# Step7环境下 CMMT 速度控制调试手册

# Standard Telegram 1 报文通讯



姓名:马晓峰 Festo 技术支持 2024 年 7 月 1 日

#### 关键词:

Step7, Profinet, Fb283, CMMT, Standard telegram 1

#### 摘要:

本文介绍了使用 Step7 控制 Festo CMMT telegram 1 控制器的实例,通讯协议为 profinet, PLC 编程软件为 Step7。文档主要内容包括运动控制功能块调用,速度控制调试。

#### 目标群体:

本文仅针对有一定自动化设备调试基础的工程师,需要对 Festo CMMT 伺服以及西门子 Step7 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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方法 1: 使用 FB283 功能块控制。
https://support.industry.siemens.com/cs/document/25166781/sinamics-g-s-toolbox-v2-1-s7-
function-blocks?dti=0&1c=en-WW
SINAMICS G/S: Toolbox V2.1 / S7 Function Blocks
Entry Associated product(s)
DESCRIPTION:
The SINAMICS toolbox comprises a sample project 'Fb283_Bsp_V2_1 zip', which includes an interface block that allows to conveniently connect the SINAMICS converters to PROFIBUS / PROFINET.
This version supports the following converters:
SINAMICS G120     SINAMICS G120
SINAMICS G130     SINAMICS G150
SINAMICS G100     SINAMICS S110
SINAMICS S120 The formula black FR00 all the second data. This black is second data. This black is second data.
SINAMICS S110 and S120, but it can also be used as a mere speed drive.
Further, the FB283 provides the following functions:
The existing drive parameters can be read or overwritten.     The fault buffer can be read out.
<ul> <li>You can transfer up to 64 traversing blocks with one function trigger.</li> <li>Max. 10 arbitrary parameters can be read / written with one job (e.g. to adapt the product).</li> </ul>
This S7 function block is documented in the file 'Fb283_V21_ger.PDF', which is also included in the toolbox ZIP file and can be read using the Acrobat
Reader.
图 1 网页展示
方法 2: 使用 IO 映射直接控制速度控制。
通过配置的 IO 地址控制电机运行。如图 2: 配置标准报文 1;
输入从 120.0 开始,输出从 120.0 开始长度一致均 4 个 Byte。
X7 MP/DP In Province Ethemet(1): PBOEINET-IO. Surtem (100)
X2         PN-0
X2 P2 R Port 2

•							Þ
	(1) CMMT-AS						
Slot	Module	Order nu	I Address	Q address	Diagnosti	Comment	Access
0	G CNNT-AS	CMMT-AS	-		2042*		Full
X7	FN-10 Interface				2041*		Full
XFT Fi	Pavt 1				2040*		Full
XF2 Fi	Pavt 2				2039*		Full
17	DO SERVO				2037*		]
1.7	🚺 Module Access Point				2037*		Full
1.2							
1.3	Standard telegram 1, PZ~		120 123	120 123			Full
1.4	empty submodule				2038×		Full

图 2 项目硬件配置

这个和功能块功能类似,本文档不介绍。

# 2 程序导入及调用

本文档不介绍硬件插入等操作,可以通过微信公众号费家优品->Service2See 查找 Step7 环境下 profinet 控制 CMMT-PN 可以查看详细程序硬件配置。

值得注意的是:速度控制硬件配置使用的是报文1(图2所示)。

# 2.1 功能块导入,

将下载的功能块及 UDT 文件拷贝到 Step7 程序中。如图 3 所示涉及到的功能块有: FB283, FC70, 数据块有: DB70, DB283; 自定义数据 UDT30000; UDT30002; UDT30009; 这些拷贝至项目内。

🖬 0B1		STL	52	Organization Block	0.1	
🔊 FB283	SINA_FB	STL	8134	Function Block	2.1	SINA_FB
🕾 FC70		STL	182	Function	0.1	
FC71		STL	182	Function	0.1	
🖬 FC72		STL	182	Function	0.1	
🖬 FC73		STL	182	Function	0.1	
📾 DB70	Axis_Speed_control	DB	1068	Data Block	0.1	
🖽 DB71	Axis_TVB+MDI_TLG110	DB	2744	Data Block	0.1	
🔲 DB72	Axis_TVB+MDI_TLG111	DB	2744	Data Block	0.1	
🖬 DB73	Axis_TVB+MDI_APC	DB	2744	Data Block	0.1	
🕮 DB283	InstanceDB_to_FB283	DB	698	Instance data block	0.0	
🕮 UDT30000	UDT_Basis	STL		Data Type	2.0	UDT30000
UDT30001	UDT_64TraversingBlocks	STL		Data Type	2.0	UDT30001
UDT30002	UDT_FaultBuffer	STL		Data Type	2.0	UDT30002
UDT30007	UDT_TVB+MDI_APC	STL		Data Type	2.0	UDT30007
UDT30008	UDT_TVB+MDI_TLG111	STL		Data Type	2.0	UDT30008
🕮 UDT30009	UDT_SpeedControl	STL		Data Type	2.0	UDT30009
UDT30010	UDT_TVB+MDI_TLG110	STL		Data Type	2.0	UDT30010

图 3: 需要拷贝的程序块

# 2.2 功能块参数配置

● FC70 的调用

● FB283 的调用:



图 5 FB283 调用

主要参数

LADDR: 硬件配置中的地址匹配图 2 红色框起始地址; LADDR\_DIAG: 诊断地址需要和图2 蓝色框地址一致;

AXIS\_NO

:=B#16#2

### 2.3 电机的控制

#### 2.3.1 使能逻辑

	1	Address	Symbol	Display format	Status value	Modify value
1		DB70.DBX 172.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert1	DEC	0	
2		DB70.DBX 172.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert2	DEC	0	
3		DB70.DBX 172.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Fuehr	DEC	0	
4		DB70.DBX 172.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert3	DEC	0	
5		DB70.DBX 172.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert4	DEC	0	
6		DB70.DBX 172.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert5	DEC	0	
7		DB70.DBX 172.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Drehm_betr	DEC	0	
8		DB70.DBX 172.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert7	DEC	0	
9		DB70.DBX 173.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus1	DEC	0	
10		DB70.DBX 173.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus2	DEC	0	
11		DB70.DBX 173.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus3	DEC	0	
12		DB70.DBX 173.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Freiwechsel	DEC	0	
13		DB70.DBX 173.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Hochl_frei	DEC	0	
14		DB70.DBX 173.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.HL_start	DEC	0	
15		DB70.DBX 173.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw	DEC	0	
16		DB70.DBX 173.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks	DEC	0	

图6控制字

图 6 为控制字的截图。

### ▶ 设备复位:

启动前提条件:

DBX 172.2 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Fuehr 置位为1; 启动上 位机控制。该信号是 Step7 控制 CMMT 的前提条件。

DBX 173.7 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Stoer\_ruecks 控制器复位。 将此信号置位为1;对控制器进行故障复位。

#### ▶ 设备给使能信号

"Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Aus1 DB70.DBX 173.0 "Axis Speed control".Speed Control.WR PZD DREHZAHL.STW1.Aus2 DB70.DBX 173.1 DB70.DBX 173.2 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Aus3 这三个信号是控制控制器使能的重要信号。

第一步:确认设备无故障

第二步:给电机驱动前准备;控制字 DBX173.2; DBX173.1; DBX173.0 按下述步骤置位。 控制字

1) DB70.DBX 173.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.ST	W1.Aus3	置位为	1
	DB70 DBX 172.0 "Axis Speed control Speed Control WR PZD DREHZAHL STW1 reserviert1	DEC	0	

DB70.DBX 172.0	AXIS_Speed_control.Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert1	DEC	0
DB70.DBX 172.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert2	DEC	0
DB70.DBX 172.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Fuehr	DEC	1
DB70.DBX 172.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert3	DEC	0
DB70.DBX 172.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert4	DEC	0
DB70.DBX 172.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert5	DEC	0
DB70.DBX 172.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Drehm_betr	DEC	0
DB70.DBX 172.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert7	DEC	0
DB70.DBX 173.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus1	DEC	0
DB70.DBX 173.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus2	DEC	0
DB70.DBX 173.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus3	DEC	1
DB70.DBX 173.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Freiwechsel	DEC	0
DB70.DBX 173.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Hochl_frei	DEC	0
DB70.DBX 173.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.HL_start	DEC	0
DB70.DBX 173.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw	DEC	0
DB70.DBX 173.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks	DEC	0
	图 7: 控制字 173.2 置位		

#### 状态字:

DB70.DBX213.5"Axis\_Speed\_control".Speed\_Control.RD\_PZD\_DREHZAHL.ZSW1.Kein\_AUS\_3\_steht\_an 0 变更为 1;

DB70.DBX 212.0	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.nsoll_gleich_nist	DEC	0
DB70.DBX 212.1	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Fuehrung_gefordert	DEC	1
DB70.DBX 212.2	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Vergl_Wert_erreicht	DEC	0
DB70.DBX 212.3	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert1	DEC	1
DB70.DBX 212.4	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert2	DEC	0
DB70.DBX 212.5	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert3	DEC	1
DB70.DBX 212.6	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Drehmombetr	DEC	1
DB70.DBX 212.7	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert4	DEC	1
DB70.DBX 213.0	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Einschaltbereit	DEC	0
DB70.DBX 213.1	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Betriebsbereit_KeineStoe	DEC	0
DB70.DBX 213.2	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Status_Reglerfreigabe	DEC	0
DB70.DBX 213.3	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Stoerung_wirksam	DEC	0
DB70.DBX 213.4	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_2_steht_an	DEC	0
DB70.DBX 213.5	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_3_steht_an	DEC	1
DB70.DBX 213.6	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Einschaltsperre	DEC	1
DB70.DBX 213.7	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Warnung_wirksam	DEC	0



# 控制字:

2) DB70.DBX 173.1 "Axis Speed control".Speed Control.WR PZD DREHZAHL.STW1.Aus2 置位为1:

"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert1	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert2	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Fuehr	DEC	1
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert3	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert4	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert5	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Drehm_betr	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert7	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus1	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus2	DEC	1
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus3	DEC	1
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Freiwechsel	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Hochl_frei	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.HL_start	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw	DEC	0
"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks	DEC	0
	*Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert1 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert2 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert3 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert3 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert4 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert5 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert5 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert7 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert7 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.reserviert7 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.Aus1 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.Aus2 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.Aus3 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.Aus3 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.Hus3 *Axis_Speed_control Speed_Control WR_PZD_DREHZAHL STW1.Hus3tart *Axis_Speed_control Speed_CONTOWR_PZD_DREHZAHL STW1.Hus3tart *Axis_Speed_control Speed	"Axis_Speed_control 'Speed_control WR_PZD_DREHZAHL.STW1.reserviert1       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert2       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert3       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert3       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert3       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert4       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert5       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert7       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.reserviert7       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.aus1       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Aus1       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Aus3       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Aus3       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Aus3       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Hoch_frei       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Hoch_frei       DEC         "Axis_Speed_control' Speed_control WR_PZD_DREHZAHL.STW1.Hoch_frei       DEC <td< td=""></td<>

图 9: 控制字 173.1 置位

# 状态字:

"Axis\_Speed\_control".Speed\_Control.RD\_PZD\_DREHZAHL.ZSW1.Einschaltbereit 由1变更为0 "Axis\_Speed\_control".Speed\_Control.RD\_PZD\_DREHZAHL.ZSW1.Kein\_AUS\_2\_steht\_an 由 0 变更为 1

### "Axis\_Speed\_control".Speed\_Control.RD\_PZD\_DREHZAHL.ZSW1.Einschaltbereit 由 0 变更为 1

	_							
DB70.DBX	212.0	"Axis_Speed_	_control".Speed	I_Control.RD_P2	D_DREHZAHL.ZSW1.nsoll_	_gleich_nist	DEC	0
DB70.DBX	212.1	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.Fuehr	rung_gefordert	DEC	1
DB70.DBX	212.2	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.Verg	_Wert_erreicht	DEC	0
DB70.DBX	212.3	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.reser	viert1	DEC	1
DB70.DBX	212.4	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.reser	viert2	DEC	0
DB70.DBX	212.5	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.reser	viert3	DEC	1
DB70.DBX	212.6	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.Drehr	nombetr	DEC	1
DB70.DBX	212.7	"Axis_Speed_	_control".Speed	L_Control.RD_P2	D_DREHZAHL.ZSW1.reser	viert4	DEC	1
DB70.DBX	213.0	"Axis_Speed_	_control".Speed	I_Control.RD_P2	D_DREHZAHL.ZSW1.Einsc	haltbereit	DEC	1
DB70.DBX	213.1	"Axis_Speed_	_control".Speed	I_Control.RD_PZ	D_DREHZAHL.ZSW1.Betrie	ebsbereit_KeineStoe	DEC	0
DB70.DBX	213.2	"Axis_Speed_	_control".Speed	I_Control.RD_PZ	D_DREHZAHL.ZSW1.Statu	s_Reglerfreigabe	DEC	0
DB70.DBX	213.3	"Axis_Speed_	_control".Speed	I_Control.RD_PZ	D_DREHZAHL.ZSW1.Stoer	ung_wirksam	DEC	0
DB70.DBX	213.4	"Axis_Speed_	_control".Speed	I_Control.RD_P2	D_DREHZAHL.ZSW1.Kein_	AUS_2_steht_an	DEC	1
DB70.DBX	213.5	"Axis_Speed_	_control".Speed	I_Control.RD_P2	D_DREHZAHL.ZSW1.Kein_	AUS_3_steht_an	DEC	1
DB70.DBX	213.6	"Axis_Speed_	_control".Speed	[_Control.RD_P2	D_DREHZAHL.ZSW1.Einsc	haltsperre	DEC	0
DB70.DBX	213.7	"Axis_Speed_	_control".Speed	[_Control.RD_P2	D_DREHZAHL.ZSW1.Warn	ung_wirksam	DEC	0

图 10: 状态字

# 值得注意的是:上述两位控制字可以长期置位为1; 控制字:

3) "Axis\_Speed\_control". Speed\_Control. WR\_PZD\_DREHZAHL. STW1. Aus1 0 \_| - (上升沿) 1 当驱动器出现故障或首次启动时,该信号必须有一个上升沿,也就是说 0 到 1 的上升沿且维持 1,设备才能正常上驱动!

DB70.DBX 172.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert1	DEC	0
DB70.DBX 172.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert2	DEC	0
DB70.DBX 172.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Fuehr	DEC	1
DB70.DBX 172.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert3	DEC	0
DB70.DBX 172.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert4	DEC	0
DB70.DBX 172.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert5	DEC	0
DB70.DBX 172.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Drehm_betr	DEC	0
DB70.DBX 172.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert7	DEC	0
DB70.DBX 173.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus1	DEC	1
DB70.DBX 173.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus2	DEC	1
DB70.DBX 173.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus3	DEC	1
DB70.DBX 173.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Freiwechsel	DEC	0
DB70.DBX 173.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Hochl_frei	DEC	0
DB70.DBX 173.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.HL_start	DEC	0
DB70.DBX 173.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw	DEC	0
DB70.DBX 173.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks	DEC	0

# 状态字:

#### "Axis\_Speed\_control".Speed\_Control.RD\_PZD\_DREHZAHL.ZSW1.Betriebsbereit\_KeineStoe 由 0 变更为 1;

DB70.DBX 212.0	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.nsoll_gleich_nist	DEC	0
DB70.DBX 212.1	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Fuehrung_gefordert	DEC	1
DB70.DBX 212.2	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Vergl_Wert_erreicht	DEC	0
DB70.DBX 212.3	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert1	DEC	1
DB70.DBX 212.4	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert2	DEC	0
DB70.DBX 212.5	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert3	DEC	1
DB70.DBX 212.6	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Drehmombetr	DEC	1
DB70.DBX 212.7	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert4	DEC	1
DB70.DBX 213.0	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Einschaltbereit	DEC	1
DB70.DBX 213.1	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Betriebsbereit_KeineStoe	DEC	1
DB70.DBX 213.2	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Status_Reglerfreigabe	DEC	0
DB70.DBX 213.3	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Stoerung_wirksam	DEC	0
DB70.DBX 213.4	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_2_steht_an	DEC	1
DB70.DBX 213.5	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_3_steht_an	DEC	1
DB70.DBX 213.6	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Einschaltsperre	DEC	0
DB70.DBX 213.7	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Warnung_wirksam	DEC	0



上述步骤完成控制器准备就绪。

第三步:给电机驱动

控制字:

DB70.DBX 173.3 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Freiwechsel 置位为1

DB70.DBX 172.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert1	DEC	0
DB70.DBX 172.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert2	DEC	0
DB70.DBX 172.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Fuehr	DEC	1
DB70.DBX 172.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert3	DEC	0
DB70.DBX 172.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert4	DEC	0
DB70.DBX 172.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert5	DEC	0
DB70.DBX 172.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Drehm_betr	DEC	0
DB70.DBX 172.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.reserviert7	DEC	0
DB70.DBX 173.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus1	DEC	1
DB70.DBX 173.1	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus2	DEC	1
DB70.DBX 173.2	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus3	DEC	1
DB70.DBX 173.3	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Freiwechsel	DEC	1
DB70.DBX 173.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Hochl_frei	DEC	0
DB70.DBX 173.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.HL_start	DEC	0
DB70.DBX 173.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw	DEC	0
DB70 DBX 173 7	"Axis Speed control".Speed Control.WR PZD DREHZAHL.STW1.Stoer ruecks	DFC	0

图 13: 控制字

状态字:

由

"Axis_Speed_control".Speed_Control.RD_PZD_DRE	HZAHL.ZSW1.Status_Reglerfreigabe	9
由 0 变更为 1; 等待运动指令。		
DB70.DBX 212.0 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.nsoll_gleich_nist	DEC 🚺 1
DB70.DBX 212.1 "Axis_Speed_control".Speed_Contro	rol.RD_PZD_DREHZAHL.ZSW1.Fuehrung_gefordert C	DEC 🚺 1
DB70.DBX 212.2 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.Vergl_Wert_erreicht C	DEC 0
DB70.DBX 212.3 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.reserviert1 C	DEC 🚺 1
DB70.DBX 212.4 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.reserviert2	DEC 🚺 1
DB70.DBX 212.5 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.reserviert3	DEC 🚺 1
DB70.DBX 212.6 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.Drehmombetr C	DEC 🚺 1
DB70.DBX 212.7 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.reserviert4 C	DEC 🚺 1
DB70.DBX 213.0 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.Einschaltbereit C	DEC 📘 1
DB70.DBX 213.1 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.Betriebsbereit_KeineStoe	DEC 📘 1
DB70.DBX 213.2 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.Status_Reglerfreigabe	DEC 📘 1
DB70.DBX 213.3 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.Stoerung_wirksam C	DEC 0
DB70.DBX 213.4 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_2_steht_an C	DEC 🚺 1
DB70.DBX 213.5 "Axis_Speed_control".Speed_Contr	rol.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_3_steht_an C	DEC 🚺 1
DB70.DBX 213.6 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.Einschaltsperre C	DEC 0
DB70.DBX 213.7 "Axis_Speed_control".Speed_Control	rol.RD_PZD_DREHZAHL.ZSW1.Warnung_wirksam C	DEC 0

图 14: 状态字

控制器准备就绪指示灯常亮,且电机有励磁声,控制器准备就绪。

### 2.4 运行设备

# 2.4.1 速度的给定

速度设定的变量为: DB70.DBW 174 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.nsoll\_h 数据类型为 int。

速度给定是基于基本速度值(Base value velocity 图 15 蓝色框)的百分比换算而成。

16384 即:16#4000 即为100%的基本速度值。

➡ Fieldbus

速度的基准:在FAS软件中:Fieldbus -> Configuration ->Dynamic values 中的 Base value velocity。如本实例基本速度是 0.20m/s;

加/减速度的设定依靠 FAS 内的 Acceleration/Deceleration 黄色框所示. 如图 15 所示

	Configuration			
	Interface			
	Extended process	Coast stop		
[	Digital I/O	Acceleration	5.00	m/s²
4	Analogue I/O	Deceleration	5.00	m/s²
E	ncoder interface	Jerk	500.00	m/s³
- /	Axis 1	Develoption (output dev ACI (ACI)		] ]2
	Motor	Deceleration (system stop ACI/AC3)	1.00	m/s
	Gearbox	Jerk (system stop AC1/AC3)	1000.00	m/s³
	Axis	Deceleration (stop ramp)	15.00	m/s²
	Record table	lerk (ston ramn)	1000.00	m/s <sup>3</sup>
	Monitoring functi		1000100	1
	Closed loop	Base value acceleration	1.00	m/s²
	Auto tuning	Base value deceleration	1.00	m/s²
	Vibration compen	Base value velocity	0.20	m/s
	Feed forward cont			1
	<ul> <li>Position trigger</li> </ul>	Base value velocity (controller)	749.9999	rpm
		图 15 FAS 界面		



Network2:速度换算。

举例: MD10 为期望的运行速度,使用的单位为 mm/s。将设定速度与基本速度值相除获得比率,然 后再与基数系数 16384 相乘获得放大后的速率,使用 Round 运算将 Real 转换成 DINT; Network3: 取 Dint 低位传送到速度值

		~臣			
15	DB70.DBX 173.6 "Axis_Speed_cont	rol".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw	DEC	1	
16	DB70.DBX 173.7 "Axis_Speed_cont	roll.Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks	B DEC	0	
17	DB70.DBW 174 "Axis_Speed_cont	rol".Speed_Control.WR_PZD_DREHZAHL.nsoll_h	DEC	819	
18	MD 10		FLOATING_POINT	10.0	10.0

图 17 监控器内的速度 设定速度 10mm/s,下图为 FAS 实际速度。约为 10mm/s

	Disconnect Plu Cont	rol Powerstage	Stop Acknowledge all Store on device	C C Reinitialize Restart device	Star	REC
Device s	itate				۲	> Watch window
				11,410,410,000		Active motion task Velocity (4)
Se	ervo drive		Axis Standstill reached	and in standstill window		Referencing status Drive NOT referenced (100)
_	J	_				Setpoint Position -2191.4262295 mm
	Acknowledge all					Position actual value (encoder 1 -2191.4246083 mm
Status	Category	ID	Name	Timestamp		Setpoint value velocity controlle
•	Information (4)	D1.07/02/00125.0	Standstill reached and in standstill window	07.03:23:58.128		0.0099976 m/s
•	Information (4)	D1.07j02j00124.0	Standstill reached	07.03:23:58.128		Velocity actual value (encoder 1
						Constraint HUS

图 18 FAS 实际速度

# 2.4.2 启动运行

### 前提条件:执行了 2.3 章节的步骤,控制器无故障,电机处于励磁状态。 控制字:

DB70.DBX 173.4 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Hochl\_frei Hochlaufgeber Freigabe DB70.DBX 173.5 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.HL\_start Hochlaufgeber start DB70.DBX 173.6 "Axis\_Speed\_control".Speed\_Control.WR\_PZD\_DREHZAHL.STW1.Frei\_sollw Freigabe Sollwert 将三个信号置位为1。

DB70.DBX 173.0	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Aus1 DEC	1
DB70.DBX 173.1	"Axis_Speed_control.WR_PZD_DREHZAHL.STW1.Aus2 DEC	1
DB70.DBX 173.2	"Axis_Speed_control.WR_PZD_DREHZAHL.STW1.Aus3 DEC	1
DB70.DBX 173.3	"Axis_Speed_control.WR_PZD_DREHZAHL.STW1.Freiwechsel DEC	1
DB70.DBX 173.4	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Hochl_frei DEC	1
DB70.DBX 173.5	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.HL_start DEC	1
DB70.DBX 173.6	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Frei_sollw DEC	1
DB70.DBX 173.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks DEC	0
DB70.DBW 174	"Axis_Speed_control.WR_PZD_DREHZAHL.nsoll_h DEC	-819
MD 10	FLOATING_POINT	-10.0
AW 122	DEC	-819



# 2.5 速度反馈

# 2.5.1 使用程序转换

速度的反馈和速度给定是一致的;反馈值仍为基础速度值的百分比;如图 20 所示 状态字反馈地址为:

#### DB70.DBW 214 "Axis\_Speed\_control".Speed\_Control.RD\_PZD\_DREHZAHL.nsoll\_h

DB70.DBX 173.7	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.STW1.Stoer_ruecks	DEC	0
DB70.DBW 174	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.nsoll_h	DEC	819
MD 10		FLOATING_POINT	10.0
AW 122		DEC	819
DB70.DBX 212.0	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.nsoll_gleich_nist	DEC	1
DB70.DBX 212.1	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Fuehrung_gefordert	DEC	1
DB70.DBX 212.2	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Vergl_Wert_erreicht	DEC	0
DB70.DBX 212.3	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert1	DEC	1
DB70.DBX 212.4	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert2	DEC	1
DB70.DBX 212.5	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert3	DEC	1
DB70.DBX 212.6	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Drehmombetr	DEC	1
DB70.DBX 212.7	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.reserviert4	DEC	1
DB70.DBX 213.0	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Einschaltbereit	DEC	1
DB70.DBX 213.1	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Betriebsbereit_KeineStoe	DEC	1
DB70.DBX 213.2	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Status_Reglerfreigabe	DEC	1
DB70.DBX 213.3	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Stoerung_wirksam	DEC	0
DB70.DBX 213.4	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_2_steht_an	DEC	1
DB70.DBX 213.5	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Kein_AUS_3_steht_an	DEC	1
DB70.DBX 213.6	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Einschaltsperre	DEC	0
DB70.DBX 213.7	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.ZSW1.Warnung_wirksam	DEC	0
DB70.DBW 214	"Axis Speed control".Speed Control.RD PZD DREHZAHL.nsoll h	DEC	820

图 20 状态字

获得实际速度则需要换算转换,需要下面的程序辅助。 Bietwort d: Title:



图 21 程序图

按照图 21 编程后获得实际速度值。

### 2.5.2 使用 PNU 读取实际数据

图 22 监控设定及目标值;蓝色框为设定速度,绿的框为读取的速度值。

DB70.DBW 174	"Axis_Speed_control".Speed_Control.WR_PZD_DREHZAHL.nsoll_h	DEC	-819
MD 10		FLOATING_POINT	-10.0
AW 122		DEC	-819
DB70.DBW 214	"Axis_Speed_control".Speed_Control.RD_PZD_DREHZAHL.nsoll_h	DEC	-832
DB70.DBW 16	"Axis_Speed_control".Basis.single.tasksi	DEC	11311
DB70.DBX 14.0	"Axis_Speed_control".Basis.single.RD	BOOL	false
DB70.DBD 20	"Axis_Speed_control".Basis.single.Data	FLOATING_POINT	-0.009994906

图 22 监控值

步骤 1: 通过访问 DB70. DBW16 Basis. single. tasksi Auftragsnummer oder Parameternummer 设置需要读取速度的任务号: 查询到 PNU 号码为 11311;将此值填写到 DBW16 并赋值。

Rew Project*	<b>#</b> 9, 00	cmmt-as ×		
PARAMETERISATION	CONTROL DIAGNOSIS			
CMMT-AS-C2-3A-PN- Path: 192.168.0.2 Connected	S1 Disconnect	Plug-in PLC Disabled Control Powerstage Stop	Acknowledge all	levice Reinitialize
Parameter pages <	Parameter list		C 🗉	🕞 🌱 🗙 velocity
Extended process	ID 🌱	Name	Y Value	Y Unit Y
Digital I/O	<ul> <li>/Axis1/Actual motor informatio</li> </ul>	n group[0] (32) 💭		
Analogue I/O	P1.7124.0.0	Current maximum velocity		1.813334 m/s =
Encoder interface	P1.7127.0.0	Current nominal velocity		Actual valacity value anceder
▼ Axis 1	<ul> <li>/Axis1/Actual value management</li> </ul>	nt group[0] (10) 💭		channel 1
Motor	P1.1210.0.0	Actual velocity value encoder channel 1		P1.1210.0.0 (FLOAT32)
Gearbox	P1.1211.0.0	Actual velocity value encoder channel 2		PROFINET: PNU 6.0 (INT) PNU 8.0 (DINT)
Axis	<ul> <li>/Axis1/Application limitation group</li> </ul>	oup[0] (14) 💭		PNU 11311.0 (REAL)
Record table	P1.1301.0.0	Velocity limitation status	Active	Specifies the velocity measured by the primary encoder.
Monitoring functi	P1.1304.0.0	Limit value velocity limit positive direction of movement		1.00 m/s =

图 23 FAS 参数号

步骤二:启动读取 DB70. DBX14.0 Basis. single. RD;启动读取信号。

第三步:读取到实际速度值: "Axis\_Speed\_control". Basis. single. Data;数据类型 DINT,将此 信号转换成 REAL 即为实际的速度。

# 3 报警信息

CMMT 的报警信息可以通过 DB70. DBW16 Basis. single. tasksi 任务管理器读取到故障码。操作步骤;

1) DB70. DBW16 Basis.single.tasksi 设置为 30002;即 UDT30002"UDT\_FaultBuffer";读取的故障 点存储在 DB70 中的 UDT30002 中。

2) 启动 DB70. DBX14.0 Basis. single. RD 读取信号;

3) 读取完成信号 DB70. DBX14.2 "Axis\_Speed\_control". Basis. single. Done;

4) 查看故障代码: DB70. DBW266 存储的故障代码 229; 图 24 所示。和 FAS 实际报警可以对应上图 25 所示。

264.0	Fault.Stoerfall1.Stoereintrag0.Stoercode	INT	0	0	
266.0	Fault.Stoerfall1.Stoereintrag0.Stoernummer	INT	0	229	
268.0	Fault.Stoerfall1.Stoereintrag0.Stoerzeit	DINT	L#0	L#118498626	
272.0	Fault.Stoerfall1.Stoereintrag0.Stoerwert	DINT	L#0	L#0	
276.0	Fault.Stoerfall1.Stoereintrag1.Stoercode	INT	0	0	
278.0	Fault.Stoerfall1.Stoereintrag1.Stoernummer	INT	0	0	

图 24 故障代码

St	Common error EnDat 2.2 D0.18/01/00229.0 Acknowledge all		Avis Standstill reached D1.07/02[00124.0		
Status	Category	ID	Name	Timestamp	
	Information (4)	D1.07 02 00124.0	Standstill reached	07.03:48:59.399	
	Information (4)	D1.07 02 00122.0	Target velocity reached	07.03:48:59.499	
	Information (4)	D1.07 02 00121.0	Target position reached	07.03:48:59.600	
	Information (4)	D1.07 02 00125.0	Standstill reached and in standstill window	07.03:50:03.754	
	Stop category 0 (4096)	D0.18 01 00229.0	Common error EnDat 2.2	07.05:38:03.436	

图 25 FAS 的故障代码