

# service & SUPPORT

**Technology CPUs**  
FAQ

**SIEMENS**

Upgrading the SINAMICS S120 Firmware and Adapting the  
S7T Config Project Data

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## Question

How is a SINAMICS S120 drive upgraded from firmware V2.1 to firmware V2.2 in an S7T Config project?

## Answer

Follow the steps listed below, which describe the upgrading in detail.

## 1      **Requirements**

This description assumes that the following requirements are met:

1. A CompactFlash card with the SINAMICS S120 firmware V2.2x is available. If you obtained the firmware from the internet, generate a CompactFlash card with the firmware V2.2x as described e.g. in the A&D Support article 21553993.
2. The currently (prior to the upgrade) configuration executable on the SINAMICS device to be upgraded was read and a backup of the entire Step7 project was created.

## 1.1 Procedure for backing up the configuration of the SINAMICS drive


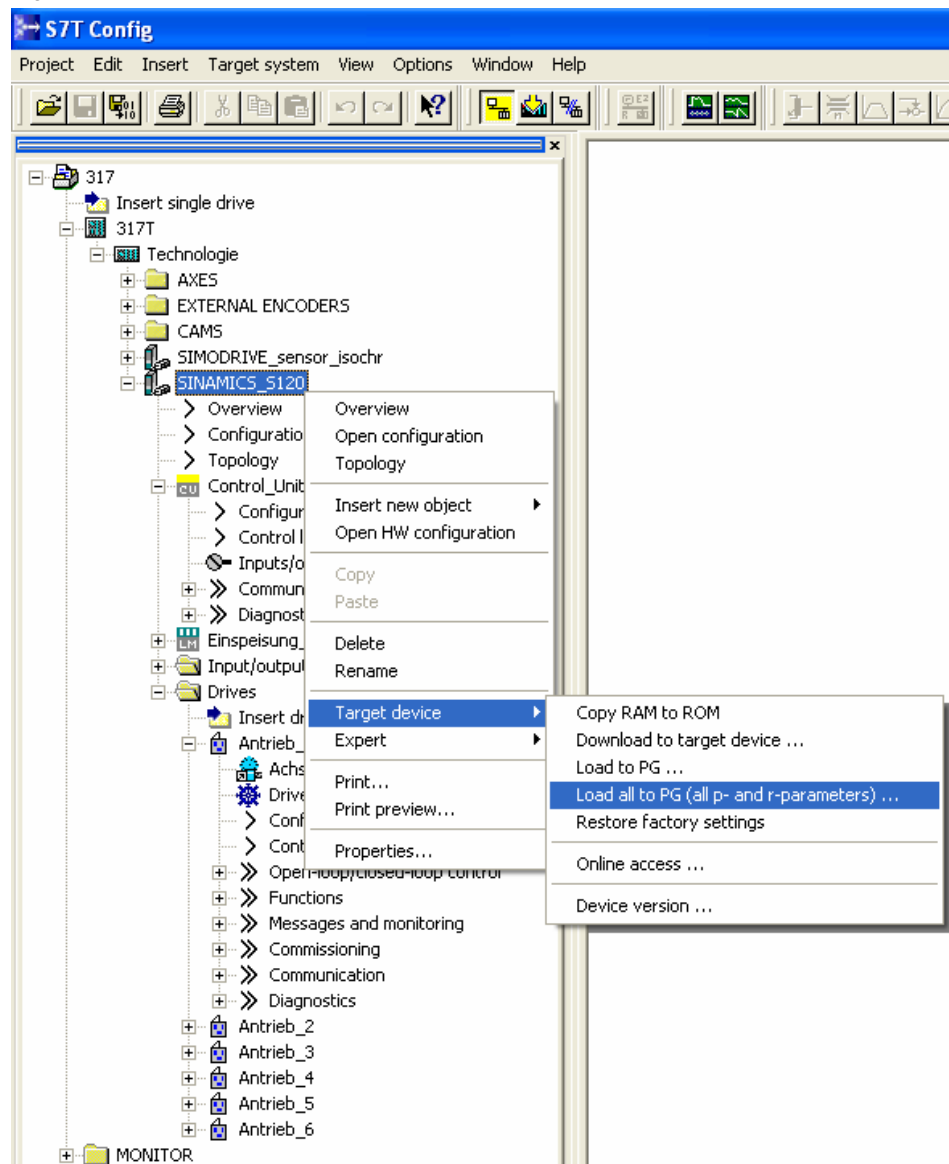
1. Establish an online connection to S7T Config by clicking  and back up the current configuration. In the Navigator, select the respective SINAMICS drive and select the context menu command Target device > Load all to PG (all p- and r- parameters)...

Figure 1-1



2. Exit S7T Config and save the entire Step 7 project in the SIMATIC Manager.

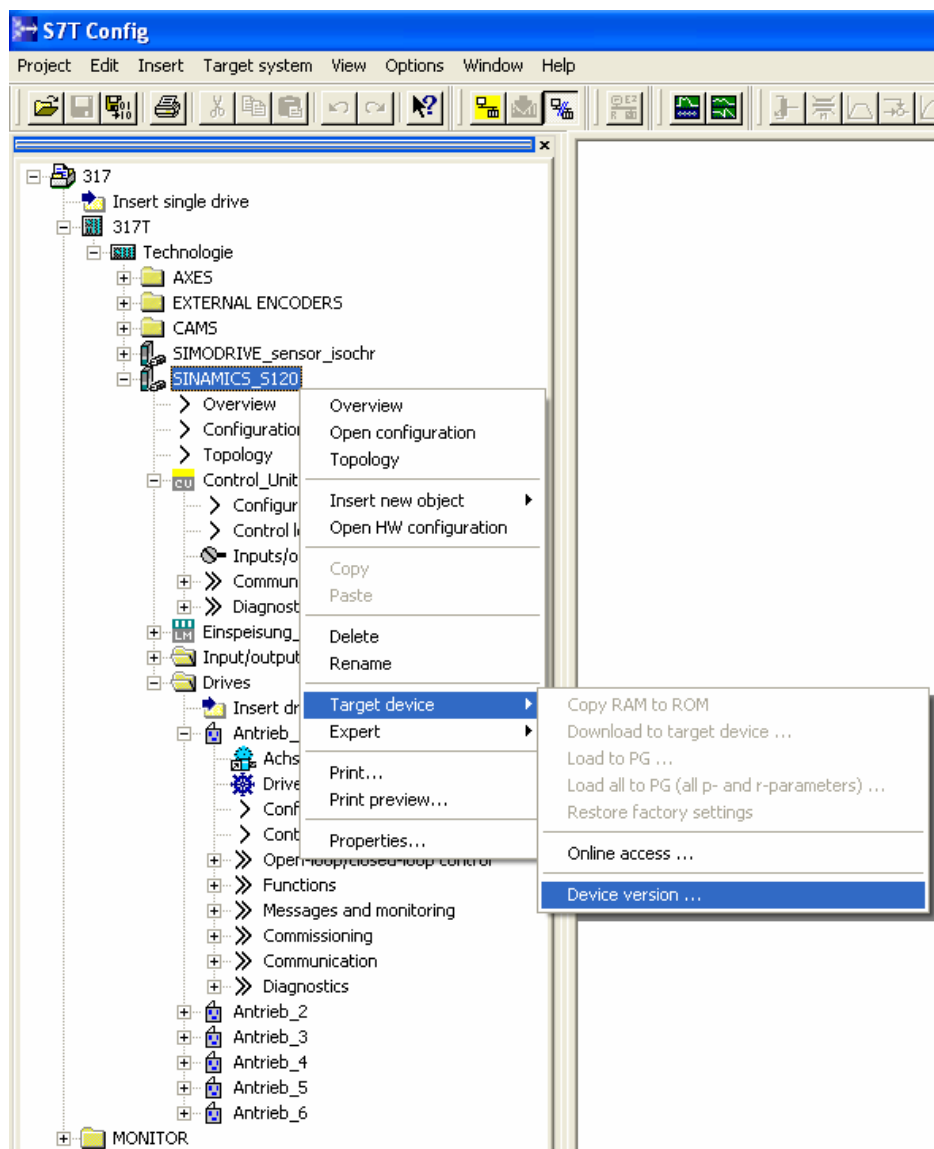
**Note** For safety reasons, we recommend creating a backup before upgrading.

## 2 Upgrading the SINAMICS Firmware and Adapting the S7T Config Project Data

### 2.1 Upgrading the firmware of the SINAMICS drive

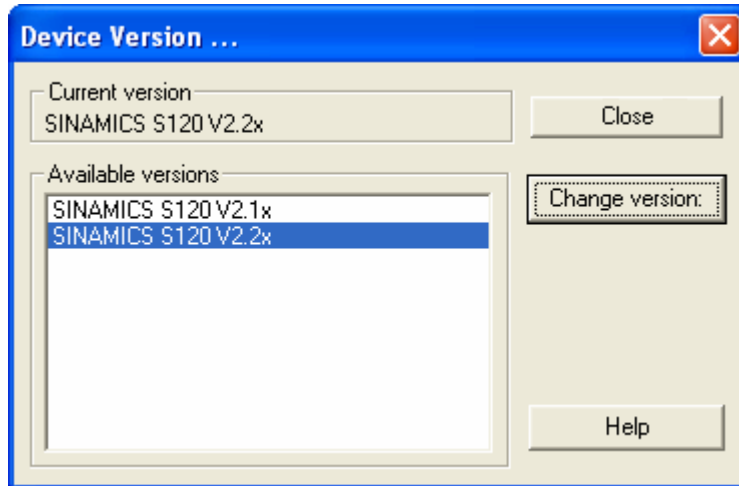
1. Start S7T Config. Via the context menu, change the device version of SINAMICS S120 from V2.1 to V2.2 in S7T Config.



Figure 2-1



2. Select the new device version V2.2x and click the “Change version:” button.

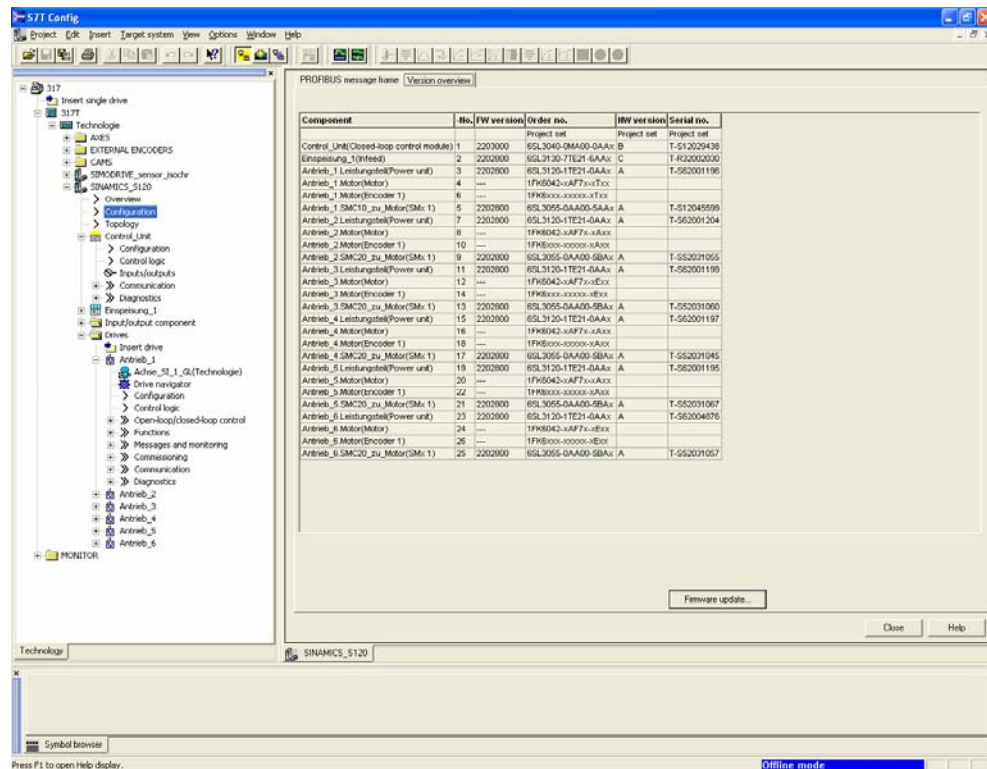
Figure 2-2





3. Save and compile the project by clicking 
4. Switch off the 24 V DC power supply of SINAMICS
5. Plug the CompactFlash card in the SINAMICS control unit
6. Switch the 24 V DC power supply back on
7. In S7T Config, establish an online connection to SINAMICS by clicking 

8. Open the “Configuration” dialog box by double-clicking in the Navigator and switch to the “Version overview” tab. Click the “Firmware update...” button

Figure 2-3



A dialog box for updating the firmware of the connected components opens.

9. Select all components and apply the Firmware update.
10. In S7T Config, terminate the online connection to SINAMICS by clicking 
11. Switch off the 24V DC supply voltage of SINAMICS
12. Switch the 24V DC supply voltage of SINAMICS back on
13. Reestablish an online connection to SINAMICS by clicking 


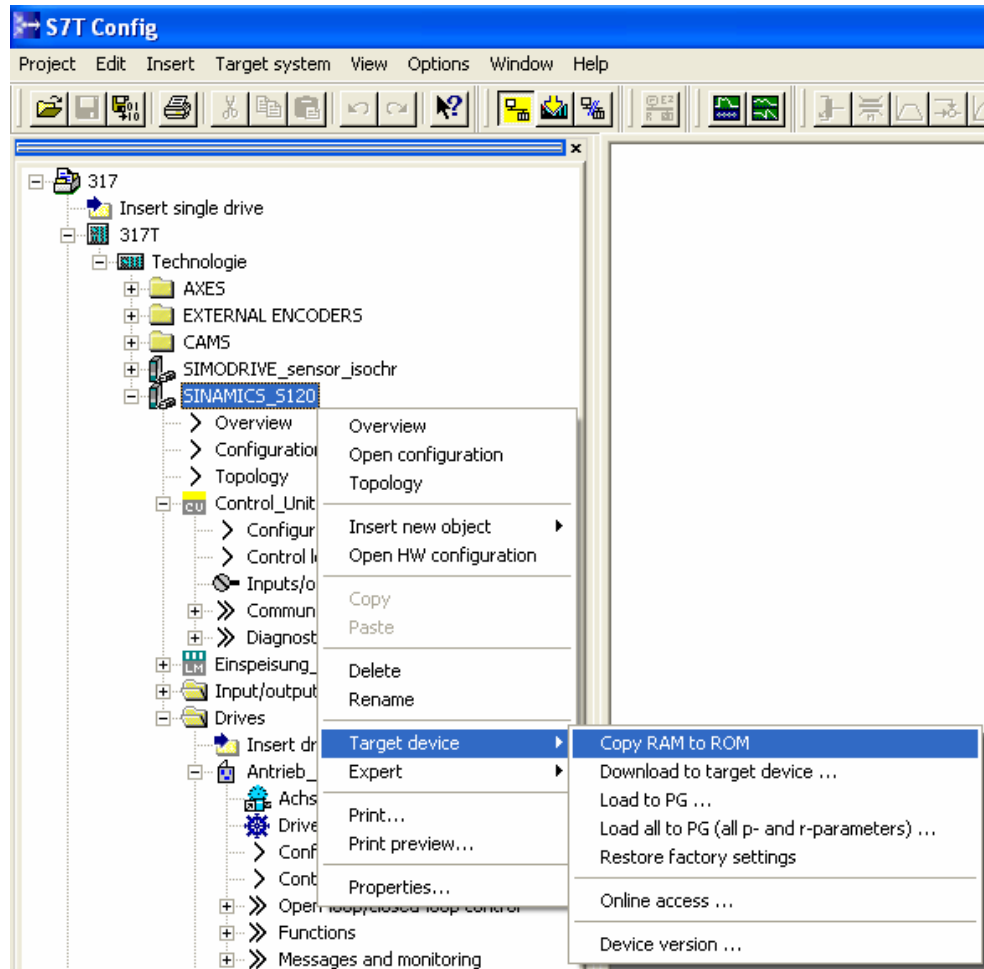
14. By means of S7T Config, load the project to SINAMICS by clicking . Subsequently, select the context menu command Target device > Copy RAM to ROM.

Figure 2-4



The upgrading of the firmware in SINAMICS is completed. The status of SINAMICS is displayed in the alarm window. If no errors are displayed, the drive is now ready for operation.



## 2.2 Parameter adaptations to SINAMICS S120 V2.2x

Due to new functionalities in the SINAMICS S120 firmware V2.2, errors or warnings on the individual drive components may possibly be displayed. If this is the case, it is required to adapt individual parameters.

**Note**

The parameters have to be adapted for each SINAMICS drive in the project.

### 2.2.1 Parameter adaptations for the PROFIBUS message frame

You have to adapt the used message type. Two options are available:

- In the expert list by selecting the message in the p922 parameter:

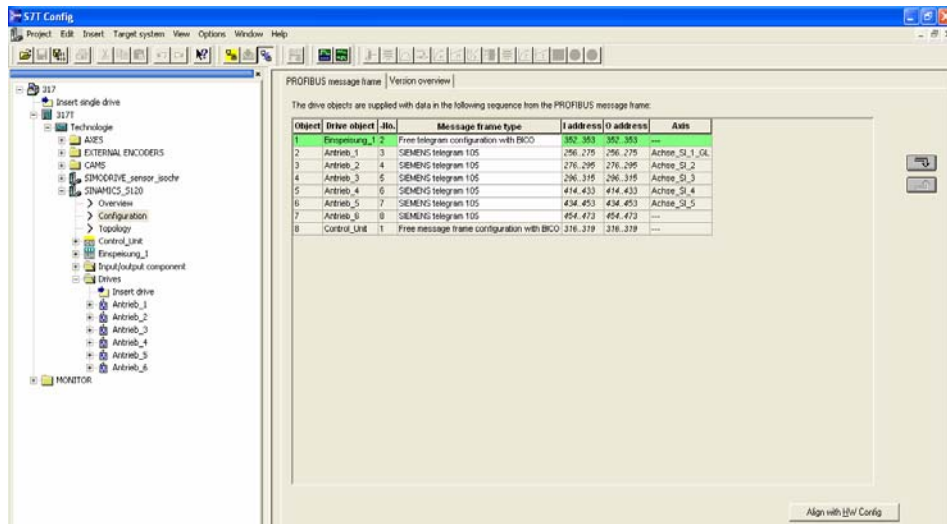
Figure 2-5

Parameter	D	+	+	Parameter text	Value Antrieb_1	Unit	Changeable to	Access	Minir
r899			+	CO:BO: Status word sequential control	3A37H	-		2	
p922				PROFIBUS PZD telegram selection	SIEMENS telegram 105 (105)	-	Ready to run	1	
p925				PROFIBUS clock synchronous sign-of-life tolerance	Standard telegram 2 (2)	-	Operation	3	0
r930				PROFIBUS operating mode	Standard telegram 3 (3)	-		3	
r944				Counter for fault buffer changes	Standard telegram 4 (4)	-		2	
r945[0]		+		Fault code	Standard telegram 5 (5)	-		2	
r947[0]		+		Fault number	Standard telegram 6 (6)	-		3	
r948[0]		+		Fault time received in milliseconds	SIEMENS telegram 102 (102)	-		3	
r949[0]		+		Fault value	SIEMENS telegram 103 (103)	-		3	
p952				Fault cases, counter	SIEMENS telegram 105 (105)	-	Operation	3	0
p970				Reset drive parameters	SIEMENS telegram 106 (106)	-	Commissioning (P	2	
p971				Save drive object parameters	Free telegram configuration with BICO (999)	-	Operation	1	
r975[0]		+		Drive object identification, Company (Siemens = 42)	not active (0)	-		2	
r979[0]		+		Encoder format PROFIdrive, Header	42	-		3	
p1000[0]	C			Macro connector inputs (C) for speed setpoints	20753	-	Ready to run	1	0
p1055[0]	C			Bl: Jog bit 0	0	-	Ready to run	3	
p1056[0]	C			Bl: Jog bit 1	0	-	Ready to run	3	
p1062[0]	D			Maximum speed	8500.000	rpm	Ready to run	1	0
p1083[0]	D			CO: Speed limit in positive direction of rotation	210000.000	rpm	Operation	2	0
r1084				Speed limit positive effective	8300.000	rpm		3	
p1086[0]	D			CO: Speed limit negative direction of rotation	-210000.000	rpm	Operation	2	-2100
r1087				Speed limit negative effective	-8300.000	rpm		3	
p1121[0]	D			Ramp-function generator ramp-down time	10.000	s	Operation	1	0
p1135[0]	D			OFF3 ramp-down time	0.000	s	Operation	2	0
p1140[0]	C			Bl: Enables the ramp-function generator	Antrieb_1 : r2090.4	-	Ready to run	3	
p1141[0]	C			Bl: Start ramp-function generator	Antrieb_1 : r2090.5	-	Ready to run	3	
p1142[0]	C			Bl: Enable speed setpoint	Antrieb_1 : r2090.6	-	Ready to run	3	
p1155[0]	C			Ct: Speed controller speed setpoint 1	0	-	Ready to run	3	
p1160[0]	C			Ct: Speed controller speed setpoint 2	0	-	Ready to run	3	
r1169				CO: Speed controller, speed setpoints 1 and 2	0.000	rpm		3	
r1170				CO: Speed controller, setpoint sum	0.000	rpm		3	
p1189[0]	D		+	Speed setpoint configuration	3H	-	Operation	2	0H
p1190				Ct: DSC position deviation XERR	Antrieb_1 : r2060[6]	-	Ready to run	3	
p1191				Ct: DSC position controller gain KPC	Antrieb_1 : r2060[8]	-	Ready to run	3	
p1192[0]	D			DSC enc selection	Encoder 1 (motor encoder) (1)	-	Operation	3	
p1193[0]	D			DSC encoder adaptation factor	1.000	-	Operation	3	0
p1215				Motor holding brake configuration	No motor holding brake being used (0)	-	Operation	2	
p1216				Motor holding brake, opening time	100	ms	Operation	2	0
p1217				Motor holding brake closing time	100	ms	Operation	2	0
p1226				Threshold for zero speed detection	20.0	rpm	Operation	2	0
p1227				Zero speed detection monitoring time	4.000	s	Operation	2	0
p1228				Pulse cancellation delay time	0.000	s	Operation	2	0
p1240				Vdc controller or Vdc monitoring configuration	Inhib Vdc ctrl (0)	-	Operation	3	
p1244				DC link voltage threshold, upper	750	V	Operation	3	400
p1248				DC link voltage threshold, lower	450	V	Operation	3	100
p1250				Vdc controller proportional gain	1.00	/A/V	Operation	3	0

or

- in the Configuration dialog box of SINAMICS under PROFIBUS message frame

Figure 2-6



click the “Align with HW Config” button.

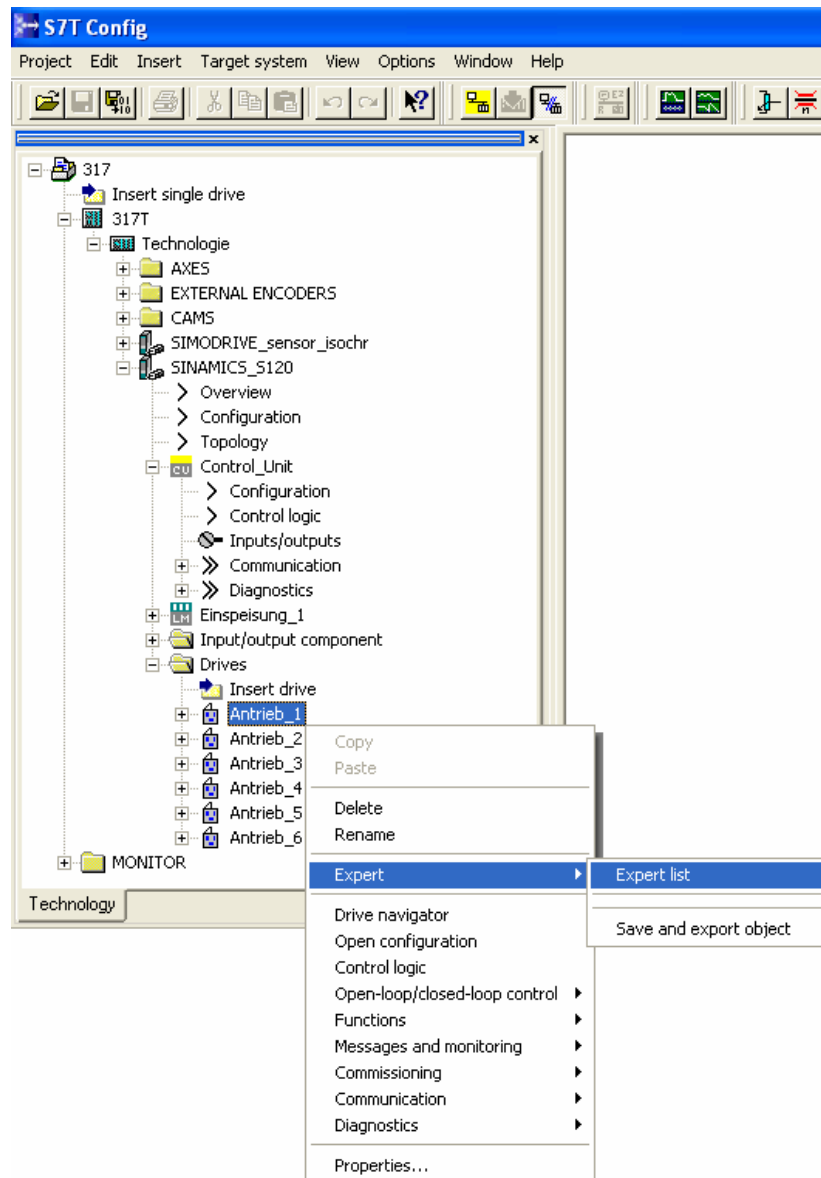
## 2.2.2 Parameter adaptations for absolute value encoders

### Encoder identification

The firmware V2.2x now supports an encoder identification for absolute value encoders. If you use an absolute value encoder, you have to perform an encoder identification. Error ID F07414 displayed in the alarm window indicates that it is required to perform an encoder identification.

1. Select the drive to be upgraded and select Expert > Expert list in the context menu

Figure 2-7




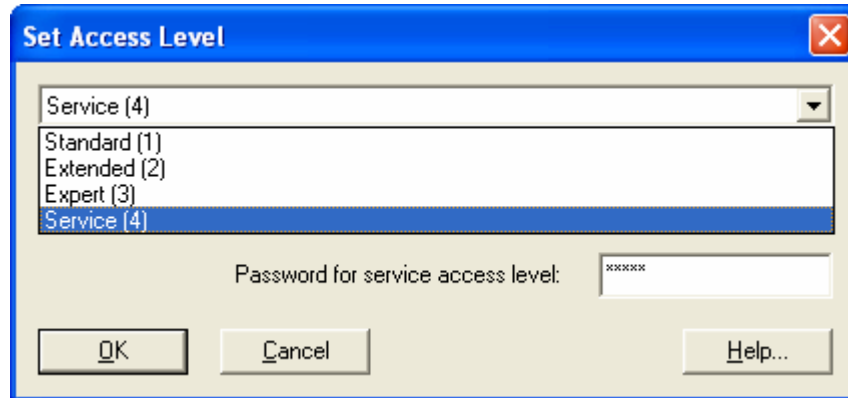
2. Change the access level   
Select access level Service (4).

Figure 2-8



Ask Technical Support for the password required for access level “Service (4)”.

Technical Support for all A&D products can be contacted

- via the web form for Support Request

<http://www.siemens.de/automation/support-request>

- Phone: + 49 180 5050 222
- Fax: + 49 180 5050 223

Further information on our Technical Support is available on the internet at

<http://www.siemens.com/automation/service>

- In the drop-down list of the *p10* parameter, select “Encoder commissioning (4)” in the expert list.

Figure 2-9

Parameter	D	+	+	Parameter text	Value Antrieb_1	Unit	Changeable to	Access	Minimum	N
r2				Drive operating display	[00] Operation - everything enabled (0)	-	-	1		
p10				Drive, commissioning parameter filter	Ready (0)	-	Ready to run	1		
p15				Macro drive object	Ready (0)	-	Commissioning (P)	1	0	9
r20				Speed setpoint, smoothed	Quick commissioning (1)	rpm		2		
r21				Actual speed, smoothed	Power module commissioning (2)	rpm		2		
r24				Drive output frequency smoothed	Motor commissioning (3)	Hz		3		
r25				Drive, output voltage smoothed	Encoder commissioning (4)	V		2		
r26				DC link voltage, smoothed	Technological application/Units (5)	V		2		
r27				Absolute actual current, smoothed	Data sets (15)	A		2		
r28				Modulation depth, smoothed	Download (29)	%		3		
r29				Drive, smoothed field-generating current actual value	Parameter reset (30)	A		3		
r30				Current actual value, torque-generating, smoothed	Safety Integrated commissioning (95)	A		3		
r31				Actual torque smoothed	0.0	Nm		2		
r32				Power factor, smoothed	0.01			2		
r33				Torque utilization, smoothed	0.00	kW		2		
r35				CO: Motor temperature	0.1	%		3		
r36				Power module overload I2t	27.5	°C		2		
r37[0]				Power module temperatures, Maximum inverter	0.0	%		3		
p45			+	Smoothing time constant, display values	45	°C		3		
r46			+	CO:BO: Missing drive enable signals	1.00	ms	Operation	2	0	5
r50			+	CO:BO: Command data set CDS effective	0H	-		1		
r51			+	CO:BO: Drive data set DDS effective	0H	-		2		
r56			+	CO:BO: Closed-loop control status word 1	0H	-		2		
r60				CO: Speed setpoint before the setpoint filter	10H	-		3		
r61				CO: Speed actual value motor encoder	0.00	rpm		3		
r62				CO: Speed setpoint after the filter	0.00	rpm		2		
r63				CO: Actual speed, smoothed	-0.03	rpm		3		
r64				CO: Speed controller system deviation	-14.65	rpm		3		
r65				Slip frequency	-0.03	rpm		3		
r66				CO: Drive output frequency	0.00	Hz		3		
r67				Maximum drive output current	0.4	Hz		3		
r68				CO: Absolute current actual value	9.50	A		3		
r69[0]			+	Phase current, actual value, Phase U	0.0	A		3		
r70				CO: Actual DC link voltage	-0.00	A		3		
r72				CO: Drive, output voltage	596.40	V		3		
r74				CO: Modulat_depth	1.1	V		3		
r75				Current setpoint, field-generating	0.87	%		3		
r76				Current actual value, field-generating	0.00	A		3		
r77				CO: Current setpoint, torque-generating	0.00	A		3		
r78[0]			+	CO: Current actual value, torque-generating, Umsmoothed	-0.03	A		3		
r79[0]			+	CO: Torque setpoint total, Umsmoothed	0.00	A		3		
r80				CO: Torque actual value	0.16	Nm		3		
r81				CO: Torque utilization	0.00	Nm		3		
r82[0]			+	CO: Actual active power, Umsmoothed	0.1	%		3		
r83				CO: Flux setpoint	-0.00	kW		3		
r84				CO: Actual flux	100.0	%		3		

- In the drop-down list of the *p440* parameter, select “Transfer serial number (1)” in the expert list.

Figure 2-10

Parameter	D	+	+	Parameter text	Value Antrieb_1	Unit	Changeable to	Access	Minimum	N
p431[0]	E			Commutation angle offset	0.00	°	Commissioning (P 3)		-180	1:
p440[0]	E			Copy encoder serial number	No action (0)		Commissioning (P 4)			
p441[0]	E			Encoder commissioning serial number part 1	No action (0)		Commissioning (P 4)	0H		FI
p442[0]	E			Encoder commissioning serial number part 2	Transfer serial number (1)		Commissioning (P 4)	0H		FI
p443[0]	E			Encoder commissioning serial number part 3	0H		Commissioning (P 4)	0H		FI
p444[0]	E			Encoder commissioning serial number part 4	0H		Commissioning (P 4)	0H		FI
p445[0]	E			Encoder commissioning serial number part 5	0H		Commissioning (P 4)	0H		FI
r451[0]		+		Commutation angle factor, Encoder 1	3			3		
r455[0]		+	+	Encoder configuration recognized, Encoder 1	0H			3		
r456[0]		+	+	Encoder configuration supported, Encoder 1	800010H			3		
r458[0]		+	+	Sensor module properties, Encoder 1	E0030004H			3		
r460[0]		+		Encoder serial number part 1, Encoder 1	0H			3		
r461[0]		+		Encoder serial number part 2, Encoder 1	0H			3		
r462[0]		+		Encoder serial number part 3, Encoder 1	0H			3		
r463[0]		+		Encoder serial number part 4, Encoder 1	0H			3		
r464[0]		+		Encoder serial number part 5, Encoder 1	0H			3		
r479[0]		+		CO: Diagnostics encoder position actual value Gn_XIST1,	3986199			4		
p480[0]		+	+	Cl: Signal source for encoder control word Gn_STW, Enc	Antrieb_1 : r205[5]		Operation	3		
r481[0]		+	+	CO: Encoder status word Gn_ZSW, Encoder 1	0H			3		
r482[0]		+		CO: Encoder actual position value Gn_XACT1, Encoder 1	3986200			3		
r483[0]		+		CO: Encoder actual position value Gn_XACT2, Encoder 1	0			3		
r487[0]		+	+	Diagnostic encoder control word Gn_STW, Encoder 1	0H			3		
p488[0]		+		Measuring probe 1 input terminal, Encoder 1	No probe (0)		Operation	3		
p489[0]		+		Measuring probe 2 input terminal, Encoder 1	No probe (0)		Operation	3		
p491				Motor encoder fault response: ENCODER	Encoder fault results in OFF2 (0)		Ready to run	3		
p492				Maximum speed difference for each sampling cycle for sq	0.0	rpm	Operation	3	0	2:
p495[0]		+		Equivalent zero mark, input terminal, Encoder 1	No equivalent zero mark (evaluation o		Operation	3		
p496[0]		+		Encoder diagnostic signal selection, Encoder 1	not active (0)		Operation	4		
r497[0]		+		Encoder diagnostic signal double word, Encoder 1	0			4		
r498[0]		+		Encoder diagnostic signal word low, Encoder 1	0			4		
r499[0]		+		Encoder diagnostic signal word high, Encoder 1	0			4		
p500				Technology application	Feed drive (limit current limitation) (10		Ready to run	2		
p528				Units system for controller gains	Physical representation (0)		Commissioning (P 4)			
p578[0]	D			Calculate parameters that are dependent on the technolog	No calculation (0)		Ready to run	2		
p580				Measuring probe, input terminal	No probe (0)		Operation	3		
p581				Meas probe, edge	0		Operation	3	0	1:
p582				Measuring probe, pulses per revolution	1		Operation	3	1	8:
p583				Measuring probe, maximum measuring time	10	s	Operation	3	0	11:
r586				CO: Measuring probe, speed actual value	0.00	rpm		3		
r587				CO: Measuring probe, measuring time measured	0			3		
r588				CO: Measuring probe, pulse counter	0			3		
r589				Measuring probe, delay time	0			3		
p600[0]	M			Motor temperature sensor for monitoring	Temperature sensor via encoder 1 (1		Operation	2		
p601[0]	M			Motor temperature sensor type	KTY84 (2)		Operation	2		
p603				Cl: Motor temperature	0		Ready to run	2		
p604[0]	M			Motor overtemperature alarm threshold	120.0	°C	Operation	2	0	2:

The serial numbers are written into *p441* to *p445*. After execution, *p440* is automatically reset to value (0).

- In the drop-down list of the *p10* parameter, select "Ready (0)" in the expert list

Figure 2-11

Parameter	D	+	+	Parameter text	Value Antrieb_1	Unit	Changeable to	Access	Minimum	N
r2				Drive operating display	[00] Operation - everything enabled (0)	-	-	1		
p10				Drive, commissioning parameter filter	Ready (0)	-	Ready to run	1		
p15				Macro drive object	Ready (0)	-	Commissioning (P	1	0	9
r20				Speed setpoint, smoothed	Quick commissioning (1)	rpm	-	2		
r21				Actual speed, smoothed	Power module commissioning (2)	rpm	-	2		
r24				Drive output frequency smoothed	Motor commissioning (3)	Hz	-	3		
r25				Drive, output voltage smoothed	Encoder commissioning (4)	V	-	2		
r26				DC link voltage, smoothed	Technological applicationUnits (5)	V	-	2		
r27				Absolute actual current, smoothed	Data sets (15)	A	-	2		
r28				Modulation depth, smoothed	Download (29)	%	-	3		
r29				Drive, smoothed field-generating current actual value	Parameter reset (30)	A	-	3		
r30				Current actual value, torque-generating, smoothed	Safety Integrated commissioning (95)	A	-	3		
r31				Actual torque smoothed	0.0	Nm	-	2		
r32				Power factor, smoothed	0.01		-	2		
r33				Torque utilization, smoothed	0.00	kW	-	2		
r35				CO: Motor temperature	0.1	%	-	3		
r36				Power module overload I2t	27.5	°C	-	2		
r37[0]				Power module temperatures, Maximum inverter	0.0	%	-	3		
p45		+		Smoothing time constant, display values	45	°C	-	3		
r46			+	CO:BO: Missing drive enable signals	1.00	ms	Operation	2	0	5
r50			+	CO:BO: Command data set CDS effective	0H	-	-	1		
r51			+	CO:BO: Drive data set DDS effective	0H	-	-	2		
r56			+	CO:BO: Closed-loop control status word 1	10H	-	-	3		
r60				CO: Speed setpoint before the setpoint filter	0.00	rpm	-	3		
r61				CO: Speed actual value motor encoder	0.00	rpm	-	2		
r62				CO: Speed setpoint after the filter	-0.03	rpm	-	3		
r63				CO: Actual speed, smoothed	-14.65	rpm	-	3		
r64				CO: Speed controller system deviation	-0.03	rpm	-	3		
r65				Slip frequency	0.00	Hz	-	3		
r66				CO: Drive output frequency	0.4	Hz	-	3		
r67				Maximum drive output current	9.50	A	-	3		
r68				CO: Absolute current actual value	0.0	A	-	3		
r69[0]			+	Phase current, actual value, Phase U	-0.00	A	-	3		
r70				CO: Actual DC link voltage	596.40	V	-	3		
r72				CO: Drive, output voltage	1.1	V	-	3		
r74				CO: Modulat_depth	0.87	%	-	3		
r75				Current setpoint, field-generating	0.00	A	-	3		
r76				Current actual value, field-generating	0.00	A	-	3		
r77				CO: Current setpoint, torque-generating	-0.03	A	-	3		
r78[0]			+	CO: Current actual value, torque-generating, Umsmoothed	0.00	A	-	3		
r79[0]			+	CO: Torque setpoint total, Umsmoothed	0.16	Nm	-	3		
r80				CO: Torque actual value	0.00	Nm	-	3		
r81				CO: Torque utilization	0.1	%	-	3		
r82[0]			+	CO: Actual active power, Umsmoothed	-0.00	kW	-	3		
r83				CO: Flux setpoint	100.0	%	-	3		
r84				CO: Actual flux	100.0	%	-	3		

## Rotor position identification

If your system is equipped with a synchronous motor, a new rotor position identification is required because of the performed encoder identification. This is indicated by the error ID F31811 displayed in the alarm window.

6. Enter "1" in the *p1990* parameter in the expert list.

Figure 2-12

Parameter	D	+	+	Parameter text	Value Antrieb_1	Unit	Changeable to	Access	Minir
r1987				Rotor position identification trigger characteristic	0	%	-	3	
p1990				Rotor position identification angular commutation offset, commissioning	1		Operation	3	0
p2000				Reference speed reference frequency	3000.00	rpm	Ready to run	2	6
p2001				Reference voltage	1000	V	Ready to run	3	10
p2002				Reference current	9.50	A	Ready to run	3	0.1
p2003				Reference torque	10.93	Nm	Ready to run	3	0
r2004				Reference power	3.4	kW	-	3	
r2032			+	Master control, control word effective	0H	-	-	2	
p2037				PROFIBUS STW1.10 = 0 mode	Freeze setpoints and continue to pro	-	Ready to run	3	
p2038				PROFIBUS STWZSW interface mode	SIMODRIVE 611 universal (1)	-	Ready to run	3	
p2045				CI: Clock synchronous PROFIBUS signal source for master sign-of-life	Antrieb_1 : r2050[3]	-	Ready to run	3	
r2050[0]		+		CO: PROFIBUS PZD receive word, PZD 1	47FH	-	-	3	
p2051[0]		+		CI: PROFIBUS PZD send word, PZD 1	Antrieb_1 : r2089[0]	-	Operation	3	
r2053[0]		+	+	PROFIBUS diagnostics send PZD word, PZD 1	7B7H	-	-	3	
r2060[0]		+		CO: PROFIBUS PZD receive double word, PZD 1 + 2	47FFFFFFH	-	-	3	
p2061[0]		+		CI: PROFIBUS PZD send double word, PZD 1 + 2	0	-	Operation	3	
r2063[0]		+	+	PROFIBUS diagnostics PZD send double word, PZD 1 + 2	3B7FFD8H	-	-	3	
r2065				PROFIBUS diagnostics master sign-of-life	0	-	-	3	
r2075[0]		+		PROFIBUS diagnostics telegram offset PZD receive, PZD 1	2	-	-	3	
r2076[0]		+		PROFIBUS PZD diagnostics telegram offset send, PZD 1	2	-	-	3	
p2080[0]		+		Bit: PROFIBUS send status word 1, Bit 0	Antrieb_1 : r899_0	-	Operation	3	
p2081[0]		+		Bit: PROFIBUS send status word 2, Bit 0	Antrieb_1 : r51_0	-	Operation	3	
p2082[0]		+		Bit: PROFIBUS send free status word 3, Bit 0	Antrieb_1 : r2199.5	-	Operation	3	
p2083[0]		+		Bit: PROFIBUS send free status word 4, Bit 0	0	-	Operation	3	
p2088[0]		+	+	PROFIBUS invert status word, Status word 1	0H	-	Operation	3	0H
r2089[0]		+		CO: PROFIBUS send status word, Status word 1	7B7H	-	-	3	
r2090		+		Bit: PROFIBUS PZD1 received bit-serial	47FH	-	-	3	
r2091		+		Bit: PROFIBUS PZD2 received bit-serial	FFFFFFH	-	-	3	
r2092		+		Bit: PROFIBUS PZD3 received bit-serial	6C16H	-	-	3	
r2093		+		Bit: PROFIBUS PZD4 received bit-serial	F00DH	-	-	3	
r2094		+		Bit: PROFIBUS PZD received bit-serial	0H	-	-	3	
r2095		+		Bit: PROFIBUS PZD received bit-serial	0H	-	-	3	
p2098[0]		+	+	Invert connector-binector converter bit-serial	0H	-	Operation	3	0H
p2099[0]		+		CI: PROFIBUS PZD selection receive bit-serial	0	-	Operation	3	
p2100[0]		+		Setting the fault number for fault response	0	-	Operation	3	0
p2101[0]		+		Setting the fault response	NONE (0)	-	Operation	3	
p2103[0]		C		Bit: 1. Acknowledge faults	Antrieb_1 : r2090.7	-	Operation	3	
p2104[0]		C		Bit: 2. Acknowledge faults	0	-	Operation	3	
p2105[0]		C		Bit: 3. Acknowledge faults	0	-	Operation	3	
p2106[0]		C		Bit: External fault 1	1	-	Operation	3	
p2107[0]		C		Bit: External fault 2	1	-	Operation	3	
p2108[0]		C		Bit: External fault 3	1	-	Operation	3	
r2109[0]		+		Fault time removed in milliseconds	0	ms	-	3	
r2110[0]		+		Alarm number	13000	-	-	2	
p2111				Alarm counter	2	-	Operation	3	0
p2112[0]		C		Bit: External alarm 1	1	-	Operation	3	



## 2.2.3 Parameter adaptations for incremental encoders

If you use an incremental encoder at the drive, it may be required to adapt the *p1082* parameter in the expert list. This is indicated by the error ID F07432 displayed in the alarm window.

For permanent-magnet synchronous motors, it is to be avoided in the field weakening that an EMF which is too high is applied to the terminals and consequently to the converter in case of a failure of the field weakening power. For this reason, boundary conditions were introduced for the *p1082* parameter.

To meet the boundary conditions for the *p1082* parameter, you must not enter a value which is larger than the result of the following formula:

$$p1082 = \frac{9590}{p316}$$

The value 9590 is a constant in the formula

Figure 2-13

Parameter	D	+	+	Parameter text	Value Antrieb_1	Unit	Changeable to	Access	Minir
p1056[0]	C			Bl: Jog bit 1	0	-	Ready to run	3	
p1082[0]	D			Maximum speed	8500.000	rpm	Ready to run	1	0
r1084				CO: Speed limit in positive direction of rotation	210000.000	rpm	Operation	2	0
p1086[0]	D			Speed limit positive effective	8300.000	rpm	Operation	2	0
r1087				CO: Speed limit negative direction of rotation	-210000.000	rpm	Operation	2	-2100
p1121[0]	D			Speed limit negative effective	-8300.000	rpm	Operation	2	0
p1135[0]	D			Ramp-function generator ramp-down time	10.000	s	Operation	1	0
p1140[0]	C			OFF3 ramp-down time	0.000	s	Operation	2	0
p1141[0]	C			Bl: Enables the ramp-function generator	Antrieb_1 : r2090.4	-	Ready to run	3	
p1142[0]	C			Bl: Start ramp-function generator	Antrieb_1 : r2090.5	-	Ready to run	3	
p1155[0]	C			Bl: Enable speed setpoint	Antrieb_1 : r2090.6	-	Ready to run	3	
p1160[0]	C			Ct: Speed controller speed setpoint 1	0	-	Ready to run	3	
r1169				Ct: Speed controller speed setpoint 2	0	-	Ready to run	3	
r1170				CO: Speed controller, speed setpoints 1 and 2	0.000	rpm	Operation	2	0
p1189[0]	D			CO: Speed controller, setpoint sum	0.000	rpm	Operation	2	0
p1190				Speed setpoint configuration	3H	-	Operation	2	0H
p1191				Ct: DSC position deviation XERR	Antrieb_1 : r2060[6]	-	Ready to run	3	
p1193[0]	D			Ct: DSC position controller gain KPC	Antrieb_1 : r2060[8]	-	Ready to run	3	
p1192[0]	D			DSC enc selection	Encoder 1 (motor encoder) (1)	-	Operation	3	
p1193[0]	D			DSC encoder adaptation factor	1.000	-	Operation	3	0
p1215				Motor holding brake configuration	No motor holding brake being used (0)	-	Operation	2	0
p1216				Motor holding brake, opening time	100	ms	Operation	2	0
p1217				Motor holding brake closing time	100	ms	Operation	2	0
p1226				Threshold for zero speed detection	20.0	rpm	Operation	2	0
p1227				Zero speed detection monitoring time	4.000	s	Operation	2	0
p1228				Pulse cancellation delay time	0.000	s	Operation	2	0
p1240				Vdc controller or Vdc monitoring configuration	Inhib Vdc ctrl (0)	-	Operation	3	
p1244				DC link voltage threshold, upper	750	V	Operation	3	400
p1248				DC link voltage threshold, lower	450	V	Operation	3	100
p1250				Vdc controller proportional gain	1.00	A/V	Operation	3	0
p1300[0]	D			Open-loop/closed-loop control operating mode	Speed control (with encoder) (21)	-	Ready to run	2	
p1317[0]	D			V/f control diagnostics activation	Off (p1300 eff) (0)	-	Ready to run	3	
p1318[0]	D			V/f control ramp-up/ramp-down time	10.000	s	Operation	3	0
p1319[0]	D			V/f control voltage at zero frequency	0.0	V	Operation	3	0
p1326[0]	D			V/f control programmable characteristic frequency 4	150.00	Hz	Operation	3	0
p1327[0]	D			V/f control programmable characteristic voltage 4	228.0	V	Operation	3	0
p1400[0]	D			Speed control configuration	1A4H	-	Operation	2	0H
p1404[0]	D			Sensorless operation changeover speed	210000.0	rpm	Operation	3	0
r1406				CO/BO: Control word speed controller	0H	-	Operation	3	
r1407				CO/BO: Status word speed controller	10H	-	Operation	3	
r1408				CO/BO: Closed-loop control status word 3	1H	-	Operation	3	
p1414[0]	D			Speed setpoint filter activation	0H	-	Operation	3	0H
p1415[0]	D			Speed setpoint filter 1 type	Low pass: PT1 (0)	-	Operation	3	
p1416[0]	D			Speed setpoint filter 1 time constant	0.00	ms	Operation	3	0
p1417[0]	D			Speed setpoint filter 1 denominator natural frequency	2000.0	Hz	Operation	3	0.5
p1418[0]	D			Speed setpoint filter 1 denominator damping	0.700	-	Operation	3	0.05