# Omron PLC 通过 EthernetIP 控制 YJKP

组态与功能块调用



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### 关键词:

EtherNet/IP, YJKP, Omron, SYSMAC Studio

#### 摘要:

本文介绍了 Omron PLC 通过 EherNet/IP 总线通讯控制 YJKP 压机时,组态和功能块调用的步骤。

### 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 YJKP 压机以及 Omron SYSMAC Studio 有一定了解。

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我们会持续更正和更新文档内容, 恕不另行通知。

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### 1.1 YJKP 总线模式设置

YJKP 需要设置为 Host 主机 模式,同时总线选择 EtherNet/IP 形式



#### 1.2 YJKP 外部接线

压机运行在总线模式下:

短接 X17.4.2 和 X17.4.1,即将 X17.4.2 输入信号短接 24V,具体见下图: 其他接线请参考相关说明书。

	X17 (.07	7)					Digital Input	X18 CAN 2	-
	X19 (.03	8)	Ar	nalog Input	X20 (.	.07)		Digital Output	2
-	X17.0	X17.1	X17.2	X17.3	X17.4			X18	1
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					123			1234	
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	X19.0								
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# 2 Omron PLC 侧配置

### 2.1 EDS 文件安装

Sysmac Studio 软件自带 EtherNetIP 配置工具,从"工具"-"Ethernet/IP 连接设置"进入,为了让 CJ 等 PLC 适用, 本文使用 NetWork Configuratior 进行配置。

打开 NetWork Configuratior 软件,安装 EDS 文件,先安装"CommunicationModule",再安装"Chassis"(EDS 文件下载: https://www.festo.com.cn/net/zh-cn\_cn/SupportPortal/Downloads/455721/491887/GSAY-A4-F7-Z13-V1-1.0.zip)



安装成功后会出现以下第三方"EtherNet/IP Adapte"



### 2.2 配置 EtherNet/IP 站点

#### 2.2.1 添加 Ethernet/IP 主站

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· · · · · · · · · · · · · · · · · · ·	C EtherNet/IP_1	
B N301-1200     B N401-1300     B Rev 1     B Rev 1     B Rev 2     B N4501-1300     B Rev 2     B N4501-1300     B Rev 2     B N4501-1400     B Rev 2     B N4501-1400     B Rev 2     B N4501-4400     B Rev 2     B N4501-4400     B Rev 2     B N4501-4500     F Rev 2     B	Usage of Device Bandwidth Detail.	

#### 2.2.2 添加 EtherNet/IP Adapte 从站

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] & @   37 37   ♦ ♦ 🔽   @   #   #   #	2 <b>2 2 3 5</b>	
Network-Corrigueator     Vendor     Vendor     Vendor     Vendor     Senart Sottware Solutions GmbH     Defensive Adapter     Defensive Adapter     Defensive Adapter     Defensive Adapter     Rev 2     Rev 2     Rev 3     Rev 3     Rev 3     Rev 3     Rev 3	EtherNet/P 1       Usee of Device Bandwidh       Detail.	

### 2.3 更改 IP 地址

右键点击站点,在"change node address"中更改 IP 地址分别改为如下"192.168.0.1"和"192.168.0.2"

File Edit View Network Device	EDS File Tools Option	Help	
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		N 8 4 4	
× Message Code Date	Description	Change Made Address	
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		Synchronize Identity	
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		Property	
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### 2.4 配置主站建立变量

双击主站"NJ501-1500"图标,在主站内建立变量标签 abyInput 和 abyOutput, size 都为 104Byte。此处标签名要和 Omron PLC 程序中的变量相同,否则通讯不成功。



# 2.5 配置从站

双击进入从站,更改"Data Size"为104

	Edit Device Parameters Parameters Module	<b></b>
E I	Parameter Name	Value
100.100.0	<ul> <li>All parameters</li> </ul>	
therNet/	0001 Data Size	104
	0002 Config Parameter	0
1	0001 Deb Eine	
	Default:5 Min:0 Max:511	
		Reset
	Default Setup	Expand All Collapse All

## 2.6 关联主从站

鼠标左键点主从站不放,将其拖向主站图标(如下左图),将弹出如下右图,并依下右图设置。



#### 下载配置到网络 2.7

#### 选择"EtherNetI/F"

		🙀 Untitled - Network Cor	nfigurator	
		File Edit View Netw	ork Device EDS File Tools Option Help	
Option Help		🗅 😂 🖬 🗐 🗸 😹 🗍	Select Connect Network Port	×
Select Interface	CJ2 USB/Serial Port	   6 <sup>×</sup> 8   53 53   4	Select a network port that you would like to connect.	
Edit Configuration File	Ethemet I/F	Network Configurator	Browse	
Setup Monitor Refresh Timer	Ethernet -> CS/CJ1 ETN-EIP Unit I/F	EtherNet/IP Ha		
Install <u>P</u> lugin Module	NJ/NX/NY Series Ethernet Direct I/F	🍈 🧓 3S - Smar		
Install Interface Module	NJ/NX Series USB Port	⊞ I Festo Con     ⊡ IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		
	1752 SmartGuard USB Port	🖻 🧰 DeviceType		
Update Parameter automatically, when Configuration was changed		Banario D		
Update Device Status automatically, when it was connected on Network				
			Device Information	
			Device Type : Revision :	
Usage of Device Bandwidth		Message Code	Refresh	Option
Detai			0K Cancel	

### "DownLoad 参数到网络"

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	×	EtherNet/IP_1
B Rev 2	^   [	
		Network Configurator 83
●     ● </td <td></td> <td>In order to enable new configuration, downloading parameters to all devices will start. OK?</td>		In order to enable new configuration, downloading parameters to all devices will start. OK?
	•	Usage of Device Bandwidth Detail

#### 程序的编写 2.8

程序的编写请参考 GSAY-A4-F7-Z13-V1-1.0 (下载地址: https://www.festo.com.cn/net/zhcn\_cn/SupportPortal/Downloads/455721/491887/GSAY-A4-F7-Z13-V1-1.0.zip)文档中的例子, 以下主要讲解操作流程。

#### 建立全局变量 2.8.1

建立如下全局变量,要与之前配置 EtherNet/IP 主站时建立的变量名一致

oplorer 👻 🖡	🚭 Main_Program - Program0 🛛 🖨 I/O N	fap 🔤 Global Variables 🗙						
	Name	Data Type	Initial value	AT	Retain	Constant	Network Publish	Comment
roller_0	abyInputData	ARRAY[1104] OF BYTE					Input	This array con
rations and Setup	abyOutputData	ARRAY[1104] OF BYTE					Output	This array con
EtherCAT		a			_			
CPU/Expansion Racks								
I/O Map								
Controller Setup								
Motion Control Setup								
Cam Data Settings								
Event Settings								
Task Settings								
Data Trace Settings								
nming								
POUs								
🛒 Programs								
V 💀 Program0								
L 🚭 Main_Program								
. 😹 Functions								
麗 Function Blocks								
Data								
.5g Data Types								
🔤 Global Variables								
Tasks								

当如下的程序全部导通,说明配置已经起作用,另要注意设置超时时间

â là ≍ A №   K   A × & & ? > ™ U 님 ₽   Ц ┖ ┖ ᅚ	_
A Main Bronzen, Proceeding X	
Variables	
Status of the communication module [FAUSE No connection established  TRUE Connection established     [JP: Berolinesiss	
portcases that the builts – Grees a list of nodes that Grees a tilt of nodes for is therefore a strength of the second strength of the se	
communications can be established therNet/P // Prometicions are required to used via the connections for CP communicate with the	
Communications porta- Communications 1 (Ha.: Communications 1 (Ha.: System Status or the Ca.: Sy	
stSystemDataRefstConnectionSettings.tTimeout := T#2000ms:	
2 This function block maps the input data in the structure "stSystemDataRef" -> stSystemDataRefabyInputData depending	
OMapling-JOsta     Pi_JAsping-JOsta     Pi_Sasping-JOsta     No	
is Stystem DataRef – It System DataRef —	
3 This function block establisher a connection between the bost outern and controls the	
communication mode for the connection fbConnect	

#### 2.8.3 FB\_Connet 模块设置为 Cyclic 模式

FB\_Connet 模块设置为 Cyclic 模式, 然后置 xConnectEnable 为 True, 在 xActive 输出 True 表示模块正常运作。

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												1	океас	writec	Dject									

### 2.8.4 依照模块的使用步骤进行控制操作

下图为Homing的操作流程,其他的操作请参考 "Servo Press Kit YJKP - Description of host function blocks in CODESYS (V3).PDF"文档或者到如下地址下载 "https://www.festo.com.cn/net/zh-cn\_cn/SupportPortal/Downloads/455732/491901/Servo%20Press%20Kit%20YJKP%20-%20Description%20and%20integration%20of%20host%20function%20blocks%20in%20CODESYS%20(V3).zip"

#### Homing

- Precondition of function block "FB\_Connect":

   Input "xEnable" is TRUE
   Input "enTargetComMode" is 0x01 (Cyclic communication mode)
  - 3. Output "xActive" is TRUE
  - Output "enActualComMode" is 0x01 (Cyclic communication mode) 4.
    - Output "xConnected" is TRUE Output "xError" is FALSE 5.
    - 6.
- 2. Precondition of function block "FB\_PressControl":
  - 1. Input "xEnable" is TRUE
  - 2. 3.
  - Output "xActive" is TRUE Output "xActive" is TRUE Output "xInOperation" is FALSE Output "xSystemError" is FALSE Output "xError" is FALSE
  - 4. 5.
- Precondition of function block "FB\_SystemSettings": 3.
  - Input "xEnable" is TRUE
     Output "xActive" is TRUE

  - Output "xStatusHW\_Config" is TRUE
     Output "xInOperation" is FALSE

  - Output "xnoperation" is FALSE
     Output "xSystemError" is FALSE
     Output "xError" is FALSE
     Set input "xAbort" to TRUE
- 4.
- 5.
- Set input "xStartHoming" to TRUE During operation output "xInOperation" is TRUE 6.
- Homing can be aborted via set input "xAbort" to FALSE 7. 8.
  - Condition of homing aborted
    - Check if output "xActive" is TRUE
       Check if output "xInOperation" is FALSE

    - 3.
    - 4.
    - Check if output "xSystemError" is FALSE Check if output "xError" is FALSE Check if output "xError" is FALSE Check if output "xSystemIsHomed" is FALSE 5
- 9. Condition of homing done
  - 1. Check if output "xActive" is TRUE
  - Check if output "xInOperation" is FALSE Check if output "xSystemError" is FALSE 2.
  - 3.
  - Check if output "xError" is FALSE Check if output "xSystemIsHomed" is TRUE 4. 5.

#### 2.8.5 取得压力,位置,速度参数。

可以通过 FB\_PressControl 控制 YJKP 动作,以及取得压力,位置,速度参数。

		topressContro	01	
		FB_PressContr	rol	
	stSystemDataRef	stSystemDataRef — —	<ul> <li>stSystemDataRef</li> </ul>	-stSystemDataRef
xPressControlEnable	This data structure c			This data structure c
		xEnable	ENO	
Activate press control				
functions for the Festo	xPressControlEnableSv	xEnableSystem	xActive	-xPressControlActive
system   FALSE: Action	Enable system comma-			Function block is activ
stopped resets outputs I	xPressControlStartHo	xStartHoming	xSystemEnabled	-xPressControlSystemE
TPLIE: Action running	Homing command I E.	AS car ci ronning	Abystemendored	System is enabled I E
The contraction running	uiPressControlSelecte	uiSelectedProgramNumber	xSystemIsHomed	-xPressControlSystemIs
	Selected progra			System is homed I
	xPressControll oadPro	xl oadProgram	xProgramI gaded	-xPressControlProgram
	Load program comma	A could regress	All region courses	Program is loaded   Fa
	xPressControlStartRec—	xStartRecordReferenceCurve_uil.o	adedProgramNumber	-uiPressControll oaded
	Start record reference		adean rogrammaniser	Loaded progra
	xPressControlStartPres	vStartPressProcess	vStenModeActive	vPressControlStepMod
	Start press process co	ASTOR TO COST TO COST	Astephnoderictire	Step mode is activ
	vPressControlAbort—	xAbort	vStenDone	
	Abort command   FAI		xotepoone	Step is done   Falling
	vPressControlStenMode	vStenMode	vInOneration	vPressControlInOperat
	Stap mode comman	x Stephnode	Anoperation	System is in operatio
	vPressControlOuitSyst —	vOuitSystemError	vSystemError	vPressControlSystemEr
	Quit curtom error com	xQuitSystementor	xsystementor	Sustem organ LEALSE
	vPressControlDigititalIn	vDiatitalInput9	vPecultOK	vPressControlPesultOK
	Victual digital input 0 f	xbigitalinputs	ARESULOR	OK result of the pro
	vPressControlDigitating	vDiatitalInput10	vPecultNOK	vPressControlPesultNOK
	Vidual disital issue	xbigitalinputio	ARESULINON	NOK result of the pro
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	Virtual digital input	xbigitainputii	riviaximumPosition	Maximum position of
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	XPressControlDigitalin	xDigitiaimputis	xDigitalOutpute	-xpresscontrolDigitalo
	Virtual digital input	u Direkite ile mutt C	UDisite Outsuit7	virtual digital output
	Vistual disital issue	xDigtitalinputite	xDigitalOutput/	- xpresscontroiDigitalo
	virtual digital input		vDisitalOutsut0	virtual digital output
			xDigitalOutputo	- xpresscontrolDigitalo
			vDigitalOutput0	virtual digital output
			xbigitalOutputs	Virtual disital subaut
			vDisitalOutput10	virtual digital output
			xDigitalOutputto	-xpresscontrolDigitalo
			vDigitalOutput11	virtual digital output
			xbigitalOutputtt	Vistual disital subsut
				virtual digital output
			xDigitalOutput12	-xPressControlDigitalO
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			ractualPosition	Actual applitud
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