SIMOTION

Frequently asked Questions

How Can the Technological Data Coupling Be Used with the Drive? (Available for SIMOTION SCOUT V3.2 or later)





Table of Contents

1	Question	. 3
2	Solution	. 3
3	Configuration	. 4
3.1	Assignment of the Variables in the Technological Data Block	4
3.2	Normalization of the Variables	5
3.3	Creating Technological Data for the SINAMICS_Integrated Drive	6
3.4	Other Settings in the SINAMICS_Integrated Drive	7
3.5	Creating Technological Data for SIMODRIVE 611U Drive	7
3.6	Creating Technological Data for SIMOVERT MASTERDRIVES Drive	. 7
3.7	Checking SCOUT Settings	7
4	Application	. 7
4.1	Introduction	. 7
4.2	Control Variables	7
4.3	TORQUE Program	. 7
4.4	POS Program	7
4.5	N_M_SETPOINT Program	. 7

Technological Data

1 Question

How can I use the technological data coupling to the drive?

Amendment to the manual "Axis_Technology_Functions", Chapter 2.4.4,

and to the SIMOTION SCOUT online help.

2 Solution

By activating the technological data block, the controller can cyclically predefine technological data to the drive or read this data from the drive.

This feature is supported by SIMOTION SCOUT V3.2 or later.

For example, technological data is required for the implementation of a winder functionality with SIMOTION.

Technological data is transmitted in addition to the standard message frame.

If the technological data block is configured upon the configuration of the axis, all words transmitted additionally are assigned a specific significance in SIMOTION.

3 Configuration

3.1 Assignment of the Variables in the Technological Data Block

The order and significance of the words in the technological data block is predefined in SIMOTION SCOUT.

In the drive, the corresponding parameters must be linked to the additional words in the PROFIBUS message frame.

Table 2-1: Variable designations in the SIMOTION SCOUT and Drive (SINAMICS S120 or SINAMICS_Integrated)

Direction	Word No.	Designation in SIMOTION SCOUT	Designation in the Drive
SIMOTION -> Drive	1	(Axis).DefaultAdditiveTorque	P1511 additional torque 1 P1512 weighting
	2	(Axis).DefaultTorqueLimitPositive	P1522 upper torque limit/motor
	3	(Axis).DefaultTorqueLimitNegative	P1523 lower torque limit/regenerative
Drive -> SIMOTION	1	(Axis).ActualTorque.Value	r80 actual torque value

Table 2-2: Variable designations in the SIMOTION Scout and Drive (SIMODRIVE 611U)

Direction	Word No.	Designation in SIMOTION SCOUT	Designation in the Drive
SIMOTION -> Drive	1	(Axis).DefaultAdditiveTorque	P50113 MsetExt torque setpoint
	2	(Axis).DefaultTorqueLimitPositive	Not existing
	3	(Axis).DefaultTorqueLimitNegative	Not existing
Drive -> SIMOTION	1	(Axis).ActualTorque.Value	P50114 Msetpoint smoothed torque setpoint

Table 2-3: Variable designations in the SIMOTION Scout and Drive (SIMOVERT MASTERDRIVES)

Direction	Word No.	Designation in SIMOTION SCOUT	Designation in the Drive
SIMOTION - > Drive	1	(Axis).DefaultAdditiveTorque	P262 Torque setpoint Q.M(additional)
	2	(Axis).DefaultTorqueLimitPositive	P263 M(limit1,set) upper
	3	(Axis).DefaultTorqueLimitNegative	P264 M(limit2,set) lower
Drive -> SIMOTION	1	(Axis).ActualTorque.Value	R007 Actual torque value

For more detailed information on the parameters for further drives, refer to the corresponding equipment manual.

3.2 Normalization of the Variables

Normalized variables are transmitted via the PROFIBUS. A factor is transmitted instead of transmitting absolute values (for 100%, the factor is 4,000h). Factors from -200 to +200% are therefore supported.

These factors refer to the motor torque that is entered in parameters depending on the drive or calculated from various parameters. For more detailed information, refer to the documentation on the corresponding drive.

In SIMOTION SCOUT, the value stored in the configuration data

(Axis).TypeOfAxis.SetPointDriverInfo.DriveData.maxTorque

will be used as reference torque. This value can be modified in offline mode via the expert menu of the axis.

Figure 2-1 , Axis, maximum torque

-					
-Ę	SetPointDriverInfo	Drive interface			
\mathbf{H}	-📮 DriveData	Drive characteristic values for stand			
Т	-maxSpeed	Maximum speed of the drive	6000.0	6000.0	6000.0
Т	LmaxTorque	Maximum torque of the drive	1.38	1.38	1.38
	+ InvertSetPoint	Direction of rotation adjustment		\smile	
\mathbf{I}	-actorType	Drive type	NO_TYPE (0)	NO_TYPE (0)	NO_TYPE (0)
- 1					

To ensure a homogeneous evaluation of the factor transmitted via PROFIBUS, the torque settings in the drive must correspond to the settings in SIMOTION SCOUT.

For SINAMICS_Integrated, this value is defined in P2003.

Figure 2-2, P2003 drive parameter, maximum torque

				- 1		
p1990			Rotor position identification angular comm	n	0	-
p2000			Reference speed reference frequency		6000.00	rpm
p2001			Reference voltage		1000	V
p2002			Reference current	1	3.00	A
p2003			Reference torque		1.38	Nm
r2004			Reference power		9	KVV
r2032		+	Master control, control word effective		OH	-
0007					-	

Technological Data

3.3 Creating Technological Data for the SINAMICS_Integrated Drive

Table 2-4 Manual extension of the PROFIBUS message frame in the hardware configuration, illustrated via the example of a project with SIMOTION D435 and SINAMICS_Integrated and the Axis_RED:

No.	Action	Remark
1	Provide the corresponding prerequisites: Create a project with D435 and SINAMICS_Integrated. Create drives under SINAMICS_Integrated. A Siemens standard message frame must be used for this purpose (e.g. 105). Open the SINAMICS_Integrated configuration.	SIMUTION SCOUT - TechData Project Edit Insert Target system View (Image: Simulation of the system

2	All created objects are shown in the	SINAMICS_Solograted - Configurations
	"SINAMICS_Integrated - Configuration"	PERFECTs investigg for a provided with the following section and the DEPENDE managements from the DEPENDE managements from
	menu.	Object Drive object Hs. Message frame type I address (0 address 5000)
	Objects with I/O addresses must be indicated on top in order to be able to assign physical addresses via an adjustment with HW Config. The adjustment must be performed afterwards.	1 1820 2 Pres message home configuration with BCD
		PROFIBUS neckage frame Version overview
	Check information on the arrangement of the objects. Object 1 corresponds to Drive_RED with the addresses 256275. The address range for Message frame 105 includes 10/10words I/O Important! The "SINAMICS_Integrated - Configuration" window must be closed afterwards.	The diver objects are applied with data in the following sequence from the PROFIBUS message frame: Object Brave object Bits Message frame type 1 adds size 0 adds mess SIM01 1 Drive, PED 3 SEMBIS biogram 106 256, 276
3	Open the hardware configuration.	HW Config - [SIMOTION D (Configuration) TechData]
4	Double-click on the	Decklori Coloris Window Frep Image: Coloris Window Frep PROFIBUS(1): DP master system (2) PROFIBUS Integrated: DP master system (1) PROFIBUS Integrated: DP master system (1) Image: Coloris Image: Coloris Image: Coloris
4	"SINAMICS_Integrated" object to open the "DP Slave Properties". The "Configuration, Survey" window shows the objects of SINAMICS Integrated. The object that has previously been determined for Drive_RED is selected here. (Object 1)	General Configuration Dark Synchronization



_		
5	Click the "Activate" button to check whether the master-slave configuration has been automatically created. The corresponding message pops up. Click on Yes to confirm that you actually want to activate the user settings and then click on "Detail" to open the corresponding menu.	Konfiguration (2468:63201) Die Master-Slave-Konfiguration wurde automatisch erzeugt und deshalb für Benutzereingaben gespert. Damit sollen unbeabsichtigte Benutzereingaben verhindert werden. Wollen Sie dennoch die Konfiguration für Benutzereingaben aktivieren? Ja Nein Lonfiguration (4184:53201)
		Yes No
6	Since Object 1 is shown in the uppermost table line and is assigned to physical addresses starting with 256, this object refers to Slots 4 and 5. The length of the actual-value message frame must be extended by one word. The length of the setpoint message frame is extended by three words.	DP Slave Properties X Seriesi Configuration (Lock Sprichronization) Set Infaced stave Set Infaced stave Type Action value Set Type Action value PCD1 Set Set PCD1 Set Setorint PCD1 Setorint PCD1 Setorint PCD1 Setorint PCD1 Acta value PCD1 Setorint PCD1 Matter Stave configuration1 Protection Matter Stave configuration1 Protection Motion Statement Setorint Protection Setorint Protection Matter Stave configuration1 Protection Motion Protection Setorint
7	Due to the extended message frame length and the continuous address allocation, the HW Config moves the addresses to a free range. Here: Starting with 296.	OP Stave Projectics X Server all Configuration Dock Synchronization Set In local times PPOPIBLS partner Set In local times PPOPIBLS partner Type Address Type D. One. 4 Account water PCD 1 New 2 26 5 Satigate PCD 1 Output 2 26 13 Next 3 7 Actor discorn PCD 1 Output 2 276 10 Next 3 Principal 8 Satigate PCD 1 Output 2 276 10 Next 3 Principal 8 Satigate PCD 1 Output 2 278 10 Next 3 Principal 10 Actor discorn 1 Output 2 278 10 Next 3 Principal 11 Image Image Image Image Image Image 11 Image Image Image Image Image Image Image Image Iman

Copyright © Siemens AG Copyright 2005 All rights reserved



8	B The addresses can be modified with the Bave Properties											×
	other objects in such a way that a	General	Config.4ation	Clock Syr	chronization							4
	consecutive address allocation in	Slot	Iniosal	stave.	PfV	OFICUS)	partner	-				
			Туре	Address	type	D)	10-4.	Pro:	Lorgh	hi linit	Contria	
	ascending order is ensured once more.	4	Actual yelue	PCD 1	Inpud	2	256	12	11	WAYE	Entrol	
		5	Setpoint	PCD 1	Output	2	256	1	13	YAD' D	Critrel	
	In this example, an address range of	B	Acts deconn.	-	A STA		200	-	10	Sec. 14	Caller	
	13words I/O respectively has been	10	Saturat	0.01	Dedreit	2	282		10	Water of 1	Print I	
		9	Acia disconn.	CMP F	Vapa.	5	E.VC.	-	10	CTUE M	PERSON OF	
1	reserved for Drive_RED.	10	Avia decorn.		-						and all	
		11										
		1 Su	www.kibetail/			1.1				1		
										1		
		935	02200 10				-	Trises.	88.	1.10	cerc:90	
		Net	ter-Sleve conlig	unstion 4	I belowalid							
		Sh	dion:	SIMO	TIDN D							
		Ca	conset.	-	namere:						141	
			0.000									
		0K	2						Ce	incel	Help	1
		15									-	-
9	After the changes to Object 1, the	DP Slave	Properties	The tre	d and done l	3					1	×1
	message frame type has been changed			Leaves south	circita and	-						1
	to "User-Defined" in the "Survev" menu.	1000			De	thuit:		*				
	······································	Obj	ect .		Telegrans	¢			1	Optor		
		1	Light Telephone 1	Ins provide	40			-	-		_	
		3	None	103,1-20-10	1161				-		-	
		4	None									
	Click on OK to apply the settings											Ш
	choix on orx to apply the settings.											
											34	
											Ŧ	П
		\ Su	vey (Detail)	3		11		-	1		1	
		20000							11 12:30 1	0.4	the second second	
							24	inser of	Diffeor	Uek	10 00,000	
		Mai	ter Slave config	uration 4	(CALCORD)							
		Ma	ster: store	12) DF S(MO	TION D							
			(Sec.)				_	_	_	_		
		6	In the								1	
						_	_	-	_	2.0]
		DK							Can	cel	Help	1
								197	_			



10	A message in SIMOTION informs the user that changes can only become effective after an "Adjustment to the HW Config" in the SINAMICS_Integrated configuration menu. Click on OK to confirm this message and then click on "Save and compile" to save the changes in the HW Config.	Konfiguration (2468:63215) Achtung! Wurde das Telegramm verändert, so müssen Sie im SCOUT/STARTER des SINAMICS "SINAMICS_Integrated" die Konfiguration PROFIBUS-Telegramm öffnen und den Button "Abgleichen mit HW Konfig" betätigen. Erst dadurch wird der SCOUT/STARTER mit HW Konfig abgeglichen.
		Diese Meldung in Zukunit nicht mehr anzeigen. OK OK If the telegram has been changed, you have to open the PROFIBUS telegram configuration in SCOUT/STARTER of SINAMICS "SINAMICS Integrated" and press the "Adjust to HW config" button. Only then will SCOUT/STARTER be adjusted to HW config.
		C Do not display this message again.





12	The required process data must now be linked with the PROFIBUS message frame in the drive. The parameters are assigned by clicking on the newly created words in the "Communication, PROFIBUS" drive sub- menu. In the example, this is the receive direction: WORD 11: P1511 additional torque 1 WORD 12: P1522 upper torque limit WORD 13: P1523 lower torque limit When entering the P1522 and P1523 parameters, a message pops up to inform the user that these parameters are interconnected with the P1520 and P1521 parameters. Click on "Yes" to cancel the existing interconnection. Torque limits via the PROFIBUS are now possible.	P		FIBUS receive PZD messag 1 WORD 2 DWORD 3 WORD 3 WORD 4 WORD 5 WORD 6 WORD 6 WORD 10 WORD 10 WORD 11 WORD 11 WORD 12 WORD 13 WORD 14 WORD 14 WORD 15 WORD 15 WORD 16 WORD 16 WORD 16 WORD 17 WORD 18 WORD 19 DWORD 10 WORD 10 WORD 10 WORD 10 WORD 11 WORD 11 WORD 12 WORD 13 WORD 14 WORD 14 WORD 15 WORD 14 WORD 15 WORD 15 WORD 16 WORD 17 WORD 18 WORD 19 DWORD 10 WORD 10 WORD	ve direction e frame p1430[0] p1542[0] p1542[0] p1542[0] p1190,0 p1190,0 p1511[0] p1522[0] p1522[0] p1522[0] p1522[0] 	PROFIBUS transmit direction Free telegram configuration with BICO CI: Speed pre-control
			(15)	"p int lim Do	Existing 1522[0], (erconnec it, upper/ you wan	g interconnection will be cancelled! CI: Torque limit, upper/motoring'' is already ted to ''Drive_ROT, p1520[0], CO: Torque motoring''. It to cancel the existing interconnection? Yes No

13	In the example, the unsmoothed actual torque value of the r80 parameter is transmitted to WORD 11. Since this parameter is not available by default, it must be searched for in "Further Interconnections".	PROFIBUS transmit direction Free telegram configuration with BICO Optimize View Drive_ROT, p2051[10] CI: PROFIBUS PZD send word, PZD 11 Please select the signal source! Drive_ROT			
		P no.		Parameter	text
		100%			
		r35		CO: Motor te	emperature
		r46		CO/BO: Mis:	sing drive enable signals
		r50		CO/BO: Con	nmand data set CDS effective
		r51		CO/BO: Driv	ve data set DDS effective
		r56		CO/BO: Clos	sed-loop control status word 1
		r60		CO: Speed :	setpoint before the setpoint filter
		r61		CO: Speed a	setpoint after the filter
		r63		CO: Actual :	speed, smoothed
		r64		CO: Speed of	controller system deviation
		r66		CO: Drive or	utput frequency
		r68		CO: Absolut	te current actual value
		r70		CO: Actual I	DC link voltage
		r74		CO: Modulat	t denth
		r77		CO: Current	setpoint, torque-generating
		r78[0]		+ CO: Current	actual value, torque-generating, Umsmoothed
		r79[0]		+ CO: Torque	setpoint total, Umsmoothed
		r80		CO: Torque	actual value
			DK	Cancel	
14	WORD 11 shows r80. Torque actual	PROFIBUS receive	e direction PROFIBU	IS transmit direction	
	value	PZD message	frame Free tele	egram configuration with BICC	Optimize 🔽
	value		189[0] CO: PROFIBUS 2051[0], CI: PROFIBU	send status wor	1 WORD 2085(0), CO: PROFIBUS send st. 0x0 H
					2 DWORD 163, CO: Actual speed, smoothed 0x0 H
	Close the window.		189(1) CO: PROFIBUS 2051[3], CI: PROFIBU	IS PZD senx	3 WORD 000 H
	Save and compile the settings		189(2) CO: PROFIBUS	send status wor	4 WORD 2009011 CO: PROFIBIUS send at _ Dof _ H
			2051(4), CI: PROFIBU	IS PZD sent	5 W080 - 2009/21 00 - 88/59918
			189(3) CO: PROFIBUS	send status wor	
					6 WORD status word 0x0 H
					7 DWORD r482[0], CO: Encoder actual positi 0x0 H
					8 WORD 0 0x0 H
					9 DWORD 1483[0], CO: Encoder actual positi 0x0 H
					10 WORD 000 H
					11 WORD 180, CO: Torque actual value 0x0 H
					12 WORD 0 0 0 H
					13 WORD 000 H
					14 WORD 040 H
					15 WORD 0 0.00 H



15	Perform an adjustment to the HW Config in the "SINAMICS_Integrated – Configuration" window.	POPUELT energies law Verone of the law of upgrave to the POPUELT energies have to the POPUELT energie
16	Create a TO axis under D435. Also use the standard message frame (in this case: Message frame 105) and tick the "Activate technology data block in the message frame" checkbox. "Save and compile" the configuration. Next, go online and download the project.	Artis configuration - Ands RED - Drive assignment Which clive unit are you using? Units Align Sinamics devices. Which message hand type do you want to use for data tarufer? Westage frame viscant. Units Which device binking data thock in the message frame viscant. Units Westage digital Information for real axes You can establish the connection/to a drive on this page. For a drive x Westage K Back Continue z

3.4 Other Settings in the SINAMICS_Integrated Drive

Based on the parameters defined so far, certain settings have been performed automatically for the drive.

However, the scaling and the selection of the torque limitation type still need to be adjusted.

These settings must be performed online on the drive. After performing the changes, the user can go offline again. Next, RAM must be copied to ROM and the changes must be loaded into the PG. The project must be saved and compiled in offline mode. Afterwards, it is possible to go online again.



Figure 2-3 : P1511 parameter applied as additional torque 1 (PZD 11)

The factor assigned to Additional torque 1 is a scaling with the value 0. Afterwards, Additional torque 1 becomes ineffective.

100% or another desired value can be selected instead.

Figure 2-4, P1512 parameter, scaling with 100%



Technological Data



Figure 2-5, P1522 parameter applied as upper torque limit (PZD 12)

Technological Data



Figure 2-6, P1523 parameter applied as lower torque limit (PZD 13)

The setting "Motor/regenerative active = No" corresponds to the behavior of a MASTERDRIVE or MICROMASTER. The motor/regenerative torque is therefore limited to the highest permissible value.

Besides the motor torque limitation upon traversing in the forward direction and acceleration, a regenerative torque limitation becomes active upon traversing in the reverse direction and deceleration. To avoid this behavior, the user can select "Yes" for the setting "Motor/regenerative active".



Figure 2-7 , Motor/regenerative active = Yes

Technological Data



Figure $\,$ 2-8 , P1522 and P1523 parameters and scaling with 100% with motor/regenerative torque limit

Different torque limits refer to acceleration and deceleration processes, independently of the traversing direction.

The M_limit_1 and M_limit_2 values are updated when going online. The limit values are indicated in P1520 and P1521. These values depend on the selection of the technological application of the axis in P500.

A feed drive with limit current limitation is defined for default setting P500 = 101. The maximum value for the drive is selected in this context (1.38 Nm).

IÌ	r487[0]		+	+	Diagnostic encoder control word Gn_ST	loH,	-
Ш	p488[0] + Measuring probe 1 input terminal, Encode No probe		No probe (0)	-			
Ш	p489[0]		+		Measuring probe 2 input terminal, Encode	No probe (0)	-
Ш	p491	1491 Motor encoder fault response: ENCODER Encoder fault results in OFF2 (0)		-			
Ш	p492				Maximum speed difference for each sam	0.0	rpm
Ш	p495[0]		+		Equivalent zero mark, input terminal, Enco	No equivalent zero mark (evaluation of 💌	-
Ш	p500	Technology application Feed drive (limit current limitation) (10 🔽 -		-			
Ш	p578[0]	D			Calculate parameters that are dependent	ent Standard drive (SERVO) (100)	
Ш	p580 Measuring probe, input terminal Feed drive (limit current limitation) (101)						
Ш	p581				Meas probe, edge	Spindle drive (rated current limitation) (102)	
	p582				Measuring probe, pulses per revolution	1	-
	n583				Measuring probel maximum measuring tim	10	s

Figure 2-9	P500 parameter, change of the technological application
-407(0)	Discussed in an index analysis and a CT 100

The calculation of P1520, P1521 and other important parameters relevant for controlling changes through the selection of "Standard drive (SERVO)(100)".

The P578[0] parameter must be set to 1 to perform the recalculation. P1520/P1521 changes to the nominal torque (0.6 Nm) defined in the P312 parameter.

This change does not affect the scaling of the transmission via Profibus. Only the P2003 parameter is relevant in this context.

3.5 Creating Technological Data for SIMODRIVE 611U Drive

Table 2-5 Manual extension of the Profibus message frame in the hardware configuration – example of a project with SIMOTION D435 and SIMODRIVE 611U and the "611U" axis.

No.	Action	Remark
1	Create the relevant prerequisites: Create the project with D435 and SIMODRIVE 611U.	Online Neues Gerät anlegen Einzelantrieb einfügen D435 ABLAUFSYSTEM I/O GERÄTEGLOBALE VARIABLEN ACHSEN ACHSEN Achse einfügen Achse einfügen Achsis_611U EXTERNE GEBER KURVENSCHEIBEN TECHNOLOGIE PROGRAMME SIMODRIVE_611U_DP2_DP3 SINAMICS_Integrated Vibersicht
2	The desired message frame can be selected first from the hardware configuration in the properties of SIMODRIVE 611U, Configuration. A defined address range can be reserved in this way. For Message frame 105, respectively 10Words I/O can be defined. Afterwards, the number of additional words must be entered into the length, i.e. + 1 word for the actual value and + 3 words for the setpoints. The message frame type changes automatically to "No Default".	DP Slove Properties X Benaul Configuration Clack Synchronization Internode communication - converses Default No Default Y Y Y Strippe Address PROFIBUS partner Internode communication - conversion Strippe Address PROFIBUS partner Y Strippe Address PROFIDUS partner Provident Brite Hen Strippe Address PROFIDUE partner Provident Brite Hen V Address Strippe Provident Brite Hen V Master-Steve configuration 1 Provident Brite Hen Provident Brite Hen Master-Steve configuration 1 Master State configuration 1 Provident Brite Hen Provident Brite Hen Master-Steve configuration 1 Master State configuration 1 Provident Brite Hen Providen

3	With SimoCom U, the parameters	915:0	PZD setpoint value assignment PROFIBUS	0
	indicated in the list on the right-hand side	915:1	PZD setpoint value assignment PROFIBUS	50001
	must be adapted in the expert list of parameters.		PZD setpoint value assignment PROFIBUS	50007
			PZD setpoint value assignment PROFIBUS	50007
			PZD setpoint value assignment PROFIBUS	50003
	Decementar 022 0 allows free measure	915:5	PZD setpoint value assignment PROFIBUS	50101
	Parameter 922 = 0 allows free message	915:6	PZD setpoint value assignment PROFIBUS	50009
	frame configuration.	915:7	PZD setpoint value assignment PROFIBUS	50025
		915:8	PZD setpoint value assignment PROFIBUS	50025
	The parameters used in the standard	915:9	PZD setpoint value assignment PROFIBUS	50026
	message frame (here: 105) must be	915:10	PZD setpoint value assignment PROFIBUS	50026
	entered into the 915 and 916 parameters	915:11	PZD setpoint value assignment PROFIBUS	50113
	entered into the 515 and 516 parameters.	915:12	PZD setpoint value assignment PROFIBUS	0
		915:13	PZD setpoint value assignment PROFIBUS	0
	The 50113 identifier can be entered as	915:14	PZD setpoint value assignment PROFIBUS	0
	an additional setpoint in the 915:11	915:15	PZD setpoint value assignment PROFIBUS	0
	parameter.	915:16	PZD setpoint value assignment PROFIBUS	0
	This is the external torque setpoint	916:0	PZD actual value assignment PROFIBUS	0
	(MsetExt) (n-setpoint-operation Software	916:1	PZD actual value assignment PROFIBUS	50002
	Version 4.1 or later)	916:2	PZD actual value assignment PROFIBUS	50008
		916:3	PZD actual value assignment PROFIBUS	50008
		916:4	PZD actual value assignment PROFIBUS	50004
	The 50114 identifier can be entered into	916:5	PZD actual value assignment PROFIBUS	50102
	the 916:11 parameter as an additional	916:6	PZD actual value assignment PROFIBUS	50010
	actual value.	916:7	PZD actual value assignment PROFIBUS	50011
	This is the smoothed torque setpoint	916:8	PZD actual value assignment PROFIBUS	50011
	controlling the motor torque (Mset)	916:9	PZD actual value assignment PROFIBUS	50012
		916:10	PZD actual value assignment PROFIBUS	50012
		916:11	PZD actual value assignment PROFIBUS	50114
		916:12	PZD actual value assignment PROFIBUS	0
		916:13	PZD actual value assignment PROFIBUS	0
		916:14	PZD actual value assignment PROFIBUS	0
		916:15	PZD actual value assignment PROFIBUS	0
		916:16	PZD actual value assignment PROFIBUS	0
		918	PROFIBUS node address	4
		922	PROFIBUS frame selection	0
4	Create a TO avia under D425		con-vers_error-verseessacranality	24
-	Use standard message frame (here: message frame 105) and tick the "Activate technology data block in the message frame" checkbox. Next, "Save and Compile" the configuration.		Weikhes Antitetsgenik vervenden Sie? Ar Strattersver, GHU, DP2, DP3 Ar Systems Smarticigenik vervenden Sie? Ar Systems Smarticigenik vervenden Sie? Ar Systems Smarticigenik vervenden Sie? Ar Smarticigenik vervenden Sie? Smarticigenik vervenden Sie? Ar Smarticigenik vervenden Sie Sie Ge Datenikante Telegram 105 Telegram Vervende gedaterebeck verveng DSD) Technologisaterebeck verveng DSD) Technologisaterebeck verveng DSD) Technologisaterebeck verveng DSD) Technologisaterebeck verveng DSD) Nationalizieren bei iselen Achteen sicht inder enzeigen Ardiesen Stette konnen Sie die Verbindung zu einem Ardiesen Stette konnen Sie die Verbindung zu einem	elet: egung vervenden? massider4

3.6 Creating Technological Data for SIMOVERT MASTERDRIVES Drive

Table 2-6 Manual extension of the Profibus message frame in the hardware configuration – example of a project with SIMOTION D435 and SIMOVERT MASTERDRIVES CBP2 and the "MD_CBP2" axis

No.	Action	Remark
1	Create all relevant prerequisites: Create a project with D435 and SIMOVERT MASTERDRIVES CBP2.	Online Einzelantrieb einfügen Einzelantrieb einfügen D435 ABLAUFSYSTEM FI/O GERÄTEGLOBALE VARIABLEN ACHSEN Achse einfügen Achse einfügen Achse einfügen Achse_MD_CBP2 MASTERDRIVES_CBP2 Konfiguration Mechanik Vorbelegung Steuertafel Steuertafel Steuertafel Profile Verschaltungen Hesstatster MESSTASTER MAXS 611U
2	The desired message frame should be selected first from the hardware configuration, properties of the SIMOVERT MASTERDRIVES, Configuration. A defined address range is reserved in this way. For standard message frame 5, respectively 9Words I/O are defined. If more words are required, the number of additional words must be entered into the length, i.e. + 1 word for the actual value and + 3 words for the setpoints. The message frame type then changes automatically to "No Default".	DP Store Properties XI General Configuration Dock Synchronization Internets communication -overview! Internet Properties Default Note State PROFIBUS partner State Internet States PROFIBUS partner Master States configuration 1 Profile Master States States States States OK Cancel Heb



3	With DriveMon, the parameters must be adapted via free parameterization. Parameter 922 = 999 allows free message frame configuration	
4	Create a TO axis under D435. Use standard message frame (here: message frame 105) and tick the "Activate technology data block in the message frame" checkbox. Next, "Save and Compile" the configuration.	Actestoningur stom - Aches_ 940_CEP2-Antmekszundhamg Image: Comparison of the standard sta

3.7 Checking SCOUT Settings

The user can check in the expert menu of the axis whether settings for the use of the technological data block exist and have been correctly defined. This check can be performed by means of a repeated run of the axis configuration.

Table 2-7 Checking the settings required for using technological data

No.	Action	Remark
1	Technological data is attached as INT to the In/Out drives log. This is defined in the technologicalData.enable configuration data. This data is set to YES by ticking the "Activate technology data block in the message frame" checkbox. The logical addresses for the technological data are shown in the technologicalDataOutInfo and technologicalDataInInfo configuration data. They start after the standard message frame.	H StandStillSignal Standstill signal SvvLinit Software limit switch H SystemDeadTimeData System-related dead times H TechnologicalData Drive interface for specific paramete H GaAddress Logical address 276 H VeloctlyPositionProfile Profile end identification YES (173) H VeloctlyPositionProfile Profile end identification YES (173) HypeOfAxis Axis type REAL_AXIS (0)

4 Application

4.1 Introduction

The example is based on the use of a sample case with SIMOTION-D435.

When configuring the drive, the P210 parameter must be set to the reduced mains voltage: $1.5 \times 230V = 345V$

After configuring the data traffic via the extended PROFIBUS message frame on the drives and SIMOTION side, technological data is available for the user program.

The program example is executed in Motion tasks and programmed in MCC.

The TORQUE unit includes the global variables required for controlling the program.

This unit also includes the following programs:

- TORQUE The additional torque and the torque limits are enabled and disabled here.
- POS For starting and stopping Axis_RED.
- N_M_SOLL For switching the operating mode of the drive from speed control with encoder (21) to torque control with encoder (23)

The ERROR unit includes the empty ERROR program which has been integrated into the TechnologicalFault task and the PeripheralFault task to avoid CPU stops. The user must expand these programs to be able to respond specifically to errors.

In Motion Tasks, programs with an endless while loop programmed through WAIT 0ms conditions at the end of the while loop must be suspended in the Round Robin task. In this way, the user can avoid this MT blocking the processing of other Motion Tasks during two servo cycles.

An additional torque is used in this example.

Notice! No speed control is possible if the torque control option is enabled (SINAMICS_Integrated P1300 = 23, torque control (with encoder)). If the load torque is too low, the motor will accelerate up to excess speeds.

If the drive is traversed in speed-controlled mode and the additional torque option is used, this torque will only occur during acceleration and deceleration. (feedforward control). This feedforward control option allows acceleration at a constantly defined torque. For example, this application is useful for winders which have to accelerate significant masses (rollers) in a defined time.

The additional torque is no longer effective as soon as the speed setpoint has been reached. A change provokes a brief jerk and the speed controller compensates the required torque to ensure that the speed can be maintained.

4.2 Control Variables

Start	Starts the Axis_RED axis with a Move motion.
Stop	Stops the Axis_RED axis with a speed-controlled stop with abort
Velocity	Speed in °/s
boAdditiveTorque	1 = activates additional torque, 0 = deactivates additional torque
rAdditiveTorque	Additional torque in Nm
boTorqueLimitPositive	1 = activates positive torque limitation0 = deactivates positive torque limitation
rTorqueLimitPositive	Positive torque limit
boTorqueLimitNegative	1 = activates negative torque limitation0 = deactivates negative torque limitation
rTorqueLimitNegative	Negative torque limit
boErrorTorque	1= indicates if the activation/deactivation of a torque command persists for more than 3 seconds and thus causes an error. Must be reset by the user to execute the function again.



Technological Data

boReadDriveParameter	1 = after the start of CPU 1, parameter 1300 is read. If the operating mode is changed, this variable is set to 1 to verify the parameter change.
eActMode	Actual mode N – Speed control M – Torque control
eSetMode	Desired mode N – Speed control M – Torque control

4.3 TORQUE Program

This program is started with Motion Task 1 after startup and continuously runs after a delay of 5 seconds for the start-up of the TO in a while loop. It is continuously checked whether an activation or deactivation of the additional torque or of the torque limits shall be performed. In this case, the function is executed once. An error message pops up if the corresponding function cannot be successfully completed within 3 seconds (i.e. the state variable still shows the former state). This error must be reset to execute the function again.

The activation is performed via AdditiveTorqueType and TorqueLimitType with DEFAULT_VALUE. The value transferred via the system variables of the axis thus becomes effective in the IPO cycle. This transfer is performed upon the program start.

Axis_RED.DefaultAdditiveTorque	:= rAdditiveTorque
Axis_RED.DefaultTorqueLimitNegative	:= rTorqueLimitNegative

Axis_RED.DefaultTorqueLimitPositive := rTorqueLimitPositive

The system functions mentioned below are used for activation and deactivation.

These functions are performed only once upon a change from Activate to Deactivate and vice-versa.

_enableAxisAdditiveTorque, _disableAxisAdditiveTorque,

_enableAxisTorqueLimitPositive, _disableAxisTorqueLimitPositive,

_enableAxisTorqueLimitNegative, _disableAxisTorqueLimitNegative

4.4 POS Program

Cancels the axis enable in OFF state.

Errors occurring after the start are acknowledged.

As soon as all errors have been acknowledged, the axis enable is switched. The axis is started at the predefined speed by issuing the Move command.

Afterwards, the system waits for a stop. Further switching actions also take place if a TO error occurs.

The axis is stopped if a stop command has been issued.

The axis is also stopped if an error occurs upon the axis enable or when the Move command is issued.

The start and stop commands are automatically reset.

4.5 N_M_SETPOINT Program

The drive reads this parameter again upon the start of the CPU and after a change of the P1300 parameter in the drive.

The user can switch between speed-controlled mode with encoder (21) and torquecontrolled mode with encoder (23).

This option shall allow testing of the additional torque under the corresponding control conditions.