 2 KB Version 34.0.13.18 (02.04.2024) More 6 SHA-512 Ŧ đ 34.0.13.18 2 KB 33.0.9.10 Version 33.0.9.10 (30.06.2023) More 6 SHA-512 Ŧ đ 2 KB 功能块下载链接: https://www.festo.com.cn/assets/attachment/zh-CN/661056/786875 功能块 $\overline{}$ ••• Function blocks Rockwell Point-to-point (PtP) library for servo drives with Ethernet/IP in Studio 5000 from Rockwell. Version changes:... More Ŧ Version 2.8 (07.01.2025) More SHA-512 42 MB đ 2.8 Version 2.7 (12.09.2024) More Ŧ đ 2.7 SHA-512 40 MB 1 Version 2.6 (05.06.2024) More 2.6 6 SHA-512 33 MB Ŧ

# 3.2 新项目文件

Logix Designer - CMMT_Test [1769-L24ER-QB1B 34.11]		- 8 ×			
File Edit View Search Logic Communications Tools V	Window Help				
New Ctrl+N	s 🏂 🎜 📴 ங 🕒 🖪 🖄 🦉 🎼 🛱 🖓				
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No Forces	Add-On PlantPAx Safety Alarms Bit Timer/	Counter Input/Output Compare Compute/N			
Save Save Cur+S Vew	Project ? X	⊘ New Project ? ×			
New Component	Search X	1769-L24ER-QB1B CompactLogix™ 5370 Controller CMMT Test			
Compact go Lc Page Setup Generate Report	>gix > Compact GuardLogix® 5370 Safety Controller > Compact GuardLogix® 5380 Safety Controller ✓ CompactLogix® 5370 Controller	Revision: 4 34 v 软件和固件版本保持一致			
Print  Print Options  Recent Projects	1769-L16ER-BB1B CompactLogix <sup>™</sup> 5370 Controller 1769-L18ER-BB1B CompactLogix <sup>™</sup> 5370 Controller 1760-L18ERM-BB1B CompactLogix <sup>™</sup> 5370 Controller	Use only the selected Security Authority for authentication and authorization			
	1769-L19ER-BB1B CompactLogix <sup>™</sup> 5370 Controller 1769-L24ER-QB1B CompactLogix <sup>™</sup> 5370 Controller	Secure With: Updical Name <controller name=""> Permission Set</controller>			
<ul> <li>▲ 1769 Bus</li> <li>1769 Bus</li> <li>Ø [0] 1769-L24ER-QB1B CMMT_Test</li> <li>▲ G Embedded I/O</li> </ul>	1769-L24ER-QBFC1B CompactLogix <sup>™</sup> 5370 Controller 1769-L27ERM-QBFC1B CompactLogix <sup>™</sup> 5370 Controller 1760-L20EP CompactLogix <sup>™</sup> 5370 Controller	ucas quion.			
<ul> <li>              ¶1 Embedded Discrete_IO ■ Expansion I/O * menet \$1769-L24ER-QB1B CMMT_Test      </li> </ul>	Name: CMMT_Test 3 Location: C:\Users\cn0ckn\Documents\Studio 5000' v Browse	6			
	Cancel Back Next Finish	Cancel Back Next Finish			
De Controller Organizer					
Search Results @Watch					
Ready		Communication Software: RSLinx Cla -			

# 3.3 安装 CMMT-AS EDS 文件



#### 3.4 组态 CMMT 模块

#### 按照如下步骤添加 Festo\_CMMT 模块

🖁 Logix Designer - CMMT_Test [1769-L24ER-QB1B 34.11]					
File Edit View Search Logic Communications Tools Window Help					
🏠 🖆 💾 🖶 🗴 🗇 ĉז 🎾 🦿	- 🗸 🏂 🎜 📴 🗽 🕞 😹 🖄 🗰 😘 🤹				
■ RUN ■ OK Path <none></none>					
Energy Storage I/O Offline No Fo	rces 🕨 No Edits 🤰				
Controller Organizer 🔷 🔻 🛪	Select Module Type				
a =	Catalog Module Discovery Favorites				
Controller CMMT_Test     Controller Tags     Controller Fault Handler	<ul> <li>Controller CMMT_Test</li> <li>⊘ Controller Tags</li> <li>Clear Filters</li> <li>Eide Filter≠</li> <li>✓ Module Type Category Filters</li> <li>✓ Module Type Vendor Filters</li> </ul>				
Power-Up Handler	✓ 20 - Comar≅R ✓ Advanced Emergy Industries, Inc. ✓ Analog ✓ Bray International, Inc				
A C MainTask	CIP Motion Safety Track Section V Buerkert Fluid Control Systems				
MainProgram					
Unscheduled	Catalor Rumber - Description Vendor Category				
🔺 🖾 Motion Groups	CMMT-AS CMMT-AS Feeto Ceneric Device (ke				
Ungrouped Axes					
Assets	1 of 696 Module Types Found Add to Favorites				
h Logical Model	Close on Greate Close Rain				
✓ ⊆ I/O Configuration					
A III 1709 BUS	El New Module X El Mandaula De Grateria et				
Embedded I/O	General     General     Module Definition*				
[1] Embedded Discrete_IO	Mode the Type CMMTASCANTAS Heme Photosi Perconjugate Vendor Feets Revision: 1 ∨ 001 €				
Expansion I/O	- Marcin Poor 1001 4 Photo Atlant 5 Electronic Kausing Commutible Module				
New Module	Deceptor Origination Too tast control				
Import Module	Connections:				
Discover Modules	Name Size Tag Suffix				
Paste Ctrl+V	写久X19的IP地址 DriveProfile - Input: 12 INT 1 CMMT:11 Exclusive Owner Output 12 1 CMMT:01				
Properties Alt+Enter	ModoUchian Review: 1001 Lixetere Enyang Compatible Nodale				
Print	Consisten: DeePerk Disease De. 数据类型修改成 "INT"				
i Controller Orga I La Logical Organizer					
D Search Results Watch Bit Charles OK Cancel Help					
Ready					

#### 3.5 导入 PTP 功能块



#### 3.6 PTP\_Drives\_Festo\_EIP 功能块调用与配置



输入输出硬件接口地址映射



注: ConnectionFaulted 置位,说明 CMMT 与 PLC 通信已断开。

#### 3.7 编译及下载程序



#### 3.8 PTP\_Drives\_Festo\_EIP 功能块说明

变量分为三个部分:硬件接口变量区域、控制变量区域、监控变量区域

FIF_DIIVES_LESIO_LIF		
PTP_Drives_Festo_EIP	CMMT_Ctrl	
I_O_I_n_t_e_r_f_a_c_e	0 🖛	-(AxisEnabled)
DRV_Status	CMMT:I1.Data	
DRV_Control	CMMT:O1.Data	
C_o_n_t_r_o_l_A_r_e_a	0 🗢	
ModePos	2 🕈	-(AxisSpFixed)
EnableAxis	0 🗢	
CancelTraversing	1+	-CAxisAckSetpoint)
IntermediateStop	1+	
Positive	0 🗢	-ClampTorqueReached
Negative	0 🗢	
Jog1	0 🖛	
Jog2	0 🖛	
AckError	0 🖛	
ReleaseBrake	0 🖛	
TravelToFixStop	0 🖛	-(AxisError)
ExecuteMode	0 🖛	
Position	0 🖛	
Velocity	0 🖛	
OverV	100 🗢	-(Error)
OverAcc	100 🖛	
OverDec	100 🖛	
ConfigEPos	15 🖛	
BaseSpeedValue	3000.0 🖛	
ConnectionFaulted CMMT:	1.ConnectionFaulted	
	0 🔶	
MonitorArea	0 🕈	
ActVelocity	0.0 🖛	
ActPosition	0 🖛	
ActMode	0 🔶	
EposZSW1	0 🕈	
EposZSW2	0 🖛	
ActWarn	0 🖛	
ActFault	0 🖛	
Status	16#0000 🗢	

功能块变量说明			
引脚	数据类型	默认值	描述
硬件接口			
DRV_Status	Array of INT[12]		CMMT 状态字硬件接口
DRV_Control	Array of INT[12]		CMMT 控制字硬件接口
输入			
ModePos	INT	2	运行模式选择:
			1 = 相对定位
			2 = 绝对定位
			4 = Festo Atuomation Suite 中的寻零模式寻零
			5 = 当前位置置零
			6 = 记录表模式
			7 = 点动
			8 = 点动增量
EnableAxis	BOOL	0	0 = 停止(OFF1); 1 = 使能驱动器
CancelTraversing	BOOL	0	0 = 取消当前运行任务; 1 = 正常运行
IntermediateStop	BOOL	1	0 = 暂停当前运行任务; 1 = 正常运行
Positive	BOOL	0	正方向
Negative	BOOL	0	负方向
Jog1	BOOL	0	正向点动(信号源 1)
Jog2	BOOL	0	负向点动(信号源 2)
AckError	BOOL	0	故障复位
Release Brake	BOOL	0	打开伺服电机刹车
TravelToFixStop	Bool	0	激活 Travel to Fixed Stop 模式
ExecuteMode	BOOL	0	执行 ModePos 设定的任务
Position	DINT	0	ModePos=1 或 2: 位置设定值
			ModePos=6: 位置表行号
Velocity	DINT	0	ModePos=1、2、3 时的速度设定值
OverV	INT	100[%]	所有运行模式下的速度倍率 0-199%
OverAcc	INT	100[%]	ModePos=1、2、3时的设定加速度百分比 0~100%
OverDec	INT	100[%]	ModePos=1、2、3时的设定减速度百分比 0~100%
ConfigEPOS	DINT	15	常用功能为:
			Bit0=1, 激活 Coast Stop(OFF2)
			Bit1=1, 激活 Quick Stop (OFF3)
			Bit2=1, 激活软限位功能
			Bit3=1, 激活硬限位功能
BaseSpeedValue	REAL	300.0	基础速度值,需要填入 FAS 软件中 Base value velocity 的值
ConnectionFaulted	BOOL	0	驱动器通讯状态
输出			
AxisEnabled	BOOL	0	CMMT 使能状态反馈
AxisPosOk	BOOL	0	目标位置到达,运动完成
AxisSpFixed	BOOL	0	轴是否移动
AxisAckSetpoint	BOOL	0	ExecuteMode 信号被 CMMT 接受后,状态置 1
AxisRef	BOOL	0	零点设置完成
ClampTorqueReached	BOOL	0	固定停止点已到达
AxisWarn	BOOL	0	CMMT 报警
AxisError	BOOL	0	CMMT 故障
Lockout	BOOL	0	驱动处于禁止接通状态
ActVelocity	REAL	0.0	实际速度反馈
ActPosition	DINT	0	实际位置反馈
ActMode	INT	0	运行模式确认
EPosZSW1	INT	0	EPOS ZSW1 状态
EPosZSW2	INT	0	EPOS ZSW2 状态
ActWarn	INT	0	CMMT 当前的报警代码
ActFault	INT	0	CMMT 当前的故障代码
Error	BOOL	0	1=功能块报错
Status	INT		16#7002:无错误,功能块正在执行
			16#8401: 驱动错误
			16#8402: 驱动禁止启动
			16#8403: 运行中寻零个能开始
			16#8600: 週代甲断
			10#8202: 个上棚的运行模式选择
			10#8203: 个止佣的设定值参数
			10#8204: 个止哪的位直亏(位直表楔式)

ConfigEPos Bit Details					
ConfigEPos	Function Description				
Bit - 0	OFF2 (Coast Stop )				

Bit - 1	OFF3 (Quick Stop )
Bit - 2	Software Limits Enable(激活软限位)
Bit - 3	Hardware Limits Enable(激活硬限位)
Bit - 4	Probe Edge Evaluation
Bit - 5	Select Probe
Bit - 6	External Block Change (via BUS)
Bit - 7	FW Pending - Signal Source Reference Mark
Bit - 8	FW Pending - Continuous Setpoint Transfer MDI
Bit - 9	FW Pending - DDS Bit 0
Bit - 10	FW Pending - DDS Bit 1
Bit - 11	FW Pending - DDS Bit 2
Bit - 12	FW Pending - DDS Bit 3
Bit - 13	FW Pending - DDS Bit 4
Bit - 14	FW Pending - Parking Axis Selection
Bit - 15	Motor Brake O=Close 1=Open
Bit -16to Bit-29	Reserved
Bit - 30	STW2.8 Travel to Fixed Stop
Bit - 31	Reserved

#### EPOS ZSW1 Bit Details

Epos ZSW1 Bits	Function Description
Bit - 0	Position Record Selected Bit 0
Bit - 1	Position Record Selected Bit 1
Bit - 2	Position Record Selected Bit 2
Bit - 3	Position Record Selected Bit 3
Bit - 4	Position Record Selected Bit 4
Bit - 5	Position Record Selected Bit 5
Bit - 6	Position Record Selected Bit 6
Bit - 7	Reserved
Bit - 8	Negative Hardware Limit Switch is Activated
Bit - 9	Positive Hardware Limit Switch is Activated
Bit - 10	Jogging Task is Active
Bit - 11	Homing Task is Active
Bit - 12	FW Pending - Flying Reference Active
Bit - 13	Position Record Task is Active
Bit - 14	FW Pending - MDI Setup Active
Bit - 15	MDI Mode is Active

#### EPOS ZSW2 Bit Details

EPOS ZSW2 Bits	Function Description
Bit - 0	Tracking Mode Active
Bit - 1	Velocity Limit Active
Bit - 2	Ready to Accept new Setpoint
Bit - 3	FW Pending - PrintMark OutSide Outer Window
Bit - 4	Axis is Moving Positive
Bit - 5	Axis is Moving Negative
Bit - 6	Negative Software Limit Switch is Activated
Bit - 7	Positive Software Limit Switch is Activated
Bit - 8	Actual Position <= CAM Position 1
Bit - 9	Actual Position <= CAM Position 2
Bit - 10	Direct Output 1 Via Traversing Block
Bit - 11	Direct Output 2 Via Traversing Block
Bit - 12	Fixed STOP Reached
Bit - 13	Fixed STOP Clamping Torque Reached
Bit - 14	Travel to Fixed STOP Active
Bit - 15	Traversing Task Active

# 4 PLC 功能块基本控制

本章介绍不同运行模式下的 PTP\_Drives\_Festo\_EIP 功能块的配置,轴的使能和停止,硬件限位和软件限位的启用以及实际速度监控。

#### 4.1 使能驱动器

EnableAxis=True 成功使能驱动器时 AxisEnabled=True

#### 4.2 设置 CancelTraversing 和 IntermediateStop

- a) CancelTraversing, IntermediateStop 对于定位模式(绝对定位/相对定位/记录表)有效,点动和寻零模式下无效。 控制定位时应该常置为 true,切换为 false 则立即停止定位运动。
- b) 运动过程中设置 CancelTransing=False, 轴按最大减速度停止, AxisPosOK 变为 True, 终止当前任务, 轴停止后可 进行运行模式的切换。
- c) 运动过程中设置 IntermediateStop=False, 轴按当前任务中的减速度停止, AxisPosOK 保持 False 状态,暂停当前任 务,再次设置 IntermediateStop=True 时,轴会继续执行当前的任务,不需要再次触发 ExecuteMode。轴静止后可进 行运行模式的切换。

#### 4.3 软限位和硬限位激活

#### ConfigEPOS=15 默认是激活软硬限位的

Gearbox	Software limit positions active	Active	٦
Axis 9	Negative software limit position	-2.00 mm	
Record list		-5.00	
Monitoring functions	+ Positive software limit position	97.00 mm	1
Closed loop			_

我们可以通过实际情况来设置软限位和硬限位, ConfigEPOS=3 即同时禁用了软硬限位。详情请查看 ConfigEPos Bit Details 定义。

#### 4.4 实际速度反馈

FAS 软件中的 Base valueVelocity 是实际速度反馈的基本速度值,该值需要填入功能块 BaseSpeedValue 变量中,经过内 部运算,功能块中的 ActVelocity 才能显示正确的实际速度反馈值。所以 FAS 软件中的 Base valueVelocity 是不需要进行 修改的,将数值填入功能块中即可。

	<b>*</b> Q <b>@</b>	CMMT-AS-C2-3A-M ×			
PARAMETERIZATION	CONTROL DIAGNOSIS				
CMMT-AS-C2-3A-MP- CMMT-AS-C2-3A-MP-S Path: 192.168.0.10 Disconnected	-S1 51 Connect		1		t to Def
Parameter Pages <	Telegram				
Drive Configuration	Dynamic Values				
Device Settings	Coast stop			0	
<ul> <li>Fieldbus</li> </ul>	Acceleration	5.00	m/s²		
▼ Profiles	Deceleration	5.00	m/s²	PTP Drives_Festo_EIP PTP_Drives_Festo_EIP CMMT_Ctrl I O I n t e r f a c e 0 DRV Status CMMT:11.Data	
CiA 402	Jerk	500.00	m/s³	DRV_Control CMMT:01.Data (AxisPosOk) (AxisPosOk)	_
▼ PROFIdrive	Deceleration (system stop AC1/	1.00		CancelTraversing	_
Factor Group	AC3)	1.00	m/s <sup>2</sup>	IntermediateStop 1 Positive 0 Negative 0	ed)—
Telegram	Jerk (system stop AC1/AC3)	1000.00	m/s³	Jog1 0+ AxisRef	-
AC4 (PROFIN	Deceleration (stop ramp)	15.00	m/s <sup>2</sup>	TravelToFixStop	_
Extended Pro			]	ExecuteMode 0+ Position 0+ Velocity 0+	
Digital I/O	Jerk (stop ramp)	1000.00	m/s³	OverV         100+         -         CError>           OverAcc         100+         -         100+         -	_
Analog I/O	Base value acceleration	1.00	m/s²	ConfigPos 15+ BaseSpeedValue 315.0+	-
Encoder Interface	Base value deceleration	1.00	m	ConnectionFaulted CMM1:11.ConnectionFaulted M_o_n_i_t_o_r_A_r_e_a 0 ← ActVelocity 0.0 ←	
<ul> <li>Axis 1</li> </ul>	Base value velocity 🔾	0.315	m/s	ActMode 315即315mm/s=0.135m/s	
Motor	Base value velocity (PLC, motorside)	1575.00	r/min	Lpos2SW2         1*           ActWam         0*           ActFault         0*           Status         16#7002*	
CMMT_MP*				Fes	sto Autom

# 4.5 驱动器寻零(4)

a) 寻零方式、寻零速度和加速度在 Festo Automation Suite 中设置

- b) 功能块上 OverV 可设置寻零速度倍率, OverAcc 和 OverDec 可设置寻零加减速度倍率。
- c) ModePos=4 切换为寻零模式, ExecuteMode 置位触发寻零, 寻零过程中不可复位 ExecuteMode 信号, 否则会导致寻 零中断。
- d) 寻零成功后 AxisRef 置 1, 此时可复位 ExecuteMode 触发信号。

_				Usable stroke: 10	0.00 mm						
	$\oplus$										
	•	10 2	0 30 4	0	50 60 	70	80 	) 9(			
	•									7	
									L.T.		
Homing method	寻零模式				Homing parameters						
			L —			Velocity [m/s]	Acce	I. [m/s²]	Jerk [m/s	3]	
Method		Negative stop (-17)		•	Crawl	0.005	-	1.00	-	100.00	-
		5	•	寻零速度	Search	0.01	-	1.00	-	100.00	] -
Move to axis zero p homing	oint after	<ul> <li>Active</li> </ul>			Running	0.05	-	1.00	-	100.00	] -
					Nominal current limit va	lue scaling factor			0.30	]	
					Limit position detection	time monitoring windo	w		0.20	s	
					Homing timeout				60.00	s	

注意:

对于多圈绝对值编码器马达, FAS 或者 PLC 执行寻零动作后, 自动执行零点偏移掉电保存功能。

#### 4.6 相对定位模式(1)和绝对定位模式(2)

- a) ModPos=1 或 2 设置定位模式
- b) 设置目标位置 Position 和目标速度 Velocity (OverV 可设置速度倍率) 假设目标位置 80mm, 功能块中需要设置 80000 假设目标速度 2mm/s, 功能块中需要设置 2 注意:功能块中的给定目标值与实际值的比列关系

						PTP_Drives_Festo_EIP		
						PTP_Drives_Festo_EIP	Axis1	
`	Matala					l <u>Olnterfac</u> e	0 🖛	(AxisEnabled)
/	watch window					DRV_Status	CMMT1:I1.Data	
						DRV_Control	CMMT1:01.Data	(AxisPosOk)
	A 12 12 12 1					C_o_n_t_r_o_l_A_r_e_a	0 🗢	
	Active motion task					ModePos	2 🗭	(AxisSpFixed)
	Position (5)					EnableAxis	1 🗭	
						CancelTraversing	1 🖛	(AxisAckSetpoint)
						IntermediateStop	1 🗭	
	Deferencing status					Positive	0 🕈	(AxisRef)
	Referencing status					Negative	0 🕈	
	Drive referenced (200)	Factor group				Jog1	0 🗢	-(AxisWarn)-
						Jog2	0 🗢	
						FlyRef	0 🗢	-(AxisError)-
	Setpoint Position					AckError	0 🗢	
	Seeponerosition	Current user u	nit	Metric (m. m/s 1(6)		ExecuteMode	1 🗭	-(Lockout)
	80.00 mm	Current user u	init	Metric [11, 11/5,] (0)		Position	80000 🕈	
						Velocity	2 🕈	-(Error)
						OverV	100 🔶	
	Position actual value (encoder 1)	Position	- O		-6	OverAcc	100 🕈	
	00.0000629 mm					OverDec	100 🕈	
	00.0000050 11111					ConfigEPos	15 🖛	
		Mala sites	0		2	BaseSpeedValue	5000.0 🖛	
		velocity	- C -		-3	ConnectionFaulted CMMT1:I1	ConnectionFaulted	
	Setpoint value velocity controller		L				0 🗭	
	0.0020554 m/s					MonitorArea	0 🗭	
	0.0020334 11/5					ActVelocity	0.010761432 🗧	
						ActPosition	80000	
	Mala attaction from the data data data					ActMode	2 🗭	
	velocity actual value (encoder 1)					EposZSW1	-32768	
	-0.0000277 m/s					EposZSW2	4 🗭	
						ActWarn	0 🗭	
_						ActFault	0 🗭	
						Status	16#7002 4	
						Status	16#7002	

#### c) 设置定位模式的加减速度

功能块上的 OverAcc 和 OverDec 的默认值是 100%,可设置减速度倍率。加减速度基准值在 Festo Automation Suite 中设置:

<ul> <li>Profiles</li> </ul>		Deceleration	5.00	m/s²
CiA 402		Jerk	500.00	m/s³
<ul> <li>PROFIdriv</li> <li>Facto</li> </ul>	e r Group	Deceleration (system stop AC1/ AC3)	1.00	] m/s²
Teleg	ram	Jerk (system stop AC1/AC3)	1000.00	] m/s³
AC4 (	PROFIN	Deceleration (stop ramp)	15.00	m/s²
Exten	ded Pro	Jerk (stop ramp)	1000.00	m/s³
Digital I/O				-
Analog I/O		Base value acceleration	1.00	m/s²
Encoder Interfa	ace	Base value deceleration	1.00	m/s²
<ul> <li>Axis 1</li> </ul>		Base value velocity 🔾	0.315	m/s

d) ExecuteMode 上升沿激活定位任务,当 AxisAckSetpoint 信号置位后,复位 ExecuteMode 信号。运动过程中 AxisPosOK 为 False,运动完成时 AxisPosOK 为 True。

#### 注意:

- 1. 对于绝对位置定位和相对位置定位模式,当前正在运行的任务可以通过 ExecuteMode 上升沿被新任务替换,也就 是说会按照新的 Position、Velocity、OverAcc、OveDec 去执行新任务,并且任务切换时速度不会减速到 0,而是在 当前速度基础上,按照新的加减速度运动。
- 2. 相对定位中,运动方向由 Position 中设置值的正负来确定(例如: -1000 反向运动)

#### 4.7 当前位置置零(5)

- a) ModPos=5 设置当前位置置零模式
- b) ExecuteMode 上升沿激活当前位置置零功能,当前位置 ActPosition 会变为 0, Festo Automation Suite 软件中显示的 位置也变为 0。

#### 注意:

1. FAS 中的 Axis zero point offset 参数在 ModPos=5 的模式下也是生效的,如果需要触发 ExecuteMode 的时候立刻将 位置置零,需要把此参数改为 0。

Axis zero point offset

3.00 mm

2. FAS 软件中回零方式 Current position(37) 与该模式功能一样。

#### 4.8 记录表模式(6)

- a) 记录表需要提前在 Festo Automation Suite 中设置好
- b) ModPos=6 设置记录表模式
- c) Position 设置目标记录号(1~63),例:设置目标位置是2,则走的位置是下图 30mm 的位置
- d) ExecuteMode 上升沿激活记录号对应功能,运动过程中 AxisPosOK 为 False,运动完成时 AxisPosOK 为 True

Digital I/O	记录	步					Vel	ocity override	 0—		100
Analog I/O Encoder Interface	 1	Task1	<b>Record type</b> Position (5)	<b>Type</b> Positioning absolute (0)	Target position 0.00 mm	Velocity 0.40 m/s	Acceleration 5.00 m/s <sup>2</sup>	Comment	S	ľ	â
<ul> <li>Axis 1</li> <li>Motor</li> </ul>	 2	Task2	Record type Position (5)	<b>Type</b> Positioning absolute (0)	Target position 30.00 mm	Velocity 0.40 m/s	Acceleration 5.00 m/s <sup>2</sup>	Comment	S	ľ	â
Gearbox Axis	3	Task	Record type Position (5)	<b>Type</b> Positioning absolute (0)	Target position 50.00 mm	Velocity 0.40 m/s	Acceleration 5.00 m/s <sup>2</sup>	Comment	S		â
Record Table Monitoring Functi									A	dd Reco	ord Set

#### 4.9 点动模式(7)

a) Model b) Jog1 : c) Jog2 :	Pos=7 设 = True	置点动模式,点动速度在 Festo Auto 数活正向点动, Jog1 = False 停止点 数活负向点动, Jog2 = False 停止点	omation Suite 中设。 点动 点动	2011年1月11日1日11日11日11日11日11日11日11日11日11日11日11日						
Motor										
Gearbox										
Axis		Dynamic Values - Jog Mode								
Record Ta	ble		2.00	1						
Monitorin	g Functi	Slow motion time (t1)	2.00	s		V 1			Dhace 2	
Closed Lo	op	Velocity (v1)	0.03	m/s		V2 _			FildSe 2	$\neg$
Auto Tuni	ng	Acceleration (acc1)	1.00	m/s²						
Vibration	Compe	Jerk (phase 1)	100.00	m/s³		V1_	Phase 1			
Feed Forw	vard Con									
Modulo N	lode	Velocity (v2)	0.06	m/s						
<ul> <li>Position T</li> </ul>	rigger	Acceleration (acc2)	1.00	m/s²						
<ul> <li>Touch Pro</li> </ul>	be	Jerk (phase 2)	100.00	m/s³			acc <sub>1</sub>	t <sub>1</sub> acc <sub>2</sub>		
Travel to F	ixed Stop		2.加用觉得容开可容/1和/23	。 5署成—	-#¥					
Master/Sl	ave									
Manual M	lovement	Dynamic Values - Single Step Mode								

# 4.10 点动增量模式(8)

ModPos=8 设置	点动增量模式
<b>Jog1</b> 和 <b>Jog2</b> 用来	来启动点动增量功能

Parameter Pages <	Parameter List		8 🕩 🕩 🍸	× 21453			
Motor	ID 🕈	Name 🕈	Value	Ŷ	Unit	Ŷ	Ŷ
Gearbox	<ul> <li>/Axis1/Jog mode group[</li> </ul>	)] (41) <i>Ç</i>					
Record Table	P1.214530.0.0	Relative position jog 1		3.00	mm		
Monitoring Functi	P1.214535.0.0	Slow jog 2 velocity		0.02	m/s		
Closed Loop	P1.214536.0.0	Slow jog 2 acceleration		1.00	m/s²		
Auto Tuning	P1.214537.0.0	Slow jog 2 jerk		100.00	m/s³		
Vibration Compe	P1.214538.0.0	Relative position jog 2.		-3.00	mm		
Feed Forward Con	P1.214539.0.0	Jog duration 2 movement		2.00	s		
Modulo Mode			1				
<ul> <li>Position Trigger</li> </ul>							
<ul> <li>Touch Probe</li> </ul>							
Travel to Fixed Stop							
Master/Slave							
Manual Movement							
Operator Unit							
Parameter List							

点动增量即触发段相对位移,位移的长度和方向由 relative positive jog 参数决定,jog1 对应的参数值为 P1.214538.0.0, jog2 对应的参数为 P1.214530.0.0。

# 5 参数读写

请注意: MSG 指令读写参数是非周期的,每触发一次读写一次。

## 5.1 MSG 指令通过 PNU 号对参数进行访问

每个参数对应的 PNU 号可以从 CMMT-SW 手册 PNUs reference list 查找(Profinet 和 EtherNet/IP 使用相同的 PNU 号) 下载地址如下:

https://www.festo.com.cn/assets/attachment/en/665942/771542

Bookmarks X		12.5	PNUs reference list
		PNU	Name
About this document		Profile s	pecific parameters
CMMT-AS Plug-in		1.0	STW1
Product configuration		2.0	ZSW1
Motion control		3.0	STW2
Motion monitoring		4.0	ZSW2
Control		5.0	NSOLL A/NSOLL B
Technology functions			·····
Safety signals		6.0	Actual velocity value
Diagnostics and fault clearance	•	7.0	NSOLL_A/NSOLL_B
Operator unit CDSB			
EtherCAT		8.0	Actual velocity value
PROFINET		9.0	Gn_STW
📮 General		10.0	Gn_ZSW
Standards		11.0	Position 1 encoder n
PROFINET communication		12.0	Position 2 encoder n
> 📮 PROFIdrive	_	13.0	Gn_STW
PNUs reference list		14.0	Gn_ZSW
EtherNet/IP		15.0	Position 1 encoder n

### 5.2 读单个参数示例

读取实际电流值										
PNU	Name	Data type	Access	Parameter						
<b>11190.0</b>	Actual active current value	FloatingPoint	ro	P1.814.0.0						

#### a) 新建 **MSG** 指令



Data type

Unsigned16

Unsigned16

Unsigned16

Unsigned16

Integer16

Integer16

Integer32

Integer32

Unsigned16

Unsigned16

Unsigned32

Unsigned32

Unsigned16

Unsigned16

Unsigned32

Access

rw

ro

rw

ro

rw

ro

rw

ro

rw

ro

ro

ro

rw

ro

ro

Parameter

P1.1147990.0.0

P1.1145990.0.0

P1.1148990.0.0

P1.1146990.0.0

P1.11280502.0-

P1.11280502.0-

P1.1149990.0.0

P1.1143990.0.0 P1.1142990.0.0

P1.1141990.0.0

P1.1149990.1.0

P1.1143990.1.0

P1.1142990.1.0

ð ×

P1.1210.0.0

P1.1210.0.0

0.

.0

Insatnce: PNU 号小数点左侧数值 Attribute: PNU 号<mark>小数点右侧数值</mark>

c)新建变量

# 读取的电流值数据类型是 FloatingPoint,创建变量选择 REAL 数据类型。

Message Configuration - Read_Parameter X	New Tag	<b>4</b> ×
Configuration* Communication* Tag	Name: 2 current	Create 🔻
Message Type: CIP Generic ~	Description:	∧ Cancel
Service Get Attribute Single Source Element:		Help
Service e (Hex) Class: 401 (Hex) Destination	Usage: <controller></controller>	~
Instance: 11190 Attribute: o (nex)	Type: Base ~ Connec	tion
	Alias For:	~
	Data Typ 3 REAL	
○ Enable ○ Enable Waiting ○ Start ○ Done Done 0	Parameter Connection:	$\sim$
⊖ Error Coi Extended Error ☐ Timed Oi♥	Scope: CMMT_Test	~
Error	External Access:	~
确定 取消 应用(A) 帮助	Style: Float	$\sim$

d) Destination Elements 关联变量来存放读取的参数值

Message Configuration - Read_Parameter	×
Configuration* Communication* Tag	
Message Type: CIP Generic V	
Service Type: Get Attribute Single Source Element:	vtes)
Service e (Hex) Class: 401 (Hex) Destination current Code: Instance: 11190 Attribute: o (Hex) New Tag	~
○ Enable ○ Enable Waiting ○ Start ○ Done Done 0	
© Error Coi Extended Error □ Timed Oi Error Error M定 取消 应用(A) Ⅰ	爭助
e)与 CMMT 建立通讯路径	
Message Configuration - Read_Parameter Configuration* Communication* Tag	×
Path:     Browse  Browse	]
Path: CMMT1 0 ÷	

#### f) 触发 MSG 指令,当 Done(DN 完成位)=True,参数读取完成,通过 MOV 指令显示读取的数值。 ab –

(A)

hе imed Or

Vessage Configuration - Read_Parameter         Configuration       Communication       Tag         Message Type:       CIP Generic         Service       Get Attribute Single       ✓         Service       Get Attribute Single       ✓         Service       (Hex)       Class:       401         Instance:       11190       Attribute:       0       (Hex)	x rce Element: rce Length: tination ment: New Tag	MSG Message Control Read_Parameter MOV Source currei -0.02110719 Dest currei -0.02110719
) Enable ) Enable Waiting ) Start ) Error Coi Extended Error Error CMMT1 Error 确定	Done 4 □ Timed Oi年	

🔹 (Octal)

帮助

Large Connection

0

0

⊡… 🛁 I/O Configuration ⊑… 🌐 1769 Bus

Ethemet

CMMT\_Test

OK

Cancel

Help

Embedded I/O

Expansion I/O

#### 5.3 写单个参数示例

修议 Fast jog I velocity 的迷没	修改 Fast	jog 1 vel	ocity	的速度
----------------------------	---------	-----------	-------	-----

PNU	Name	Data type	Acces	s Parameter	
11355.0	Fast jog 1 velocity	FloatingPoint	rw	P1.1514.0.	0
a)新建及酉 Message Ty Service Typ Service Cod Class: 401 Insatnce: F Attribute: I	已置 MSG 指令 pe:CIP Generic e:Custom e:10 PNU 号 <mark>小数点左侧数值</mark> PNU 号小数点右侧数值				
Message Co	onfiguration - Write_Param	eter		×	MSG Message Control Write Parameter
Configurati	ion* Communication Tag	9	_	-	-(CN) -(DN) -(ER)
Message Ty	vpe: CIP Generic	```	1		
Service Type:	Custom	Source Element	t:	✓ (Bytes)	
Service Code:	0 (Hex) Class: 401	(Hex) Destination Element:		~	
⊖ Enable	○ Enable Waiting ○ Sta	rt O Done	Done	0	
O Error Co	Extended Erro	r	Timed	Oi <b>t</b>	
Error Error					
	确定	取消	应用(A)	帮助	
b)新建变量	量和定义数据长度				
新建两个变	量:Fast_Jog_1_Veloci Fast_log_1_Veloci	ty_Send 用来存放 tv_receive 田来存	(发出数值 前接收数	佶	
New Tag	1451_J05_1_VCtoch	× N	New Tag	ļ <del>LI</del> .	×
Name:	Fast_Jog_1_Velocity_Send	Create 🔻	lame: F	ast_Jog_1_Velocity_receiv	e Create 💌
Description:	^	Cancel	escription:		Cancel
		Help			Help

Description:	^	Cancel	Description:		^	Cancel
		Help				Help
	· · · · · · · · · · · · · · · · · · ·	]			~	
Usage:	<controller></controller>		Usage:	<controller></controller>		
Туре:	Base ~ Connection		Туре:	Base ~	Connection	
Alias For:	~		Alias For:		~	]
Data Type:	REAL		Data Type:	REAL		
Parameter Connection:	~		Parameter Connection:		~	]
Scope:	CMMT_Test 🗸	]	Scope:	CMMT_Test	~	
External Access:	Read/Write ~	]	External Access:	Read/Write	~	
Style:	Float ~		Style:			
Constant			Constant			
Sequencin	9		Sequencing	1		

c) Source Element: 关联变量 Fast\_Jog\_1\_Velocity\_Send

#### e) Destination Element: 关联变量 Fast\_Jog\_1\_Velocity\_receive

Message Configuration - Write_Parameter	×
Configuration* Communication Tag	
Message Type: CIP Generic	~
Service Custom  V Service Custom  V	Source Element: log_1_Velocity_Send ↓ Source Length: 4
Code:         10         (Hex)         Class:         401         (Hex)           Instance:         11355         Attribute:         0         (Hex)	Destination g_1_Velocity_receive v Element: New Tag
○ Enable ○ Enable Waiting ○ Start	O Done Done 0
⊖ Error Co₁ Extended Error Error Error	☐ Timed Or
确定	取消 应用(A) 帮助
f)与 CMMT 建立通讯路径	
Message Configuration - Write_Parameter	
Configuration <sup>*</sup> Communication Tag	



g) Fast\_Jog\_1\_Velocity\_Send 变量写入值: 0.05, 触发 MSG 指令,当 Done(DN 完成位)=True,参数写入成功 h) Fast\_Jog\_1\_Velocity\_receive 收到的值也是 0.05。

Message Configuration - Write_Parameter X	MSG Message Control Write_Parameter(EN)
Configuration Communication Tag	(DN) (ER)
Message Type:       CIP Generic         Service       Set Attribute Single       Source Element:       Fast_Jog_1_Velocity_          Type:       Source Length:       4       (Bytes)         Service       10       (Hex)       Class:       401       (Hex)         Code:       10       (Hex)       Class:       401       (Hex)         Instance:       11355       Attribute:       0       (Hex)       New Tag	设定値 Source Fast_Jog_1_Velocity_Send 0.05↓ Dest Fast_Jog_1_Velocity_Send 0.05↓ MOV Source Fast_Jog_1_Velocity_receive 0.05↓ Dest Fast_Jog_1_Velocity_receive 後收値
⊖ Enable ⊖ Enable Waiting ⊖ Start	
⊖ Error Coi Extended Error ☐ Timed Oi♥ Error CMMT1	
Error	
에지도 먹지(티 ////(A) +#814)	
<b>Festo Automation Suite</b> 软件查看, <b>Velocity</b> 的值已经被修改成 0.05。	
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected Disconnect Plug-in Plug-in Disconnect Disable Disa	ed  ed  stop Acknowledge all
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected     Disconnect     Plug-in PLC     Plug-in Disab     Enable Disab       Parameter pages      Jog mode	ed O E C C C C C C C C C C C C C C C C C C
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected     Disconnect     Plug-in PLC     Enable Disab       Parameter pages      Jog mode	ed O E Acknowledge all
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected     Disconnect     Plug-in PLC     Plug-in Disab     Enable Disab       Parameter pages      Jog mode       Digital I/O Analogue I/O	ed O E Acknowledge all
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Enable Disab         Parameter pages        Jog mode         Digital I/O Analogue I/O Encoder interface       Movement parameters	ed O Acknowledge all
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Plug-in Disab       Plug-in PLC       Enable Disab         Parameter pages        Jog mode       Powerstag         Digital I/O       Analogue I/O       Movement parameters         Encoder interface       Slow motion time	ed ed ge Stop Acknowledge all 2.00 s
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Plug-in Disab       Pnug-in Disab         Parameter pages        Jog mode         Digital I/O       Analogue I/O       Movement parameters         Encoder interface       Slow motion time         Motor       Velocity (slow)	ed ed ge Stop Acknowledge all 2.00 s 0.02 m/s
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Enable Disab         Parameter pages        Jog mode         Digital I/O Analogue I/O Encoder interface       Movement parameters         Axis 1       10       Slow motion time         Motor       Velocity (slow)         Gearbox       Acceleration (slow)	ed ge Stop Acknowledge all 2.00 s 0.02 m/s 1.00 m/s <sup>2</sup>
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Plug-in Disab       Pnotbial       Disab         Parameter pages        Jog mode       Control       Powerstag         Digital I/O       Analogue I/O       Movement parameters       Movement parameters         • Axis 1       10       Slow motion time         Motor       Velocity (slow)       Acceleration (slow)	ed ge Stop Acknowledge all 2.00 s 0.02 m/s 1.00 m/s <sup>2</sup>
CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Plug-in Disab       Pnote       Enable Disab         Parameter pages        Jog mode         Digital I/O       Analogue I/O       Movement parameters         Encoder interface       Slow motion time         Motor       Velocity (slow)         Gearbox       Axis       9         Record list       Jerk (slow)	ed ge Stop EF Acknowledge all 0.02 m/s 1.00 m/s <sup>2</sup> 100.00 m/s <sup>3</sup>
CMMT-AS-C4-3A-EP-S1 Path: 192.168.0.1 Connected       Disconnect       Plug-in PLC       Plug-in Disab       Plug-in Disab       Pnote         Parameter pages        Jog mode       Control       Powerstar         Digital I/O       Analogue I/O       Movement parameters       Movement parameters         Encoder interface       III       Slow motion time         Motor       Velocity (slow)       Acceleration (slow)         Axis       9       Acceleration (slow)         Record list       Jerk (slow)       Jerk (slow)	ed       Image: Stop       Image: Stop       Acknowledge all       Image: Stop         2.00       s       Image: Stop       Image: Stop       Image: Stop         2.00       s       Image: Stop       Image: Stop       Image: Stop       Image: Stop         1.00       m/s <sup>2</sup> Image: Stop
CMMT-AS-C4-3A-EP-S1 CMMT-AS-C4-3A-EP-S1 Path: 192.1680.1 Connected       Disconnect       Plug-in PLC       Enable Disab         Parameter pages        Jog mode         Digital I/O       Analogue I/O       Movement parameters         Encoder interface       Slow motion time         Motor       Velocity (slow)         Gearbox       Axis       Image: Slow motion time         Axis       Image: Slow motion time       Jerk (slow)         Monitoring functions       Image: Slow motion time       Jerk (slow)         Velocity       Closed loop       Acceleration	ed       Image: Stop       Image: Stop       Acknowledge all         Acknowledge all       Image: Stop       Image: Stop         Image: Imag

# 5.4 参数掉电保持

### PNU1018 参数写入1(数据类型 INT),实现参数掉电保持

PNU	Name	Function	Description
1018	Save parameter set	Controlling method	Value = 1: execute method
	-	_	Value = 0: Reset method

触发 MSG 指令,当 Done (完成位)=True,参数写入完成。

Í	Message Configuration - Write_Parameter3	
-	Configuration Communication Tag	Message (EN)
	Message Type: CIP Generic	Message Control Write_Parameters (CHV)
	Service Set Attribute Single   Source Element: Save_parameter_set	
_	Service       10       (Hex)       Class:       401       (Hex)       Destination       FAS_Save_the_parar ~         Instance:       1018       Attribute:       0       (Hex)       New Tag	Move Source Save_parameter_set 1 ← Dest Save_parameter_set 1 ←
	◯ Enable ◯ Enable Waiting ◯ Start	
	○ Error Code: Extended Error Code:	

### 5.5 重启驱动器

可以通过 PNU1000 来复位 (数据类型 INT), 验证掉电保持功能

PNU	Name	Function	Description
1000	Reset Device	Controlling method	Value = 1: execute method
			Value = 0: Reset method

#### 零点偏移保存 6

i.

#### 使用 PTP\_Drives\_Festo\_EIP 功能块完成回零操作 6.1

PTP_Drives	s_Festo_EIP
PTP Drives Festo EIP	CMMT Axis1 (AxisEnabled)
IOInterface	- 0+
DRV Status	CMMT AS Axis X:I1.Data (AxisPosOk)
DRV_Control	CMMT_AS_Axis_X:01.Data
ControlArea	0 ← (AxisSpFixed)
ModePos	4 🗲
EnableAxis	1 ← AxisAckSetpoint
CancelTraversing	1 €
IntermediateStop	1 ← K(AxisRef) —
Positive	0 ←
Negative	0 ← (AxisWarn)—
Jog1	0 🗲
Jog2	0 ← (AxisError)—
FlyRef	0 🗲
AckError	0 🗧 -(Lockout)
ExecuteMode	1+
Position	5000 ← (Error)
Velocity	5 ←
OverV	100 €
OverAcc	100 🗲
OverDec	100 €
ConfigEPos	15 🗲
BaseSpeedValue	5000.0 <del>C</del>
ConnectionFaulted CMMI_AS_	Axis_X:11.ConnectionFaulted
	0.4
M_O_N_IT_O_F_A_F_E_a	0 05356639= 003 6
Activelocity	2.00000208-000 -
ActPosition	44
Epos ZSW4	2048 4
Epos ZSW2	2040
A ctWarn	4 <del>.</del>
ActFault	04
Status	16#7002
otatos	10#1002

#### 6.2 通过 MSG 指令保存零点偏移

PNU1007 保存零点偏移(数据类型 INT)

PNU	Name	Function	Description		
1007	Save zero point offset	Controlling method	Value = 1: execute method		
			Value = 0: Reset method		

触发 MSG 指令,当 Done (完成位)=True,参数写入完成。

-	Trigger 3	Message Configuration - Write, Parameter4       Corriguration Communication Tag       Message Type:       Service Set Attribute Single       Service Set Set Set Set Set Set Set Set Set Se	Message Ontrol Write_Parameter4 (EN) Message Control Write_Parameter4 (ER) (ER) Move Source Save_zero_point_offset 1 Dest Save_zero_point_offset 1 •
		○ Enable     Enable Wating     ○ Statt     ● Done     Done Length: 0       ○ Error Code:     Extended Error Code:     Timed Out ◆       Error Fath:     Error Text:	

#### 6.3 MSG 多次执行零位保存操作

当第一次执行完零位保存后,需要执行以下操作,将零位保存标志位复位,以便进行下一次零位保存操作。 标准位复位:

**Reset method**(**Value = 0**): **PNU1007** 写入 0, 触发 MSG 指令,当 Done(完成位)=**T**rue,参数写入成功。 <mark>如果不执行标志位复位动作,再次零点保存的话,MSG 指令会报错。</mark>

# 7 扩展报文(简称 EPD)

FESTO 扩展报文是在原有通讯报文的基础上追加的一种可用于自由映射周期性过程数据的报文。该报文提供了 **32bytes** I/0 过程映射区(**32 Input/32 Output bytes**),可以通过 CMMT 配置软件 FAS 对需要映射的参数进行配置。

#### 7.1 FAS 软件中 EPD 组态

<mark>添加读写参数后,</mark>	需要断使能进行初始化(Reinitialize)和保存(Store on device)	
	▲ Q ② CMMT-AS-C2-3A-M × 斯使能,,,进行初始化和保存	▲ Login - □ × 动作FESTO
PARAMETERIZATION	CONTROL DIAGNOSIS	
CMMT-AS-C2-3A-MP CMMT-AS-C2-3A-MP- Path: 192.168.0.10 Connected	S1 Disconnect	REC Reset to Default
Parameter Pages <	Extended Process Data	💼 Delete All Received Data 🛛 🔝 🖉 <
Drive Configuration	) Sent Data 发送给PLC	
Device Settings	0 D Parameter Type Byte position Function	Block ID 🖉 💼
<ul> <li>Fieldhus</li> </ul>		
Configuration		需要读取的参数 Add Process Channel
EtherCAT	Number	of bytes Tx 0
PROFINET	Number (Offline)	of bytes Tx 4
EtherNet/IP - Mo	PLC inpu	ut configuration 9
<ul> <li>Profiles</li> </ul>		-
CiA 402	○ Received Data	
▼ PROFIdrive	ID Parameter Type Byte position Function Block ID	
Factor Group	0 P1.526801.0.0 Clamping torque REAL 0 9	
Telegram	添加零	需要写入的参数
AC4 (PROFIN		Add Process Channel
Extended Pro	Number	of bytes Rx 0
Digital I/O	Number (Offline)	of bytes Rx 4
	PLC outp	ut configuration 9

#### 7.2 Studio5000 中 EPD 组态

添加扩展报文地址

ð 🖫	General Connection Module Info Internet Protocol Port Configuration Network	
Controller CMMT_EP_Test		
Controller Tags	Type: CMMT-AS CMMT-AS	
📁 Controller Fault Handler	Vendor: Festo	
🛑 Power-Up Handler		
🔺 <u> </u> Tasks	Parent: Local	
🕨 Դ MainTask	Name: CMMT_Axis Ethemet A	Module Definition* X
📕 Unscheduled	Private	
🔺 🚍 Motion Groups	Description:	Revision: 1 V UUT
🛑 Ungrouped Axes	IP Add	Electronic Keving: Compatible Module
🔺 🖳 Assets		Lieuronic Reying.
🔺 <u> Add-On Instructions</u>	O Host N	Connections:
PTP_Drives_Festo_EIP		Nama Ciza Tao Cuffy
🔺 <u> Data</u> Types		
4 🐖 User-Defined	Module Definition	DriveProfile - Exclusive Owner
191 UDT_RecvBuf	Revision: 1.001	Output: 12 CMMT Axis:01
111 UDT_SendBuf	Seving: Compatible Module	Extended Process Data - Input: 32 SINT 2 CMMT_Axis:12
Strings		Exclusive Owner Output: 32 CMMT_Axis:02
Add-On-Defined	bdules Is: DriveProfile - Exclusive Owner	
Predefined X Cut	Ctrl+X	
Module-Defined	Ctrl+C	
Trends		
Logical Model	Change 2	
▲ I/O Configuration Delete	Delete	
The second	ence Ctrl+E	OK Cancel Help
	ОК	Or Candor Hulp
Embedded I/O     Export Mod	ule	
Function 1/O	racking Group	
A Setternet	Alt+Enter	
1769-124FR-OB18 CMMT		
CMMT-AS CMMT Axis	•	
El chini i i comini Acti		communicate

# 7.3 导入 EPD 功能块文件



# 7.4 EPD 功能块调用与配置

🗧 🗴 🗗 â 🔊 🤊	添加EPD功能均	<b></b> 去到程序中						
orage Path: AB_ETHIP-1\192.168.0	0. Add-Or Festo, Et tende av ocessData v1.2 RsL	.ogix5000 are	mpute/Math N	love/Logical File/Misc. File/Shift	► Sequencer I			
ganizer 👻 🕈 🗶	Festo_ExtendedProcessData     Festo_ExtendedProcess      EPD_Input     EPD_output	? ?(Error)	New Parame	eter or Tag	5 ×	EPD功能块创建名和	R	~
roller CMMT_EP_Test ontroller Tags ontroller Fault Handler	EPD_Config_Input EPD_Config_Output EPD_Config_Output In_EPD_Object0 FOR Config_Output EPD_Object0	?? ?? ??	Nam 4	CMMT_EPD	Create 🔻	Festo_Extend Festo_extend EF 3	tedProcessData	^
ower-Up Handler	EI	?? ?? ??	Description:	^	Cancel	EPD_Config_ EPD_Config_ In_EPD_Obje	Cut Instruction	Ctrl+X Ctrl+C
AainProgram Parameters and Local Tags	In_EPD_Object5 ?? In_EPD_Object6 ?? In_EPD_Object7 ??	?? ?? ??		v	,	In_EPD_Obje In_EPD_Obje In_EPD_Obje	Delete Instruction	Ctrl+V Delete
E01_CMMT_Status	Out_EPD_Object1 ? Out_EPD_Object2 ? Out_EPD_Object3 ?	?? ?? ??	Usage: Type:	Base V Connection		In_EPD_Obje In_EPD_Obje In_EPD_Obje In_EPD_Obje	Add Ladder Element Edit Main Operand Descr	Alt+Insert ription
E03_CMMT_EPD nscheduled on Groups	Out_EPD_Object4 ? Out_EPD_Object5 ? Out_EPD_Object6 ? Out_EPD_Object7 ?	?? ?? ??	Alias For:	Easte ExtendedPresseeData		Out_EPD_Ob Out_EPD_Ob Out_EPD_Ob	Save Instruction Defaults Clear Instruction Defaults	5
ngrouped Axes s dd-On Instructions	ErrorID ?	??	Parameter Connection:		·	Out_EPD_Ob Out_EPD_Ob Out_EPD_Ob Out_EPD_Ob	Remove Force Go To	Ctrl+G
Festo_ExtendedProcessData			Scope:	🔓 MainProgram 🗸	·	Out_EPD_Ob ErrorID	Instruction Help	
In Logic PTP Drives Festo FIP			Access:	Read/Write ~	/		E Remove All Unknown Pa	rameters

### 7.5 AOI\_EPD 功能块定义入口地址

Mapping of the ExtendedProcessData objects     Mame     Mame

#### **7.6** EPD 功能块变量说明

Name	Data Type	Usage	Description
Festo_EPD	Festo_EPD	InOut	
EnableIn	BOOL	Input	
EnableOut	BOOL	Output	
EPD_Input	SINT[32]	InOut	Extended Input Data
EPD_Output	SINT[32]	InOut	Extended output data
EPD_Config_Input	DINT	<mark>Input</mark>	configuration of EPD input data (SINT=1, USINT=2, INT=3, UINT=4, DINT=5, REAL=9)
EPD_Config_Output	DINT	Input	configuration of EPD output data (SINT=1, USINT=2, INT=3, UINT=4, DINT=5, REAL=9)
In_EPD_Object0	REAL	Output	Extended input data object 0
In_EPD_Object1	REAL	Output	Extended input data object 1
In_EPD_Object2	REAL	Output	Extended input data object 2
In_EPD_Object3	REAL	Output	Extended input data object 3
In_EPD_Object4	REAL	Output	Extended input data object 4
In_EPD_Object5	REAL	Output	Extended input data object 5
In_EPD_Object6	REAL	Output	Extended input data object 6
In_EPD_Object7	REAL	Output	Extended input data object 7
Out_EPD_Object0	REAL	Input	Extended output data object 0
Out_EPD_Object1	REAL	Input	Extended output data object 1
Out_EPD_Object2	REAL	Input	Extended output data object 2
Out_EPD_Object3	REAL	Input	Extended output data object 3
Out_EPD_Object4	REAL	Input	Extended output data object 4
Out_EPD_Object5	REAL	Input	Extended output data object 5
Out_EPD_Object6	REAL	Input	Extended output data object 6
Out_EPD_Object7	REAL	Input	Extended output data object 7
Error	BOOL	Output	error occured in this function block
ErrorID	INT	Output	error identification 10 = "EPD_Config_Input" too long 11 = "EPD_Config_Output" too long 20 = number "0" in "EPD_Config_Input" is not allowed 21 = number "0" in "EPD_Config_Output" is not allowed 30 = not supported datatype in "EPD_Config_Input" 31 = not supported datatype in "EPD_Config_Output" 40 = unknown datatype in "EPD_Config_Input" 41 = unknown datatype in "EPD_Config_Output"

#### 7.7 读参数

Name	Data type	Access	Parameter
Actual torque value motor shaft	real	ro	P1.150.0.0

a) EPD\_Config\_Input 写入 9(数据类型 REAL=9)

b) In\_EPD\_Object0 显示接近 0 的数值。

ExtendedProcessData EPD_Input	CMMT12 Data	ar
EPD Output	CMMT-02 Data	
EPD Config Input	9 🖛	
EPD Config Output	0 🖛	
In EPD Object0	0.004169912 +	
In EPD Object1	0.0 ←	
In_EPD_Object2	0.0 🗢	
In_EPD_Object3	0.0 🗢	
In_EPD_Object4	0.0 🗢	
In_EPD_Object5	0.0 🗢	
In_EPD_Object6	0.0 🕈	
In_EPD_Object7	0.0 🕈	
Out_EPD_Object0	0.0 🕈	
Out_EPD_Object1	0.0 🕈	
Out_EPD_Object2	0.0 ←	
Out_EPD_Object3	0.0 🕈	
Out_EPD_Object4	0.0 🕈	
Out_EPD_Object5	0.0 🕈	
Out_EPD_Object6	0.0 🕈	
Out_EPD_Object7	0.0 🕈	
ErrorID	0 🗢	

# c) FAS 软件确认,数值读取成功

CMMT-AS-C2-3 CMMT-AS-C2-3 Path: 192.168.0. Connected	<b>3A-MP-</b> : 8A-MP-S 10	<b>51</b>	Disconnect			0	:≡\$	( <sup>7</sup> =)	• REC		Res	ot to Defa
Parameter Pages	<	Paramete	er List					Ŷ	× P1.150			R
Motor		ID	٩	Name			Ŷ		٩	Unit	۲	Ŷ
Gearbox		▼ /Ax	is1/Torque g	roup[0] (8	B) (C							
Record Table		P1.150.0.0		Actual t	orque value m	otor shaft			0.004018886	Nm		
CMMT_MP											F	esto Automat

#### 7.8 写参数

Name	Data type	Access	Parameter
Clamping torque	Real	rw	P1.526801.0.0
		DDAL O	

# a) EPD\_Config\_Output 写入 9(数据类型 REAL=9)

#### b) Out\_EPD\_Object0 写入值 0.2

ExtendedProcessData	Festo_EIP	
<ul> <li>ExtendedProcessData</li> </ul>	CMMT_EPD	
EPD_Input	CMMT:I2.Data	-(Error)
EPD_Output	CMMT:O2.Data	
EPD Config Input	0 🖛	
EPD Config Output	9 🗢	
In_EPD_Object0	0.0 🗢	
In_EPD_Object1	0.0 🗢	
In_EPD_Object2	0.0 🗢	
In_EPD_Object3	0.0 🗢	
In_EPD_Object4	0.0 🖛	
In_EPD_Object5	0.0 🖛	
In_EPD_Object6	0.0 🖛	
In EPD Object7	0.0 🖛	
Out EPD Object0	0.2	
Out_EPD_Object1	0.0 🗢	
Out EPD Object2	0.0 🖛	
Out_EPD_Object3	0.0 🖛	
Out_EPD_Object4	0.0 🖛	
Out EPD Object5	0.0 🖛	
Out_EPD_Object6	0.0 🖛	
Out_EPD_Object7	0.0 🖛	
ErrorID	0 🖛	

# c) **FAS** 软件确认,数值写入成功

	<b>A</b> Q	CMMT-AS-C2-3A-M ×				Login – 🗆 ×
PARAMETERIZATION	CONTROL	DIAGNOSIS				
CMMT-AS-C2-3A-MF CMMT-AS-C2-3A-MP Path: 192.168.0.10 Connected	P-S1 -S1 Disconnect		d 🖬 🗇 🖱		<b>S</b> eset to Defau	lt
Parameter Pages <	Parameter List		C 🗉 🖬 🎙	× clamping torque		> Watch List 🎄
Motor	ID 🕈	Name 🕈	Value	Y Unit Y	Ŷ	Actual torque value motor
Gearbox	<ul> <li>/Axis1/Control</li> </ul>	imitation group[0] (21) $\mathcal{C}$				Clamping terms
Axis Record Table	P1.526801.0.0	Clamping torque		0.20 Nm		0.20 Nm
Monitoring Functi	P1.11280407.0.0	Clamping torque offset		0.00 Nm		Position actual value (enc 79 998693 mm
Closed Loop	Closed Loop / Axis1/PROFIdrive POS_ZSW2 group[0] (16) C					POS 75W2 12 Fixed stop r
Auto Tuning	P1.112413130.0.0	POS_ZSW2.13 Fixed stop Clamping torq	Active			False
Vibration Compe						POS_ZSW2.13 Fixed stop False
Parameter List					Festo Automatic	0 100 %

# 8 定位模式下力控制 "Travel to fixed stop"

### 8.1 原理说明

"Travel to fixed stop"功能可以理解为定位模式下的扭矩控制。当伺服在定位过程中遇到阻挡时,输出扭矩被钳制在设定的 clamping torque 而不再升高,伺服持续输出扭矩而不报跟随误差。 时序图示例



### X是位置值的曲线

M是夹紧扭矩值的曲线

● to设定目标位置、速度,执行普通定位任务。

● t<sub>1</sub> ConfigEPos.30(对应功能块的 TravelToFixStop 变量)上升沿信号,将普通定位任务转换为带扭矩钳制的 travel to fixed stop 任务。

**Epos\_ZSW2.14** Move to fixed stop active 为确认信号。此信号持续期间,伺服屏蔽跟随误差报错,并且最大输出扭矩限 定为 clamping torqe 设定值。

● t₂电缸接触物体后阻力增大,跟随误差产生。

● t<sub>3</sub>跟随误差增加到一定程度,判定为停止, Epos\_ZSW2.12(Fixed Stop Reached)置位。

判定窗口参数为 P1.4693 和 P1.4694。

示例:

、图参数设置意味跟随误差持续	<b>0.1s</b> 超过 0.001m,	则判定为停止。

P1.4693.0.0	Fixed stop detection damping time	0.10	S	•
P1.4694.0.0	Limit value following error	0.001	m	

● t₄检测到实际扭矩到达 clamping torque 设定值后, Epos\_ZWS2.13 置位(Fixed Stop Clamping Torque Reached)。 判定窗口参数 P1.4611.0.0 Monitoring window target torque 和 P1.468.0.0 damping time。 示例:

clamping torque=0.1Nm,窗口设置如下图,当实际扭矩到达 0.1Nm,持续 0.1 秒内波动范围不超过±0.02N(即实际扭矩 0.08Nm~0.12Nm)时判定到达钳制扭矩, Epos\_ZWS2.13 置位。

伺服会持续输出扭矩,直到取消任务或者执行新的任务。

Parameter pages	<	Monitoring functions				
<ul> <li>Axis 1</li> </ul>	13					
Motor		Target reached				
Gearbox Axis	11	Monitoring window target position	0.00008000001	m		
Record list		Monitoring window target velocity	0.0016	m/s		
Monitoring functions	2	Monitoring window target	0.02	Nm	-	
Closed loop			0.10		L	
Auto tuning			0.10	2	Γ	

两种例外情况:

1. 未检测到阻挡

如果运行到目标位置都未满足停止窗口,则 Epos\_ZWS2.13(Fixed Stop Clamping Torque Reached)和 Epos\_ZWS2.12(Fixed Stop Reached)不会置位,而 AxisPosOK 会置位。同时 CMMT 会报一条诊断消息 D1.05l02l279: Fixed stop not detected。

2. 检测到停止后发生位移

**Epos\_ZSW2.12**(Fixed Stop Reached)置位后,系统基于当前位置,检测电缸位移,如果位移超过行程限制参数范围,CMMT 驱动器会报一条诊断消息 **D1.05l02l280**: Monitoring window of fixed stop left。

P1.11280408.0.0	Stroke limit positive for detection of a fixed stop	3.00	mm
P1.11280409.0.0	Stroke limit negative for detection of a fixed stop	-3.00	mm

如果电机实际扭矩减小到扭矩到达判定窗口之外, Epos\_ZSW2.13(Fixed Stop Clamping Torque Reached)会复位。

**注意:** D1.05l02l279 和 D1.05l02l280 默认级别为"通知",如果需要将其定义为"警告"或者"故障",可以在 Error Classification 中设置。最近的警告和故障的代码可在功能块上直接获取。

Diagnosis pages	<	Error classification	Error classification				
Device state							
I/O state		Go to diagnosis page "Error I	og"				
Error log		Store warnings to error log	Active				
Error classification		Store warnings to error log					
Trace configuration Trace display Auto tuning		Error messages					
		ID	Name	Category (actual configured)			
		D1.05 02 00071.0	Trajectory generator error	Stop category 1 (256)	-		
		D1.05 02 00079.0	Torque increase ramp invalid	Stop category 1 (256)	•		
		D1.05 02 00279.0	Fixed stop not detected	Warning (16)	•		
		D1.05 02 00280.0	Monitoring window of fixed stop left	Warning (16)	•		
		D1.05 02 00282.0	Encoder not ready	Stop category 1 (256)	•		
		D1.05 02 00283.0	Brake test failed	Stop category 1 (256)	•		

### 8.2 相关参数

CMMT 驱动器的参数可	T以通过 PNU 非周期性读写,也可设置扩展报文来	<b>采</b> 实时读写。	
Input/output	Description	PNU	Parameters(P1.*)
ConfigEPos.30	Traverse to fixed endstop	12254.0	1148080
Epos_ZSW2.14	Move to fixed stop active	12379.0	112413140
Epos_ZSW2.13	Fixed Stop Clamping Torque Reached	12378.0	112413130
	Fixed stop detection monitoring window	11636.0	4694
	Fixed stop detection damping time	11635.0	4693
	Fixed stop negative stroke limit	12331.0	11280409
	Fixed stop positive stroke limit	12330.0	11280408
Epos_ZSW2.12	Fixed Stop Reached	12377.0	112413120
	Monitoring window target torque	11566.0	4611
	Damping time target reached	11152.0	468
	Clamping torque	12168.0	526801
	Actual torque on motor shaft	11069.0	150
	Actual torque value gear shaft	11070.0	151
	Lower limit value torque	11214.0	852
	Upper limit value torque	11215.0	853

#### 8.3 如何实现"Travel to fixed stop"功能

#### a) PLC 设置 Clamping torque=0.2Nm(可参考扩展报文中的读写参数部分)



**TravelToFixStop:** 0->1(可以在定位过程中触发), **EPOS\_ZSW2.14** Traverse to fixed stop active 作为确认信号。 d) 运行模式

设置 ModePos=1 或 2 (相对运动或绝对运动)

#### 设置 Position 和 Velocity (Position 的值一定要大于到达固定停止点的位置值)

- e) Enable: 0->1, ExecuteMode: 0->1 执行定位任务。
- f)探测到停止点后,EPOS\_ZSW2.12 置位 探测到输出扭矩达到 clamping torque 后,EPOS\_ZSW2.13 置位 之后电机持续输出 clamping torque 的扭矩

📙 MainProgram - MainRoutine* 🧳 Program Parameters and Local Tags - MainProgram 🗙										
Scope: L MainProgram V Show: All Tags V There Filter										
	Nam	e	📰 🔺 Usage	Value 🔸	Force Mask •	Style	Data Type	Description	Constant	^
	4 (	CMMT_Ctrl.EposZSW2		-4092		Decimal	INT			
		CMMT_Ctrl.EposZSW2.12		1		Decimal	BOOL	Fixed Stop Reached		
		CMMT_Ctrl.EposZSW2.13		1		Decimal	BOOL	Fixed Stop Clamping Torque Reached		
		CMMT_Ctrl.EposZSW2.14		1		Decimal	BOOL	Travel to Fixed Stop is Active		
		CMMT_Ctrl.EposZSW2.15		1		Decimal	BOOL	Traversing Task is Active		
	▶ (	CMMT_Ctrl.ActWarn		0		Decimal	INT	Warning Number	141 2000 2 2	
	► \M	lonitor Tags Edit Tags /			<				澎沽 W	/11

g) 实时扭矩读取(可参考扩展报文中的读写参数部分)



#### 也可以通过 FAS 软件查看



注: 组态配置中没有减速机 读取 P1.150.0.0 参数作为反馈实时扭矩值 组态配置中有减速机 读取 P1.151.0.0 参数作为反馈实时扭矩值

# h) 曲线监控

可以使用 FestoAutomationSuite 软件中 Trace 功能采集相应的曲线





# 9 故障和警告代码

PTP\_Drives\_Festo\_EIP 功能块中有 AxisWarn, AxisError 两个状态信息用来判断驱动器的状态,另外 ActWarn 和 ActFault 这两 个变量用来显示驱动器的警告代码和故障代码

PTP_Drives_Festo_EIP		
PTP_Drives_Festo_EIP	Axis1	(Automotion block)
		(AXISENADIED)
DRV_Status	CMMT1:01 Data	(AviaDeeOk)
	CMMTT.OT.Data	(AXISPUSUK)-
	2	(Avia Calificad)
EnableAvie	1	Axisoprixed/-
CanceTraversing	1	(Avie AckSetnoint)
IntermediateStop	14	AXISACKSELPUINT/-
Positive		(Avis Def)
Negative	04	(Aviance)
Jog1	0	🗹 AxisWarn 📜
Jog2	0 🖕	(/ distrainy
FlyRef	0 🔶	(AxisError)
AckError	0 🖛	
ExecuteMode	1 🗭	(Lockout)
Position	100000	
Velocity	5 🗢	(Error)
OverV	100 🗢	
OverAcc	100 🗢	
OverDec	100 🖛	
ConfigEPos	1073741839 🗢	
BaseSpeedValue	5000.0 🖛	
ConnectionFaulted CMMT1:I1.0	ConnectionFaulted	
	0 🔶	
M_o_n_i_t_o_r_A_r_e_a	0 🗢	
ActVelocity	0.0 🖛	
ActPosition	97000 🕈	
ActMode	24	
EposZSW1	-32768	
EDOSZSW2	129	
Activarn	112	
Statua	10	
 	10000000111	





Positive software limit position D1.07|01|00110.0

Acknowledge all							

Status	Category	ID	Name	Timestamp	
	Information (4)	D1.07 02 00122.0	Target velocity reached	07.07:14:10.074	
	Information (4)	D1.07 02 00121.0	Target position reached	07.07:14:10.175	
	Stop category 1 (256)	D1.07 01 00110.0	Positive software limit position	07.07:14:54.023	
	Warning (16)	D1.07 01 00112.0	Limitation positive direction	07.07:14:54.025	

#### 故障代码查询路径:

