SMS 简易运动电缸通过 Festo IO Link Tool 升级固件 v19 v19 固件支持 Pos_{imp}中间定位模式



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关键词:

Festo IO Link Tool, SMS 简易运动电缸, CPX-AP-I 系统, 固件升级, 直接定位模式

摘要:

本文介绍了通过 Festo IO Link Tool (简称为 IO Link Tool)软件和基于 CPX-AP-I-4IOL-M12 主站模块升级从站 SMS 简 易运动电缸的固件版本。通过 IO Link Tool 工具使用 SMS 新版本的临时存储功能 RAM,测试中间定位模式。

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 产品有一定了解。

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 软件版本

1.1 硬件软件版本

名称	版本	备注
Festo IO Link Tool	V5.1.1	Festo 官网下载
CPX-AP-I-EP-M12	V1.3.1	通过 FAS/FFT 升级固件
CPX-AP-I-4IOL-M12	V1.4.13	通过 FAS 升级固件
EGSS-BSIODD 文件	EGSS-BS-20210504-IODD1.1	Festo 官网下载
EGSS/EMCS-ST	V16.0.17.87	出厂硬件固件

1.2 网络拓扑



2 操作过程

2.1 IO Link Tool 软件设置

可通过以下两种方式进行<mark>主站</mark>的基本配置:

● 离线配置(标识 2): Catalog 产品目录→Master 主站,拖动 AP-EP 主站到 Topology(标识 1)的视图中。

Nesto IO-Link Tool - [(192.168.0.50) CPX-A	AP-I-EP]							– 0 ×
File Options View Help	Logged	in as Specialist -						_ & ×
(192.168.0.50) CPX-AP-I-EP						То	pology	Search Master
i y 🖉 🖉 🖉 🖓 🕨 📩 🖓						6	EtherNetIP	
Common Port Config Settings							(192.168.0.50) CPX-AP-I-EP	
Vendor	Mandan	Freedow .			1			
	Vendor	Pesto Dx014D						
FESTO								
Product								
	Product name	CPX-AP-I-EP]	L		
	Description	Festo CPX-AP-I decentralised remote I/O system		^		Ca	talog	Filter
				~			⊟-C]] Master ⊟-C]] Festo	^
1.5 25 25 Lunu	IOLM	Festo-CPX-AP-I-EP-20210430-IOLM1.5.xml					Chercat	
	IOLM Revision	1.0			_		2 EtherNet/IP	
	FW Revision		IOLM Device ID	0x7B6452			PROFINET	
Main Communication Interface				Enter IP Address				
	Fieldbus Vendor ID	0x001A	Fieldbus Device ID	IP Address	192.168.0.50 ~		⊜-⊂] IO-Link ⊜-⊂] Festo	
EtherNet/IP	Fieldbus DD				Cancel Ok		ia-C] EGSS ia-C] EGSS-BS	
				-			EGSS-BS-KF-3	12 (IOL1.1) 15 (IOL1.1)
	IP Address 3	192.168.0.50 MAC Address	00:0E:F0:63:EC:5C]		EGSS-BS-KF-6 EGSS-YE-BS-F	60 (IOL1.1) KF-32 (IOL1.1)
Tool Communication Interface							EGSS-YE-BS-H	KF-45 (IOL1.1) KF-60 (IOL1.1)
	Tool Communication Type	TMG_SMITCP					EGSS-BS-KF-3	2-25-8P-ST-M-H1-PLK-AA (IOL1.1)
	Connection Reference	192.168.0.50	Unique Identifier 00:	0E:F0:63:EC:5C			EGSS-BS-KF-3	2-75-8P-ST-M-H1-PLK-AA (IOL1.1)
							EGSS-BS-KF-4	5-25-10P-ST-M-H1-PLK-AA (IOL1.1)
							EGSS-BS-KF-4	IS-50-10P-ST-M-H1-PLK-AA (IOL1.1) IS-75-10P-ST-M-H1-PLK-AA (IOL1.1)
							EGSS-BS-KF-4	5-100-10P-ST-M-H1-PLK-AA (IOL1.1 I5-125-10P-ST-M-H1-PLK-AA (IOL1.1
							EGSS-BS-KF-4	5-150-10P-ST-M-H1-PLK-AA (IOL1.1
							EGSS-BS-KF-6	0-75-12P-ST-M-H1-PLK-AA (IOL1.1)
							EGSS-BS-KF-6	0-125-12P-ST-M-H1-PLK-AA (IOL1.1
							EGSS-BS-KF-6	0-150-12P-ST-M-H1-PLK-AA (IOL1.1 0-200-12P-ST-M-H1-PLK-AA (IOL1.1
							EGSS-BS unit	with EMCS-ST-42 (IOL1.1) with EMCS-ST-57 (IOL1.1)
							GSS-BS unit	with EMCS-ST-42 (IOL1.1) with EMCS-ST-57 (IOL1.1)
						-	<	>
						1		~

● 在线搜索(标识1):不确定产品型号的情况下使用。在 Topology 区,使用 Search 按钮搜寻 AP 主站模块,例如 CPX-AP-I-EP-M12(EP 主站),然后点击确认自动添加进 Topology 区

注意: IO Link 从站需要手动配置,请按 2.2 步骤进行。

2.2 添加新版 IODD 文件

- Catalog 界面,点击右键→Import IODD。
- 菜单 Option——Import IODD→Path 目录下选择最新下载的 IODD(2021 版本)
- 软件<mark>内置 IODD</mark>版本是早期版本,无固件升级 FW update 功能,旧版本文件都是在 Festo AG&Co.KG 目录下。
- 新导入的 IODD 文件都是在 Festo 目录下, 刷固件的时候注意只能用新版本。
- 若添加文件版本错误,也可以找到设备在线模式下确认详细版本号。
- 导入时可以用不同设备的,操作的时候,请使用与 SMS 产品一致的 IODD 文件,文件仅作示意。

注意: IODD 基于 IO link V1.1 版本,此处描述的是 Festo 文件发布的版本号,如,最新 V1.2.7,旧的则是 V1.2.6,

V1.0.21, 而文件上只显示 20210504 发布时间对应最新版本 V1.2.7,因此使用 2021 以及更新版本的 IODD 才可以刷固件。



2.3 IO Link 主站端口设置

2.3.1 进入 AP 系统的 IO Link 端口配置页面(标识	1),	右键点击空白处	(标识2)	然后进入	Configure Station 界面。
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0	Festo IO-Link Too	ol - [((192.168.0	.50) CPX-A	P-I-EP]		
(📎 File Opti	ions	View	Help	Logged in a	as Specialist -	
(1	92.168.0.50) CPX-A	P-I-EF	2				
	- 0 P _M		44	P.			
	1 Port Config	Se	ettings				
	Ports						_
	Port		Mode		Vendor	Device 0 I	
					2 Configure Stati	ion	

2.3.2Configure Station 界面中需要添加 CPX-AP-I-4IOL-M12 主站模块,点击 Add 添加 1 个。 请按网络中模块的实际数量添加。

Configure Station					×
Module Name	CPX-AP-I-4IOL	F	Festo IO-Link master with 4 ports type B		Add Delete
Address	1 🔹 0 🚖 0	€ 0 €		~	ok
Address	Module Type	Module Name		Nb of	Ports
				\searrow	

2.3.3 回到 Port Config 界面,从 Catalog 界面拖动 ELGS 产品到主站端口 1device 位置:

0	Festo IO-Link Too	l - [((192.168.0.50) CPX-	AP-I-EP]			Catalog	Filter
(File Opti 92.168.0.50) CPX-AF	ons P-I-EF	View Help		Logged in as Specialist -			-
: (Common Port Config Ports	Se	ettings					B 35-TB-KF-45 (IOL1.1 35-TB-KF-60 (IOL1.1 35-YE-TB-KF-45 (IOL 35-YE-TB-KF-60 (IOL 35-TB-KF-45-200-ST
	Port		Mode	Vendor	Device	0 1	😵 ELC 🌚 ELC	S-TB-KF-45-300-ST- S-TB-KF-45-500-ST-
	2 0 0 0, 1, 4	۲	IO-Link	Festo	ELGS-TB-KF-45-200-ST-M-H1-PLK-AA		@ ELC	S-TB-KF-45-600-ST- S-TB-KF-45-800-ST-
	2 0 0 0, 2, 4	۲	IO-Link				@ ELC	S-TB-KF-45-1200-ST S-TB-KF-45-1200-ST S-TB-KF-45-1500-ST
	20000, 3, 4	۲	IO-Link				@ ELC	S-TB-KF-60-200-ST-
	2 0 0 0, 4, 4	۲	IO-Link					3S-TB-KF-60-500-ST- 3S-TB-KF-60-600-ST- 3S-TB-KF-60-800-ST- 3S-TB-KF-60-1000-ST
								55-TB-KF-60-1200-ST 55-TB-KF-60-1500-ST 35-TB-KF-60-1800-ST 35-TB-KF-60-2000-ST 35-TB unit (IOL1.1) 35-TB unit (IOL1.1) KG

2.3.4 点击 Go Online 按钮(绿色三角)进行连接,点击 Write to Master 确认下载端口配置:

Port	1	Mode	Vendor	Device				0	Т		
2 0 0 0, 1, 4	۲	IO-Link	Festo	ELGS-TB-KF-45-200	ST-M-H1-PLK-AA						
2 0 0 0, 2, 4	۲	10-Link									
2 0 0 0, 3, 4	۲	10-Link									
2 0 0 0, 4, 4	۲	IO-Link									
							Synchronize Port Co Configured by PLC PLC connected The port configuration choose whether you u master. read from master	n figur C m or ma want to r	ation ster vt transfe	Module Configurat Port Configurat Master Variable atlables have been char ier the configuration from the configuration from write to master	uration Changed ion Changed es Changed nged. You can the master to the the tool to the Cancel
Port Config Det	ails										
Vendor ID	0x014D	Device ID	0x000259 Product ID	8083665		10-Link M	ode compatible	V1.1	\sim		
IODD	Festo-ELC	GS-TB-20210504-	IODD1.1.xml								
	Device PD) Length	Inputs 2	Dutputs 2							

٦

2.4 确认当前固件版本

在线模式自动进入 IO Link 从站参数页面。 若没有跳转,可以双击主站 Port1 的 EGSS 设备进入从站设置标签页。 找到 Identification 页面,读到 EGSS 原设备固件 v16.0.17.87:

Festo IO-Link Tool - [ELGS-TB-KF-45-200-ST-M-H1-PLK-AA @ CPX-AP-I-EP ()[2 0 0 0, 1, 4]]						
File Options View Help Logged in as Specialist						
(192.168.0.50) CPX-AP-I-EP 0[20000, 1, 4] ELGS-TB-KF-45-200-ST-M-H1-PLK-AA		<u></u>				
\Xi 🚔 🔸 🛧 📩 block write mode 🔹 🔸		- •				
Common Process Data Identification Deservation Parameter Diagnosis Scope Generic FW Update IODD						
Name	R/W	Value	State	Unit		
Vendor Name	ro	Festo AG & Co. KG	d			
Vendor Text	ro	http://www.festo.com	d			
Product Name	ro	EGSS-BS-KF-45-50-10P-ST-PLK				
Product ID	ro	8087641	d			
Part Number	ro	8087641	d			
Product Text	ro	Simplified Motion Series	d			
Serial Number	ro	3S7PPJW0QHH	d			
Hardware Revision	ro	V0718_C66	d			
Firmware Revision	ro	V16.0.17.87_release	d			
Hardware Identification Key	ro	BOOTLOAD_FW	d			
Application-specific Tag	rw		d			
Function Tag	rw		d			
Location Tag	rw		d			
V0718_C66 V16.0.17.87_release BOOTLOAD_FW						

2.5 对比旧固件参数页面

2.5.1 旧界面 V16 版本固件:显示部分参数红色 W,则是固件无此参数,无法同步。 绿色 d 状态则是与设备正常同步参数。

注意:下图红框部分为 Enable File Handling 和 Execute firmware update。需要打开才可以进行文件下载和固件更新。 默认是 Disabled,需要切换到图示 Enable 状态,即显示完整文字的状态。

若没提前激活,在步骤 2.7 下载升级过程完成后点击也可以让新的固件文件生效。

Print Option Ver Help Legard in as Specialist CDR 100 00 CP-d-tP (DEDDDDD, 2, 4] EEE-0-1-2-4-45-00-00-2-1-4-0-45-0-45-0-45-0-45-0-45-0-45-0-45-	Festo IO-Link Tool - [EGSS-BS-KF-45-50-10P-ST-M-H1-PLK-AA @ CPX-AP-I-EP ()[2]0]0[0, 1, 4]]						
(10): Discover-ter:	File Options View Help Logged in as Specialist						
Image: Second	(192.168.0.50) CPX-AP-I-EP ()[2 0 0 0, 2, 4] EGSS-ES unit with EMCS-ST-42 ()[2 0 0 0, 1, 4] EGSS-ES-EF-45-50-10F-ST	T-M-H1-PLK-AA ()[2]	0 0 0, 3, 4] ELGS-BS-BF-45 () [2 0 0 0, 4, 4] EGSS-BS unit	with EMCS-ST-	42		
Come Prevent Points Mathification (Asservation) Preventer	🔚 🛃 🕂 🕇 🕇 block write mode 🔹 🔸						
Jean Note Derive Averas Loka. Load Harr Later fore Preter Note Note Briter Averas Loka. Load Harr Later fore rr Note Note Note Speed Tan' rr 108 4 1 Fores rr 108 4 1 Informant rr 108 4 1 Informant rr 108 4 1 Informant rr 108 4 4 Informant rr 108 4 4 Informant rr 108 4 4 Informant rr 109 4 4 Informant rr 109 4 4 Informant rr 109 4 4 Informant rr 100 4 4 Informant rr 100 4	Common Process Data Identification Observation Parameter Diagnosis Scope Generic FW Update IODD						
[-] Cartal parameter rr Market Market Laker La	Nane E/W Value						
Provie Acress Lock Local Var Interface rr 98 4 Speed Th' rr 98 4 Forces rr 98 4 Interacts Takinani Arrants rr 108 4 5 Interacts Takinani Arrants rr 108 5 5 5 Interacts Takinani Arrants rr 108 5 <td>[-] Control parameters</td> <td></td> <td></td> <td></td> <td></td> <td></td>	[-] Control parameters						
Speed Ta' rr 108 1 Speed Ta' rr 108 4 Fores rr 108 4 Informas rr 108 4 Information Tort rr 108 108 Syste Coma	Device Access Locks Local User Interface	rw Unlock	ked	•	d		
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Execute file handling	Enable file handling	rw Enable	e file handling	•	d		
rw Enable file handling . rw Execute firmware update .	Execute file handling	rw Execut	te firmware update	•	d		
rw Enable file handling				_			
rw Execute firmware update	Test 1 Cite Las Dias						
rw Execute firmware update -	is ruspic life venoring						
	rw Execute firmware update			*			

2.5.2 加载 V19 固件文件

在"FW Update"页面导入 v19.0.4.107 版本的 EMCS 固件文件

点击 Update 按钮

注	意	:	

此文件对应电机型号 EMCS-ST 的 V19 固件, SMS 的电缸都	需要刷电机固件。		
Festo IO-Link Tool - [EGSS-BS unit with EMCS-ST-42 @ CPX-AP-I-EP ()[2](0](0], 2, 4]]			
File Options View Help Logged in as Specialist			
(192.168.0.50) CPX-AP-I-EP ()[2 0 0 0, 2, 4] EGSS-BS unit with EMCS-ST-42 ()[2 0 0 0, 1, 4] EGSS-BS-KF-45-50-	0P-ST-M-H1-PLK-AA ()[2 0 0 0, 3, 4] 1	ELGS-BS-KF-45 ()[2 0 0 0, 4, 4] EGSS-BS	5 unit with EMCS-ST-42
Common Process Data Identification Observation Parameter Diagnosis Scop 1 FW Update IODD			
Vendor ID 0x014D 333 HW-ID-Key			
Boot Mode Available Firmware Packages Current FW Revisio		2	Import Firmware Package
Firmware Package		FW Revision Re	lease Date IODD PW
Festo-EMCS_ST_V019.0.4.107_release-20210315-IOLFW1.0.ioffw		2338 202	1-03-15
			11 ²
Description Firmware for Simplified Motion Series Unit - V019.0.4.107		rassword	View
			~ ~
Info Message			A
Resource State			Update Firmware
			opaare III maare
			· · · · ·

2.5.3 弹出确认界面"请勿在升级过程中中断设备连接",点击 OK 确认下一步。

IO-Link Device Tool						
Firmware Revision: V16.0.17.87_release Product Name: EGSS-BS-KF-45-50-10P-ST-PLK	^					
Firmware update will start now. Please do not disconnect the device until the update has been finished. Do you want to start?						
Do not show this message again cancel ok						

2.6 等待升级过程

V19 文件传输速度与网络相关,设备网络不稳定可能造成更新时间较长,达到 30min。请耐心等待。 注意:

受限于软件版本和设备网络连接可能不稳定,开始时偶尔出现无法重启 IO Link 设备状态。 <mark>请重新点击更新按钮</mark>。

Common Process Data Identification Observation Parameter Diag	gnosis Scope Generic FW Update	IODD					
Vendor ID 0x014D 333 HW-ID-Key BOOTL	LOAD FW						
Boot Mode not activ	ive						
Available Firmware Packages Current FW Revision V16.0.1	17.87_release				Impor	t Firmware Package	
Firmware Package				FW Revision	Release Date	IODD P	w
Festo-EMCS_ST_V019.0.4.107_release-20210315-IOLFW1.0.ioffw				2338	2021-03-15		
new Device IDs 🗸 🗸				Password		Vi	ew
Description Firmware for Simplified Motion Series Unit - V019.0.4.10	107						^
							\sim
Info Message							^
							\vee
Resource	State					Update Firmwan	e
	Password accepted.						^
	Device does not reboot for bootmode						
	Please try again.						
							~

重新点击更新固件按钮后启动 Blob 文件传输模式。 Finish 提示之后,重启整套设备。

State
Rich transfer CBC check ok
Blob transfer finished successful.
Activation ok.
Device does not reboot after firmware activation

2.7 在 Identification 标签页确认固件版本已更新

🗞 Office AP EP ELGS Festo IO-Link Tool - [ELGS-TB-KF-45-200-ST-M-H1-PLK-AA 💿 CPX-AP-I-EP (192.168.0.50)[2]0]0]0, 1, 4]]						
File Options View Help Logged in as Specialist •						
(192.168.0.50) CPX-AP-I-EP (192.168.0.50)(2000), 1, 4] ELGS-TB-KF-45-200-ST-M-H1-PLK-AA						
E E + + + I block write mode						
Common Process Data Identification Observation Parameter Diagnosis Scope Generic FW Update IODD						
Name	R/W	Value				
Vendor Name	ro	Festo				
Vendor Text	ro	http://www.festo.com				
Product Name	ro	EGSS-BS-KF-45-50-10P-ST-PLK				
Product ID	ro	8087641				
Part Number	ro	8087641				
Product Text	ro	Simplified Motion Series				
Senial Number	ro	3S7PPJW0QHH				
Hardware Revision	ro	REVA				
Firmware Revision	ro	V19.0.4.107_release				
Hardware Identification Key	ro	BOOTLOAD_FW				
Application-specific Tag	rw					
Function Tag	rw					
Location Tag	rw	•••				

3 中间定位模式操作

3.1 状态机

固件在 V19.0.4.107 以上, IO link 控制模式支持基本直接定位模式。 其余详细参数需要参考 EMCS-ST 电机的参数手册,202108C 版。 Pos_{imp}状态图:



过程数据控制字:

Start_{imp}——启动中间定位运动 Start_{in}——启动 In 位置/Lim_{in} Start_{out}——启动 Out 位置/Lim_{out}

过程数据中的状态字: Pos_{imp}——中间位置已到位 Pos_{in}——In 已到位 Pos_{out}——Out 已到位

使用到的系统参数: Pos_{imp}——中间位置数值,参数 264.0.

3.2 设置中间位置定位操作.

- 1 打开系统参数 Parameter 界面
- 2 设定位置,输入 Intermediate Position 参数,mm 单位,输入示例 15.0mm。
- 3 点击下载按钮同步参数,等待该参数同步,显示绿色 d 状态
- 4 点击 Execute" Move Intermediate"执行直接定位

Office AP EP ELGS Festo IO-Link Tool - [EGSS-YE-BS-KF-45 @ CPX-AP-I-EP (192.168.0.50)[2]0]0[0, 1, 4]]				
File Options View Help Logged in as Specialist				
(192.168.0.50) CPX-AP-I-EP (192.168.0.50)[2]000, 1, 4] EGSS-YE-BS-KI-45				
3 + + + I block write mode				
Common Process Data Identification 1 Parameter Diagnosis Scope Generic FW Update IODD				
Name	R/W	Value	Sta	e Unit
[-] Control parameters				
Device Access Locks.Local User Interface	rw	Unlocked	r d	
Speed "Out"	rw	10%	r d	
Speed "In"	rw	10%	r d	
Force	rw	10%	r d	
Reference	rw	false	r d	
Execute "Reference" Movement	wo			
Position "Start Press"	rw	0.00	d	mm
End Position "Out"	rw	30.00	d	mm
Intermediate position 2	rw	15.00	d	mm
Quit Error	wo			
[-] System commands				
System Command	wo	Execute "Move In"		
System Command 4	wo	Execute "Move Intermediate"		
System Command	wo	Execute "Move Out"		
System Command	wo	Stop motion		
System Command	wo	Disable power stage		
System Command	wo	Enable power stage		
System Command	wo	Restore factory settings		
System Command	wo	Execute "Reference" Movement (False)		
System Command	wo	Execute "Reference" Movement (True)		
[-] Parameter storage				
Auto store active	rw	true	- d	
Number of storage operations	ro	20	d	
Store parameters	wo			
[-] File handling commands				
Enable file handling	rw	Enable file handling	d	
Execute file handling	rw	Please make a choice	d	

3.3 读取当前位置

- 1 进入观察 Observation 界面
- 2 确认当前位置已经到达 15.0mm

3 过程数据状态位, State" Intermediate"为 True. 状态与 State In/ State Out 一致

Common Process Data Identification Observation Parameter Diagnosis Scope Generic FW Update IODD				
Name	R/W	Value	State	Unit
Current position	ro	15.00	d	mm
Current speed	ro	0.10	d	mm/s
Current force	ro	-5	d	N
Current temperature	ro	36	d	°C
Current electric current	ro	0.0	d	A
Current electric voltage	ro	24.1	d	V
Number of cycles total	ro	6	d	
Number of cycles since reset	ro	6	d	
Mileage total	ro	0.000281	d	km
Mileage since reset	ro	0.000281	d	km
Reset cycle & mileage	wo			

4 常见问题 FAQ

- 可使用其它 AP 主站模块进行升级:
 - 。 CPX-AP-I-EC-M12版本在 1.4.30以上,通过 CPX-E-CEC 的 EOE 功能与 PC 连接
 - 。 CPX-AP-I-PN-M12版本在 1.2.24以上,与 EP 模块一样直接连接 PC
- CDSU-1 工具可以直接连接 SMS 产品,同样更新固件,但是工具硬件固件版本要 v2.0 以上。
- Festo IO Link Tool 工具需要一定权限才能读取 C 盘的 IODD 文件。若权限受限会弹出文件不能读取的故障信息,此时 Catalog 页面无 IODD 文件。关闭后,右键→通过管理员打开,可以临时解决。如下图:

Microsoft INET Framework	×
Unhandled exception has occurred in your application. If you click Continue, the application will ignore this error and attempt to continue. If you click Quit, the application will close immediately.	
Details Continue Quit See the end of this message for details on invoking just-in-time (JIT) debugging instead of this dialog box. Exception Text Exception Text System.NullReferenceException: Object reference not set to an instance of an object at IOLDT_Main.fmMain.0() at IOLDT_Main.fmMain.0(Object , EventArgs) at System.EventHandler.Invoke(Object sender, EventArgs e) at System.Windows.Forms.Form.OnLoad(EventArgs e) at System.Windows.Forms.Form.OnCreateControl()	а х
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