

CDE3000 Positioning Controller System

External Update Service for Basic Firmware

Stand: 05.08.2008

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Introduction

As part of our product maintenance process, we are continuously extending the firmware of the drive system. This software update service is intended to provide you with information on new releases and improvements of the various software versions.

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1 Version 3.00-03

First released version:	CS (XOR): AEC9
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2 Version 3.10-01

Changes compared with version: V 3.00-03	CS (XOR): 0B41
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2.1 New Functions

No.:	Function:
1.	Control, SZUE <ul style="list-style-type: none">• Direction of rotation via FGPOL• Speed tracking error control included (SDIF)
2.	I/O, Encoder <ul style="list-style-type: none">• Resolver cable break detection activated• SSI wire break detection activated again
3.	Field bus <ul style="list-style-type: none">• Object 607E Polarity for DS402 set points and actual values implemented• Profibus-Module-sizes (CM-DPV1) included in Scope• Can-Object 606C "actual speed" included
4.	Parameter <ul style="list-style-type: none">• Encoder setting NONE included• Default APGN = 0• Default R-FLW = HALT• Value range from DOOPC to 0 ... 1 limited, default == 1• Def. R-FLW = HALT• R-OFF : parameter setting warning or no reaction
5.	Others <ul style="list-style-type: none">• New Scope-sizes: Input and output word UM814O, ENPO, PLC-variable

2.2 Changes, Improvements

No.:	Changes, Improvements
	<p>Control, SZUE</p> <ul style="list-style-type: none"> • New functionality E-OFF: E-OFF will be announced when the device will be switched-on too early • Zero-Offset for ISA1 corrected • Bug fixing, resolver position jumps at E-CAN-31 • Reworked calculation of uzk • Resolver: wrong error message corrected • Cam gear: Or-disjunction via all cams for PLC-flag reworked
	<p>I/O, Encoder</p> <ul style="list-style-type: none"> • Bug fixing: analogue input 0..10V at setting „set point 0 at 0V“ with no function • In case that several inputs are parameterized to the same function, values will be OR-gating (pos. logic) or AND-gating (neg. logic). Logic at disjunction multiple/HOLD corrected
	<p>Field bus</p> <ul style="list-style-type: none"> • EDS-File: Update via CIA-Conformance-Test • Reset of Sync-cycle time (Conformance-Test) • Error at setting inputs OSD0/1/2 via PZD cleared • Bug fixing Interpolated Position Mode and homing

3 Version 3.10-03

Änderungen gegenüber Version: V 3.10-01	CS (XOR): D5D7
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3.1 New Functions

Nr.:	Functions
1.	Fieldbus <ul style="list-style-type: none">• The actual Position in increments is shown in the parameter 6063H (position actual value)• The actual velocity is shown the parameter (606CH velocity actual value).
2.	Control <p>The new parameter 258 FOPAR to set internal and external outputs. This parameter can be mapped as object 2102H:</p> <ul style="list-style-type: none">• OS00 Bit 1• OS01 Bit 2• OS02• OE00• OE01• OE02• OE03• OV00• OV01• OS03• OS04

3.2 Changes, Improvements

Nr.:	Changes / Improvements
1.	PLC: Checks to write or read a parameter via PLC are improved (the attempt to write an non existing parameter is detected and ignored).

4 Version 4.00-01

Changing verses version:	V 3.10-03	CS (XOR): D855
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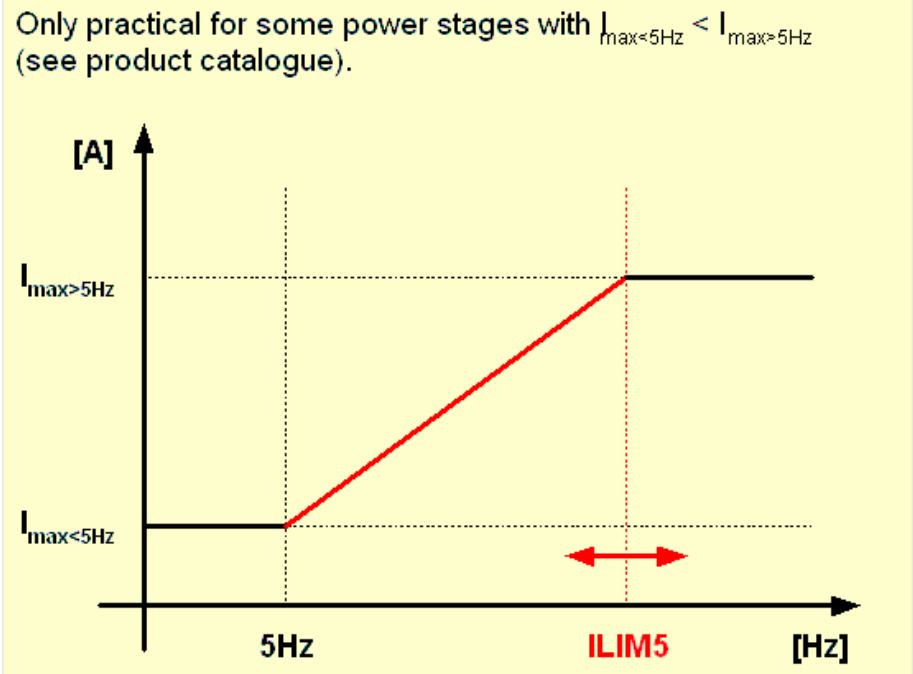
4.1 New functions

N ^o :	Function
1.	<p>PLC functions extended</p> <p>Here you will find the basic changing, for details to the online help. Please see the application manual for CDE3000.</p> <p>Note!!! This extended version is available with DriveManager version 3.60 or higher and PLC editor version 3.60 or higher. All existed dataset respectively PLC program made with PLC editor version 2.xx or 1.xx are not compatible. For changing this program to the new PLC version 3.xx, please see Change to version PLC 3.xx.pdf.</p> <ul style="list-style-type: none"> • Numbers of lines of PLC from 255 up to 498 • New subprogram logic • Start- and stop program selectable • 2 new event programs (operation via marker, input and output) • Possibility to completely handle programs in 1 ms (cycle monitoring) • Extended instruction syntax (for calculation operation, subprograms, current-, reference-position and master encoder position delay, jump instruction, touchprobe, connection of variables) • New mathematical functions (absolute, root, logarithm, sine, cosine, exponent and power) • New reference and contouring error reduce possibilities • Cam disc operation via PLC • PLC directly accesses to the parameter TXPDO/RXPDO attribute in 1 ms task • Only the following parameter will be saved, the first 20 (0-19) H variables, F variables and marker) • Attention!!! Old PLC programs are not dataset compatible!!! <p style="margin-left: 40px;">Reading the program from previously dataset (old, less lines, ...) Transformation the program via V3.xx compiler Saving the program in a new dataset (new PLC version V3.x)</p>
2.	<p>Extension of the output behaviour from the cam controller</p> <p>It is possible to set the output behaviour of each cam via parameter 737 CCOMX; 738 CCOSL and 739 CCODT:</p> <p>CCOSL to</p> <ul style="list-style-type: none"> • STD default, output becomes 1 with rising edge of the set point and 0 with trailing edge • HIDE output becomes 1 with rising edge of the set point and 0 after time t in parameter 739CCODT with trailing edge • LODT output becomes 1 with rising edge of the set point and 0 after time t in parameter 739 CCODT • HLDT output becomes 1 with rising edge of the set point and 0 after time t in parameter 739CCODT <p>CCOMX If the output selector FOxxx = FOCMX is parameterized, the mask can be defined with parameter CCOMX, which activates the output if one of the masked set point is active.</p>

3.	<p>Online switching frequency transfer</p> <p>The transfer of the switching frequency occurs through the I2xt control:</p> <p>688 PMSW to</p> <ul style="list-style-type: none"> • OFF no switching frequency transfer • ON transfer to maximum PMFS and minimum to the smallest switching frequency, which brings a benefit • 4 kHz transfer only between PMFS and the specified frequency. If this is \geq PMFS, there is no transfer • 8 kHz see 4 kHz • 12 kHz see 4 kHz <p>Current switching frequency will be shown in parameter 689 PMFSA</p> <p>General index of the switching barrier in % refer to the cut off barrier of the I2xt The parameter 687 PSMIT can adjust in percentages the barriers for it is switching.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>PMFSA [kHz]</th> <th>upshift</th> <th>downshift</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>PMSIT - 0*5 % - 2%</td> <td>100</td> </tr> <tr> <td>8</td> <td>PMSIT - 1*5 % - 2%</td> <td>PMSIT - 0*5 % + 2%</td> </tr> <tr> <td>12</td> <td>PMSIT - 2*5 % - 2%</td> <td>PMSIT - 1*5 % + 2%</td> </tr> <tr> <td>16</td> <td>0</td> <td>PMSIT - 2*5 % + 2%</td> </tr> </tbody> </table>	PMFSA [kHz]	upshift	downshift	4	PMSIT - 0*5 % - 2%	100	8	PMSIT - 1*5 % - 2%	PMSIT - 0*5 % + 2%	12	PMSIT - 2*5 % - 2%	PMSIT - 1*5 % + 2%	16	0	PMSIT - 2*5 % + 2%
PMFSA [kHz]	upshift	downshift														
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12	PMSIT - 2*5 % - 2%	PMSIT - 1*5 % + 2%														
16	0	PMSIT - 2*5 % + 2%														
4.	<p>Braking chopper ED-barrier in BR-version</p> <p>The power loss in an internal braking chopper will be controlled through an I²t integrator. While crossing this barrier the error E-BRC-48 will get reported. Error response via default “disable power stage” and can be changed via parameter 518 R-BRC. A warning can be signalled at a percentage of the maximum via 509 WLBRC.</p>															
5.	<p>Support for the power output stage FS7</p> <ul style="list-style-type: none"> • Ramp like rising of the current from 0 up to 5 Hz • Current limiting to avoid an E-OC 															
	<p>Scope upgrade</p> <p>New scope variables</p> <ul style="list-style-type: none"> • Drive counting error Speed.diff • V/f motor voltage eff. link Vmot.eff • V/f active current iw • V/f active current filtered iwF • V/f shock absorption effective iwAp • V/f shock absorption correction voltage of the desired frequency fApD • PLC program number and PLC program line are separated now • Resolver position • Resolver speed 															
6.	<p>Parameter AMREF external torque input control</p> <p>An additive current value for the current controller can be set in the parameter AMREF 855 during U/F operation The torque can be external pre-controlled in regular operation. Attention, this parameter is transient and will not be saved.</p>															

7.	<p>Parameter ANREF external speed pre-control</p> <p>The speed can be external pre-controlled in regular operation. Attention, this parameter is transient and will not be saved.</p>
8.	<p>Rotating direction via end switch without error message LIM2</p> <p>Error response to end switch reaction (HW and SW) New input function /LIM2. This can be parameterized to several inputs. If the input is low, STOP will be set and a speed rotation barrier occurs until leaving the end switch.</p>
9.	<p>Motor phase breakdown identification in U/F operation</p> <p>A motor phase breakdown identification will only take place during standard start-up in U/F operation.</p>
10.	<p>CDE/B OpenLoop; range of values expansion of the nominal voltage</p> <p>The maximum motor voltage for U/F is changed from 460 V to 600 V. This considers both data sets in parameter 616 Index 0 and 1.</p>
11.	<p>Torque pre-control for position control</p> <p>The pre-control values for the speed and torque will be generated via fine interpolation. These can be over plugged in percentages via parameter 824 MPREF. Default is 0.00 % = off.</p>
12.	<p>Behavior of TargetReach bits</p> <p>751 PORPS =</p> <p>0 (default) TargetReached will be set, if ROI path is finished and the actual value is in the nominal value +-POWIN. TargetReached also at HALT or quick stop.</p> <p>1 TargetReached will be set if ROI nominal and actual value is in the nominal voltage range +- POWIN. TargetReached also at HALT or quick stop.</p> <p>2 TargetReached will be set if ROI path is finished and the actual value is in the nominal voltage range +-POWIN. NO TargetReaches also at HALT or quick stop.</p> <p>3 TargetReached will be set if ROI nominal and actual value are in nominal value range +-POWIN. NO TargetReached at HALT or quick stop.</p>
13.	<p>Magnetical SINCOS encoder via X6</p> <p>The resolver control can be switched off via parameter 437 CFX6 to SINCO adjustment. Therefore magnetical sin-cos encoder and sine hall encoder can be analyzed through the resolver input. Attention: The resolver input expects an amplitude of 4,5 Vss and a maximum frequency lower than 1 kHz. Smaller amplitudes can cause a definition loss or a shutdown E-EC (wire break) and higher frequency can cause the loss of the commutation.</p>

14.	<p>CAN - new mappable sizes</p> <ul style="list-style-type: none"> • 79 POS2 actual position value of redundant encoder • 86 TSYS time after activation • 87 TOP counter for operation hours • 299 IFOUT Array mappable actual value • 419 IOSTA status of digital in- and output • 672 DS402 apparent current actual value (new initiation) • 673 DS402 voltage ISA0 (new initiation) • 674 DS402 voltage ISA1 (new initiation) • 752 VLACT actual speed in speed unity • 797 SFIL actual speed in speed unity • 853 DCVPD intermediate circuit voltage 																										
15.	<p>Actual value parameter with an index of different sources</p> <p>A size can be signed out of an index in parameter 299 IFOUT (index parameter) via parameter 297 IFSEL (source) and 298 IFTME (Tn of PT1 filter). The following sizes are available:</p> <table border="0"> <tr> <td>SPEED:</td> <td>77_Speed</td> </tr> <tr> <td>VMOT:</td> <td>404 motor voltage eff., has to be multiplied with $\sqrt{3}/\sqrt{2}$</td> </tr> <tr> <td>DCV:</td> <td>405 intermediate circuit voltage</td> </tr> <tr> <td>REFV:</td> <td>406 actual speed value</td> </tr> <tr> <td>APCUR:</td> <td>408 apparent current</td> </tr> <tr> <td>VLACT:</td> <td>752 actual speed in speed unity</td> </tr> <tr> <td>POACT:</td> <td>754 actual position in path unity</td> </tr> <tr> <td>POREF:</td> <td>755 nominal position in path unity</td> </tr> <tr> <td>PODIF:</td> <td>756 contouring error in path unity</td> </tr> <tr> <td>H22A0:</td> <td>672 actual value eff. apparent current</td> </tr> <tr> <td>H22A1:</td> <td>673 actual value analogue input ISA0 in mV</td> </tr> <tr> <td>H22A2:</td> <td>674 actual value analogue input ISA1 in mV</td> </tr> <tr> <td>H2274:</td> <td>628 actual torque value EasyDrive</td> </tr> </table>	SPEED:	77_Speed	VMOT:	404 motor voltage eff., has to be multiplied with $\sqrt{3}/\sqrt{2}$	DCV:	405 intermediate circuit voltage	REFV:	406 actual speed value	APCUR:	408 apparent current	VLACT:	752 actual speed in speed unity	POACT:	754 actual position in path unity	POREF:	755 nominal position in path unity	PODIF:	756 contouring error in path unity	H22A0:	672 actual value eff. apparent current	H22A1:	673 actual value analogue input ISA0 in mV	H22A2:	674 actual value analogue input ISA1 in mV	H2274:	628 actual torque value EasyDrive
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H22A1:	673 actual value analogue input ISA0 in mV																										
H22A2:	674 actual value analogue input ISA1 in mV																										
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16.	<p>New DS402 operation</p> <p>-4 is like "ProfilePositionMode", but a new required position will be accepted if a new set point applies. With "ChangeSetImmediately" the required position will be set to actual position.</p> <p>-5 is like „ProfileVelocityMode“, the required position will be set to actual position via bit 5 „ChangeSetImmediately“</p>																										
17.	<p>Synchronisation with asynchronous motor and torque</p> <p>This function allows running up a rotating asynchronous motor with torque at actual speed and does not start at speed 0.</p>																										

<p>18.</p>	<p>Current limiting for fast I*t ILIM5</p> <p>Below 5 Hz a current limiting can be set, so no error shutdown with over current less than 5 Hz can happen. If a frequency greater-than-or-equal to 5,125 Hz is registered in parameter 834 ILIM5, the current limiting for the registered frequency is active. The current up to 5 Hz will be defined smaller than 5 Hz in I_{max}. The current will be hoisted up to the maximum value of the output in ramps up to the limit frequency (834) afterwards.</p> <p>Only practical for some power stages with $I_{\max < 5\text{Hz}} < I_{\max > 5\text{Hz}}$ (see product catalogue).</p>  <p>The graph plots current [A] on the vertical axis against frequency [Hz] on the horizontal axis. A horizontal dashed line at the lower level is labeled $I_{\max < 5\text{Hz}}$, and a higher one is labeled $I_{\max > 5\text{Hz}}$. A vertical dashed line at 5 Hz marks the start of the ramp. A red line starts at (5 Hz, $I_{\max < 5\text{Hz}}$) and rises linearly to (ILIM5, $I_{\max > 5\text{Hz}}$). A horizontal solid line continues at $I_{\max > 5\text{Hz}}$ for frequencies above ILIM5. A red double-headed arrow is positioned between the 5 Hz and ILIM5 marks on the x-axis.</p>
<p>19.</p>	<p>Reference type -7</p> <p>Equal to the reference type -1 (actual position = zero correction), but correction to the actual position and not to the reference position. These type erases an actual following error and set the position to the zero correction.</p> <p>Analog zum Referenzfahrttyp -1 (aktuelle Position = Nullpunktoffset) 1, jedoch Korrektur auf Istposition nicht auf Sollposition. Bei diesem Referenzfahrttyp wird ein aktueller Schleppfehler verworfen und die Position gleich dem Nullpunktoffset gesetzt.</p>
<p>20.</p>	<p>SCGF0</p> <p>The speed controller will be reduced at all encoder. For incremental encoder systems the reduction occurs after achieving the stand still range, for all other encoders the reduction occurs from approximately 117 rpm.</p>
<p>21.</p>	<p>Jitter filter for master encoder</p> <p>A jitter will be suspended in the encoder signal at the TTL master encoder, because it could cause a drift of the axis. This could happen if the TTL signal comes from the control respectively the encoder simulation.</p>
<p>22.</p>	<p>Upgrading of the input with function TP0</p> <p>The new input function touchprobe 0 is implemented and available at all inputs. The actual position will be registered in 1ms raster.</p>

4.2 Changing's, improvements

Nr.:	Changing's / improvements
1.	<p>Output functions</p> <ul style="list-style-type: none"> • C_RDY shows „ready to switch on“ and not only „operation enabled“, therefore ACTIV can be used • PRACT technology controller active respectively output unequal 0 • FOCMX on of the cams from parameter 737 CCOMX is active • FOPAR Output control via parameter 258 FOPAR • WIT the Output for warning thresholds protection motor will set up 1% to 100% (the threshold is programmable via parameter 337 WLITM).
2.	<p>Presetting solution PCB_3 and PCC_3</p> <p>The start condition for PLC will be set, in case of these both presetting solutions, to start via bus and not via term.</p>
3.	<p>Gear ratio</p> <p>Gear ratio with a denominator to 4294967295 (32 Bit) are now possible.</p>
4.	<p>Conducting Encoder</p> <p>Conducting encoder function in PLC and cam gear has been corrected. Conducting encoder operation for speed control has been corrected, reference speed only set via reference from RDIG and not via nsoll3.</p>
5.	<p>Software limit switches</p> <ul style="list-style-type: none"> • The software limit switches will be limited to the presentable value range in 32 bit increments. The overflow during the conversation to the user units is intercepted • To start the homing no second start is necessary, if the drive is out of the software limit switches.
6.	<p>R-OLM value range expanded</p> <p>The fault reaction R-OLM is expanded with the two reactions NoERROR and warning.</p>
7.	<p>Override via analog input</p> <p>Override function via analog input results 0-10 V = 0-150 %.</p>

8.	<p>CAN</p> <p>Interpolated Position Mode Speedjump in transition from IP Mode to quickstop has been removed.</p> <p>CAN Easy Drive Basic and ProgPos The bit reverence value reached is in both operation modes corrected.</p> <p>CAN Easy Drive TablePos The function halt is corrected and the driving job will be continued after the command halt is taken back.</p> <p>CAN Target reached in Quickstop Target reached Bit will set by reaching standstill in quickstop.</p> <p>CAN SDO Abort telegramm There will be no response to a SDO abort telegram.</p> <p>CAN New Setpoint Flank of Bit 4 New Setpoint in the control word will be detected only by a real flank and not by a transition of the operation mode.</p> <p>CAN Adresse The default CAN Adresse is now 1 and not 0.</p> <p>CAN Object 60FD status digital inputs CAN Object is shown in parameter 709.</p>
9.	<p>Analoginputs read in PLC</p> <p>The level of the analog inputs are corrected by the calibration data.</p>
10.	<p>Tablepositioning WSTP</p> <p>The linking of various tablejobs about the function “without stop from target position (WSTP)” does not lead to an endless speed positioning, if reference is equal the actual position.</p>
11.	<p>Table-positioning repetitions</p> <p>The configured repetition of tablejobs will be ignored in absolute mode.</p>
12.	<p>Controlmodule in V/F Mode</p> <p>All control modules in V/F mode, start up current controller, etc are in default setting off.</p>
13.	<p>Profibus Statusword</p> <p>In the profibus statusword PZD2 the operation modes Easy Drive DirectPos and Table-Pos are now the bits driving job active. Target position is taken over corrected.</p>

14.	<p>Error messages</p> <p>E-OFF</p> <p>There is no error message coming after switching off the power supply. The error only occurs if the power supply turns back in short time. The error reaction could be parameterized to warning or no error.</p> <p>Excess rotation speed</p> <p>The error for excess rotation speed will be shown now with E-FLW 153.</p> <p>E-PAR</p> <p>In the parameter 423 ERPAR will be shown the parameter number which causes the error.</p>
15.	<p>Drivecom State machine</p> <p>The Bit 15 will show the status of the motor brake.</p>



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Subject to technical changes.