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博途 (TIA Portal) 模块 032-600 SIMATIC S7-1500 的全局数据块



57-1500

THA-BHAN

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SIMATIC S7-1500 的全局数据块

1 目标

本章学习的是如何利用 TIA Portal 编程工具在 SIMATIC S7-1500 上使用全局数据块。

该课程单元介绍了 SIMATIC S7-1500 全局数据块的结构、设置及访问方法。其中,将逐步讲解 了在 TIA Portal 中创建全局数据块及在程序中对该数据进行读访问和写访问的方法。

可以使用第3章所述的 SIMATIC S7 控制器。

2 前提条件

本章的基础是"SIMATIC S7 CPU1516F-3 PN/DP 的模拟值"一章。为完成本章的学习,您可能 需要重新温习如下项目: "SCE_ZH_032-500_Analog_Values_R1508.zap13"。

3 所需的硬件和软件

- 工程组态站:硬件和操作系统是工程组态站的前提
 (更多信息参见博途 (TIA Portal) 安装 DVD 里的自述文件)
- 2 博途 (TIA Portal) 中的 SIMATIC STEP 7 Professional 软件 V13 及以上版本
- 2 控制器 SIMATIC S7-1500/S7-1200/S7-300,例如 CPU 1516F-3 PN/DP –
 固件 V1.6 及以上版本,带存储卡和 16DI/16DO 以及 2AI/1AO
 提示:数字输入端和模拟输入/输出端应布线至开关面板。
- 4 工程组态站和控制器之间的以太网连接



4 理论

4.1 数据块

数据块与代码块的不同之处在于,前者用于保存用户数据,而非指令。

数据块里包含的是用户程序工作时所要用到的可变数据。您可以任意确定全局数据块的结构。

全局数据块可以接纳来自*其他所有模块*的数据,并加以利用(参见图 1)。但背景数据块的访问权原则上只对其对应所属的功能块开放。数据块的最大规格和所使用的 CPU 型号有关,且将随之变化。



图 1: 全局数据块和背景数据块之间的差别。

全局数据块的应用示例包括:

- 将信息存储到一个仓库系统中。"哪些产品分别保存在哪?"
- 保存指定产品的对应配方。

数据块中的数据通常是永久存储的。因此在出现电压故障时或 CPU 停止/启动时也不会丢失。

4.2 SIMATIC S7-1500 的数据类型

在 SIMATIC S7-1500 中有许多不同的数据类型,可表达不同的数据格式。下表列出了基本数据 类型。

数据类型	大小 (位)	范围	常量输入示例
Bool	1	0至1	TRUE、FALSE、0、1
Byte	8	16#00 至 16#FF	16#12、16#AB
Word	16	16#0000 至 16#FFFF	16#ABCD、16#0001
DWord	32	16#00000000 至 16#FFFFFFFF	16#02468ACE
Char	8	16#00 至 16#FF	"A"、"r"、"@"
Sint	8	-128 至 127	123、-123
Int	16	-32,768 至 32,767	123、-123
Dint	32	-2,147,483,648 至 2,147,483,647	123、-123
USInt	8	0至255	123
UInt	16	0至65,535	123
UDInt	32	0至4,294,967,295	123
Real	32	+/-1.18 x 10 ⁻³⁸ 至 +/-3.40 x 10 ³⁸	123.456、-3.4、-1.2E+12、 3.4E-3
LReal	64	+/-2.23 x 10 ⁻³⁰⁸ 至 +/-1.79 x 10 ³⁰⁸	12345,123456789 -1.2E+40
Time	32	T#-24d_20h_31 m_23s_648ms 至 T#24d_20h_31 m_23s_647ms 保存为: -2,147,483,648 ms 至 +2,147,483,647 ms	T#5m_30s 5#-2d T#1d_2h_15m_30x_45ms
String	变量	字节大小: 0 至 254 个字符	"ABC"
Array		Array(数组)将相同数据类型的 数据依次排列,并在地址范围内进 行连续定址。单个数组元素的属性 是相同的,在对属性进行项目组态 时,具体设置到数组变量。	
Struct		STRUCT 的组成成分中包含不同 的数据类型,每种数据类型的数量 是固定的。数据类型为结构性类型 或数组的组成部分可以嵌套在一个 结构中。 其他数据类型请参见在线帮助。	

4.3 优化后的块

S7-1500 控制系统的数据存储过程得以优化。在优化后的块中,可以根据数据类型自动为全部 变量分类。通过分类可使变量之间的数据间隙减小到最低限度,并且在存储用于处理器的变量 时,能以更为优化的方式进行访问。

- 由于文件存储已由系统进行优化且不受变量声明的影响,因此访问速度始终保持在最快水平。
- 不会由于错误或绝对访问造成不一致的危险,因为通常为符号访问。
- 声明变更不会导致访问错误,因为通过过程可视化系统进行的访问都是符号访问。
- 可将单个变量有针对性地定义为"保留"。
- 无需/无法在背景数据块中进行设置。全部设置都在所属的功能块中进行(例如保留)。
- 数据块中的预留内存可实现更改且不会丢失当前值(加载而不重新初始化)。

4.4 加载而不重新初始化

如需后续更改已在控制系统中运行的用户程序,可借助 S7-1500 控制系统在运行中扩展已优化 功能块和数据块的接口。无需将控制系统置于 STOP 即可下载更改后的模块,且已加载变量不 会影响当前值。



图 2: 加载而不重新初始化

在控制系统处于 RUN 期间执行以下步骤:

- 1. 激活"加载而不重新初始化"
- 2. 在现有块中插入新定义的变量
- 3. 在控制系统中加载扩展的块

新定义的变量初始化。现有变量保持其当前值。

前提条件:针对该块定义有预留内存,并将该块连同其预留内存一起加载到 CPU 中。

5 任务要求

在该章节中,应为"SCE_ZH_032-500 模拟值"章节中的程序扩展一个数据块,其数据将集中提供给"MOTOR_SPEEDCONTROL"[FC10] 和"MOTOR_SPEEDMONITORING"[FC11] 功能使用

6 规划

应通过全局数据块 "SPEED_MOTOR"[DB2]进行 "MOTOR_SPEEDCONTROL"[FC10]和 "MOTOR_ SPEEDMONITORING"[FC11]功能的数据管理及额定值设定。

该全局数据组应作为扩展添加在项目"032-500_Analog_Values"中。该项目必须事先取回。

在组织块"Main"[OB1] 中,需要事先将"MOTOR_SPEEDCONTROL"[FC10] 和 "MOTOR_SPEEDMONITORING"[FC11] 功能与源自全局数据块"SPEED_MOTOR"[DB2] 的变 量互连。

6.1 用于电机转速控制和转速监控的全局数据块

在数据块"SPEED_MOTOR"[DB2] 中以 Real 为数据类型(32 位浮点数)将转速额定值和转速 实际值创建为第一变量。转速额定值的起始值为 + 14 rpm。

接着创建一个用于监控转速正限值的结构 (Struct) "Positive_Speed"。

该结构包含两个变量"故障极限值"(起始值 + 15 rpm)和"警告极限值"(起始值 + 10 rpm),数据格式为 Real(32 位浮点数),"故障"和"警告"两个变量的数据格式为 Bool(二 进制数)。

结构 (Struct)"Positive_Speed"作为副本重新插入,并在用于监控转速负限值的 "Negative_Speed"中重命名。

此处变量"故障极限值"的起始值为 - 16 rpm, "警告限值"的起始值为 - 14 rpm。

6.2 技术示意图

在此处可查看有关任务要求的技术示意图。



-Q0 Hauptschalter/Main switch	S1 Start/start	-S4 Tippbetrieb -M1 rückwärts/ Manual -M1 backwards
-P4 aktiviert/active	-S2 Stopp/stop	-P7 ausgefahren/extended
-P2 Handimanual -P3 Auto/auto		-S5 Zylinder -M4 extend -S5 Zylinder -M4 einfahren/ cylinder -M4 retract

图 4: 控制面板

6.3 分配表

任该住务中需要使用以下信亏作为全向操作致。

DI	类型	标号	功能	NC/NO
I 0.0	BOOL	-A1	发出"紧急停机 ok"报警	NC
I 0.1	BOOL	-K0	机组"接通"	NO
10.2	BOOL	-S0	手动 (0)/自动 (1) 模式选择开关	手动 = 0 自动 = 1
10.3	BOOL	-S1	自动模式启动按钮	NO
I 0.4	BOOL	-S2	自动模式停止按钮	NC
I 0.5	BOOL	-B1	"气缸 -M4 已驶入"传感器	NO
l 1.0	BOOL	-B4	"滑道已占用"传感器	NO
I 1.3	BOOL	-B7	"部件位于输送带末端"传感器	NO
IW64	BOOL	-B8	电机转速实际值传感器 +/-10V 相当于 +/- 50 rpm	

DO	类型	标号	功能	
Q 0.2	BOOL	-Q3	输送带电机 -M1 可变转速	
QW 64	BOOL	-U1	电机在两个方向上的转速调节值 +/-10V 相当于 +/- 50 rpm	

分配表的缩写说明

- DI
 数字输入
 DO
 数字输出
- AI 模拟输入 AO 模拟输出
- I
 输入
 Q
 输出
- NC Normally Closed (常闭触点)
- NO Normally Open (常开触点)

7 结构化的逐步式引导指南

以下是帮助您实现规划的引导指南。如果您已经充分了解,只需要使用带标号的步骤标题作为 参考。否则,则需要遵从引导指南以下步骤中的详细说明。

7.1 取回一个现有项目

→ 在扩展章节"SCE_ZH_032-500 模拟值"中的"SCE_ZH_032-500_Analog_Values_
 R1508.zap13"项目之前,需要先将其取回。为了取回现有项目,必须在项目视图中通过 → 项目 → (Project) 搜索相应的压缩文件包。然后用"打开"(Open)确认您的选择。
 (→项目→取回→选择一个.zap 文件包→打开)



→ 接下来可以选择用于保存取回项目的目标目录。用"确定"(OK) 按钮确认您的选择。
 (→目标目录 → 确定)

→ 将打开的项目另存为 032-600_Global_Data_Blocks。

(→ 项目 → 另存为 ... → 032-600_Global_Data_Blocks → 保存)

M Siemens - G:\Automation\032_300_Analog	_Values\032_300_Analog_Values		_ 🗆 X
Project Edit View Insert Online Options	Tools Window Help) ± C ⁴ ± 🗓 🔃 🕼 🖳 🌠 Go online 🖉 Go offline 🚮 🖪 🕞 X ² 🖃 🛄	Totally Integrated Automation PORT	ΓAL
Migrate project	(Tasks 🔳 🔳	
Close Ctrl+W		Options	
Save Ctrl+S			1
Save as Ctrl+Shift+S		Y Find and replace	sks
Delete project		· I ind and replace	
Archive		Find:	
Retrieve			ibra
Tard Reader/USB memory		Whole words only	rie
Uperade		Match case	v ,
		Find in substructures	
A Print preview		Find in hidden texts	
Gilautomation/03_1032_300_Analog_Values		Use wildcards	=
Exit		Use regular expressions	
		O Whole document	
	🖸 Properties 🚺 Info 👔 🖞 Diagnostics 📑 🖃 🔻	From current position	
	General	O Selection	
		 Down 	
	No 'properties' available.	O Up	
	No 'properties' can be shown at the moment. There is either no object selected or the selected	Find	~
> Details view	object does not have any displayable properties.	Languages & resources	-
Portal view Overview	🗸 Projec	t 032_300_Analog_Values opened.	

7.2 创建全局数据块"SPEED_MOTOR"

- → 选择 CPU 1516F-3 PN/DP 的"程序块"(Program blocks) 文件夹并点击"添加新块"(Add new block),从而在此处创建一个全局数据块。
 - (→ CPU_1516F [CPU 1516F-3 PN/DP] → 添加新块)



→ 在接下来的对话框中选择 → 用以下名称命名新块: "SPEED_MOTOR"。类型 (Type)
 选择"Global DB",自动分配编号 (Nummer) 2。勾选"新建并打开"(Add new and open)。现在,单击"确定"(OK)。

(→ A标: SPEED_MOTOR → 类型: Global DB → I 新建并打开 → 确定)

Add new block			>
Name:			
SPEED MOTOR			
	Type:	🧧 Global DB 🔍	
OB	Language:	DB	
Organization	Number:	2	
		🔘 Manual	
		 Automatic 	
ER	Description:		
Eurotion block	Data blocks (DBs) save program data.	
Tunction block			
-rc			
Function			
Data block	1.1		
	wore		
Additional inform	nation		
Add new and open			OK Cancel

→ 数据块"SPEED_MOTOR"自动显示出来。现在首先为此处显示的变量"转速额定值"(Speed_Setpoint)和"转速实际值"(Spped_Actual_Value)创建所属注释。数据类型 (Data type)选择"Real"。同时为"转速额定值"(Speed_Setpoint)设置起始值 10.0 rpm。
 (→转速额定值 → Real → 10.0 → 转速实际值 → Real)

_												
0	032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2] ■ ■ 🗮 🗙											
1	# # ► F R & & 6 6 E U * .											
	SP	EED_M	TOR									
		Name		Data typ	e Start value	Retain	Accessible from HMI	Visible in HMI	Setpoint	Comment		
1		▼ Stat	c									
2	-	• 5	peed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)		
з		• 5	peed_Actual_Value	Real	0.0					Speed actual value in revolutions per minute (range: +/-50 rpm		

提示: 注意, 请使用正确的数据类型。

→ 在下一步我们要创建变量结构"Struct",以便之后对其进行复制。

 $(\rightarrow \text{Struct})$

03	032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2] _ ■ ■ = ×												
1													
SPEED_MOTOR													
		N	ame	Data type	Start value	Retain	Accessible from HMI	Visible in HMI	Setpoint	Comment			
1		•	Static										
2		•	Speed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)			
З		•	Speed_Actual_Value	Real	0.0					Speed actual value in revolutions per minute (range: +/-50 rpm			
4			<add new=""></add>										
				RTM		^							
				Real									
				S5Time									
				SInt									
				String									
				Struct		*							
	<	Т			10					>			

→ 指定结构名称"Positive_Speed"和注释。

 $(\rightarrow \text{Positive}_\text{Speed})$

0	32-6	00_	_Global_Data_Blocks	→ CPU1	516F [CPU	1516F	-3 PN/DP] → Progr	ram blocks 🔸	SPEED_	MOTOR [DB2] _ 🖬 🖬 🗙	
3	2 U = a a a a a a a a a a a a a a a a a a										
	SPEED_MOTOR										
		Nar	ne	Data type	Start value	Retain	Accessible from HMI	Visible in HMI	Setpoint	Comment	
1	-	•	Static								
2	-	•	Speed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)	
з	-	•	Speed_Actual_Value	Real	0.0					Speed actual value in revolutions per minute (range: +/-50 rpm	
4	-00	•	 Positive_Speed 	Struct 🔳]					Parameters for error/warning positive speed	
5			Add new>								
6		•	<add new=""></add>								

→ 在此结构下方创建用于转速监控的变量,并指定相应的起始值,如图所示。

032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2] = = = ×												
SPEED_MOTOR												
Name	Data type	Start value	Retain	Accessible from HMI	Visible in HMI	Setpoint	Comment					
1 🕣 🔻 Static												
2 📲 Speed_Setpoint	Real	14.0	~			~	Speed set point in revolutions per minute (range: +/-50 rpm)					
3 🔄 🔹 Speed_Actual_Value	Real	0.0	~				Speed actual value in revolutions per minute (range: +/-50 rpm					
4 📲 💌 Positive_Speed	Struct		~				Parameters for error/warning positive speed					
5 🤕 🔹 Threshold_Error	Real	0.0	 Image: A start of the start of				Speed limit / if exceeded an error is displayed					
6 📲 🔹 Threshold_Warning	Real	0.0	V			~	Speed limit / if exceeded a warning is displayed					
7 🔄 🔹 Error	Bool	false	 Image: A start of the start of				error limit exceeded					
8 📶 📮 Warning	Bool 🔳	false	~				warning limit exceeded					

提示: 注意, 请使用正确的数据类型。

→ 现在,选中并复制 (Copy) 结构。

(→复制)

032-600_Global_Data_Blocks	CPU151	6F [CPU 1	516F-3	BPN/DP] ▶ Prograu	m blocks 🔸 🤅	SPEED_M	IOTOR [DB2]
🛫 🛫 🛼 🛃 🗮 🛤 🗛 🗛	6) 🖹 🛛						
SPEED_MOTOR							
Name	Data type	Start value	Retain	Accessible from HMI	Visible in HMI	Setpoint	Comment
1 📶 🔻 Static							
2 📹 🔹 Speed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)
3 💷 🔹 Speed_Actual_Value	Real	0.0					Speed actual value in revolutions per minute (range: +/-50 rpm
4 Positive Speed	Struct III						Parameters for error/warning positive speed
5 a Prinsert row		0.0					Speed limit / if exceeded an error is displayed
6		0.0	V				Speed limit / if exceeded a warning is displayed
7 🚽 💥 Cut	Ctrl+X	alse	 Image: A start of the start of				error limit exceeded
8 📢 🗐 Сору	Ctrl+C	alse	V				warning limit exceeded
📋 Paste 궁	Ctrl+V						
X Delete	Del						
Rename	F2						
Update interface							
Cross-reference information	Shift+F11						
Show overlapping accesses							
Go to local point of use							

→ 将所复制的结构再次插入"Positive_Speed"之下。

(→插入)

03	2-6	00_G	ilobal_Data_Blocks	CPU15 [*]	16F [CPU 1	516F-3	B PN/DP] ▶ Program	m blocks 🕨 S	SPEED_M	IOTOR [DB2] _ 🗖 🖬 🗙
#	1	۰	B 12 B B B	6) 🖹 🛛						
	SPI	ED_I	MOTOR							
		Name	•	Data type	Start value	Retain	Accessible from HMI	Visible in HMI	Setpoint	Comment
1		▼ St	atic							
2		•	Speed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)
з		•	Speed_Actual_Value	Real	0.0					Speed actual value in revolutions per minute (range: +/-50 rpm
4		• •	Positive_Speed	Struct						Parameters for error/warning positive speed
5			Threshold_Error	Real	0.0					Speed limit / if exceeded an error is displayed
6			Threshold_Warning	Real	0.0	 Image: A start of the start of				Speed limit / if exceeded a warning is displayed
7			Error	Bool	false	 Image: A start of the start of				error limit exceeded
8			Warning	Bool	false	V				warning limit exceeded
9			zādd news				-			
		insert Add ar	row							
	~	Add To	w							
	X	Cut		Ctrl+X						
		Сору		Ctrl+C						
	Ē	Paste	AT.	Ctrl+V						
	×	Delete		Del						
		Renan	ne	F2						
		Cross-	reference information S	hift+F11						

→ 将新结构命名为"Negative_Speed",并再次指定注释。

 $(\rightarrow Negative_Speed)$

03	2-60	0_G	ilobal_Data_Blocks	CPU151	16F [CPU 1	516F-3	3 PN/DP] → Program	m blocks 🔸 🤅	SPEED_M	IOTOR [DB2]			
3	# # & R & B & E U % 3												
	SPEED_MOTOR												
	Name Data type Start value Retain Accessible from HMI Visible in HMI Setpoint Comment												
1	-	▼ St	atic										
2	-00	•	Speed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)			
З	-		Speed_Actual_Value	Real	0.0		~			Speed actual value in revolutions per minute (range: +/-50 rpm			
4	-	• •	Positive_Speed	Struct			\checkmark	\sim		Parameters for error/warning positive speed			
5	-00		Threshold_Error	Real	0.0	V				Speed limit / if exceeded an error is displayed			
6		. •	Threshold_Warning	Real	0.0	V	~	\sim		Speed limit / if exceeded a warning is displayed			
7	-00		Error	Bool	false	V				error limit exceeded			
8	-00		Warning	Bool	false	V				warning limit exceeded			
9	-0	• •	Negative_Speed	Struct 🔳						Parameters for error/warning negative speed			
10	-		Threshold_Error	Real	0.0	V				Speed limit / if exceeded an error is displayed			
11			Threshold_Warning	Real	0.0	 Image: A start of the start of	~	\checkmark		Speed limit / if exceeded a warning is displayed			
12	-00	. •	Error	Bool	false	V				error limit exceeded			
13			Warning	Bool	false	 Image: A start of the start of	✓			warning limit exceeded			
14		•	<add new=""></add>										
	<												

→ 请不要忘记点击 Save project。最终完成的全局数据块"SPEED_MOTOR"[DB2] 如下所示。检查是否为所有变量勾选了 G 保留 (Retain),以及是否输入了相应的起始值。只有这样,数据块中的数据在停电后或 CPU 停止/启动后依旧可以得以保留。同样,应普遍勾选 G*通过 HMI 访问"(Accessible from HMI) 和 G**HMI 中可见"(Visible in HMI) 选项,如此才可以在对该项目进行后续扩展时通过可视化系统(人机界面)顺利访问全部变量。仅当数据块中包含预设值时才激活 G** 设定值"(Setpoint)选项。

(→ 🗵		\checkmark	\checkmark)
------	--	--------------	--------------	---

	032-600 Global Data Blocks) (PU1516E [CPU 1516E-3 PN/DP]) Program blocks) SPEED MOTOR [DB2]												
03	2-6	00	_G	lobal_Data_Blocks	CPU151	16F [CPU 1	516F-3	3 PN/DPJ 🕨 Progra	m blocks 🕨	SPEED_N	$[OTOR [DB2]] = \blacksquare \blacksquare X$		
1	# # • ₽ # & & b b = U * *												
	SPEED_MOTOR												
	Name Data type Start value Retain Accessible from HMI Visible in HMI Setpoint Comment												
1		•	St	atic									
2		•		Speed_Setpoint	Real	14.0					Speed set point in revolutions per minute (range: +/-50 rpm)		
з	-00	•		Speed_Actual_Value	Real	0.0					Speed actual value in revolutions per minute (range: +/-50 rpm		
4		•	•	Positive_Speed	Struct			~			Parameters for error/warning positive speed		
5	-		•	Threshold_Error	Real	16.0	 Image: A set of the set of the				Speed limit / if exceeded an error is displayed		
6			•	Threshold_Warning	Real	14.0	 Image: A start of the start of	~			Speed limit / if exceeded a warning is displayed		
7	-		•	Error	Bool	false	 Image: A start of the start of				error limit exceeded		
8			•	Warning	Bool	false	V				warning limit exceeded		
9	-	•	٠	Negative_Speed	Struct						Parameters for error/warning negative speed		
10			•	Threshold_Error	Real	-16.0	V				Speed limit / if exceeded an error is displayed		
11			•	Threshold_Warning	Real 🔳	-14.0					Speed limit / if exceeded a warning is displayed		
12			•	Error	Bool	false	Image: A start and a start				error limit exceeded		
13			•	Warning	Bool	false	 Image: A start of the start of	~			warning limit exceeded		
14		•		<add new=""></add>									
	<								1111		>		

提示: 该逐步式引导指南的后文还将继续介绍设定值的使用。

7.3 在组织块中访问数据块的数据

→ 双击打开组织块"Main"[OB1]。



→ 删除"Main"[OB1] 中不再需要的临时变量。仅需要布尔变量

"Motor_Speed_Control_Ret_Val"。

(→删除)

l	_D	ata	_Blocks CPU1516F [CPU 1516F-3 F	PN/DP] →	Program blo	cks 🕨 Main [OB1] 🛛 🗕	∎∎×						
iĝ	ka ka 🕸 🔹 🖡 🚍 🚍 🖓 📲 🗮 🔛 🖉 🐿 🔛 👘 🚱 🖓 📲 📲 🖓 🥦 🔢												
	Ma	in											
		Na	me	Data type	Default value	Comment							
1	-00	•	Input										
2		•	Initial_Call	Bool		Initial call of this OB							
з	-00	•	Remanence	Bool		=True, if remanent data are a	vailable						
4	-	•	Temp										
5		•	Motor_speed_monitoring_error_max	Bool 🔳	st Insert rov	v							
6		•	Motor_speed_monitoring_warning_max	Bool	Add row								
7	-00	•	Motor_speed_monitoring_warning_min	Bool	<u> </u>	c. L. Y	_						
8		•	Motor_speed_monitoring_error_min	Bool		Ctrl+X							
9		•	Motor_speed_monitoring_actual_speed	Real		Ctrl+C							
10	-00	•	Motor_speed_monitoring_Ret_Val	Bool		Ctri+v							
11		•	Constant		X Delete	Del							
12		•	<add new=""></add>		Rename	F2							
					Update in	nterface							
					Cross-refe	erence information Shift+F11							
					Go to loca	al point of use							
	<			1111	·		>						

→ 接着点击垂直编辑区域中的 III 符号,会并排显示出数据块"SPEED_MOTOR"[DB2] 和组 织块"Main"[OB1]。

(→□)

iject Edit View Insert Online Options Too	ols Window Help (# ± 🖥 🗓 🗊 🖳 🌠 💋 Go online 🖉 Go offlin		N	Totally Integrated Automation PORTAL
Project tree		F [CPU 1516F-3 PN/DP]	Program blocks Main [OB1]	_ # = ×
Devices			Split editor space vertically	
P 0.0	🔹	+ R0 A0 Co All Q1	10k _ %9. 99 ll	
			a ∧ i a aio. ≻ina	-4
- D 032 000 Clabel Dete Blacks	Walti			
OS2-600_Global_Data_blocks	Name	Data type Default value	Comment	
Add new device	1 C a laisial Call	Deal	Initial call of this OB	
		Deal	The Grand and the second links	
Croisier [croisiers high] Device configuration	A C Tame	8001	= irue, ir remanent data are available	
Opling & diagnostics	5 C a Mater aread manifester Dat Val	Real [7]		
Program blocks	6 G Constant	8001 (1)		
Add new block	T A Add news			
Main [OB1]				
MOTOR SPEEDCONTROL [FC10]				
MOTOR_SPEEDMONITORING [FC11] MOTOR_AUTO [FB1]	a >=1 [??] → -oi ↦ -[=]			
MOTOR_AUTO_DB [DB1]	 Block title: "Main Program Sween (Curle)" 			A
SPEED_MOTOR [DB2]	Comment			
Technology objects	connent			=
External source files	Network 1: Speed monitoring conveyor m	otor		
PLC tags	Comment			
PLC data types				
Watch and force tables	%FC11			
Online backups	"MOTOR_SPEEDMON	TORING"		
Traces		#Motor speed		
Program info		monitoring_	-	
Device proxy data		Error_max - error_max		
PLC alarms		#Motor speed		
E Text lists		monitoring_	-	
Local modules		warning max		100%
Common data	·		1001 -	
Details view			Sector Properties	🔄 Info 🚺 🖞 Diagnostics 👘 👘 🗕 🦳

→ 使用鼠标通过拖放将互连所需的变量从数据块"SPEED_MOTOR"[DB2] 拖至所调用功能的 接口上及组织块 "Main"[OB1] 中的功能块上。首先将变量"转速实际值 "(Speed_Actual_Value) 拖至块"MOTOR_SPEEDMONITORING"[FC11] 的输出"转速实际 值"(Actual_speed) 上。

(→转速实际值)

◎3locks > CPU1516F [CPU 1516F-3 PN/DP] > Program blocks > Main [OB1] _ ■ ■ ■	× 📼CPU1516F [CPU 151	I6F-3 PN/DP] → Program blocks → Si	PEED_MOTOR [DB2] 📃 🖬 🗮 🗙
(2) (2) 영영 한 1월	SPEED_MOTOR	* 6 6 1 1	⊒
	Name	Data type Start value	Retain Accessible f Visible in
a >=1 122 → -0 ↦ -[=]	1 📶 💌 Static		
	🔨 2 🔕 = Speed_Setpoin	t Real 14.0	
Vetwork 1: Speed monitoring conveyor motor	3 📲 Speed_Actual_	Value Real 🔳 0.0	
Comment	4 💷 = 👻 Positive_Speed	Struct	
	5 💷 🔹 Threshold_E	rror Real 16.0	
%FC11	6 📲 🔹 Threshold_V	Varning Real 14.0	
"MOTOR_SPEEDMONITORING"	= 7 📶 🔹 Error	Bool false	
#Motor speed	8 📲 🔹 Warning	Bool false	
monitoring_	9 🕘 🛎 🔻 Negative_Spee	d Struct	
Error_max — error_max	10 📲 🔹 Threshold_E	rror Real -16.0	
#Motor speed	11 🕣 🔹 Threshold_V	Varning Real -14.0	
monitoring_	12 📲 🖷 Error	Bool false	
EN Warning_max warning_max	13 📶 💻 Warning	Bool false	
88			
Speed_limit_ Werning_min 17.0error_max #Wotor_speed_ mentione			
15.0 warning_max Error_min - error_min			
-10.0 warning_min monitoring_			
-12.0 — error_min ENO — ENO			
K III > 100%	× (

→ 如图所示,将网络 1 (Network 1) 中的其他触点与源自"SPEED_MOTOR"[DB2] 数据块的变 量互连。



→ 如图所示,将网络 2 (Network 2) 中的其他触点与源自"SPEED_MOTOR"[DB2] 数据块的变 量互连。



→ 如图所示,将网络 3 (Network 3) 中的其他触点与源自"SPEED_MOTOR"[DB2] 数据块的变量互连。



7.4 保存程序并编译

→ 如需保存项目请点击菜单里的 Save project 按钮。如需编译全部块,则需点击文件夹"程序块"(Program blocks)并选择菜单里的编译符号

(→ 🔚 Save project → 程序块 → 🛅)



→ 随后会在"信息"(Info) -"编译"(Compile) 区域中显示已成功完成编译的块。

	Ropert	ies	🗓 Info	i [Diagno	stics	7 🗏 ▼
General (1) Cross-reference	ces Compile Syntax						
😢 🛕 🚺 Show all messages							
Compiling completed (errors: 0; wa	rnings: 0)						
! Path	Description	Go to	?	Errors	Warnings	Time	
✓ ▼ CPU1516F		N		0	0	7:26:42 AM	
 Program blocks 		N		0	0	7:26:42 AM	
SPEED_MOTOR (DB2)	Block was successfully compiled.	>				7:26:42 AM	
Main (OB1)	Block was successfully compiled.	N				7:26:44 AM	
v	Compiling completed (errors: 0; warnings: 0)					7:26:48 AM	
	completes (choist of warningst of					7.20.40740	

7.5 加载程序

- Magenta Siemens G:\Automation\032-600_Global_Data_Blocks\032-600_Global_Data_Blocks . o x Project Edit View Insert Online Options Tools Window Help Totally Integrated Automation PORTAL 월 💁 🔒 Save project 🚇 🐰 道 道 🗙 与主 (객 호 🖥 🖳 🌆 🖳 🕼 🚇 🖓 Go online 🖉 Go offline 🍶 🖪 🖡 🛠 🖃 🗍 IO Global Data Blocks → CPU1516F [CPU 1516F Download to device Project tree Devices B O O Instructions 🔲 🛃 032-600_Global_Data_Blocks ^ & >=1 ??? -1 -01 → -[=] 🍄 Add new device h Devices & networks Block title: "Main Program Sweep (Cycle)" 1 ⇒ Testing CPU1516F [CPU 1516F-3 PN/DP] Device configuration Network 1: Speed monitoring conveyor motor Online & diagnostics 🕶 🔙 Program blocks Comment Add new block Tasks 👔 💁 Main [OB1] FC11 MOTOR SPEEDCONTROL [FC10] "MOTOR_SPEEDMONITORING" MOTOR_SPEEDMONITORING [FC11] EN MOTOR_AUTO [FB1] %/W64 "-B8" — Actual_ speed_AI Libraries MOTOR_AUTO_DB [DB1] SPEED_MOTOR [DB2] "SPEED_MOTOR". "SPEED_MOTOR" Technology objects Speed_limit_ error_max Positive_Speed. Threshold_Error Positive_Speed. Error External source files Error_max 🕨 🚂 PLC tags "SPEED MOTOR" "SPEED_MOTOR" PLC data types Positive_Speed. Warning Positive_Speed. Threshold_ Warning Watch and force tables Speed_limit_ warning_max Warning max Online backups "SPEED_MOTOR" 🕨 🔀 Traces Negative_ Second White in 100% ~ Program info "SPEED MOTOP" Ш Device proxy data Properties Info 🔒 🖳 Diagnostics > Details view Portal view 🔛 Overview 💶 Main SPEED_MOTOR 🗸 The project 032-600_Global_Data_Blo
- → 成功完成编译后,整个控制器将加载所创建的程序及硬件组态,如前面的课程单元所述。
 (→ □)

7.6 观测/控制数据块中的值

- → 为了观测已加载数据块的变量,必须先打开所需的数据块。接着可以点击开启/关闭观测的
 〒 符号。
 - $(\rightarrow \text{SPEED}_\text{MOTOR} [\text{DB2}] \rightarrow \textcircled{P})$



→ 在"观测值"(Monitor value) 一列中可观测到 CPU 中当前可用的值。

03	2-6	00	_G	lobal_Data_Blocks	CPU151	6F [CPU 1	516F-3 PN/DF] ▶ Pr	ogram bl	locks 🕨	SPEED_	MOTOR [DB2] 📃 🖬 🖬 🗙		
- Maria	2 2 4 5 V 1 4 5 6 6 E 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1													
	SPEED_MOTOR													
	Name Data type Start value Monitor value Retain Access Visibl Setpoint Comment													
1		-	St	atic										
2		•		Speed_Setpoint	Real	14.0	14.0		~			Speed set point in revolutions per .		
З		•		Speed_Actual_Value	Real	0.0	15.06981					Speed actual value in revolutions .		
4		•	•	Positive_Speed	Struct				~			Parameters for error/warning posit.		
5			•	Threshold_Error	Real	16.0	16.0	 Image: A start of the start of				Speed limit / if exceeded an error i.		
6			•	Threshold_Warning	Real	14.0	14.0	 Image: A start of the start of	~			Speed limit / if exceeded a warnin		
7			•	Error	Bool	false	TRUE	V	~			error limit exceeded		
8			•	Warning	Bool	false	FALSE	 Image: A start of the start of	~			warning limit exceeded		
9			•	Negative_Speed	Struct							Parameters for error/warning nega.		
10			•	Threshold_Error	Real	-16.0	-16.0	 Image: A start of the start of	~			Speed limit / if exceeded an error i.		
11			•	Threshold_Warning	Real	-14.0	-14.0	 Image: A start of the start of	~		~	Speed limit / if exceeded a warnin		
12			•	Error	Bool	false	FALSE	 Image: A start of the start of	~			error limit exceeded		
13			•	Warning	Bool	false	FALSE	 Image: A start of the start of				warning limit exceeded		
14				<add new=""></add>										

→ 右键点击单个值,即可打开用于"控制"(Modify)该值的对话框。

(→控制→控制值: 14.0→确定)

03	2-6	00	_G	lobal_Data_Blocks	CPU151	6F [CPU 1	516F-3 PN/DF	P] → Pr	ogram bi	locks 🔸	SPEED_	MOTOR [DB2] 📃 🖬 🗮 🗙
	1	6	۰.	B/ 1 B- B- B-	🗈 🖻 🛛							-
	SP	EEC)_N	NOTOR								
		Na	me		Data type	Start value	Monitor value	Retain	Access	Visibl	Setpoint	Comment
1		•	Sta	atic								
2		•		Speed_Setpoint	Real 🔳	14.0	14.0		~			Speed set point in revolutions per
з		•		Speed_Actual_Value	Modify					_	_	× utions
4		•	•	Positive_Speed					_			g posit
5			•	Threshold_Error	Operand:	"SPEED_	MOTOR".Speed_	Setpoint	Data t	ype:	Real	
6			•	Threshold_Warnin	Modify value	: 13.0			Forma	t	Floating	-point number varnin.
7			•	Error								
8	-00		•	Warning								
9		•	•	Negative_Speed								OK Cancel g nega
10			•	Threshold_Error								i error i
11	-00		•	Threshold_Warning	Real	-14.0	-14.0	 Image: A start of the start of				Speed limit / if exceeded a warnin.
12			•	Error	Bool	false	FALSE	 Image: A start of the start of				error limit exceeded
13			•	Warning	Bool	false	FALSE	 Image: A start of the start of				warning limit exceeded
14		•		<add new=""></add>								

7.7 初始化设定值/重置起始值

(→ 📴)

 → 点击 ➡ 符号,对设定值进行初始化。勾选了 ➡"设定值"的变量将会把当前值采纳作为起 始值。

0	32	-60(_G	lobal_Data_Blocks	CPU151	6F [CPU 1	516F-3 PN/DF	Progra	m blocks	SPEED	_MOTOR	[DB2] _	
10													
	SPEED MOTOR												
		N	- me		Dinitializ	æ setpoints	Monitor value	Retain	Accessibl	Visible i	Setpoint	Comment	
1	4		St	atic		1							
2	4			Speed_Setpoint	Real	14.0	13.0					Speed set point in revolutions per minute (ran	
з	-			Speed_Actual_Value	Real	0.0	15.06981					Speed actual value in revolutions per minute ((.
4	-		•	Positive_Speed	Struct							Parameters for error/warning positive speed	
5	-	01		Threshold_Error	Real	16.0	16.0				~	Speed limit / if exceeded an error is displayed	
6	-	01		Threshold_Warning	Real	14.0	14.0				~	Speed limit / if exceeded a warning is displayed	c
7	-	01		Error	Bool	false	TRUE					error limit exceeded	
8	-	01		Warning	Bool	false	FALSE					warning limit exceeded	
9	4		•	Negative_Speed	Struct							Parameters for error/warning negative speed	
10) -	01		Threshold_Error	Real	-16.0	-16.0					Speed limit / if exceeded an error is displayed	
11	•	01		Threshold_Warning	Real	-14.0	-14.0					Speed limit / if exceeded a warning is displayed	c
12	2	01		Error	Bool	false	FALSE					error limit exceeded	
13	4	01		Warning	Bool	false	FALSE					warning limit exceeded	

03	032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2]													
10	è i	ŝģ	۹.	B/ 1 B- B- B- 1	🔈 🖿 👢	00h						a		
	SPEED_MOTOR													
-	Name Data type Start value Monitor value Retain Accessibl Visible i Setpoint Comment													
1		•	St	atic										
2	2 💶 = Speed_Setpoint Real 14.0 14.0 🗹 🗹 🗹 Speed set point in revolutions per minute (ran.													
З	1			Speed_Actual_Value	Real	0.0	15.27055					Speed actual value in revolutions per minute (
4	1		•	Positive_Speed	Struct							Parameters for error/warning positive speed		
5	1			Threshold_Error	Real	16.0	16.0	V				Speed limit / if exceeded an error is displayed		
6	1			Threshold_Warning	Real	14.0	14.0	V				Speed limit / if exceeded a warning is displayed		
7	1			Error	Bool	false	TRUE					error limit exceeded		
8	1			Warning	Bool	false	FALSE					warning limit exceeded		
9	1		•	Negative_Speed	Struct							Parameters for error/warning negative speed		
10		1		Threshold_Error	Real	-16.0	-16.0					Speed limit / if exceeded an error is displayed		
11	1	1		Threshold_Warning	Real	-14.0	-14.0					Speed limit / if exceeded a warning is displayed		
12	-			Error	Bool	false	FALSE					error limit exceeded		
13	1			Warning	Bool	false	FALSE					warning limit exceeded		

→ 点击 🏜 符号重置全部起始值。

(→ 🍢)

03	2-6	00_	Global_Data_Blocks	CPU151	6F [CPU 1:	516F-3 PN/DP] Progra	am blocks	SPEED_	MOTOR	[DB2] _ I I X	
		1.0										
÷.	Ē	6	s 🛃 📭 🖬 🗛 🔂 I	3 E 🔢	00h							
	SP	EED	Parat start values									
		Nan	neset start values	Data type	Start value	Monitor value	Retain	Accessibl	Visible i	Setpoint	Comment	
1	-00	•	Static	i 间								
2	-	•	Speed_Setpoint	Real	14.0	13.0					Speed set point in revolutions per minute (ran.	
з		•	Speed_Actual_Value	Real	0.0	15.27055					Speed actual value in revolutions per minute (.	
4	-00	•	 Positive_Speed 	Struct							Parameters for error/warning positive speed	
5			Threshold_Error	Real	16.0	16.0	Image: A start and a start				Speed limit / if exceeded an error is displayed	
6	-		Threshold_Warning	Real	14.0	14.0					Speed limit / if exceeded a warning is displayed	
7			Error	Bool	false	TRUE		~			error limit exceeded	
8	-00		 Warning 	Bool	false	FALSE					warning limit exceeded	
9	-	•	 Negative_Speed 	Struct							Parameters for error/warning negative speed	
10			Threshold_Error	Real	-16.0	-16.0	V				Speed limit / if exceeded an error is displayed	
11	-		Threshold_Warning	Real	-14.0	-14.0		<			Speed limit / if exceeded a warning is displayed	
12	-00		Error	Bool	false	FALSE	V				error limit exceeded	
13	-		 Warning 	Bool	false	FALSE	Image: A start and a start				warning limit exceeded	

03	32-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2]											
- Million	; ₁	5	•	B/ 📴 B- B- B- 1	3 🖹 🔢							=
	SP	EEC)_N	IOTOR								
		Na	me		Data type	Start value	Monitor value	Retain	Accessibl	Visible i	Setpoint	Comment
1	-00	•	Sta	tic								
2	2 🕣 = Speed_Setpoint				Real	0.0	13.0			<	\checkmark	Speed set point in revolutions per minute (ran.
з	-00	•		Speed_Actual_Value	Real	0.0	15.27055					Speed actual value in revolutions per minute (.
4	-00	Positive_Speed			Struct			Image: A start and a start				Parameters for error/warning positive speed
5	-		•	Threshold_Error	Real	0.0	16.0			<	~	Speed limit / if exceeded an error is displayed
6			•	Threshold_Warning	Real	0.0	14.0			<		Speed limit / if exceeded a warning is displayed
7			•	Error	Bool	false	TRUE			<		error limit exceeded
8			•	Warning	Bool	false	FALSE			\checkmark		warning limit exceeded
9		•	•	Negative_Speed	Struct					<		Parameters for error/warning negative speed
10			•	Threshold_Error	Real	0.0	-16.0			\checkmark		Speed limit / if exceeded an error is displayed
11			•	Threshold_Warning	Real	0.0	-14.0			<		Speed limit / if exceeded a warning is displayed
12	-		•	Error	Bool	false	FALSE			~		error limit exceeded
13			•	Warning	Bool	false	FALSE			\checkmark		warning limit exceeded

7.8 数据块"快照"

→ 点击 **I** 符号可对观测值进行"快照",借此将这些值应用为起始值或稍后将它们传回 CPU 中。

(→ 📭)



032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2]												
1	i i	de la	🗞 🍢 🎼 🛼 🔂	🗈 🗄 🔢 😭								
	SP	EED	_MOTOR (snapshot cre	eated: 7/29/2015 7	:54:43 AM)							
		Na	ne	Data type	Start value	Snapshot	Monitor value	Retain	Accessible f	Visible in	Setpoint	Com
1	-	•	Static									
2	-	•	Speed_Setpoint	Real	14.0	13.0	13.0					Spee
З	-00	•	Speed_Actual_Value	Real	0.0	15.19097	15.19097					Spee
4	-00	•	 Positive_Speed 	Struct								Para
5	-00		Threshold_Error	Real	16.0	15.0	15.0					Spee
6	-		Threshold_Warning	Real	14.0	10.0	10.0	V			~	Spee
7	-		 Error 	Bool	false	TRUE	TRUE	V				error
8	-00		 Warning 	Bool	false	FALSE	FALSE	V				warni
9	-00	•	 Negative_Speed 	Struct								Para
10	-00		Threshold_Error	Real	-16.0	-16.0	-16.0					Spee
11			Threshold_Warning	Real	-14.0	-14.0	-14.0	V				Spee
12	-		 Error 	Bool	false	FALSE	FALSE	V				error
13	-00		 Warning 	Bool	false	FALSE	FALSE	V				warni

→ 替代地,也可以点击
 → 符号应用快照中的所有值,或点击
 ▲ 符号仅应用快照中的起始
 值。通常这里只需要设定值。

(→ 🔽)

032-600_G	lobal_Data_Blocks	CPU1516F [CPU	1516F-3 PN/DP]	Program blo	ocks > SPEED_MC	TOR [DB2]			-	∎≡×
* * *		a 🗮 🔢 🕅								
SPEED I	MOTOR (snapshot cre	eated: 7/29/2015 7:	54:43 AM)							_
Name	Copy all ve	lues from the "Snapsh	not" column to the	"Start value" colu	nitor value	Retain	Accessible f	Visible in	Setpoint	Com
1 🕣 🔻 St	atic									
2 📲 🗖	Speed_Setpoint	Real 🔳	14.0	13.0	13.0					Spee
3 📲 🗖	Speed_Actual_Value	Real	0.0	15.19097	15.64308					Spee
4 📲 🖛 🔻	Positive_Speed	Struct						\sim		Para
5 📲 🔳	Threshold_Error	Real	16.0	15.0	15.0	V				Spee
6 📶 🔳	Threshold_Warning	Real	14.0	10.0	10.0	V				Spee
7 📶 🔳	Error	Bool	false	TRUE	TRUE	V				error
8 📶 🔳	Warning	Bool	false	FALSE	FALSE	V				warni
9 📶 🕷 🔻	Negative_Speed	Struct								Para
10 📶 🔳	Threshold_Error	Real	-16.0	-16.0	-16.0	V				Spee
11 📶 🔳	Threshold_Warning	Real	-14.0	-14.0	-14.0	V				Spee
12 📶 🔳	Error	Bool	false	FALSE	FALSE	V				error
13 📶 🔳	Warning	Bool	false	FALSE	FALSE					warni

032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2]													
1	1	۱ ا	•	🛃 🐺 🛃 🙀 🖬 I	🕾 🛃 😼								
	SPE	EEC)_1	MOTOR (snapshot cre	eated: 7/29/2015 7:	:54:43 AM)							
		Na	me	Copy all	setpoints from the "Si	napshot" column t	to the "Start value"	column value	Retain	Accessible f	Visible in	Setpoint	Com
1	-	•	St	atic									
2	-	•		Speed_Setpoint	Real 🔳	14.0	13.0	13.0					Spee
з	-00	•		Speed_Actual_Value	Real	0.0	15.19097	15.64308		~			Spee
4	-00	•	•	Positive_Speed	Struct								Para
5	-		•	Threshold_Error	Real	16.0	15.0	15.0	~		✓		Spee
6	-		•	Threshold_Warning	Real	14.0	10.0	10.0	V		✓		Spee
7	-		•	Error	Bool	false	TRUE	TRUE	~				error
8	-00		•	Warning	Bool	false	FALSE	FALSE	~		✓		warni
9	-00	•	٠	Negative_Speed	Struct								Para
10	-00		•	Threshold_Error	Real	-16.0	-16.0	-16.0	V				Spee
11	-		•	Threshold_Warning	Real	-14.0	-14.0	-14.0	V				Spee
12	-		•	Error	Bool	false	FALSE	FALSE	~	Image: A start and a start			error
13	-		•	Warning	Bool	false	FALSE	FALSE	~	Image: A start and a start			warni

032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2] _ 🖬 🖬 🗙												
Ť	1	6	b 🛃 🎼 🛼 🛃	s e 🔢 🐃								
SPEED_MOTOR (snapshot created: 7/29/2015 7:54:43 AM)												
		Nar	ne	Data type	Start value	Snapshot	Monitor value	Retain	Accessible f	Visible in	Setpoint	Com
1	-	•	Static									
2	-	•	Speed_Setpoint	Real	13.0	13.0	13.0					Spee
з	-	•	Speed_Actual_Value	Real	0.0	15.19097	15.64308					Spee
4	-	•	 Positive_Speed 	Struct								Para
5	-00		Threshold_Error	Real	15.0	15.0	15.0	~				Spee
6	-00		 Threshold_Warning 	Real	10.0	10.0	10.0	~				Spee
7	-00		 Error 	Bool	false	TRUE	TRUE	\checkmark				error
8	-00		 Warning 	Bool	false	FALSE	FALSE	V				warni
9	-00	•	 Negative_Speed 	Struct				~				Para
10	-00		Threshold_Error	Real	-16.0	-16.0	-16.0	~				Spee
11	-		 Threshold_Warning 	Real	-14.0	-14.0	-14.0	~				Spee
12	-		 Error 	Bool	false	FALSE	FALSE	~				error
13	-00		 Warning 	Bool	false	FALSE	FALSE	 Image: A start of the start of				warni

→ 为将临时保存在快照中的数据重新传回 CPU,必须点击 • 符号。

(—		G))									
03				CPU1516F [CPU	1516F-3 PN/DP]		cks SPEED_MO	TOR [DB2]				
2	1	•) 🛃 🐺 🌄 🛃 📢	is 🖿 🔢 🕾								
	SPE	ED_	MOTOR (snapshot cr	eated: 7/29/2015 7	:54:43 AM)							
		Nam	e 🕨 🕨	Copy all values from t	he snapshot to the	actual values of t	ne CPU r value	Retain	Accessible f	Visible in	Setpoint	Com
1	-	▼ S	tatic									
2	-	•	Speed_Setpoint	Real 🔳	13.0	13.0	14.0					Spee
З	-	•	Speed_Actual_Value	Real	0.0	15.19097	15.06981					Spee
4	-	• •	Positive_Speed	Struct								Para
5	-		Threshold_Error	Real	15.0	15.0	15.0	V		~		Spee
6	-	-	Threshold_Warning	Real	10.0	10.0	10.0	V		~		Spee
7	-		Error	Bool	false	TRUE	TRUE	Image: A start and a start				error
8	-		Warning	Bool	false	FALSE	FALSE	Image: A start and a start				warni
9	-00	• •	Negative_Speed	Struct								Para
10	-		Threshold_Error	Real	-16.0	-16.0	-16.0	Image: A start and a start				Spee
11	-		Threshold_Warning	Real	-14.0	-14.0	-14.0	Image: A start and a start				Spee
12	-		Error	Bool	false	FALSE	FALSE	Image: A start and a start				error
13	-		Warning	Bool	false	FALSE	FALSE	Image: A start and a start				warni

03	2-6	00	G	obal_Data_Blocks	CPU1516F [CPU	1516F-3 PN/DI	P] 🔸 Program b	locks SPEED_MC	TOR [DB2]				∎≡×
2 2 2 4 5 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2													
SPEED_MOTOR (snapshot created: 7/29/2015 7:54:43 AM)													
Name Data type Start value Snapshot Monitor value Retain Accessible f Visible in Sety												Setpoint	Com
1		•	Sta	atic									
2	-00	•		Speed_Setpoint	Real	13.0	13.0	13.0			\sim		Spee
З	-	•		Speed_Actual_Value	Real	0.0	15.19097	15.06981					Spee
4	-	•	•	Positive_Speed	Struct								Para
5	-00		•	Threshold_Error	Real	15.0	15.0	15.0	Image: A start and a start				Spee
6	-00		•	Threshold_Warning	Real	10.0	10.0	10.0	Image: A start and a start	Image: A start and a start			Spee
7	-00		•	Error	Bool	false	TRUE	TRUE	Image: A start of the start	Image: A start and a start			error
8	-00		•	Warning	Bool	false	FALSE	FALSE		Image: A start and a start			warni
9	-00	•	•	Negative_Speed	Struct								Para
10	-00		•	Threshold_Error	Real	-16.0	-16.0	-16.0		Image: A start and a start			Spee
11	-00		•	Threshold_Warning	Real	-14.0	-14.0	-14.0		Image: A start and a start			Spee
12	-		•	Error	Bool	false	FALSE	FALSE		Image: A start and a start			error
13	-		•	Warning	Bool	false	FALSE	FALSE		Image: A start and a start			warni
	-								Ċ,	-			

→ 如果需要使用起始值覆盖全部设定值,则可以点击 [●] 符号。CPU 中未勾选"设定值"选项 的值将保持不变。

(→	6	b
('		· /

032-600_G	lobal_Data_Blocks	CPU1516F [CPU	1516F-3 PN/D	P] 🕨 Program	blocks	MOTOR [DB2]			_	∎≡×			
1 🔮 🔹	🛃 🐺 🛃 🛃	r 🗄 🔢 🕾											
SPEED_MOTOR (snapshot creen initialize setpoints) 54:43 AM)													
Name		Data type	Start value	Snapshot	Monitor value	Retain	Accessible f	Visible in	Setpoint	Com			
1 🕣 🔻 St	atic												
2 📲	Speed_Setpoint	Real 🔳	13.0	13.0	14.0					Spee			
3 🕣 🗉	Speed_Actual_Value	Real	0.0	15.19097	15.06981					Spee			
4 📶 = 🔻	Positive_Speed	Struct								Para			
5 📲 🔳	Threshold_Error	Real	15.0	15.0	15.0				~	Spee			
6 🕣 🔳	Threshold_Warning	Real	10.0	10.0	10.0	~			~	Spee			
7 📶 🔳	Error	Bool	false	TRUE	TRUE	V				error			
8 📶 🔳	Warning	Bool	false	FALSE	FALSE					warni			
9 🕣 = 🔻	Negative_Speed	Struct								Para			
10 🕣 🔹	Threshold_Error	Real	-16.0	-16.0	-16.0	~				Spee			
11 🕣 🔳	Threshold_Warning	Real	-14.0	-14.0	-14.0					Spee			
12 📶 🔳	Error	Bool	false	FALSE	FALSE	V				error			
13 🕣 🔳	Warning	Bool	false	FALSE	FALSE	V				warni			

032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2] _ ■ ■ = ×													
1 1 1 1	🛃 📭 🛃 🐻 (s 🖿 🚺 🕾											
SPEED_MOTOR (snapshot created: 7/29/2015 7:54:43 AM)													
Name		Data type	Start value	Snapshot	Monitor value	Retain	Accessible f	Visible in	Setpoint	Com			
1 📶 🔻 Sta	tic												
2 📶 🗉	Speed_Setpoint	Real 🔳	13.0	13.0	13.0					Spee			
3 📲 🗉	Speed_Actual_Value	Real	0.0	15.19097	15.06981			~		Spee			
4 📶 = 🔻	Positive_Speed	Struct								Para			
5 📲 🔳	Threshold_Error	Real	15.0	15.0	15.0	Image: A start of the start				Spee			
6 📲 🔳	Threshold_Warning	Real	10.0	10.0	10.0			~	~	Spee			
7 📲 🔳	Error	Bool	false	TRUE	TRUE	Image: A start of the start		~		error			
8 📶 🔹	Warning	Bool	false	FALSE	FALSE	Image: A start of the start				warni			
9 📲 🖛 🔻	Negative_Speed	Struct						~		Para			
10 📲 🔳	Threshold_Error	Real	-16.0	-16.0	-16.0	Image: A start and a start		~		Spee			
11 🕣 🔹	Threshold_Warning	Real	-14.0	-14.0	-14.0	Image: A start of the start				Spee			
12 📶 🔳	Error	Bool	false	FALSE	FALSE	Image: A start of the start				error			
13 📶 🔳	Warning	Bool	false	FALSE	FALSE					warni			

7.9 扩展数据块、加载而不重新初始化

-

→ 为使数据块"SPEED_MOTOR"[DB2] 实现"加载而不重新初始化",必须 ^I Go offline</sup>,接着随 后打开数据块的属性 (Properties)。

$(\rightarrow$	2	Go offline	\rightarrow SPEED_MOTOR[DB2] \rightarrow	属性)
----------------	---	------------	--	-----

VA	Siemens - G:\Automation\032-600_0	Slobal_Data_Blo	cks\032-600_Global_Data	_Blocks								-	۳X
P	roject Edit View Insert Online	Options Tools	Window Help								Totally	Integrated Automation	
	🛉 🎦 🔚 Save project ا 📕 🗎 🗎	X ≌) ± (°i ±	🖥 🗓 🖆 🖳 💋	Go online	🖉 Go offline 👔	hy 🖪 🖪 🗶 🗄					rotany	PORT/	AL .
	Project tree		032-600_Global_Data	_Blocks	CPU1516F [0]	CPU 1516F-3 PN/I	DP] 🕨 Program	blocks > S	PEED_MOTOF	[DB2]		_ 2 = 1	X I
	Devices												-
	Devices		station militare o			, ,							-3
	B00	<u> </u>	97 97 🍫 🕸 🛤 🖬	- 🗱 🖾 I								-1	- ș
E.			SPEED_MOTOR (sn	apshot cre	eated: 7/29/20	15 7:54:43 AM)							°
	MOTOR_AUTO [FB1]	^	Name		Data type	Start value	Snapshot	Retain	Accessible f	Visible in	Setpoint	Comment	
Ē	MOTOR_AUTO_DB (DB1)		1 🕣 🔻 Static			_							
2	SPEED_MOTOR [DB2]	Open	a man found found	pint	Real	13.0	13.0					Speed set point in revolution	bra
5	Technology objects	Micut	Cell V	I_Value	Real	0.0	15.19097					Speed actual value in revo	u 17.
西	External source files	a Conv	Ctrl+X	ed	Struct							Parameters for error/warnin	·9 "
	PLC tags	The Pacto	Ctrl+V	_Error	Real	15.0	15.0					Speed limit / if exceeded ar	ł
	FLC data types			_warning	кеат	10.0	10.0	Sec.				Speed limit / if exceeded a	N
	Watch and force tables	Copy as text			Bool	talse	TRUE					error limit exceeded	
	Add new watch table	Fill Force table Delete De					FALSE		<u> </u>			warning limit exceeded	
	big Force table	Rename F2										Parameters for error/warnin	·9··
	box watch table_1	Compile	•	Error	Real	-16.0	-16.0		<u> </u>			Speed limit / if exceeded ar	J
	Tassa	Download to	device 🕨	_warning	Real	-14.0	-14.0	V				Speed limit / if exceeded a	N
	We Program info	💋 Go online	Ctrl+K		Bool	false	FALSE	¥				error limit exceeded	
	Device providata	🔊 Go offline	Ctrl+M		8001	laise	PALSE		•			warning innit exceeded	
	PIC alarms	R. Snapshot of	the monitor values										
	Text lists	Apply snaps	hot values as start values 🕨										
	Ica indu	Concrete co	urse from blocks										
	Common data	generate so	urce nonit blocks										
	Documentation settings	Cross-referen	nce information Shift+F11				ш						>
	Languages & resources	Cross-referen	nces F11						D Propert	tion 📩	Info 🛛	Diagnostics	
	Online access	Call structure	e li-e						- rioper	ues 🖂		Diagnostics	
	Card Reader/USB memory	I Assignment	list	ferences	Compile	Syntax							
	- /	Switch progr	amming language 🔹 🕨	ages	-								
		Know-how p	rotection										
		E Print	Ctrl+P	-				Go to	? Dat	e Tim	ne		
		🔄 률 Print preview	·	uccessfull	y written to the PL	с.			7/2	9/2015 8:0	05:08 AM		^
	> Details view	Properties	Alt+Enter	1516F tern	ninated.				7/2	9/2015 8:0	06:50 AM		~
	Portal view Overview	w 🔁 Main	Watch table	1 🧧 SI	PEED_MOTOR					🗸 Con	inection to C	PU1516F terminated.	

→ 在属性窗口中,在"常规"(General) -"性质"(Attributes) 中勾选 ■"优化后的块访问"(Optimized block access)。

(→常规→性质→区优化后的块访问)

SPEED_MOTOR [DB2]		×
General		
General	Attributes	
Time stamps		
Compilation	Only store in load memory	
Protection	Data block write-protected in the device	
Attributes Download without reinitialization	Optimized block access	
	K []	>
	OK Cancel	

→ 选择了"加载而不重新初始化"(Download without reinitialization) 时为数据块分配"永久内存 中的预留"(Retentive memory reserve)。

(→加载而不重新初始化→永久内存中的预留→10字节→确定)

General	
General	Download without minitialization
Information	
Time stamps	
Compilation	Memory reserve: 100 Bytes (100 bytes available)
Protection	Enable download without reinitialization for
Attributes	retentive tags.
Download without reinitializ	Retentive memory reserve 10 Bytes (10 bytes available)
	X
A	

→ 接着,将数据块"SPEED_MOTOR"[DB] 重新加载进控制器,并选择 🍠 Go online。

 $(\rightarrow \text{SPEED}_\text{MOTOR} [\text{DB}] \rightarrow \square \rightarrow \square \rightarrow \square \text{Go online})$

iemens - G:Automation\032-600_Global_Data_ ect Edit View Insert Online Options Too → F Save project = X = 1 → X = 1 → X → 2 (Blocks ols W	\$\032-0 (ndow	500_0 He	Global_Data_Blocks Ip I Go online	🖉 Go offline 🛔	×	=				Totally	- Integrated Automation PORTA
roject tree	4)32-6(ilobal Data Blocks	CPU1516F [CPU	J 1516F-3 PN/	DP] → Program	iblocks ▶ S	PEED_MOTOR	[DB2]		_ # = ×
Devices			Dow	nload to device								
*00		s = 5										
		SPE	ED I	MOTOR								
D 032-600 Global Data Blocks		516	Name		Data tune	Start value	Spanshot	Patain	àccersible f	Visible in	Setopint	Comment
Add new device	- 1	-		: tatic	Data type	Start value	snapsnot	Retain	Accessible I	visible in	setpoint	comment
Bevices & networks				Coord Cotopint	Peol	12.0						Enand cat point in revolutio
CPU1516E [CPU1516E-3 PN/DP]	4			Speed_Setpoint	Peal	0.0						Speed set point in revolutio.
Device configuration	4			Positive Speed	Struct	0.0						Parameters for error/warning
Q Online & diagnostics	5			Threshold Error	Real	15.0						Speed limit / if exceeded an
Program blocks	= 6	-	-	Threshold Warning	Real	10.0						Speed limit / if exceeded a w
Add new block	7	-		Error	Bool	false						error limit exceeded
- Main [OB1]				Warning	Bool	false					ä	warning limit exceeded
MOTOR SPEEDCONTROL [EC10]	9	-		Negative Speed	Struct	iurae						Parameters for error/warning
MOTOR SPEEDMONITORING [EC11]	1	0	۰.	Threshold Error	Real	-16.0						Speed limit / if exceeded an
MOTOR AUTO [EB1]	1	1 40		Threshold_Warning	Real	-14.0						Speed limit / if exceeded a w
MOTOR AUTO DB [DB1]	1	2 -		Error	Bool	false						error limit exceeded
SPEED MOTOR [DB2]	1	3 - 60		Warning	Bool	false					ä	warning limit exceeded
Technology objects	1 H		-	narring	2001	ionse			-	•		Naming Inne exceeded
External source files												
PIC tags												
PIC data types												
Watch and force tables												
Add new watch table		<					Ш					
E Force table									O Propert	tion 📩	Info 🛛	Diagnostics
Watch table 1									- riopen	ues 🛛 🖼		Diagnostics
Online backups		Gen	eral	Cross-references	Compile	Syntax						
Traces		3 🔺	0	Show all messages								
Program info			لت									
Device proxy data		Me						Go to	2 Dat	a Tin		
	~	Nic	Con	acted to CRU1516E add	mere IP=107 169 0 1			0010	: 040	0/2015 8-1	12-45 AM	
D + 11 - 1	-	2	Com	rected to croision, add	ress (F=192.106.0.1.				/12	5/2015 8:	0.40 MM	

→ 现在,点击 **题** 激活"加载而不重新初始化"(Download without reinitialization),并点击"确 定"(OK)确认安全询问。

(→ 100 → 确定)

03	2-60	00_G	ilobal_Data_Blocks	CPU151	6F [CPU 1	516F-3 PN/DF] 🕨 Progra	m blocks	SPEED	_MOTOR	[DB2] _ 🖬 🖬 🗙	
₫¢	2 2 4 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7											
	SPEED_MOTOR											
		Name	•	Data type	Download	d without reiniti	alization	Accessibl	Visible i	Setpoint	Comment	
1	-	▼ St	atic									
2	-	•	Speed_Setpoint	Real	13.0	13.0					Speed set point in revolutions per minute (ran.	
З	-	•	Speed_Actual_Value	Real	0.0	15.27055					Speed actual value in revolutions per minute (.	
4		• •	Positive_Speed	Struct							Parameters for error/warning positive speed	
5	-		Threshold_Error	Real	15.0	15.0	V				Speed limit / if exceeded an error is displayed	
6	-		Threshold_Warning	Real	10.0	10.0	~			~	Speed limit / if exceeded a warning is displayed	
7			Error	Bool	false	TRUE	V				error limit exceeded	
8	-		Warning	Bool	false	FALSE	V				warning limit exceeded	
9	-	• •	Negative_Speed	Struct							Parameters for error/warning negative speed	
10			Threshold_Error	Real	-16.0	-16.0	V				Speed limit / if exceeded an error is displayed	
11	-		Threshold_Warning	Real	-14.0	-14.0	V			~	Speed limit / if exceeded a warning is displayed	
12	-		Error	Bool	false	FALSE	V				error limit exceeded	
13	-		Warning	Bool	false	FALSE	~				warning limit exceeded	

×

Cancel

Activation (0601:000020)

Do you want to enable the block function "Load without reinitialization"?

You can download the following changes to the block interface in "RUN" mode without having to reinitialize the program. The number of possible changes is limited. You can specify the size of the memory reserved for changes under "Options > Settings". Please note that changes which were made before activating the memory reserve may cause a reinitialization.

DOK.

不受限,可供培训或研发机构自由使用。© Siemens AG 2017。保留所有权利。 SCE_ZH_032-600 Global Data Blocks_S7-1500_R1703.docx → 现在,在数据块中插入任意变量。

(→ 名称: Value_test → 数据类型: Real → 起始值: 99)

03	032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2]											
2	• 🖻	÷ 1	•		3) E	Ŀ	2 😤					a
	SPEED_MOTOR											
		Na	me		Data typ	be	Start value	Retain	Accessibl	Visible i	Setpoint	Comment
1	-	•	St	atic								
2	-0	•		Speed_Setpoint	Real		13.0		V	 Image: A start of the start of		Speed set point in revolutions per minute (range: +/-50 rpm)
З	-00	•		Speed_Actual_Value	Real		0.0		V	V		Speed actual value in revolutions per minute (range: +/-50 rpm
4	-0	•	•	Positive_Speed	Struct				Image: A start and a start	 Image: A start of the start of		Parameters for error/warning positive speed
5	-00		•	Threshold_Error	Real		15.0		V	V		Speed limit / if exceeded an error is displayed
6			•	Threshold_Warning	Real		10.0		V	 Image: A start of the start of	Image: A start and a start	Speed limit / if exceeded a warning is displayed
7			•	Error	Bool		false		V	 Image: A start of the start of		error limit exceeded
8	-00		•	Warning	Bool		false		V			warning limit exceeded
9	-00	•	•	Negative_Speed	Struct				V	V		Parameters for error/warning negative speed
10	-00		•	Threshold_Error	Real		-16.0		V		~	Speed limit / if exceeded an error is displayed
11	-00		•	Threshold_Warning	Real		-14.0		V			Speed limit / if exceeded a warning is displayed
12			•	Error	Bool		false		V	 Image: A start of the start of		error limit exceeded
13	-00		•	Warning	Bool		false		V			warning limit exceeded
14		•		Value_Test	Real		99.0			Image: A start and a start		
15	ſ.	•		<add new=""></add>								

→ 现在,将数据块"SPEED_MOTOR"[DB] 重新加载至控制器。

(→ SPEED_MOTOR [DB] → \blacksquare → m载)

A Siemer	ns - G:V	Automation\032-600_Global_Data_E	Blocks\032	600_Globa	l_Data_Blocks							-			
Project E	Edit Vie	ew Insert Online Options Tool	ls Window	/ Help								Totally Integrated Automation			
🕒 🖻 🖪	Save pr	roject 🝶 🐰 🏥 🖹 🗙 🕤 ± C	* ± 🐻 🛛	L 🖸 🖳 I	📓 🚿 Go online 💋 Go o	offline 🌡	2 🖪 🖪 👌	K 🗆 💷				PORTA			
Projec	t tree			Download	to device Data_Blocks	CPU 1	516F [CPU 1	516F-3 PN/	'DP] ▶ Pro	ogram blo	cks ▶ Sl	PEED_MOTOR [DB2]			
Devi	ices														
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				SPEC	MOTOR							-4			
v Dio	32-600 (Global Data Blocks	0	J JFLLL		Data tur	ata tuno. Startualua, Bataia, Accorribi, Vicibia i				Cotnoint	Commont			
	Add ne	alobal_bata_blocks	• •	1	Castie	Data typ	e Start value	Retain	Accessibi	VISIBLE I	setpoint	Comment			
	Device	s R patworks			Statuc	Deal	13.0					Consideration in the second state of the second state (second state of the second stat			
	CPU15	16E [CPU 1516E-3 PN/DP]		2	Speed_Setpoint	Real	0.0					Speed set point in revolutions per minute (range: +/50 rpm)			
4		vice configuration	NU	4 -	 Positive Speed 	Struct	0.0					Parameters for error/warning positive speed			
-	V. Onl	line & diagnostics		5 -	Threshold Error	Real	15.0					Speed limit / if evreeded an error is displayed			
	Pro	gram blocks	0 =	6 1	Threshold Warning	Real	10.0					Speed limit / if exceeded a warning is displayed			
		Add new block	-	7 -	Error	Bool	false					error limit exceeded			
		Main [OB1]		8 -	Warning	Bool	false					warning limit exceeded			
		MOTOR SPEEDCONTROL [EC10]			 Manning Magative Speed 	Struct	aise					Parameters for error/warning pegative speed			
	1	MOTOR SPEEDMONITOPING [EC11]		10	Throshold Error	Bool	16.0					Coood limit / if overaded an arrenic displayed			
	1	MOTOR AUTO [ER1]		11	 Inteshold_Effor Threshold_Wassian 	Real	-10.0		¥			Speed minit / if exceeded an error is displayed			
	1				 Inreshold_warning Erres 	Real	-14.0		Image: A to			speed innum rexceeded a warning is displayed			
				12	Error	Bool	faise 4-les					enor minit exceeded			
		belenvekiests		13 10	 warning Makes Tast 	Bool	raise					warning innic exceeded			
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	Ess)	Aug new Watch table		Genera	General Cross-references Compile Syntax										
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> Det	tails vie	w													
↓ Po	rtal vie	w 🗄 Overview 🔠 W	atch table_1	SPE	ED_MOTOR							Connected to CPU1516F, address IP=1			
				-											
∢ Po	rtal vie	w 🔛 Overview 🐻 W	/atch table_1	SPE	ED_MOTOR							Connected to CPU1516F, address IP=1			
load ar	oviow		_	_		_		_	_						
.oau pr	eview									^					
2	0	after the disc													
U	опеск в	belore loading													
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+0	40 🗸 CPU1516F Re				ling.										
	0	 Software 	Dow	nload sof	tware to device		Cons	istent dow	nload						
	0	 Overwrite online? 	Obje	ects that e	exist online and are										

OverwriteOverwrite

Load

Finish

Refresh

Cancel

Main [OB1] SPEED_MOTOR [DB2]

888

(— 03	(→) 032-600_Global_Data_Blocks → CPU1516F [CPU 1516F-3 PN/DP] → Program blocks → SPEED_MOTOR [DB2] _ ■ ■ ×											
1												
	SPEED_MOTOR											
		Na	me		Data type	Start value	Monitor value	Retain	Accessibl	Visible i	Setpoint	Comment
1		•	Sta	atic	1 🔳							
2	-0	•		Speed_Setpoint	Real	13.0	14.0			V		Speed set point in revolutions per minute (ran.
З	-	•		Speed_Actual_Value	Real	0.0	0.0		\checkmark	~		Speed actual value in revolutions per minute (.
4	-00	•	٠	Positive_Speed	Struct			V	Image: A start and a start	V		Parameters for error/warning positive speed
5	-		•	Threshold_Error	Real	15.0	17.0	~	V	~		Speed limit / if exceeded an error is displayed
6			•	Threshold_Warning	Real	10.0	12.0	~	V	V		Speed limit / if exceeded a warning is displayed
7	-		•	Error	Bool	false	FALSE	V	V	V		error limit exceeded
8	-		•	Warning	Bool	false	FALSE	~	\checkmark	~		warning limit exceeded
9	-00	•	٠	Negative_Speed	Struct			~		V		Parameters for error/warning negative speed
10	-0		•	Threshold_Error	Real	-16.0	-16.0	~	\checkmark	V		Speed limit / if exceeded an error is displayed
11	-00		•	Threshold_Warning	Real	-14.0	-14.0	~		~		Speed limit / if exceeded a warning is displayed
12	-00		•	Error	Bool	false	FALSE	V		V		error limit exceeded
13	-		•	Warning	Bool	false	FALSE	\checkmark		~		warning limit exceeded
14		•		Value_Test	Real	99.0	99.0	\checkmark		V		

→ 如果点击" " 重新观测块,则将看到起始值未覆盖观测值。

7.10 项目归档

 → 最后我们需要将整个项目归档。请选择菜单项 →"项目"(Project) →"归档…"(Archive …)。打 开项目归档的文件夹,并以"TIA Portal 项目压缩文件包"的文件类型来保存项目。
 (→ 项目 → 归档 → TIA Portal 项目压缩文件包 → 032-600_Global_Data_Blocks...→

保存)	
-----	--

M Siemens - G:\Automation\032-600_	Global	Data_B	lock	s\032	2-600	D_Glo	bal_Data_Blocks							_ ¤ ×
Project Edit View Insert Online	Options	Tools	v t	vindo Tab [w F	Help	🛛 🔜 💋 Go online 🖉	🕈 Go offlin	e 🛵 🖪	F × -	H M H		То	tally Integrated Automation PORTAL
 Open Migrate project 	Ctrl+O	0		6	00_(Glob	al_Data_Blocks → (CPU1516F	[CPU 1510	6F-3 PN/DP] 🕨 Progra	am blocks	► SPEE	D_MOTOR [DB2] _ ■ ■ ■ X <
Close	Ctrl+W													
Save Save as Ctrl+	Ctrl+S +Shift+S		a	2	₽ SPEF	₽ 5		≥ 🖿 🖪	2 😚					Tasks
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	Cerl - D			6			Threshold_Warning	Real	10.0	Image: A start of the start		 Image: A start of the start of		Speed limit / if exceeded a warning .
A Print preview	Ctri+r			7			Error	Bool	false	Image: A start of the start		 Image: A start of the start of		error limit exceeded
s rint preview		-		8	-		Warning	Bool	false	V	Image: A start and a start	 Image: A start of the start of		warning limit exceeded
G:\Automatio\032-600_Global_Data_B	locks			9	•	•	Negative_Speed	Struct		Image: A start of the start	V	V		Parameters for error/warning negati.
G:\Automation\zu\032_300_PID_Co	ntrol	1]		10			Threshold_Error	Real	-16.0	Image: A start of the start	Image: A start and a start	 Image: A start of the start of		Speed limit / if exceeded an error is .
G:\Automation\052-3\052-300_PID_Co	ntrol			11			Threshold_Warning	Real	-14.0	Image: A start of the start	Image: A start of the start	V		Speed limit / if exceeded a warning .
G:\Automation\03\032_300_Analog_V	alues			12	•		Error	Bool	false	Image: A start and a start		Image: A start and a start		error limit exceeded
Exit				13			Warning	Bool	false	Image: A start of the start		Image: A start and a start		warning limit exceeded
Technology objects		1		14	-	1	Value_Test	Real	99.0	Image: A start of the start		 Image: A start of the start of		
External source files														
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Portal view Overvie	ew	🔛 Wa	atch t	able_	1	e s	PEED_MOTOR						Connection	n to CPU1516F terminated.

8 检查清单

编号	说明	已检查
1	数据块 SPEED_MOTOR [DB2] 已成功创建。	
2	在 Main [OB1] 中更改了程序。	
3	编译成功完成且没有出现错误报警	
4	加载成功完成且没有出现错误报警	
5	接通机组 (-K0 = 1) 气缸已驶入/反馈已激活 (-B1 = 1) 紧急停机 (-A1 = 1) 未激活 自动模式 (-S0 = 1) 未按下自动模式停止按钮 (-S2 = 1) 短暂按下自动模式启动按钮 (-S1 = 1) "滑道已占用"传感器已激活 (-B4 = 1) 之后接通输送带电机 M1 可变转速 (-Q3 = 1) 并保持激活状态 。 转速在转速额定值 +/- 50 rpm 的范围内	
6	输送带末端传感器已激活 (-B7 = 1) → -Q3 = 0(2 秒后)	
7	短暂按下自动模式停止按钮 (-S2 = 0) → -Q3 = 0	
8	激活紧急停机 (-A1 = 0) → -Q3 = 0	
9	手动模式 (-S0 = 0) → -Q3 = 0	
10	关闭机组 (-K0 = 0) → -Q3 = 0	
11	柱体未驶入 (-B1 = 0) → -Q3 = 0	
12	转速 > 故障转速最大极限值 → -Q3 = 0	
13	转速 < 故障转速最小极限值 → -Q3 = 0	
14	项目成功归档	

9 练习

9.1 任务要求 - 练习

在该练习中应额外创建全局数据块"MAGAZINE_PLASTIC"[DB3]。 在该数据块中,应对塑料零件计数器的额定值进行预先规定,并将实际值显示出来。 为此,在功能块"MOTOR_AUTO"[FB1] 中额外添加一个可互连的输入端(用于预设额定值)和 一个输出端(用于显示实际值)。

9.2 技术示意图

在此处可查看有关任务要求的技术示意图。



图 5: 技术示意图

Schalter der Sortieranlage	Automatikbetrieb	Handbetrieb / Manual mode
Switches of sorting station	Automatic mode	-S3 Tippbetrieb -M1 vorwärts/ Manual -M1 forwards
-P1 ein/on	-P5 gestartet/started	54 Timbateriah Mt südaulista/
		Manual -M1 backwards
-P4 aktiviert/active	S2 Stapp/ctap	-P7 ausgefahren/extended
	-32 30000/3000	-S6 Zylinder -M4 ausfahren/
-P2 Handimanual -P3 Autorauto		-S5 Zvlinder -M4 einfahren/
		cylinder -M4 retract

图 6: 控制面板

9.3 分配表

DI	类型	标号	功能	NC/NO
I 0.0	BOOL	-A1	发出"紧急停机 ok"报警	NC
I 0.1	BOOL	-K0	机组"接通"	NO
I 0.2	BOOL	-S0	手动 (0)/自动 (1) 模式选择开关	手动 = 0 自动 = 1
1 0.3	BOOL	-S1	自动模式启动按钮	NO
10.4	BOOL	-S2	自动模式停止按钮	NC
I 0.5	BOOL	-B1	"柱体 -M4 已驶入"传感器	NO
l 1.0	BOOL	-B4	"滑道已占用"传感器	NO
l 1.3	BOOL	-B7	"部件位于输送带末端"传感器	NO
IW64	BOOL	-B8	电机转速实际值传感器 +/-10V 相当于 +/- 50 rpm	

在该任务中需要使用以下信号作为全局操作数。

DO	类型	标号	功能	
Q 0.2	BOOL	-Q3	输送带电机 -M1 可变转速	
QW 64	BOOL	-U1	电机在两个方向上的转速调节值 +/-10V 相当于 +/- 50 rpm	

分配表的缩写说明

- DI
 数字输入
 DO
 数字输出
- AI 模拟输入 AO 模拟输出
- I
 输入
 Q
 输出
- NC Normally Closed (常闭触点)
- NO Normally Open (常开触点)

9.4 规划

请独立自主地规划并实施具体任务要求。

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9.5 检查清单 - 练习

编号	说明	已检查
1	数据块 MAGAZINE_PLASTIC [DB3] 已成功创建。	
2	在 MOTOR_AUTO [FB1] 中更改了程序。	
3	在 Main [OB1] 中更改了程序。	
4	编译成功完成且没有出现错误报警	
5	加载成功完成且没有出现错误报警	
6	接通机组 (-K0 = 1) 气缸已驶入/反馈已激活 (-B1 = 1) 紧急停机 (-A1 = 1) 未激活 自动模式 (-S0 = 1) 未按下自动模式停止按钮 (-S2 = 1) 短暂按下自动模式启动按钮 (-S1 = 1) "滑道已占用"传感器已激活 (-B4 = 1) 之后接通输送带电机 M1 可变转速 (-Q3 = 1) 启用并保持这个状态。 转速在转速额定值 +/- 50 rpm 的范围内	
7	输送带末端传感器已激活 (-B7 = 1) → -Q3 = 0(2 秒后)	
8	短暂按下自动模式停止按钮 (-S2 = 0) → -Q3 = 0	
9	激活紧急停机 (-A1 = 0) → -Q3 = 0	
10	手动模式 (-S0 = 0) → -Q3 = 0	
11	关闭机组 (-K0 = 0) → -Q3 = 0	
12	气缸未驶入 (-B1 = 0) → -Q3 = 0	
13	转速 > 故障转速最大极限值 → -Q3 = 0	
14	转速 < 故障转速最小极限值 → -Q3 = 0	
15	项目成功归档	

10更多相关信息

为帮助您进行入门学习或深化学习,您可以找到更多指导信息作为辅助学习手段,例如:入门指南、视频、辅导材料、APP、手册、编程指南及试用版软件/固件,请单击链接获取相关资料:

www.siemens.com/sce/s7-1500