InoProShop 环境下 EtherCAT 控制 CPX-AP-A-EC&VTUG-AP



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关键词:

InoProShop, Inovance, EtherCAT, CPX-AP-A-EC, IO-LINK, VAEM-L1-S-**-AP

摘要:

本文介绍了使用 Inovance-AM401-CPU1608TP PLC 控制 Festo CPX-AP-A-EC 的实例,通讯协议为 EtherCAT, PLC 编程 软件为 InoProShop。文档主要内容包括 CPX-AP-A-EC 模块硬件介绍, InoProShop 软件调试步骤介绍, festo lib 库使用及 在线诊断功能介绍等。

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 AP 系统及汇川 PLC 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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软件	版本
InoProShop	V1.7.3-SP1
Festo Automation Suite	V2.6.0.481
Library	V1.3
ESI	Festo-CPX-AP-A-EC-20230421

2 硬件环境及实物

本次测试使用的硬件实物及型号如下:

硬件型号	订货号	固件版本
CPX-AP-A-EC-M12	8129243	V1.5.33
CPX-AP-A-8DI-M12-5P	8129109	V1.100
CPX-AP-A-16DI-D-M12-5P	8129112	V1.100
CPX-AP-A-8DO-M12-5P	8129110	V1.100
CPX-AP-A-4IOL-M12	8129114	V1.5.6
VAEM-L1-S-12-AP	8081922	V1.100
SPAN-B2R-Q4-PNLK-PNVBA-L1	8035542	-
AM401-CPU1608TP	-	V3.5.9.40



2.1 硬件接口说明

2.1.1 CPX-AP-A-EC-M12 硬件接口说明

4.2.1 Product design



Fig. 1: Product design

AP 系统通讯接口[XF20](必须使用 Festo 专用 AP 通讯线缆 NEBC-D8G4-ES-**-N-S-D8G4-ET)

Connection for system communication [XF20]						
Socket M8, 4-pin, D-coded		Signal	Signal			
1	1	RX-	Received data –			
	2	TX+	Transmitted data +			
4002	3	RX+	Received data +			
3	4	TX-	Transmitted data –			

EtherCAT 通讯接口[IN XF1]

Connection for EtherCAT network [IN XF1]						
Socket M12, 4-pin, D-coded		Signal				
2	1	TD+	Transmitted data +			
100	2	RD+	Received data +			
1003	3	TD-	Transmitted data –			
4	4	RD-	Received data –			
-	Thread	Shield	Functional earth FE			

EtherCAT 通讯接口[OUT XF2]

Connection for EtherCAT network [OUT XF2]							
Socket M12, 4-pin, D-coded		Signal					
2	1	RD+	Received data +				
603	2	TD+	Transmitted data +				
1003	3	RD-	Received data –				
4	4	TD-	Transmitted data –				
	Thread	Shield	Functional earth FE				

CPX-AP-A-4IOL-M12 硬件接口说明 2.1.2

4.1 Product design



Fig. 1: Product design

IO-Link 通讯接口[X0...X3] Lo Link D [WO]

IO-Link Ports [X0] [X3] connection						
M12 socket, 5-pin, A-coded		Signal				
2	1	L+	+24 V DC sensor supply			
1000	2	P24	+24 V DC load voltage supply			
	3	L–	0 V DC sensor supply			
5 4	4	C/Q	Standard IO (in SIO mode) or IO-Link communication (in IOL mode)			
	5	N24	0 V DC load voltage supply			

2.1.3 VAEM-L1-S-12-AP 硬件接口说明

5.2.1 Product design



Fig. 1 Product design

AP 系统通讯接口[XF10] (必须使用 Festo 专用 AP 通讯线缆 NEBC-D8G4-ES-**-N-S-D8G4-ET)

Connection for system communication [XF10]					
Socket M8, 4-pin, D-coded		Signal			
1	1	TX-	Transmitted data -		
	2	RX+	Received data +		
4002	3	TX+	Transmitted data +		
3	4	RX-	Received data –		

AP 系统通讯接口[XF20] (必须使用 Festo 专用 AP 通讯线缆 NEBC-D8G4-ES-**-N-S-D8G4-ET)

Connection for system communication [XF20] Socket M8, 4-pin, D-coded Signal 1 Received data -RX-1 5 2 TX+ Transmitted data + 4 2 3 RX+ Received data + 4 TX-Transmitted data -3

电源接口[XD1](可使用标准电缆 NEBL-M8G4-E-...-N-LE4 连接)

Connection for power supply [XD1]						
Plug M8, 4-pin, A-coded		Signal				
2 - 4	1	+24 V DC logic supply PS				
2++4	2	0 V DC load supply PL				
1++3	3	0 V DC logic supply PS				
	4	+24 V DC load supply PL				

电源接口[XD2] (可使用标准电缆 NEBL-M8G4-E-...-N-M8G4 连接下一个 AP 模块的 XD1 口)

Connection for voltage forwarding [XD2]					
Signal					
+24 V DC logic supply PS					
0 V DC load supply PL					
0 V DC logic supply PS					
+24 V DC load supply PL					

电源连接示意图:

7.1.1 Power supply concept

The automation system CPX-AP-I uses two separate voltages:

- Logic supply PS: power supply for the internal electronics and sensors

- Load supply PL: power supply for the electrical outputs and valves

The voltages can be supplied jointly by one fixed power supply or separately by two fixed power supplies.



2.2 AP 系统拓扑结构

2.2.1 AP 系统地址映射说明

AP-A系统总线节点上拥有一个[XF20]接口用于连接远程 IO 模块。通过接口 [XF10] 将连接电缆连接至各个远程 IO 模块。 并可使用接口 [XF20] 转发至其他模块。

每次启动 CPX-AP 自动化系统时会自动分配模块地址。左侧第一个模块起始地址为 1,并按照先本地模块,再远程 IO 模块从左至右的安装顺序排序。



2.2.2 本次案例地址说明



1 号为 CPX-AP-A-EC, 2 号为 CPX-AP-A-8DI, 3 号为 CPX-AP-A-16DI-D, 4 号为 CPX-AP-A-8D0,5 号为 CPX-AP-A-4IOL,6 号为 VTUG-AP 阀岛。IO-LINK 主站的 Port1 连接压力传感器 SPAN。

3 InoProShop 通讯调试

3.1 下载并安装 ESI 文件

从 Festo 官网下载相应的 ESI 文件,链接如下:

https://www.festo.com.cn/cn/zh/search/?text=cpx-ap-a-ec&tab=DOWNLOADS&q=cpx-ap-a-ec

,○ cpx-ap	o-a-ec					×
产品1	教学产品 91	下载 22	主题 96			

产品信息	6	▼ 文件类型	标题	版本	
技术文档	5	Firmware	Firmware	v1.6.3 2023/5/8	\sim
Certificates	4		Supported systems: EtherCAT interface CPX-AP-I-EC-M12 (8086609) Revision 01		
Software	2	设备描述文件	EtherCAT XML	20230421	~
专业知识	5		CPX-AP EtherCAT ESI	2023/4/21	Ť
Training	0		Supported systems:		

安装(导入)ESI文件

Devices	→ ₽ X	🕼 🖄 ETHERCAT 🎁 Library Manager 👔 POU_PRG 🔌 Network Configuration 🗙 🗃 CPX_AP_A_EC_M12 🏹 ETHERCAT 🖉 Task	Config
STERNE TEST	-	📲 🤜 Refresh 🛛 🖀 Copy 🕋 Paste 🗄 Delete 📩 Undo 📸 Redo 🛛 🕲 Import EDS File 🖶 Import GSD File, 🖶 Import ECT File վ 🍕 Zoom In 矣 Zoor	m Out
🖃 🎁 Device (AM401-CPU1608TP)			
Q Device Diagnose		Modbus Master Modbus Slave Free Protocol	
- 🛞 Network Configuration		A T SCANO	
- 🐌 EtherCAT Config		CANopen Master 📄 CANlink Master 📄 CANlink Slave	
📲 LocalBus Config		The second	
🖙 🔠 PLC Logic		□ ModbusTCP Master □ ModbusICP Stave □ Melsec Master	
🖃 🧔 Application		JEtherCAT	
Library Manager		✓ EtherCAI master Grade Argente (1)	
DOU_PRG (PRG)		Stillervet/IP EtherNet/IP Master DEtherNet/IP Slave	
= 1998 Task Configuration			

← → · ↑ 🔒 › ﷺ	电脑 > 虚拟机共享文件 (\\VBoxSvr) (Z:) > Fe	esto-CPX-AP-EC-20230421	1 (1) 🗸	ひ 𝒫 捜	索"Festo-CPX-AP-EC-20
组织 ▼ 新建文件夹					::: • 🔟 ?
💪 OneDrive 🔷	名称 ^	修改日期	类型	大小	
💻 此电脑	Festo-CPX-AP-EC-20230421	2023/4/21 18:51	XML 文档	2,295 KB	
🧊 3D 对象	-				
一视频				۱.	
▶ 图片				1	
				1	
▶ 音乐				1	
三 桌面				1	
🏪 本地磁盘 (C:)				<u>۱</u>	
➡ 虚拟机共享文件 🗸					
文件名	(N): Festo-CPX-AP-EC-20230421			〜 EtherCA 打开	AT XML File(*.xml) ~ (O) 取消

重启 InoProShop 软件即可显示加载成功

ISDB_TEST.project - InoProShop(V1.7.3) SPT			j.	🌋 Device Repository		×
Ele Edit View Project Build Online Debug ③ ○ 1 1 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2		ls <u>W</u> indow <u>H</u> elp <u>P</u> ackage Manager InoPkgManager		Location: System Repository (C:\Inovance Control\InoProShop\CODESYS\Repository\Devices)	~	Edit Locations
Devices		Library Repository		Installed device descriptions:		
TSDB_TEST Device (AM401-CPU1608TP)	0	InoProShop Tool		String for a fulltext search Vendor: <a>All vendors>	~	Install
Device Diagnose W Network Configuration EtherCAT Config	Ť	Scripting Customize Options		Name Vendor Version Description	^	Uninstall Export
					~	Details
						Close

3.2 硬件及软件组态

3.2.1 CPX-AP-A-EC 节点设置

- 1. DIL 旋钮设置固定地址,有效范围 1-4094。
- 2. DIL 旋钮设置 0,则通过 EtherCAT 主站来分配地址。

旋转开关	功能
IDx100hx10hx1h	 通过 3 个旋转开关设置十六进制编码的接口 EtherCAT "Explicit Device ID"。 可能的设置: 0 = 保存的 EtherCAT 地址,未分配 "Explicit Device ID" 1 … 4094 (1_h … fff_h) = 允许的地址范围 4095 (0xFFF) = 恢复至出厂设置 设置为 0 时,接口的地址通过 EtherCAT 主站自动分配(自动 增量)。
	出厂设置:0

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3.2.2 硬件检测及程序下载

1) 将 CPX-AP-A-EC 模块与 PLC 以及 AP 阀岛正确连接并供电,新建项目。



2) 连接 PLC,设置网关并自动扫描。



3) 在线扫描 EtherCAT 从站设备(本次案例设置 CPX-AP-A-EC 的 DIL 旋钮为 001)。



双击 CPX_AP_A_EC_M12,在 General 菜单栏中可以确认 CPX-AP-A-EC 的 ECT 地址为 1001



注意:如果无法在线扫描硬件组态可以通过右键 ETHERCAT(EtherCAT Master)自行离线添加,如下所示 1.添加 EC 从站类型为 AP



2.依次添加 AP 系统子模块



4) 添加启动参数并下载程序

1.设置 CPX-AP-A-4IOL 的 Port 1 模式为 IOL_AUTOSTART

Devices - 4 ×	💮 Device 🕺 Network Con	figuration	CPX_AP_A_EC	_M12 X						
	General 3	🕂 Add	Edit 💥 Delete 🕆 Mo	ove Up 🛛 🖶 Move D	Down DownLoadAll(S	DO) CancelAllDow	nload(SDC) 🗌 Disp	laySystemParameter	
Device (AMM01CP016081P)	Process Data(PD0 Setting)	Line	Index:Subindex N	lame	Value Bitlengt	n IsDownload	Abort	if error	Jump to line if err	. Next lin
🖹 💥 Network Configuration	· · ·	1	16#F030:16#00 do	wnload slot cfg	0 208	×				0
EtherCAT Config	Startup parameters(SD0 Setting)									
LocalBus Config	Slata									_
P-III PLC Logic	3005		Select item from o	bject directory						
Application	Online									
🎁 Library Manager			Index:Subindex	Name			Flags	Type	Default ^	
DOU_PRG (PRG)	CoE Online		11000.0000000	Naminal Curl	Time Deat 2		DW	нурс	16.400	
a 🙀 Task Configuration	FoEsettings		16#05	Nominal Cycl	a Time - Port 2		DW	LICTAT	16#00	
ETHERCAT			:16#05	Enable diago	osis of IO-Link device	ost - Port 0	DW	BOOL	1	
- 他 ETHERCAT.EtherCAT_Task	EtherCAT I/O Mapping		.16#07	Enable diagn	osis of IO-Link device	ost - Port 0	DW	ROOL	1	
⊟-ॐ MainTask			.16#08	Enable diagn	osis of IO-Link device	ost - Port 1	DW	BOOL	1	
一世 POU_PRG	EtherCAT IEC Objects		.16#09	Enable diagn	osis of IO-Link device	lost - Port 3	DW	BOOL	1	
PersistentVars	Status		:16#04	Port Mode -	Port 0	ose rores	RW	LISTNT	16#00	
·····································			4 :16#0B	Port Mode - F	Port 1		RW	USINT	16#00	
SoftMotion General Axis Pool	Information		:16#0C	Port Mode - F	Port 2		RW	USINT	16#00	
HIGH_SPEED_IO (High Speed IO Module)			:16#0D	Port Mode - F	Port 3		RW	USINT	16#00	
MODBUS_TCP (ModbusTCP Device)			:16#0E	Validation & E	Backup - Port 0		RW	USINT	16#00	
EIHERCAT (EtherCAT Master)			:16#0F	Validation & E	Backup - Port 1		RW	USINT	16#00	
		1	:16#10	Validation & E	Backup - Port 2		RW	USINT	16#00	
CPX_AP_A_EC_M12_1 (Interface Modules) CPX_AP_A_EC_M12_1 (Interface Modules)			:16#11	Validation & B	Backup - Port 3		RW	USINT	16#00	
CPX_AP_A_BDI_HIZ_SP (Digital Modules)								_	Y	
CPX_AP_A_LODI_D_M12_DP (Digital Modules)			Name:	Port Mode - Port 1	L					
CPX AP A 4TOL M12 Variant 4 (TOL int Mactar Modulae)			Index: 16#	2004	÷ Bitlength:	8		÷	ок 🧹	6
VAEM 1 S 12 AP (Pneumatics VTLIG)			SubIndex: 16#	В	Value:			~	5 Court	
HIGH_SPEED_IO (High Speed IO Module)			Complete acco	ess 🔲 Byte A	Array				Cancel	
			-							_

General	🛨 Add	📄 Edit 🗶 Delete 🖪	Move Up 🛛 🗣 Move I	Down DownLoadAll(SD	O) CancelAll	Download(SDO)	DisplaySystemPa	rameter		
Process Data(PDO Setting)	Line	Index:Subindex	Name	Value	Bitlength	IsDownload	Abort if error	Jump to line if err	Next line	Comment
history bata(i bo betailig)	r. 1	16#F030:16#00	download slot cfg	0	208				0]]
Startup parameters(SD0 Setting)	- 2	16#2004:16#0B	Port Mode - Port 1	IOL_AUTOSTART	8	V			0	
Startup parameters(SD0 Setting)	· 2	16#2004:16#0B	Port Mode - Port 1	IOL_AUTOSTART	8				0	

2.下载程序



3.2.3 I/O Mapping 测试控制输出

Devices - 4 X	💮 Device 🛛 💥 Network Cor	nfiguration 🛛 🗃 CPX_AP_A_	EC_M12 X	D POU_PRG						
■ 🗿 TSD8_TEST 🔹	General	Find		Filter Show all	- A	dd FB for IO Channel	Go to Instance			
= 😏 🔟 Device [connected] (AM401-CPU1608TP)	General							-		_
- S Device Diagnose	Process Data(PDO Setting)	Variable	Mapping	Channel	Address	Туре	Default Value	Current 3	Prepared Value	Unit
🗷 💥 Network Configuration		- *		CPX_AP_A_8DO_M12_5P Output 0	%QX1.0	BIT		FALSE	TRUE	
B I PLC Logic	Startup parameters(SDO Setting)	**		CPX_AP_A_8DO_M12_5P Output 1	%QX1.1	BIT		FALSE		
资源使用表		**		CPX_AP_A_8DO_M12_5P Output 2	%QX1.2	BIT		FALSE		
- 😔 🔈 SoftMotion General Axis Pool	Slots	**		CPX_AP_A_8DO_M12_5P Output 3	%QX1.3	BIT		FALSE		
	Online	**		CPX_AP_A_8DO_M12_5P Output 4	%QX1.4	BIT		FALSE		
G MODBUS_TCP (ModbusTCP Device)		**		CPX_AP_A_8DO_M12_5P Output 5	%QX1.5	BIT		FALSE		
ETHERCAT (EtherCAT Master)	CoE Online	- **		CPX_AP_A_8DO_M12_5P Output 6	%QX1.6	BIT		FALSE		
CPX_AP_A_EC_M12 (CPX-AP-A-EC-M12)double	click	**		CPX_AP_A_8DO_M12_5P Output 7	%QX1.7	BIT		FALSE		
CPX_AP_A_EC_M12_1 (Interface Modules)	EoE settings	÷-**		CPX_AP_A_4IOL_M12_Variant_4 Port 0	%QB2	ARRAY [03] OF BYTE				
CPX_AP_A_8DI_M12_5P (Digital Modules)	Diag History	⊞- * ≱		CPX_AP_A_4IOL_M12_Variant_4 Port 1	%QB6	ARRAY [03] OF BYTE				
- 😳 🎁 CPX_AP_A_16DI_D_M12_5P (Digital Modules)		∰ * ≱		CPX_AP_A_4IOL_M12_Variant_4 Port 2	%QB10	ARRAY [03] OF BYTE				
- 🧐 CPX_AP_A_8DO_M12_5P (Digital Modules) 2	EtherCAT I/O Mapping	÷-**		CPX_AP_A_4IOL_M12_Variant_4 Port 3	%QB14	ARRAY [03] OF BYTE				
CPX_AP_A_4IOL_M12_Variant_4 (IO-Link Master		- *		VAEM_L1_S_12_AP Coil 0	%QX18.0	BIT		FALSE	TRUE	
VAEM_L1_S_12_AP (Pneumatics VTUG)	EtherCAT IEC Objects	**		VAEM_L1_S_12_AP Coil 1	%QX18.1	BIT		FALSE		

S S I T Ber Bien a % I	•	Start	F5	Channel CPX_AP_A_8DO_M12_5P Output 0	Address %QX1.0	Туре ВІТ	Default Value	Current Value	Prepared Value
	-	Stop	Shift+F8	CPX_AP_A_8DO_M12_5P Output 1	%QX1.1	BIT	F/	ALSE	
Devices		Single <u>C</u> ycle	Ctrl+F5	CPX_AP_A_8DO_M12_5P Output 2	%QX1.2	BIT	F/	ALSE	
= 🐴 TSDB TEST	10	New Breakpoint		CPX_AP_A_8DO_M12_5P Output 3	%QX1.3	BIT	F/	ALSE	
E O Price [connected] (AM401-CPU	甌	Edit Breakpoint		CPX_AP_A_8DO_M12_5P Output 4	%QX1.4	BIT	F/	ALSE	
Q Device Diagnose		Toggle Breakpoint	F9	CPX_AP_A_8DO_M12_5P Output 5	%QX1.5	BIT	F/	ALSE	
K Network Configuration		Disable Breakpoint		CPX_AP_A_8DO_M12_5P Output 6	%QX1.6	BIT	F/	ALSE	
E PLC Logic	-	Enable Breakpoint		CPX_AP_A_8DO_M12_5P Output 7	%QX1.7	BIT	F/	ALSE	
一 资源使用表		endore or egiporite		CPX_AP_A_4IOL_M12_Variant_4 Port 0	%QB2	ARRAY [03] OF BYTE			
- O SoftMotion General Axis Pool	ц <i>.</i> =	Step Over	F10	CPX_AP_A_4IOL_M12_Variant_4 Port 1	%QB6	ARRAY [03] OF BYTE			
	43	Step Into	F8	CPX_AP_A_4IOL_M12_Variant_4 Port 2	%QB10	ARRAY [03] OF BYTE			
MODBUS TCP (ModbusTCP D	¢.	Step Out	Shift+F10	CPX_AP_A_4IOL_M12_Variant_4 Port 3	%QB14	ARRAY [03] OF BYTE			
ETHERCAT (EtherCAT Master	+王	Run to Cursor		VAEM_L1_S_12_AP Coil 0	%QX18.0	BIT	Т	ku 🖊	
G M CPX AP A EC M12 (CP)	8	Set ne <u>x</u> t Statement		VAEM_L1_S_12_AP Coil 1	%QX18.1	BIT	F	N SE	1
CPX AP A EC M12	\$	Show next Statement		VAEM_L1_S_12_AP Coil 2	%QX18.2	BIT	F	LSE	
CPX AP A	572	Write values	Ctrl4E7	VAEM_L1_S_12_AP Coil 3	%QX18.3	BIT		ALSE	
CPX AP A 1000 D		Trace values	57	VAEM_L1_S_12_AP Coil 4	%QX18.4	BIT	E/	ALSE	
CPX AP A SDO M1	U	Force values	F7	VAEM_L1_S_12_AP Coil 5	%QX18.5	BIT	F/	ALSE	
CPX AP A 4IOL MI		Unforce values	Alt+F7	VAEM_L1_S_12_AP Coil 6	%QX18.6	BIT	F/	ALSE	
0 M VAEM L1 S 12 AP (T)	Flow Control				and the second se			



4 CPX-AP_Festo_Lib 库的使用

4.1 FB 库的下载及导入

从 Festo 官网下载对应的 Lib 库文件,下载链接如下: https://www.festo.com.cn/cn/zh/search/?text=CPX-AP-A-EC&tab=DOWNLOADS&q=CPX-AP-A-EC

CPX-AP-A-EC					
产品 1 教学产品 91	下载 22	主题 96			
支术文档	5	🛃 应用附注	Commissioning of CPX-AP-I-EC-M12 in Codesys SP12 with CPX-AP-I-4IOL-M12	1.20 2021/6/30	\sim
Cortificator	4		CPX-AP-I-EC-M12 and CPX-AP-I-4IOL-M12; Library included		
ertificates	4		This application note gives a step by step description of how to integrate a CPX		
Software	2	应用附注	CPX-APEC Integration with Beckhoff TwinCat 3 PLC over EtherCAT	1.20	~
专业知识	5		CPX-AP-I-EC: CPX-AP-A-EC EtherCat: TwinCat V3: Library included	2025///51	
Fraining	0		This Application Note gives a step by step description of how to integrate CPX		
		应用附注	CPX-APEC- Integration with Festo PLC over EtherCat	1.30 2023/6/30	~
			CPX-AP-I-EC; CPX-AP-A; Codesys; EtherCat; Library included This Application Note gives a step by step description of how to integrate CPX		

« Applicationing	ote-	CPX-APEC Integration with Festo PLC > 02.Libra	ry		~	0
,	^	名称 ^	修改日期	类型	大小	
n		Festo_CPX_AP_EC_15_32.library	2023/5/22 18:24	CODESYS library	413 KB	
Edge Collections		Library Version Note.pdf	2023/6/30 20:37	Adobe Acrobat Do	52 KB	

InoProShop 导入库文件:



4.2 FB 库的介绍

该库文件包含如下4个FB:

1. CPXAP_Parameter_AP 2. CPXAP_Parameter_CoE

3. CPXAP_IOLink_Parameter

4. CPXAP_Diag

注: CPXAP_Parameter_AP 与 CPXAP_Parameter_CoE 功能一致,下文仅介绍CPXAP_Parameter_CoE。

4.2.1 CPXAP_Parameter_CoE

- 该功能允许用户读或写 CPX-AP-A/I-EC 系统模块的 COE 参数。
- 用户在同一时间仅可读或者写一个参数。
- Execute 上升沿有效。

CPXAP_Parameter_COE 功能块如下图所示:

^	Scope	Name	Address	Data type	Initialization
38	🖗 VAR	CPX_AP_A_EC_PAR_COE		Festo_CPX_AP_EC.CPXAP_Parameter_CoE	
39	🖗 VAR	APCOE_Execute		BOOL	
40	🖗 VAR	APCOE_Index		WORD	
41	🖗 VAR	APCOE_SubIndex		BYTE	
42	🖗 VAR	APCOEData		POINTER TO BYTE	
43	🖗 VAR	APCOE_DataLength		UINT	
44	🖗 VAR	APCOE_ReadORWrite		BOOL	
45	🖗 VAR	APCOE_DONE		BOOL	
46	🖗 VAR	APCOE_Busy		BOOL	
47	🖗 VAR	APCOE_Error		BOOL	
48	🖗 VAR	APCOE_ErrorCode		UDINT	
49	🖗 VAR	APCOE_ErrorDescription		Festo_CPX_AP_EC.eSDOAbortCode	
50	🖗 VAR	APCOE_ReadDataLength		UDINT	

		CPX_AF	A_EC_PAR_COE		_
APCOE_Execute	<u> </u>	xExecute	xDone-	[APCOE_DONE
1001		uiEthercatAddress	xBusy-		APCOE_Busy
APCOE_Index		windex	xError-		APCOE_Error
APCOE_SubIndex		bySubIndex	udiErrorCode -		APCOE_ErrorCode
ADR(APCOEData)	_	pData	eErrorDescription-		APCOE_ErrorDescription
APCOE_DataLength	F-	uiDataLength	udiReadDataLength -		APCOE_ReadDataLength
APCOE_ReadORWrite	_	xWrite			

下表介绍了 FB 块的输入,输出变量的功能及数据类型。

输入变量

Name	DataType	Description
xExecute	BOOL	TRUE – Parameter Read/Write
		Address of the slave device i.e. the address of the CPX-AP-I or CPX-AP-A module.
uiEthercatAddress	UINT	Refer Chapter-3.2.2 for detailed description to find the uiEthercatAddress.
wIndex	WORD	Index of the Parameter which has to be Read or Written to.
bySubIndex	BYTE	Sub Index of the Parameter which has to be Read or Written to
uiDataLength	UINT	Number of Bytes of data to be Written using the Function Block.
		FALSE – Read Parameter.
xReadWrite	BOOL	TRUE – Write Parameter.
		Variable to be Read/Written with the corresponding parameter
		Data Type.
		Example : If the User wants to read or write a parameter which is of the Data Type Integer, then a
pData	POINTER TO BYTE	variable of the Data Type Integer must be linked to pData.

输出变量

Name	DataType	Description		
		TRUE – Parameter Read or Write Finished		
xDone	BOOL	FALSE- Parameter Read or Write not yet finished.		
		TRUE – Parameter Read or Write started.		
xBusy	BOOL	FALSE – Parameter Read or Write not yet started or it's completed.		
		TRUE – Parameter Read or Write has an error.		
xError	BOOL	FALSE – No error during Parameter Read or Write		
udiErrorCode	UDINT	Error code of the Read or Write command executed		
eErrorDescription	ENUM of the type eSDOAbortCode	Refer Table 4.2.1-1 for eSDOAbortCode values.		
udiReadDataLength	UDINT	Number of bytes of data read during Parameter Read		

eSDOAbortCode

Description
NO_ERROR
CRC_ERROR
OUT_OF_MEMORY
UNSUPPORTED_ACCESS_TO_OBJECT
READ_NOT_ALLOWED
WRITE_NOT_ALLOWED
NO_SUCH_OBJECT
NOT_MAPPABLE
GENERAL_PARAM_INCOMPATIBILITY
GENERAL_INCOMPATIBILTY
LENGTH_DATA_INVALID
NO_SUCH_SUBINDEX
VALUE_RANGE_EXCEEDED
VALUE_TOO_LOW
VALUE_TOO_HIGH
LOCAL_CTRL_ERROR
DEVICE_STATE_ERROR
NO_DATA_AVAILABLE

Table 4.2.1-1: eSDOAbortCode Values

4.2.2 CPXAP_IOLink_Parameter

- 该功能允许用户读或写连接在 CPX-AP-I/A-4IOL 模块上的 IO-LINK 设备的参数。
- 用户在同一时间仅可读或者写一个参数。
- Execute 上升沿有效。

CPXAP_IOLink_Parameter 功能块如下图所示:

^	Scope	Name	Address	Data type	Initialization	Persistent	Constant
5	🖗 VAR	CPX_AP_A_EC_IOLINK_PAR		Festo_CPX_AP_EC.CPXAP_IOLink_Parameter			
e	🖗 VAR	IOLINKPar_Execute		BOOL			
7	🖗 VAR	IOLink_SlotNumber		UINT			
8	🖗 VAR	IOLINK_PortNumber		USINT			
9	🖗 VAR	SPAN_Index		UINT			
10	🖗 VAR	SPAN_SubIndex		USINT			
11	🖗 VAR	SPAN_Data		POINTER TO BYTE			
12	🖗 VAR	SPAN_DataLength		UINT			
13	🖗 VAR	SPAN_ReadORWrite		BOOL			
14	🖗 VAR	SPAN_StringORNot		BOOL			
15	🖗 VAR	IOLINKPar_Done		BOOL			
16	🖗 VAR	IOLINKPar_Busy		BOOL			
17	🖗 VAR	IOLINKPar_Error		BOOL			
18	🖗 VAR	IOLINKPar_ErrorCode		UDINT			
19	🖗 VAR	IOLINK_ErrorDescription		Festo_CPX_AP_EC.eIOLinkAbortCode			
20	🖗 VAR	IOLINK_ReadDataLength		UDINT			
<							

CPX_AP_A_EC_IOLINK_PAR Festo_CPX_AP_EC.CPXAP_IOLink_Parameter 15 IOLINKPar_Execute 1001 22 IOLINKPar_Done IOLINKPar_Busy IOLINKPar_Error 22 23 24 xExecute xDone uiEthercatAddress xBusy IOLINK_SlotNumber uiSlotNumber xError IOLINK_StotNumber IOLINK_PortNumber SPAN_Index SPAN_SubIndex ADR(SPAN_Data) IOLINKPar_ErrorCode usiPort udiErrorCode IOLINK_ErrorDescription IOLINK_ReadDataLength eErrorDescription uilndex usiSubIndex udiReadDataLength pData SPAN_DataLength SPAN_ReadORWrite SPAN_StringORNot uiDataLength xReadWrite xlsString

下表介绍了 FB 块的输入,输出变量的功能及数据类型。

输入变量

Name	DataType	Description
xExecute	BOOL	TRUE – Parameter Read/Write
		Address of the slave device i.e. the address of the CPX-AP-I or CPX-AP-A module.
uiEthercatAddress	UINT	Refer Chapter-3.2.2 for detailed description to find the uiEthercatAddress.
uiSlotNumber	UINT	Slot of the CPX-AP-A-4IOL-M12 module where the IO link device is connected
usiPort	USINT	The port of the CPX-AP-A-4IOL IO Link Master module to which the IO Link de-vice is connected.
		Index of the parameter of IO Link device.
uilndex	UINT	Refer IO Link device manual.
		Sub Index of the parameter of IO Link device
usiSubIndex	USINT	Refer IO Link device manual.
uiDataLength	UINT	Number of Bytes of data to be Written using the Function Block.
		FALSE – Read Parameter.
xReadWrite	BOOL	TRUE – Write Parameter.
		TRUE- If the parameter data type is STRING.
xlsString	BOOL	FALSE- If the parameter data type is not STRING.
		Variable to be Read/Written with the corresponding parameter
		Data Type.
		Example : If the User wants to read or write a parameter which is of the Data Type Integer, then a
pData	VARIANT	variable of the Data Type Integer must be linked to pData.

输出变量

Name	DataType	Description
		TRUE – Parameter Read or Write Finished
xDone	BOOL	FALSE- Parameter Read or Write not yet finished.
		TRUE – Parameter Read or Write started.
xBusy	BOOL	FALSE – Parameter Read or Write not yet started or it's completed.
		TRUE – Parameter Read or Write has an error.
xError	BOOL	FALSE – No error during Parameter Read or Write.
udiErrorCode	UDINT	Error code of the Read or Write command executed
eErrorDescription	ENUM of the Type elOLinkAbortCode	Refer Table 4.2.2-1 for detailed description of elOLink-AbortCode.
udiReadDataLength	UDINT	Number of bytes of data read during Parameter Read.

elOLinkAbortCode	
Value	Description
16#0	NO_ERROR
16#1000	MASTER_COMMUNICATION_ERROR
16#1100	MASTER_ISDU_TIMEOUT
16#5600	MASTER_ISDU_CHECKSUM_ERROR
16#8000	DEVICE_APPLICATION_ERROR_NO_DETAILS
16#8011	INDEX_NOT_AVAILABLE
16#8012	SUB_INDEX_NOT_AVAILABLE
16#8020	SERVICE_NOT_AVAILABLE
16#8023	INDEX_NOT_WRITEABLE
16#8030	PARAMETER_VALUE_OUT_OF_RANGE
16#8031	PARAMETER_VALUE_ABOVE_LIMIT
16#8032	PARAMETER_VALUE_BELOW_LIMIT
16#8033	PARAMETER_LENGTH_OVERRUN
16#8034	PARAMETER_LENGTH_UNDERRUN
16#8035	FUNCTION_NOT_AVAILABLE
16#8036	FUNCTION_TEMPORARY_UNAVAILABLE
16#8040	INVALID_PARAMETER_SET
16#8041	INCONSISTENT PARAMETER SET
16#8082	APPLICATION_NOT_READY
16#8100	VENDOR_UNSPECIFIC
16#999	VENDOR_SPECIFIC
16#6020000	WRONG_SLOT_NUMBER
16#80000	GENERAL_SDO_ERROR
Table / 2 2-1 elOLir	hkAbortCode values

Table 4.2.2-1 eIOLinkAbortCode values

4.2.3 CPXAP_Diag

- 该功能允许用户读取 CPX-AP 系统上的模块诊断信息。诊断信息分类如下:
 - 1. 报警代码
 - 2. 发生报警的模块编号
 - 3. 发生报警的模块通道
 - 4. 报警类型
 - 5. 报警信息描述
- 用户可通过 xRestart 重启 CPX-AP 系统。

CPXAP_Diag 功能块如下图所示:

^	Scope	Name	Address	Data type	Initialization
29	VAR	CPX_AP_A_EC_Diag		Festo_CPX_AP_EC.CPXAP_Diag	
30	🖗 VAR	ReadDiag_Enable		BOOL	
31	🖗 VAR	AP_System_Restart		BOOL	
32	🖗 VAR	Diag_FB_Active		BOOL	
33	🖗 VAR	Diag_AP_Error		BOOL	
34	🖗 VAR	AP_ActiveModules		UINT	
35	🖗 VAR	AP_NumOFActiveErrors		UINT	
36	🖗 VAR	AP_Latest_Error_ModuleNo		UINT	
37	🖗 VAR	AP_ModuleDiag_Data		ARRAY [1150] OF Festo_CPX_AP_EC.stModuleDiagData	
1					

	CPX_AP_A_	EC_Diag	n i i i i i i i i i i i i i i i i i i i		
	Festo_CPX_AP_	EC.CPXAP_Diag		10	
ReadDiag_Enable	xEnable	xActive		Diag_FB_Active	
1001	uiEthercatAddress	xError		Diag_AP_Error	
AP_System_Restart -	*Restart	uiActiveModules		AP_ActiveModules	
		uiNumberOfActiveErrors		AP_NumOFActiveErrors	h
		uiModuleNo		AP_Latest_Error_Module	1
		aModuleDiagnosticData		AP_ModuleDiag_Data	1

下表介绍了 FB 块的输入,输出变量的功能及数据类型。

输入	变量
104 1	

Name	DataType	Description
xEnable	BOOL	TRUE – Continuously read diagnostic in-formation.
uiEthercatAddress	UINT	Address of the slave device i.e. the address of the CPX-AP-I or CPX-AP-A module. Refer Chapter-3.2.2 for detailed description to find the uiEthercatAddress.
xRestart	BOOL	TRUE = Restart the EtherCAT devices. The machine state changes from INIT >> PREOP >> SAFE >> OPERATIONAL.

输出变量

Name	DataType	Description
		TRUE = Connected EtherCAT device in Operation Mode.
xActive	BOOL	FALSE = Module is Disconnected from the device or Module not in Operation Mode.
		TRUE = Error exist during Diagnosis block running.
xError	BOOL	FALSE = Error is not exist during Diagnosis block run-ning.
uiActiveModules	UINT	Number of active modules connected.
uiNumberOfActiveErrors	UINT	Number of Modules having error.
uiModuleNo	UINT	Module having latest active diagnosis.
aModuleDiagnosticData	STRUCTURE of the type stModuleDiagData	Refer Table 4.2.3-1 for stModuleDiagData description

stModuleDiagData

DataType	Description
UDINT	Info Message
UINT	Currently active diagnosis on the module.
UINT	Sub Module entry of last diagnosis.
UINT	Channel entry of last diagnosis.
UDINT	Diagnosis Code of last diagnosis.
	Diagnosis Code description.
ENUM of the Type eErrorDescription	Refer Table 4.2.3-2 for eErrorDescription.
BOOL	TRUE = Module has an error.
	UDINT UINT UINT UINT UDINT ENUM of the Type eErrorDescription BOOL

Table 4.2.3-1 stModuleDiagType

eErrorDescription

Value	Description
0	NO_ERROR
16777644	CURRENT_SENSE_RESISTOR_OVERLOADED
16843019	SHORT_CIRCUIT_OVERLOAD_IN_SENSOR_SUPPLY
16843020	OUTPUT_SIGNAL_SHORT_CIRCUIT_OVERLOAD
16843105	SHORT_CIRCUIT_CHECK_INSTALLATION
16843106	EARTH_FAULT_CHECK_INSTALLATION
16843130	SHORT_CIRCUIT_ON_IQ
16843131	SHORT_CIRCUIT_ON_CQ
16843132	OVERLOAD_ON_IQ
16843133	OVERLOAD_ON_CQ
33619990	UNDERVOLTAGE_LOGIC_SUPPLY_PS
33619991	OVERVOLTAGE_LOAD_SUPPLY_PS
33620229	UNDERVOLTAGE_LOAD_SUPPLY_PL
33620230	SWITCH_OFF_LOAD_SUPPLY_PL
33620287	OVERVOLTAGE_LOAD_SUPPLY_PL
33620297	GENERAL_POWER_SUPPLY_ERROR
33882439	MEMORY_ERROR
33882440	BATTERIES_WEAK
50397229	TEMPERATURE_IN_DEVICE_TOO_LOW
50397231	DEVICE_OVERTEMPERATURE
50397506	TEMPERATURE_ERROR_OVERLOAD
50397569	PHY_OVERTEMPERATURE
100663561	START_UP_PARAMETER_REJECTED
100663562	START_UP_PARAMETER_DEVIATION_IN_LENGTH
100663631	PARAMETER_ERROR
100663632	PARAMETER_MISSING_IN_THE_DEVICE
100663688	MODULE_IDENTIFICATION_CHECK_SKIPPED
100663689	MODULE_IDENTIFICATION_CHECK_FAILED
100794678	HIGHER_THRESHOLD_EXCEEDED
100794679	LOWER_THRESHOLD_UNDERFLOW

Value	Description
100794680	VALUE_OUT_OF_RANGE
100991074	PARAMETER_SET_INVALID
117768550	MEASURING_RANGE_EXCEEDED
117899621	OVERFLOW_OF_THE_PROCESS_VARIABLE_RANGE
117899623	UNDERFLOW_OF_THE_PROCESS_VARIABLE_RANGE
134218030	DEVICE_ADDRESS_INVALID
134218130	INVALID_CYCLE_TIME
134283682	DEVICE_IN_EMERGENCY_OPERATION_SYSTEM_STATE
134283684	DEVICE_VARIANT_MISMATCH
134283693	SYSTEM_STATE_CHANGE_TO_OPERATION_FAILED
134283716	AP_MODULES_DETECTED
134283775	DEVICE_NOT_READY
134283797	DEVICE_FORCED_TO_COMMUNICATION_LOOPBACK
134283813	INVALID_TOPOLOGY
134318095	AP_PROCESS_DATA_INTERNAL_ERROR
134480273	STATUS_CHANGE_REQUEST
134480275	SYNC_MANAGER_INVALID_ADDRESS
134480276	SYNC_MANAGER_INVALID_IO_SIZE
134480277	SYNC_MANAGER_INVALID_CONFIGURATION
134480278	DC_ACTIVATION_REGISTER_INVALID
134480279	SYNC_TYPE_NOT_SUPPORTED
134873352	IO_LINK_EVENT
134873420	IO_LINK_INVALID_CYCLE_TIME
134873421	VERSION_ERROR_INCOMPATIBLE_PROTOCOL_VERSION
134873422	ISDU_BATCH_FAILED
134873451	WRONG_VENDORID
134873463	BACKUP_INCONSISTENCY_UPLOAD_ERROR
134873464	PARMETER_INCONSISTENCY_DOWNLOAD_ERROR
134873471	PROCESS_DATA_CONFIGURATION_ERROR
134873474	IO_LINK_EVENTS_OVERFLOW
134873475	MEMORY_OUT_OF_RANGE
134873476	DATA_STORAGE_INDEX_NOT_AVAILABLE
134873477	NON_SPECIFIC_ERROR_DURING_DATA_STORAGE
134873512	WRONG_DEVICEID
134873513	NO_DEVICE_CONNECTED

Value	Description
167772490	FUSE_BLOWN_OPENED
167837945	ERROR_RTE_MODULE_WATCHDOG_MONITORING
184549646	GENERAL_SOFTWARE_ERROR
184549696	SYSTEM_START
184811703	FIRMWARE_INVALID
185074063	UNSUPPORTED_FULL_DIAGNOSTIC_IMAGE_VERSION
185074064	UNSUPPORTED_DIAGNOSTIC_VERSION
185139496	APDD_INVALID
185139497	START_UP_APDD_INVALID
218169821	DIAGNOSIS_TRACE_RESETTED
65535	INVALID_SLAVEID_OR_COMMUNICATION_ERROR
Table / 2 3-2 eFrrorD	escription

Table 4.2.3-2 eErrorDescription

FB 功能演示 4.3

使用 CPXAP_Parameter_CoE 功能块读或写 CPX-AP 设备参数 4.3.1

读取参数示例:

读取 CPX-AP-A-EC-M12 的参数"Setup Monitoring Load Supply PL",出厂默认参数值为1。

Parameter	Instances	Data type	Access ¹	Array size
 Configuration of voltage monitoring load supply PL O: load voltage monitoring inactive 1: load voltage monitoring active, with suppression of diagnostics at switch-off (factory setting) 2: load voltage monitoring active 	1	UINT8	rw	_

通过 COE-ONLINE 菜单可以获取到设备参数的 Index 及 SubIndex。Index=16#2000, SubIndex=16#01。

Devices 👻 🕂 🗙	😫 ETHERCAT 🏾 🎁 Library Ma	anager 👔 POU_P	RG 🛛 💥 Network Configuration 🛛 📆 ETHE	RCAT	Jask Config	uration	Device
S TSDB_TEST		(77)- Lulu					
Device (AM401-CPU1608TP)	General	Read this page	e 🖉 Auto Update 💿 Offline from ESI file		ine from device		
- S Device Diagnose	Process Data(PDO Setting)	Index:Subindex	Name	Flags	Туре	Value	
🖃 🛞 Network Configuration		■ 16#1AF0:16#00	Diag History - TxPDO	RO	USINT		
🚽 EtherCAT Config	Startup parameters(SDO Setting)	■ 16#1AF1:16#00	Diagnosis - TxPDO	RO	USINT		
- 🗐 LocalBus Config	det.	■ 16#1C00:16#00	Sync manager type	RO	USINT		
🖙 🗐 PLC Logic	Siots	■ 16#1C12:16#00	RxPDO assign				
🖻 🧔 Application	Online	■ 16#1C13:16#00	TxPDO assign				
📲 📶 Library Manager		± 16#1C32:16#00	SM output parameter	RO	USINT		
DOU_PRG (PRG)	CoE Online	■ 16#1C33:16#00	SM input parameter	RO	USINT		
🖹 🎆 Task Configuration		= 16#2000:16#00	CPX-AP-A-EC-M12 - Module Parameter			1	
ETHERCAT	EOE settings	:16#01	Setup monitoring load supply (PL) 24 V DC	RW	USINT		1
ETHERCAT.EtherCAT_Task	ESC Register	+ 16#2001:16#00	CPX-AP-A-8DI-M12-5P - Module Parameter			-	1
🖻 🍪 MainTask		■ 16#2002:16#00	CPX-AP-A-16DI-D-M12-5P - Module Parameter				
POU_PRG	EtherCAT I/O Mapping	■ 16#2003:16#00	CPX-AP-A-8DO-M12-5P - Module Parameter				
T PersistentVars		■ 16#2004:16#00	CPX-AP-A-4IOL-M12 Variant 4 - Module Parameter				
────── 资源使用表	EtherCAT IEC Objects	■ 16#2005:16#00	VAEM-L1-S-12-AP - Module Parameter				
SoftMotion General Axis Pool	Status	■ 16#2204:16#00	CPX-AP-A-4IOL-M12 Variant 4 - ISDU Access	RO	USINT		
HIGH_SPEED_IO (High Speed IO Module)		■ 16#27F0:16#00	AP Parameter Access	RO	USINT		
MODBUS_TCP (ModbusTCP Device)	Information	■ 16#27F1:16#00	Stored Parameters NV	RO	USINT		
🖶 📃 ETHERCAT (EtherCAT Master)		16#6001:16#00	CPX-AP-A-8DI-M12-5P - Inputs	RO	USINT		
E-M CPX_AP_A_EC_M12 (CPX-AP-A-EC-M12) double click		16#6002:16#00	CPX-AP-A-16DI-D-M12-5P - Inputs	RO	USINT		
CPX_AP_A_EC_M12_1 (Interface Modules)		■ 16#6004:16#00	CPX-AP-A-4IOL-M12 Variant 4 - Inputs	RO	USINT		
CPX_AP_A_8DI_M12_5P (Digital Modules)		■ 16#6102:16#00	Diagnosis	RO	USINT		
CPX_AP_A_16DI_D_M12_5P (Digital Modules)		■ 16#7003:16#00	CPX-AP-A-8DO-M12-5P - Outputs	RO	USINT		
CPX_AP_A_8DO_M12_5P (Digital Modules)		■ 16#7004:16#00	CPX-AP-A-4IOL-M12 Variant 4 - Outputs	RO	USINT		
CPX_AP_A_4IOL_M12_Variant_4 (IO-Link Master Modules)		■ 16#7005:16#00	VAEM-L1-S-12-AP - Outputs	RO	USINT		
VAEM_L1_S_12_AP (Pneumatics VTUG)		16#9000:16#00	CPX-AP-A-EC-M12 - Module Identification	RO	USINT		
HIGH_SPEED_IO (High Speed IO Module)		. 16#9001:16#00	CPX-AP-A-8DI-M12-5P - Module Identification	RO	USINT		

指定 APCOE_Index=16#2000, APCOE_SubIndex=16#1 及触发 Execute 后变量 APCOEData 得到相关参数值为 1。



修改参数示例:

修改 CPX-AP-A-EC-M12 的参数 "Setup Monitoring Load Supply PL"为 Load voltage monitoring active,参数值为 2。

指定 APCOE_Index=16#2000, APCOE_SubIndex=16#1, APCOEData=16#2, APCOE_DataLength=16#1, APCOE_ReadORWrite=TRUE 及触发 Execute 后 DONE 信号完成。

Expression	Туре	Value	Prepared value	Address
PX_AP_A_EC_PAR_COE	Festo_CPX_AP_EC			
APCOE_Execute	BOOL	TRUE		
APCOE_Index	WORD	8192		
APCOE_SubIndex	BYTE	1		
🗄 🤣 APCOEData	POINTER TO BYTE	16#0000002		
APCOE_DataLength	UINT	1		
APCOE_ReadORWrite	BOOL	TRUE		
APCOE_DONE	BOOL	TRUE	No.	_
APCOE_Busy	BOOL	FALSE	value=	2
APCOE_Error	BOOL	FALSE		
APCOE_ErrorCode	UDINT	0		
APCOE_ErrorDescription	ESDOABORTCODE	NO_ERROR	Write	
APCOE_ReadDataLength	UDINT	0	Sucessfully	
	▲ ▼			



通过 CoE-Online 确认参数修改成功。

written=1(USINT)

Process Data(PDO Setting)	Index:Subindex	Name	Flags	Туре	Value
	16#1019:16#00	Festo Identification	RO	USINT	3
Startup parameters(SDO Setting)	± 16#10F1:16#00	Error Settings	RO	USINT	2
Slots	I6#10F3:16#00	Diagnosis History	RO	USINT	13
	I6#1603:16#00	CPX-AP-A-8DO-M12-5P - RxPDO	RO	USINT	8
Online	16#1604:16#00	CPX-AP-A-4IOL-M12 Variant 4 - RxPDO	RO	USINT	4
	± 16#1A01:16#00	CPX-AP-A-8DI-M12-5P - TxPDO	RO	USINT	8
CoE Online	16#1A02:16#00	CPX-AP-A-16DI-D-M12-5P - TxPDO	RO	USINT	16
oE settings	± 16#1A04:16#00	CPX-AP-A-4IOL-M12 Variant 4 - TxPDO	RO	USINT	8
	I6#1AF0:16#00	Diag History - TxPDO	RO	USINT	2
SC Register	± 16#1AF1:16#00	Diagnosis - TxPDO	RO	USINT	4
	I6#1C00:16#00	Sync manager type	RO	USINT	4
DiagHistory	± 16#1C12:16#00	RxPDO assign			
therCAT I/O Mapping	16#1C13:16#00	TxPDO assign			
	I6#1C32:16#00	SM output parameter	RO	USINT	32
therCAT IEC Objects	■ 16#1C33:16#00	SM input parameter	RO	USINT	32
	= 16#2000:16#00	CPX-AP-A-EC-M12 - Module Parameter			0
itatus	:16#01	Setup monitoring load supply (PL) 24 V DC	RW	USINT	Load supply monitoring active
nformation	I6#2001:16#00	CPX-AP-A-8DI-M12-5P - Module Parameter			Load supply monitoring inactive
	I6#2002:16#00	CPX-AP-A-16DI-D-M12-5P - Module Parameter			Load supply monitoring active
	I6#2003:16#00	CPX-AP-A-8DO-M12-5P - Module Parameter			
	16#2004:16#00	CPX-AP-A-4IOL-M12 Variant 4 - Module Parameter			2
	■ 16#2204:16#00	CPX-AP-A-4IOL-M12 Variant 4 - ISDU Access	RO	USINT	7
	I6#27F0:16#00	AP Parameter Access	RO	USINT	7
	■ 16#27F1:16#00	Stored Parameters NV	RO	USINT	3

4.3.2 使用 CPXAP_IOLink_Parameter 功能块读或写 IO-LINK 设备参数

读取参数示例:

读取连接在 CPX-AP-A-4IOL 模块端口 1 的压力传感器 SPAN-LK 的生产厂家。

Index	Subin-	Name	Value (example)	Access ¹⁾			Length	Format
	dex			U	м	s		
0x0010	0	Vendor Name	Festo AG & Co. KG	R	R	R	17 bytes	String
								1



指定 IOLINK_SlotNumber=16#5, IOLINK-PortNumber=1,SPAN_Index=16#10,SPAN_SubIndex=16#0 及触发 Execute 后变 量 SPAN_DataString 得到字符串 Festo AG & Co.KG。

Expre	ression			Туре	Value	Prepared value	Ac
¢ ۱	CPX_AP_A_EC_IOLINK_PAR			Festo_CPX_AP_EC			
1	IOLINKPar_Execute			BOOL	TRUE]
\$	IOLink_SlotNumber			UINT	5		
\$	IOLINK_PortNumber			USINT	1	Module 5	5
\$	SPAN_Index			UINT	16		
\$	SPAN_SubIndex			USINT	0	Dout 1	
\$	SPAN_DataString			STRING(200)	'Festo AG & Co. KG'	Pont	
± 🔅	SPAN_Data			POINTER TO BYTE	16#0000000		
\$	SPAN_DataLength			UINT	0		
\$	SPAN_ReadORWrite			BOOL	FALSE	VandarN	
\$	SPAN_StringORNot			BOOL	TRUE	vendorin	am
\$	IOLINKPar_Done			BOOL	TRUE		
\$	IOLINKPar_Busy			BOOL	FALSE		
\$	IOLINKPar_Error			BOOL	FALSE	Read	
\$	IOLINKPar_ErrorCode			UDINT	0	Read	
4	IOLINK_ErrorDescription			EIOLINKABORTCODE	NO_ERROR	Sucessful	ly/
<			A V				~
		CPX_AP_A_EC_IOL	INK_PAR				
		Festo_CPX_AP_EC.CPXA	P_IOLink_Parameter			22	
	IOLINKPar_Execute X	Execute	xDone		IOLINKPar_Done	22 IRUE	
	1001	iEthercatAddress	xBusy		IOLINKPar_Busy	23 FALSE	
	IOLINK_SlotNumber	iSlotNumber	xError		IOLINKPar_Error	24 JALSE	_
	IOLINK PortNumber 1	eiPort	udiErrorCode 0		IOLINKPar Error(ode 0	



修改参数示例:

修改连接在 CPX-AP-A-4IOL 模块端口 1 的压力传感器 SPAN-LK 的压力显示单位为 PSI (Value=3)。

Index	Sub-	Name	Value	Acc	Access ¹⁾		Length	Format
	Index			U	м	S		
0x017F	0	InA, unit	0 = bar (default), 1-kPa, 2-Mpa, 3-psi, 4-mmHG, 5-inHG, 6-inH2O, 7-kgf/cm ²	R	R/W	R/W	2 Bytes	UInteger16

指定 IOLINK_SlotNumber=16#5, IOLINK-PortNumber=1,SPAN_Index=16#017F,SPAN_SubIndex=16#0, SPAN_Data=16#3,SPAN_DataLength=16#2,SPAN_ReadORWrite=TRUE,及触发 Execute 后 DONE 信号完成,且压力表单位 已被更改为 PSI.



4.3.3 使用 CPXAP_Diag 功能块读取 AP 系统故障代码

示例 1: 断开 IO-LINK 设备压力传感器 SPAN-LK

Expression		Туре	Value	Prepared value
CPX_AP_A_EC_Diag		Festo_CPX_AP_EC.CPXAP_D	iag	
ReadDiag_Enable		BOOL	TRUE	APSystem
AP_System_Restart		BOOL	FALSE	Error
Diag_FB_Active		BOOL	TRUE	Occurred
Diag_AP_Error		BOOL	TRUE	Occurred
AP_ActiveModules		UINT	6	0.00
AP_NumOFActiveErrors		UINT	1	6 modules
AP_Latest_Error_ModuleNo		UINT	5	connected
AP_ModuleDiag_Data		ARRAY [1150] OF Festo_CF	PX_A	
AP_ModuleDiag_Data[1]		Festo_CPX_AP_EC.stModule	DiagD	dimension links
AP_ModuleDiag_Data[2]		Festo_CPX_AP_EC.stModulet	DiagD	Tmodule
AP_ModuleDiag_Data[3]		Festo_CPX_AP_EC.stModule	DiagD	having error
🗄 🏟 AP ModuleDiag Data[4]		Festo_CPX_AP_EC.stModule	DiagD	
AP_ModuleDiag_Data[5]		Festo_CPX_AP_EC.stModule	DiagD	Module No.5
< udiModuleDiagState		UDINT	257	having latest
wiActiveDiagnosisCount		UINT	1	naving latest
< uiSubModule		UINT	1	error
< uiChannel		UINT	1	
< udiDiagnosisCode		UDINT	134873513	
eErrorDescription		EERRORDESCRIPTION	N0_DEVICE_CONNEC	TED
xError		BOOL	TRUE	
	CPX_AP_A_EC_Diag	7]		
	Festo_CPX_AP_EC.CPXAP_Diag			
ReadDiag_Enable	xEnable xActiv	e Diag_FE	Active 17 TRUE	IO-LINK Device
1001	uiEthercatAddress xErro	Diag_AF	P_Error	disconnected
AP_System_Restart	xRestart uiActiveModule	s AP_Activ	veModules 19 1	
	uiNumberOfActiveError	s AP_Num	nOFActiveErrors	20 5
	uiModuleN	o AP_Late	est_Error_Module121	
	aModuleDiagnosticDate	a AP_Mod	duleDiag_Data 🖳	

示例 2: 断开模块 6-VTUG 阀岛的 AP 电缆

AP System Error
Error
Error
Occurred
- Occurred
C modulos
omodules
connected
1 module
having
naving error
MadulaNa
Viodule No.6
having latest
error
3559
3559
RUE
18 6
19 1
ors 20 6
ual Chapter 9-
scription
mmunication to a module has fa
start AP system.
eck communication cable (AP)

确认并正确连接 AP 线缆后,可通过触发 xRestart 进行 AP 系统重启故障复位。

Expression	Туре	Value	Prepare
ReadDiag_Enable	BOOL	TRUE	
AP_System_Restart	BOOL	TRUE	
Diag_FB_Active	BOOL	TRUE	
Diag_AP_Error	BOOL	FALSE	
AP_ActiveModules	UINT	6	
AP_NumOFActiveErrors	UINT	0	
AP_Latest_Error_ModuleNo	UINT	0	
🗏 🛷 AP_ModuleDiag_Data	ARRAY [1150] OF Festo_CPX_A		
🗷 🤣 AP_ModuleDiag_Data[1]	Festo_CPX_AP_EC.stModuleDiagD		No Error
🗷 🗼 AP_ModuleDiag_Data[2]	Festo_CPX_AP_EC.stModuleDiagD		Modulos
AP_ModuleDiag_Data[3]	Festo_CPX_AP_EC.stModuleDiagD		wodules
🗷 🗼 AP_ModuleDiag_Data[4]	Festo_CPX_AP_EC.stModuleDiagD		
🗷 🗼 AP_ModuleDiag_Data[5]	Festo_CPX_AP_EC.stModuleDiagD		
AP_ModuleDiag_Data[6]	Festo_CPX_AP_EC.stModuleDiagD		
🗼 udiModuleDiagState	UDINT	1	
uiActiveDiagnosisCount	UINT	0	
🔌 uiSubModule	UINT	0	
🔌 uiChannel	UINT	0	
🖗 udiDiagnosisCode	UDINT	0	
eErrorDescription	EERRORDESCRIPTION	NO_ERROR	
🖉 xError	BOOL	FALSE	
CPX_AP_A_EC_Diag			
Festo_CPX_AP_EC.CPXAP_Diag			
ReadDiag_Enable xActive xActive	Diag_FB_Acti		

			15 70115
xEnable	xActive		Diag_FB_Active
uiEthercatAddress	xError		Diag_AP_Error
xRestart	uiActiveModules	6	AP_ActiveModules
	uiNumberOfActiveErrors	0	AP_NumOFActiveErrors
	uiModuleNo	U	AP_Latest_Error_Module
	aModuleDiagnosticData		AP_ModuleDiag_Data
	1001 xEnable uiEthercatAddress xRestart	1001 xEnable xActive 1001 uiEthercatAddress xError IE xRestart uiActiveModules uiNumberOfActiveErrors uiModuleNo aModuleDiagnosticData aModuleDiagnosticData	1001 xEnable xActive 1001 uiEthercatAddress xError IE xRestart uiActiveModules uiNumberOfActiveErrors 0 uiModuleNo 0 aModuleDiagnosticData 0

5 诊断功能

5.1 LED 诊断

Module diagnostics [MD]		
LED (red, green)	Meaning	Remedy
off	Logic supply PS not available.	Check connection of logic supply PS.
green light	Module diagnostics not active	-
flashing green 0.5 Hz	Module diagnostics active Degree of severity "Information" e.g. switching off load supply PL	-
flashing red 0.5 Hz	Module diagnostics active Degree of severity "Warning" e.g. parameterisation error	Take appropriate remedial action, e.g. check parameterisation.
red light	Module diagnostics active Degree of severity "Error" e.g. undervoltage in logic supply PS	Take appropriate remedial action, e.g. check logic supply PS.
flashing red 2 Hz	Module ramp-up not yet completed. System communication not yet initial- ised.	-
flashing green 2 Hz	Module identification (service function)	-

Tab. 23: LED module diagnostics [MD]

System diagnos	itics [SD]	
LED (red,	Meaning	Remedy
green)		
\bigcirc	Logic supply PS not available.	Check connection of logic supply PS.
off		
	System diagnostics not active	-
green light		
	System diagnostics active Degree of severity "Information"	-
γ_{1}	e.g. load supply PL to a module not	
flashing green 0.5 Hz	available or firmware update in a module active.	
	System diagnostics active	
\sim	Degree of severity "Warning"	
flashing red	e.g. parametensation error in a moutie.	
0.5 Hz		
	System diagnostics active	
	e g sensor supply short circuit in a	
red light	module.	
	Module identification (service function)	-
flashing green		
2 Hz		

Tab. 24: LED system diagnostics [SD]

Load supply [PL]				
LED (red,	Meaning	Remedy		
green)				
green light	Load supply PL available.	-		
flashing green 0.5 Hz	Load supply PL not available.	Check load supply PL.		
flashing red 0.5 Hz flashing red	Load supply PL outside the tolerance range.	Check load supply PL.		

Tab. 25: LED load supply [PL]

Maintenance [MT]		
LED (yellow)	Meaning	Remedy
off	Maintenance not required.	-
	Maintenance required in at least one module in the automation system CPX-AP.	Carry out the necessary remedial meas- ures → Instructions for the applicable module.

Tab. 26: LED maintenance [MT]

EtherCAT oper	EtherCAT operating status [RUN]		
LED (green)	Meaning	Remedy	
on	Operational normal operating status	-	
flashes	Pre-operational Configuration of EtherCAT network	-	
flashes 1x briefly	Safe operational Only the input signals are updated. The outputs retain their current status.	-	
flickers	Bootstrap The interface is receiving a firmware update.	-	
off	Initialisation Normal status after switching on or after a restart	-	

Tab. 27: LED EtherCAT operating status [RUN]

EtherCAT error [ERR]

LED (red)	Meaning	Remedy
on	serious communication error Possible causes: - Application controller not responding - Watchdog timeout by ESC	Contact Festo Service → www.festo.com.
flashes	Configuration error, no network connec- tion Possible causes: - Line interrupted - No connection to master - Master is not active	Check network connections. Check the configuration and addressing of the interface.
flashes 1x briefly	EtherCAT state change from Operational to Safe-Operational due to synchronisa- tion error	_
flashes 2x briefly	Application watchdog timeout Watchdog timeout by the Sync Manager	-
flickers	Booting error Error (checksum) in application con- troller flash memory	-
off	no error	-

Tab. 28: EtherCAT error [ERR] LED

Connection status [LA X1], [LA X2]		
LED (green)	Meaning	Remedy
off	No network connection.	Check network connection.
flickers	Network connection OK. Data traffic activity.	-
on	Network connection OK. No data traffic.	-

Tab. 29: LED connection status [LA X1], [LA X2]

5.2 Emergency message 诊断

示例:断开模块 6-VTUG 阀岛的 AP 电缆。



Emergency error code	Categ	zory
0x2081	1	Current
0x3082	2	Voltage
0x4083	3	Temperature
0xF084	4	Pressure
0xF085	5	Motion
0x6386	6	Configuration/parameterisation
0x8087	7	Monitoring
0x8188	8	Communication
0xF089	9	Safety engineering
0x508A	10	Internal hardware
0x608B	11	Software
0xF08C	12	Maintenance
0xFF8D	13	Various
0xFF8E	14	Device-specific
0xFF8F	15	Customer-specific
0x9090	16	External device
0xF091	17	Security (data)
0x7092	18	Encoder

Tab. 33: Emergency error code

08 01	0127	AP Module Discon-	The AP syst	tem communication to a module has failed.
(13428	3559)	nected	Remedy	– Restart AP system.
			 Check communication cable (AP) 	

5.3 CPXAP_Diag 功能块诊断

参考 4.3.3 章节使用 CPXAP_Diag 功能块读取 AP 系统故障代码

5.4 Festo Automation Suite/Web 诊断

示例:断开连接在 Port1 口上的 IO-LINK 设备压力传感器 SPAN-LK--设备丢失故障

Step1.将 CPX-AP-A-EC 的 EC 状态机切换到 Init 状态

Devices 👻 🕈 🗙	POU_PRG CPX_AP_A	A_EC_M12_1 CPX_AP_A_EC_M12 X I ETHERCAT
□ 👘 TSDB_TEST_RECOVERED_2023-08-07T16-34-48NEW		
🖹 😳 折 Device [connected] (AM401-CPU1608TP)	General	State Machine
Q Device Diagnose	Process Data(PDO Setting)	Init Bootstrap
🗏 💥 Network Configuration		Current state: 初期化
🗐 EtherCAT Config	Startup parameters(SDO Setting)	Requested state: 初始化
🚽 LocalBus Config		Op ClearError
🖹 🗐 PLC Logic	Slots	EnE
🗄 🚫 Application [run]	Online	FOE
📲 👔 Library Manager		Download Upload
POU_PRG (PRG)	CoE Online	E2PROM access
🖹 🎆 Task Configuration		Write E2000M Dead E2000M Write E2000M YMI
	EOE settings	
ETHERCAT.EtherCAT_Task	ESC Register	
🖻 👹 MainTask		
POU_PRG	DiagHistory	
T PersistentVars	SharCAT VO Manajaa	
	EtherCAT I/O Mapping	
	EtherCAT IEC Objects	
HIGH_SPEED_IO (High Speed IO Module)	· · · · · · · · · · · · · · · · · · ·	
	Status	
🖻 😏 📃 ETHERCAT (EtherCAT Master)	The Line	
CPX_AP_A_EC_M12 (CPX-AP-A-EC-M12)		
▲ M CPX_AP_A_EC_M12_1 (Interface Modules)		
···▲ 📆 CPX_AP_A_8DI_M12_5P (Digital Modules)		
CPX_AP_A_16DI_D_M12_5P (Digital Modules)		
····▲ 💮 CPX_AP_A_8DO_M12_5P (Digital Modules)		
▲ 🕤 VAEM_L1_S_12_AP (Pneumatics VTUG)		

Step2.断开 EC-IN 的网线,并连接 EC-OUT 到 PC



Step3: CPX-AP-A-EC 的 OUT 口默认 IP 地址为: 169.254.29.16,将电脑 IP 设置同一个网段。

- Ethernet 属性	Internet Protocol Version 4 (TCP/IPv4) 属性 X
网络 身份验证 共享	常规
连接时使用: 🚽 TwinCAT-Intel PCI Ethernet Adapter (Gigabit) V2	如果网络支持此功能,则可以获取自动指派的 IP 设置。否则,你需要从网 络系统管理员处获得适当的 IP 设置。
配置(C) 此连接使用下列项目(O):	 ○ 自动获得 IP 地址(O) ● 使用下面的 IP 地址(S):
E	IP 地址(I): 169.254.29.224
	子网掩码(U): 255 . 255 . 255 . 0
 ✓ ¹/₂QoS Packet Scheduler (M GAL) ✓ ¹/₂QoS Packet Scheduler (M GAL) ✓ ¹/₂ Internet Protocol Version 4 (TCP/IPv4) 	默认网关(D):
Microsoft Network Adapter Multiplexor Protocol Microsoft LLDP Protocol Driver	自动获得 DNS 服务器地址(B)
	 使用 F 回的 DNS 服务器地址(E): 首选 DNS 服务器(P):
交表(N) □=型(U) //#注(K) 描述	备用 DNS 服务器(A):
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.	□退出时验证设置(L) 高级(V)
	确定 取消

5.4.1 FAS 诊断

=	AUTOMATI New Project	ON SUITE	*	Q	0								- c	STO
D	evice Scan	(la de la della d										
Device I	Name							1+	2 S	>	ap_i_ec			
Status	Device Na	ame	Devie	е Туре			Address	Subnet Mask	Firmwar	e A	P-A-EC			
8	▶ ap_i_ec		AP-A	-EC			169.254.29.16	255.255.0.0	1.5.33-76	54	9.254.29.16			
故障发生	ŧ													
		< Actions	Diagnosis	↑	₫ 3	-					Device Details	Actions		
+#+b-6		SError	Warning	1.51	ormation						Identification			
候 失 ³ 发 生 了 i	设备丢失	Module: 5 S Diagld=0x0	ubmodule:1 80A01A9 (No E	evice						_	Reboot			
đ	障	EventCode=	=0x1800)								Firmware			
		i mcd (0) multicast da	06:2 emon started	0:49							Network Settir	igs		
	,	i netconfigd	(0) 06:2	0:49							Device Name			
		- Current gate	eway has chang	jed.						3	Diagnosis Clic	<u>sk</u>		
		Current IP h	(0) 06:2 las changed.	0:49							Open Device V	Veb Page		



PARAMETERIZAT	ION	DIAGNOSIS	PARAMETERIZATION	DI	AGNOSIS						
CPX_AP_A_EC CPX-AP-A-EC-M Path: 169.254.29 Disconnected	12	Connect	CPX AP A_EC CPX-AP-A-EC-M12 Path: 169.254.29.16 Connected	E	Disconnect				l	事件状态 Resolve:故障恢复	5
Navigation	<	Terminal	Navigation <	Error L	og 故障等级	模块编号	故障代码		子模块编号	Raise:故障发生	距离最近一次系统后
Terminal			Terminal	Index	Category	AP Address	ID	Name	Origin	Event	Timestamp
▼ Modules			 Modules 	0	Error	5	D08 0A 001A9	No Device	Sub module (1)	Resolve	06:34:29.8309592
CPX-AP-A-EC-M12			CPX-AP-A-EC-M12	1	Error	5	D08 0A 001A9	No Device	Sub module (1)	Raise	06:34:14.3772478
CPX-AP-A-8DI-M			 CPX-AP-A-8DI-M 	2	Error	5	D08 0A 001A9	No Device	Sub module (1)	Resolve	06:32:51.6883840
► CPX-AP-A-16DI-D			 CPX-AP-A-16DI-D 	3	Error	5	D08 0A 001A9	No Device	Sub module (1)	Raise	06:24:55.0853958
 CPX-AP-A-8DO 			 CPX-AP-A-8DO 	4	Error	5	D08 01 00130	AP module p	Module	Resolve	06:19:39.6836704
 CPX-AP-A-4IOL 			CPX-AP-A-4IOL Sustem State	5	Error	6	D08 01 00130	AP module p	Module	Resolve	06:19:39.6835852
			Fror Log	6	Error	3	D08 01 00130	AP module p	Module	Resolve	06:19:39.6835706

5.4.2 Web 诊断

浏り	刘览器输入 169.254.29.16 可得到如下页面:											
\leftarrow	С	G	▲不	安全	169.254.29.16/cgi-bin/ap-terminal	A»	☆	¢	(3 {≦	Ē	~~	1
	AP-A	A-EC	AP	Ethe	rCAT → Configuration → System →				F	ES	то	

Terminal



Modules

Мо	Nodules										
Slot	Module	Code	FWVersion	Serial	Productkey	Identify	Diagnosis				
1	CPX-AP-A-EC-M12	12422	1.5.33	0x0004CBDC			ОК				
2	CPX-AP-A-8DI-M12-5P	12297	1.100.10	0x00052030	CXD20MXY1MG	\bigcirc	ОК				
3	CPX-AP-A-16DI-D-M12-5P	12289	1.100.10	0x00051AA5	GCDS6DRQWWM		ОК				
4	CPX-AP-A-8DO-M12-5P	12293	1.100.13	0x00056E39	DMGFSGNJ7YR	\bigcirc	ОК				
5	CPX-AP-A-4IOL-M12	12304	1.5.12	0x0005EDE7	NTGZB5ZS3N8		😵 No Device EventCode=0x1800 (0x080a01a9)				
6	VAEM-L1-S-12-AP	8203	1.100.13	0x00008E8A	3S7PNXLS08L	\bigcirc	ОК				

诊断界面可通过菜单栏进入

AP-A-	EC AP EtherCAT	C	System -						FESTO
0	17197.574000	EtherCAT	Diagnosis	n	080101C4 (AP Modul	le(s) detected)		
0	17205.967207	EtherCAT	About		080101C4 (AP Modul	le(s) detected)		
\otimes	17206.033533	EtherCAT	292	Module: 6	DiagId=0x08010124	(AP master lo	st)		
٢	17206.034461	EtherCAT	292	Module: 6	DiagId=0x08010124	(AP master lo	st)		
0	17223.511786	netconfigd	0	Current g	ateway has changed.				
0	17223.512790	netconfigd	0	Current n	etmask has changed.				
0	17223.520308	netconfigd	0	Current g	ateway has changed.				
٢	17662.416759	EtherCAT	425	Module: 5	Submodule:1 DiagId=	=0x080A01A9	(No Device Event	Code=0x1800)	
0	17704.770152	netconfigd	0	Current IF	^o has changed.				
0	17704.770535	netconfigd	0	Current g	ateway has changed.				
0	17704.816524	mcd	0	multicast	daemon started				
٢	18684.657695	EtherCAT	425	Module: 5	Submodule:1 DiagId=	=0x080A01A9	(No Device Event	Code=0x1800)	
•	18700.157913	EtherCAT	425	Module: 5	5 Submodule:1 DiagId=	=0x080A01A9	(No Device Event	Code=0x1800)	
۲	18700.157913	EtherCAT	425	Module: 5	Submodule:1 Diagld=	=0x080A01A9	(No Device EventC	Code=0x1800)	
Туре	Uptime 红色X:)故障发生 灰色X:)故障恢复	Application 距离最近一次系	Error	Message		模块5上的 设备	JPort1发生了 医失故障		
	蓝色!:信息	统启动的时间戳							

6 其他功能

6.1 WebServer 功能简介

1.导出	ESI 文件,修改档	莫块参数,查	f看各类f	言息					
С	₲ ▲ 不安全 16	39.254.29.16/cgi-bir	n/ap-terminal			A" r	2 🙂 🗘	€ @	∞
AP-A-	EC AP EtherCA	.T ▼ Configurat	tion - Sys	stem -				FEST	ГО
Ter	TwinCA	T Slave Informatio T Startup Comman	ids XML	EtherCAT	从站设备描述文件				
						AP线缆长度	供电电压	过程数据	
Мо	dules								×
Slot	Module		Code	FWVersion	Serial	Productkey	Identity	Show	
1	CPX-AP-A-EC-M12	click	12422	1.5.33	0x0004CBDC			Process Data	
	AP Id/Instance Parame	ter		Startup Va	alue			Supply Voltage Cable Informat	es tion
	20022:0 Setup m	onitoring load supp	oly (PL) 24 V	DC yes	Load supply monitoring a	ctive, diagnosis suppressed in c	case of switch-off	click	~
			Se	et Parameter	Load supply monitoring in Load supply monitoring a	active ctive, diagnosis suppressed in c	case of switch-off		
2	CPX-AP-A-8DI-M12-5P		12297	1.100.10	Load supply monitoring ac	CADZONAT ING		OK	
3	CPX-AP-A-16DI-D-M12	-5P	12289	1.100.10	0x00051AA5	GCDS6DRQWWM	\bigcirc	ОК	

2.模块参数操作



Stored parameter values file

\bigcirc Restore default parameter values	s 恢复出厂参数
Store current parameter values	保存当前参数
\bigcirc Upload stored values from file	从文件上载参数
	Browse

用户名: admin 密码: 产品序列号(可通过两种方法查询)

取消

方法 1: 产品硬件查询

密码



方法 2: FAS 软件查询

Device	Name					> ap_i_ec	
Status	Device Name	Device Type	Address	Subnet Mask	Firmware	AP-A-EC	
0	▶ ap_i_ec	AP-A-EC	169.254.29.16	255.255.0.0	1.5.33-7654f6fce.20220520	169.254.29.16	PESTO
		< Actions Device Nam Device Type Serial Numb	Device Details e: ap_i_ec : AP-A-EC er: 50FE0D000702	000700711D7345D			
		ProductKey: Part Numbe NOC: Firmware:	Serial Number: S0E50000702000702000701107345b- ProductKey: JSKISN6PWXP Part Number: 8129243 NOC: unknown Firmware: 1.5.33-7654f6fce.20220520				Actions
		DHCP: Address: IP Netmask: Gatawar	no 169.254.29.16 255.255.0.0			Identification	
		DNS: MAC:	0.0.0.0 00:0E:F0:70:0A:	01		Firmware	
		State:	Operational			Network Settings	š





2.AP	从站固件升级						
=	AUTOMATION SUITE New Project*	Q 0	CPX_AP_A_EC	×			♣ - □ × FESTO
	Device Scan						
Device	Name				1+	¢ C	> VAEM-L1-S-12-AP
Status	Device Name	Device Type	Address	Subnet Mask	Firmware		VAEM-L1-S-12-AP
0	▼ ap_i_ec	AP-A-EC	169.254.29.16	255.255.0.0	1.5.33-7654f6fce.20220520		
۹	CPX-AP-A-8DI-M12-5P	CPX-AP-A-8DI-M12-5P	2		v1.100.10-0-gbf1cebfc		
ø	CPX-AP-A-16DI-D-M12-5P	CPX-AP-A-16DI-D-M12-5P	3		v1.100.10-0-gbf1cebfc		•
ø	CPX-AP-A-8DO-M12-5P	CPX-AP-A-8DO-M12-5P	4		v1.100.13-0-g7159f426		•
ø	CPX-AP-A-4IOL-M12	CPX-AP-A-4IOL-M12	5		v1.5.12		•
ø	VAEM-L1-S-12-AP	VAEM-L1-S-12-AP	6		v1.100.13-0-g7159f426 select		
	< Fir VAEM-L1-S-12-AP-	-v1.100.13-0-a7159f426-lib	< Actic	ons Firn	ware T		Actions
	▲ VAEM-L1-S-12-AP-	-v1.100.13-0-g7159f426		1.100.13	eliek		Device Details
	Firmware VAEM-L1-:	S-12-AP,CPX-AP-I 8/8/2022	v	VAEM-L1-S-12-AP	v1.100.13-0-g71591426-li		Identification
	Release Notes :	0,0,ESEE	 📀	V1.43.10 VAFM-I 1-S-12-AP	v1.43.10-libap v1.46.4.ffwp	_	Firmware click
	Features: • New Diag VALVE DEFECT	T (ID: 0x07060268)				_	Support
	New Startup parameter t VALVE DEEECT Diag. (ID: 20)	co enable/disable				_	Add to Project
	New Function: Remanent Improve UELSEN monito	t Condition Counter					
	Identify-Command supplements	ort by AP-Master (activates					
	Added diagnostic messa	ge when device is running					
	trom its rescue image (e.g. a	alter inniware update	ck				
	Transfer	to Device		Loca	File		

7 帮助

7.1 附录1

CPX-AP-A-EC 手册:

https://www.festo.com.cn/cn/zh/support-portal-specific/?query=cpx-ap-a-ec&groupId=3&productName=cpx-ap-a-ec&documentId=655213

CPX-AP-A-4IOL手册:

https://www.festo.com.cn/cn/zh/support-portal-specific/?query=8129114&groupId=3&productName=IO-Link+%E4%B8%BB%E7%AB%99&documentId=656671

VAEM-L1-S-**-AP 手册

https://www.festo.com.cn/cn/zh/support-portalspecific/?query=8081923&groupId=3&productName=%E7%94%B5%E6%8E%A5%E5%8F%A3&documentId=658933