CPX-E-CEC-M1-PN 通过 EC 通讯改写 CMMT-AS-C4-3A-EC-S1 的 Record List 参数



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关键词:

CPX-E-CEC-M1-PN, EtherCat, CMMT, Record list, Codesys V3.5

摘要:

本文介绍了使用 CPX-E-CEC-M1-PN PLC 通过 Codesys V3.5 软件中 MC_WriteParameter_Festo 修改 CMMT-EC 中 Record List 的参数,并改写 0x2005.1 参数,确保被修改的 Record List 参数断电后被保存。

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 Codesys V3.5 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。

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1 软硬件环境

1.1 硬件环境

控制器型号: CMMT-AS-C4-3A-EC-S1 (5340820, K702, Rev03)



PLC 型号: CPX-E-CEC-M1-PN



1.2 软件环境

Festo Auto Mation Suite 版本为 1.1.1.610

About



Festo Automation Suite

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Licenses

Installed version 1.1.1.610 CMMT-EC 插件版本 1.1.0.110

	Plug	-ins			CMMT-AS Plug-in							
	CM Inst	IMT-AS Plug-in alled	-			Plug-in for the configuration and parametrisation of th						
	CP)	K Plug-in alled	=			Licenses						
					Installed version 1.1.0.110							
C	odesys V3.5	;版本	_									
		C	0 [)	ES	ſS						
		The pro	e IEC 61 ovided b	.13 9y	81-3 Prog Festo	gramm	ing Sy	stem				
		111111-						ii ii				
		e 1:		C	ODESYS V3.5 SP10	Patch 4 pbF						

2 驱动器器配置

新建项目		PARAMETERISATI	ON	DIAGN	DSIS	CONTRO				
	٩	CMMT-AS-C4-3, CMMT-AS-C4-3, Path: 192.168.0.1 Disconnected	A-EC-S1 A-EC-S1	Co	nnect		Plug-in PLC Control	Enabled Disabled Powerstage	Stop	Ackı
	Parame	ter pages	<	Drive confi	guration					
	Drive	configuration								
	Devic	e settings			Start	first s	etup			
	Field	ous			Start the fir	st setup wi	zard, which guide	es through the most im	portant paramet	erisation st
	Digita	al I/O								
	Analo	ogue I/O			Manu	al set	up			
	Enco	der interface			Close this o	dialog and	start the drive co	nfiguration manually.		
	 Axis 1 									
	Paran	neter list								

双击"Start first setup"进入硬件配置

Please select the components of your drive system





在 Felidbus 中选择 Point to point 以及 3.5.10.29

Parameter pages <	<	Fieldbus				
Drive configuration						
Device settings		Padeo serve			contrava durina drivus	
Fieldbus		ractor group				
Digital I/O		Current user unit	Metric [m, m/s,] (6)		Mode	Point to point 🔹
Analogue I/O		Position	-6] .	Version	351029
Encoder interface					Version	5.5.10.6.5
 Axis 1 		Velocity	-3			
Parameter list		Acceleration	-3			
		Jerk	-3			

注: Mode 中有两种; Point to point 是指常用的点到点功能; SoftMotion 是指运动控制插补等功能; Vision 版本是指: Codesys 的版本环境;

新建 Recordlit 表 O CMMT-AS-C4-3A-EC- Path: 192.168.4.11 Disconnected	S1 Conne	ct	PLC Control	Disabled Powerstage	Stop	Acknowledge all	Store on device	e Load factory	 / settings	Q Reinitialize f
Parameter pages <	Record list									
Drive configuration										
Device settings			Record type	Type	Target position	Profile velocity	Acceleration	Deceleration	lerk	End velocity
Fieldbus		1 Untitle	d Position (5)	Positioning absolute (0)	50.00 mm	0.04 m/s	0.10 m/s ²	0.10 m/s ²	10.00 m/s ³	0.00 m/s
Digital I/O										
Analogue I/O										
Encoder interface										
▼ Axis 1										
Motor										
Gearbox										
Axis										
Decord Res										

3 CodesysV3.5 配置

3.1 在 Festo 官网下载对应的库函数

https://www.festo.com.cn/net/zh-cn_cn/SupportPortal/default.aspx?q=cmmt&tab=4&s=t#result Trom Becknom.

Supported systems:

- Servo drive CMMT-AS-C2-3A-EC-S1 (5340819)
- Servo drive CMMT-AS-C4-3A-EC-S1 (5340820)

下载后,安装 Package: "工具"一"包管理器"一"安装"找到对应的路径

er_Festo %s	1	包管理器 当前安装的彩	《件包								×		MC_Halt Instance
Control		刷新 名称 CMMT-AS CODESYS	; (point to point) Package (point to point) Package SoftMotion	版本 3.5.10.30 3.5.10.30 4.2.1.1	安装日期 2019/3/25 2019/3/25 2019/1/7	更新信息	排列: 许可 无男 无男	名称 可证信息 要求的许可证 要求的许可证 要求的许可证		安装… 未安装… 详细说明			Execute
● IJπ ← → ·	个 新發	<mark>。</mark> « 01	EtherCat → Festo_Poir	ntToPoint_Code	esys_3.5.10.30) > 40_Pack	ages		ٽ ~	搜索"40_F	Packages" ■== ▼		
IE_FES :%S 201 Cc 桌面 桌面 全 On 2 thod 2 ti, ' 0 響告, 库 4 Ø 2 01 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0	19-03- 回 Pubo Nubo L E Mo C M Jojasev IOlink skbar rk	-27-郭工-北 ase List ic_VM3 :: Backup	京加隆工程机械有₽ ^	名称 CMMT-AS CMMT-ST	_PointToPoin _PointToPoin	t_3.5.10.30.р t_3.5.10.30.р	ac	修改日期 2019/2/7 22:17 2019/2/8 14:31	类型 CODES CODES	YS Packa YS Packa	大小 3,073 H 3,190 H	KB KB	
		文件名	(N):						~	Package 打开((*.package O)) 取;	¥:

3.2 打开 Codesys 项目

下载的 Festo_PointToPoint_Codesys_3.5.10.30 文件中,包含三个文件夹

名称	修改日期	类型	大小
10_Documentation	2019/2/6 18:13	文件夹	
40_Packages	2019/2/8 14:33	文件夹	
50_Examples	2019/3/25 11:45	文件夹	

打开 Examples 中的 Festo_PtP_Example_CMMT-AS 项目



进入如下图 ● Festo_PtP_Example_CMM1-AS.project* - CODESYS the IEC 61131-3 programming system provided by Festo 文件编辑 视图 工程编译 在线调试工具 窗口 帮助 🎦 🚅 🖶 | 솔 | 🌼 🗠 👃 🖻 🎕 🗙 | 🖓 🐘 🕤 | 🏙 | 🧐 🧐 🖒 📲 🔍 | 🗊 태 여 대 왕 | ㅎ | 🛒 🔎 设备 **д** × Festo_PtP_Example_CMMT-AS Device (CPX-E-CEC-M1-PN) 🖹 🗐 PLC Application 🎁 库管理器 PLC_PRG (PRG) 🖻 💹 任务配置 🖮 🍪 MainTask EtherCAT_Master.EtherCAT_Task PLC_PRG 🗄 Visualisierungsmanager VisuFBs SPS_Diagnose (PLC-Diagnosis) CPX_E_System (CPX_E_System) E_CEC_M1_PN (E-CEC-M1-PN) EtherCAT_Master (EtherCAT Master) E CMMT_AS (CMMT-AS (point to point)) PROFINET_Device (PROFINET Device) 🕆 🚡 SoftMotion General Axis Pool 消息-0个错误,0警告,0条消息 ▼ ○ 0 个错误 ● 0 个警告 ● 0 🧝 设备 🗋 POU 🗉 消息 - 0个错误,0警告,0条消息 😡 监视 1 Call Tree POU Name: ✓ ➡ Q = + →

4 Record List 说明

Recordlist 中对应的参数, 详见"CMMT-AS-SW_2018-06_809386"章节"Monitoring of events"下载地址: https://www.festo.com.cn/net/zhcn_cn/SupportPortal/InternetSearch.aspx?q=CMMT&tab=15&s=t#result.

Command record no. 1: velocity mode with stroke limitation with the parameter values noted below target velocity 2.3 m/s, maximum acceleration 3 m/s ² , maximum deceleration 4 m/s ² , jerk 200 m/s ² , atooke limitation monitor active, negative stroke limit 10 mm, positive stroke limit 190 mm, start condition "waiting" Parameters Value Comments Table type P11810.0.0 5 Date record 0: positioning mode (s) P11810.0.1 4 Date record 1: velocity mode (q) Record number P11811.0.1 1 Record number 0 P11811.0.1 1 Record number 0 P11811.0.1 1 Record number 1 Parameters value position (0) P11811.0.1 1 Record number 1 Profile velocity Record table field 2 H11812.0.0 0 absolute position (0) P11812.0.1 2.3 Target velocity Record table field 2 H11812.0.0 3 maximum acceleration Record table field 4 P11811.0.1 1 Record number celeration Record table field 5 P11814.0.1 4 maximum deceleration P11814.0.1 1 Activate stroke limitation (1 = active) Record table field 5 P11815.0.1 1 Activate stroke limitation (1 = active) Record table field 5 P11817.0.0 100 maximum acceleration P11817.0.0 100 maximum gerk Record table field 5 P11817.0.0 100 maximum deceleration P11817.0.0 100 maximum gerk Record table field 7	Name Untitle		
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Record table field 7 Activation of stroke	30.00	m/s	1
	Active		
P1.1818.0.0 0 End velocity	_		
Vegative stroke limit	0.00	mm	1
Positive stroke limit	0.00	mm	

黄匡内的参数地址分别对应 FAS 中 Record List 中的参数,同理红框一样。一共可以创建 128 个 Record List,所以对应的 参数地址有 128 个数据区。

Index.Subindex	Name	Data type	Access	PDO map-	Parameters
				ping	
0x222b.1 3	ntegration constant cur- rent regulator (active cur- rent)	FLOAT32	rw	-	P1.2224.0.0 2
0x222c.1 3	Amplification gain current regulator (reactive current)	FLOAT32	rw	-	P1.2225.0.0 2
0x222d.1 3	ntegration constant cur- rent regulator (reactive cur- rent)	FLOAT32	Γw	-	P1.2226.0.0 2
0x222e.13	Total inertia	FLOAT32	rw	-	P1.2227.0.0 2
0x222f.1 3	Velocity filter filter time constant	FLOAT32	rw	-	P1.2228.0.0 2
0×2230.1 128	Command record type	UINT32	rw	-	P1.1810.0.0 127
0×2231.1 128	Record number	SINT32	rw	-	P1.1811.0.0 127
0×2232.1 128	Record table field 1	SINT64	rw	-	P1.1812.0.0 127
0×2233.1 128	Record table field 2	SINT64	rw	-	P1.1813.0.0 127
0×2234.1 128	Record table field 3	SINT64	rw	-	P1.1814.0.0 127
0×2235.1 128	Record table field 4	SINT64	rw	-	P1.1815.0.0 127
0x2236.1 128	Record table field 5	SINT64	rw	-	P1.1816.0.0 127
0×2237.1 128	Record table field 6	SINT64	rw	-	P1.1817.0.0 127
0×2238.1 128	Record table field 7	SINT64	rw	-	P1.1818.0.0 127
0×2239.1 128	Record sequencing type	UINT32	rw	-	P1.1831.0.0 127
0x223a.1 128	Record sequencing record number start	SINT32	rw	-	P1.1832.0.0 127

参数 P1.1813.0.0 是代表 recordlist 中 table1 的 Target Position; P1.1814.0.0 代表 recordlist 中 1 中的 Profile Velocity; 其中 P1.1813.0.0 对应的索引号为 0x2233.1; P1.1814.0.0 对应的索引号为 2234.1;

5 测试

在线登录一启动 PLC 后,打开"VisuFBs"截面,找到对应的函数界面: MC_ReadParamete_Festo/ MC_WriteParamete_Festo 是读和写参数的块,写参数时需要上升沿; 要想断电后保存修改的参数,必须给索引号 0X2005.1 一个上升沿;

Recordlis 读当前数	t"当前位置 [据	"读写						/[索	引号 0x22	33.1
MC_Write	Parameter_Fes	to eParam CM	мт		MC_Read	Parameter_	Festo ReadParan	СММТ			
	Control		Dis	play		Control			Display		
Execute Parametert SubindexN Value	Number (lumber 5000000	Dor 0x2233 Bus 1 000.000 Erro	ne sy pr		Enable Parameteri SubindexN	Number	0x2233 1	Valid Busy Value Error	50	00000006.000	
		Erro	or ID	0×0				Error ID		0x0	
FAS 读取	的值:										
PARAMETE	RISATION DIAGN	IOSIS CONT	ROL								
CMMT_A CMMT-A Path: 192. Connecte	S S-C4-3A-EC-S1 .168.4.11 ed	connect	Plug-in PLC Control	Enabled Disabled Powerstage	C Stop	Acknowledge all	Store on devic	e Load factory	settings Rei	nitialize Rest	(ta
Parameter pages Drive configuration	< Record lis	t									
Device settings Fieldbus Digital I/O Analogue I/O		1 Untitl	Record type ed Position (5)	Type Positioning absolute (0)	Target positio 50.0000006 mn	n Profile velocity n 0.04 m/s	Acceleration 0.10 m/s ²	Deceleration 0.10 m/s ²	Jerk E 10.00 m/s ^a 0	i nd velocity 1.00 m/s	_
写数据											
马 <u>奴</u> 店 Excute 是	上升沿										
N	MC_WriteParam	eter_Festo				MC_ReadPa	rameter_Fe	sto			Ì
li	nstance: PLC_F	PRG.WritePa	ram_CMMT	Display	1	nstance: PL	C_PRG.Rea	dParam_0	СММТ	Diaglass	
	Execute ParameterNumber SubindexNumber	0x22:	Done 33 Busy 1			Enable ParameterNumt SubindexNumbe	ber	0x2233 1	Valid Busy Value	50000	0000.000
	Value	500000000.0	00 Error Error ID		0x0				Error Error ID		0x0
	MC WriteString	Darameter E	eeto			MC DeadStr	inaDaramet	er Eesta			
FAS 读取	的修改后的:										
CMMT_A CMMT-A Path: 192. Connecte	S S-C4-3A-EC-S1 L168.4.11 ed	onnect	Plug-in PLC Control	Enabled Disabled Powerstage	Stop Ac	knowledge all	itore on device Lo	ad factory setting	s Reinitialize	Restart devi	 ce
Parameter pages	< Record list										
Drive configuration	n			F							_
Fieldbus Digital I/O Analogue I/O		1 Untitled	Record type T Position (5) F	Type Positioning absolute (0)	Target position 50.00 mm	Profile velocity A 0.04 m/s 0.	cceleration Dece 10 m/s ² 0.10	eleration Jerk m/s² 10.00	End velo m/s³ 0.00 m/s	ocity	
Recordlis 读当前数	t"运动模式 :据	"读写						/	索	引号 0x2	230.1
	MC WriteParam	eter Festo				MC ReadPa	rameter Fe	50			
i	Instance: PLC_I	PRG.WritePa	aram_CMMT			Instance: PL	C_PRG.Re	dParam_0	СММТ		
	Col	ntrol		Display			Control			Display	
	Execute		Done			Enable		0.0000	Valid		
	ParameterNumber	0x22	30 Busy			SubinderNum	ber er	0X2230	Busy Value		5.000
	Value	5.0	00 Error			Subindexivumb			Error		5.000
			Error ID		0x0				Error ID		0x0
		n	4-					F			

FAS 读取的当前模式: positioning absolute

CMMT_ CMMT- Path: 19 Connect	AS AS-C4-3A 2.168.4.11 ted	-EC-S	1 Discor	nect		Plug-in PLC Control	Enabled Disabled Powerstage	Stop	Acknowledge all	Store on device	Load factory	settings	Reinitialize	Resta
Parameter pages		<	Record list											
Drive configuration	on													
Device settings						Record from	Time	Tarnet position	Drafile valasity	Acceleration	Deceloration	Lauk	End valacity	
Fieldbus				1	Untitled	Position (5)	Positioning absolute (0)	50.0000006 mm	0.04 m/s	0.10 m/s ²	0.10 m/s ²	10.00 m/s ³	0.00 m/s	
Digital I/O														
Analogue I/O														

写数据

MC_WriteParameter_Festo Instance: PLC_PRG.WriteParam_CMMT				MC_ReadParameter_Festo Instance: PLC_PRG.ReadParam_CMMT						
Cont	trol		Display	Contr	ol		Display			
Execute		Done		Enable		Valid			E	
ParameterNumber	0x2230	Busy		ParameterNumber	0x2230	lusy				
SubindexNumber	1			SubindexNumber	1	Value		4.000		
Value	4.000	Error				Error				
L		Error ID	0x0			Error ID		0x0		
MC WriteStringParameter Feeto				MC ReadStringP	arameter Feet	<u>^</u>				

FAS 读取修改后的参数:

PARAMETERISATION		DIAGNOSIS	CONTRO	L									
3	CMMT_AS CMMT-AS-C4-3A-EC-S Path: 192.168.4.11 Connected	1 Disconnect		Plug-in PLC Control	Enabled Disabled Powerstage	Stop	Acknowledge a	II Store on	device Lo	ad factory settings	Reinitialize	Restart device	Start
m	eter pages <	Record list											Ê
riv	e configuration												
evi	ice settings			Record type	Target velocity	Acceleration		Deceleration	Jerk	Activation of str	ke limitation	Negative stroke limit	Posit
elc	lbus	1	Untitled	Velocity (4)	0.00 m/s	0.00000000000000000	0000543675 m/s²	0.04 m/s ²	0.10 m/s ³	v		109.2616192 mm	0.00
gi	tal I/O												
nal	logue I/O				•								
100	oder interface												
Λie	1												

确保控制器断电修改的参数被保存,需要通过 MC_WriteParameter_Festo 函数,将索引号为 0x2005.1 的参数写1(注意: 该参数必须由0 变为1,上升沿时才可以实现保存功能)