



Firmware Release Notes: Class 5 SmartMotor Standard/CANopen

DISCLAIMER: Information in this document is provided in connection with Moog Animatics products. No license, express or implied, by estoppels or otherwise, to any intellectual property rights is granted by this document.

Copyright 2024 Moog Inc., Animatics. All rights reserved.

Moog Animatics Firmware Update Revision History

Release Date	Software Version	Changes	Dependencies
2/9/2024	5.0.4.69	<p>Production Release</p> <ol style="list-style-type: none"> Resolved problem in 5.x.4.68 with time overflow when a system delay occurs. (Such as PRINT with more than 32 bytes.) This time delay would cause CAN sync packets to stop being generated for multiple seconds. Improvement to CANopen gearing: when receiving sync packets, if packet is late (1/2 the time period), then reset the CANopen gearing time phase so that it will still correctly allow a time margin to allow for jitter instead of locking into the wrong time. This is important for smoothness of motion in gearing mode. CANopen gearing: no longer reset position when timeout occurred. It was not helpful to reset position in that manner as it could appear to be a slip of position. <p>Known issues:</p> <ol style="list-style-type: none"> PRINT statements that print more than 32 bytes in a single PRINT statement will delay processing of CANopen messages, 	<p><u>EDS files:</u> CANopen: SM5_OV3R9.eds</p>



Release Date	Software Version	Changes	Dependencies
		serial commands, etc. This has been a limitation prior to this version and continues to be.	
12/7/2023	5.0.4.68	<p>Engineering Build</p> <ol style="list-style-type: none"> 1. Fixed issue with user program interrupts of certain commands like TMR(8,<time>) when Z(4,8) used to clear event in an interrupt. There was a potential for events to be missed, which has been resolved. 2. I/O 4&5 are allowed to be used concurrently with Ethernet option motors (-ETH models.) Previously, the OCHN command on channel 1 would preclude the use of those I/O. This only applies to motors ordered with the Ethernet option. Non-ethernet motors will still be mutually-exclusive between the use of I/O 4&5 and the OCHN (RS-485) command on channel 1. 3. CANopen gearing sync phase delay increased. 4. CANopen event timer handling modified to avoid loss of time when main loop is too busy. 5. Fixed issue with RPDO3 (control word and position target.) The new position target wasn't be interpreted until after the control word which resulted in a need to issue the control word change again. This was a regression, as it had worked in the past. 	<p><u>EDS files:</u> CANopen: SM5_OV3R9.eds</p>
1/25/2023	5.0.4.67	Changed related to issues in other firmware types not affecting this version of firmware.	<p><u>EDS files:</u> CANopen: SM5_OV3R9.eds</p>
10/25/2022	5.0.4.66	<p>Production Release</p> <ol style="list-style-type: none"> 1. Fixed regression on follow mode input that was limiting counts per sample to 63 before overflowing. This was a result of adding SRR/SRM commands. Fixed math to avoid overflow. This issue affected version 5.x.4.59 – 5.x.4.65. 	<p><u>EDS files:</u> CANopen: SM5_OV3R9.eds</p>



Release Date	Software Version	Changes	Dependencies
		<ol style="list-style-type: none"> Fixed problem with position moves and small velocity target and repeated G commands. 	
3/30/2022	5.0.4.65	Engineering Build <ol style="list-style-type: none"> Enabled RSP3 report command to determine processor variant and revision. 	<u>EDS files:</u> CANopen: SM5_OV3R9.ed5
10/15/2021	5.0.4.64	Engineering Build	<u>EDS files:</u> CANopen: SM5_OV3R9.ed5
10/1/2021	5.0.4.63	Engineering Build <ol style="list-style-type: none"> Fixed problem with TRACE stepping and a RETURN command being issued. Changes to Combitronics fault handling mode to avoid false tripping with large numbers of motors. 	<u>EDS files:</u> CANopen: SM5_OV3R9.ed5
4/15/2021	5.0.4.61	Engineering Build <ol style="list-style-type: none"> GS was broken by changes in 5.0.4.60 related to CANCTL(28,x), fixed here. Issue #IR_3068. GS won't transmit until a PTS with remote motors is seen, this is overly protective and we can default to allowing GS until a PTS without remote motors is seen. Issue #IR_3069. Issue with servo LED status and notfault output when Combitronics fault handling enabled. (was only a problem in 5.0.4.59, and 5.0.4.60) Issue #IR_3070. 	<u>EDS files:</u> CANopen: SM5_OV3R9.ed5
3/18/2021	5.0.4.60	Engineering Build	<u>EDS files:</u> CANopen: SM5_OV3R9.ed5



Release Date	Software Version	Changes	Dependencies
		<ol style="list-style-type: none"> 1. Changes to Combitronics heartbeat/fault handling. (Issue #GR_3003) <ol style="list-style-type: none"> a. Allowed readback of setup commands CANCTL(22,value), CANCTL(23,value), CANCTL(24,value) by using RCAN(22), RCAN(23), RCAN(24) respectively. b. Added RCAN(27) to report which remote motors are not in ready state. c. More status bits added in Status word 4 to provide detail of the Combitronics fault handling state. d. Changed bit definition of status word 4, bit 13. e. Added a fault condition when Combitronics request or server handling of a request overflows. This is active only when Combitronics fault handling is enabled. This closes the potential hole of lost commands from one motor to another, which could be just as bad as the loss of communication that the Combitronics fault handling is there to detect. f. Various characteristics of the fault handling changed in terms of how status bits react (set or cleared), generally to be more obvious to diagnose and to prevent motors from moving if the whole group isn't in the ready state. 2. Added CANCTL(28,value) to modify the behavior of GS command to allow multiple sets of motors concurrently using PTS commands. 3. Improved the handling of certain status bits that had the potential for race conditions. (Though no specific issues are known to be related to this at this time.) 	
11/3/2020	5.0.4.59	Engineering Build	<u>EDS files:</u> CANopen: SM5_0V3R9.eds



Release Date	Software Version	Changes	Dependencies
		<ol style="list-style-type: none"> 1. SG command implemented #GR_3064. 2. EASAT command implemented #GR_3065. 3. Issue with MCW and RAM tables (a recent bug) #IR_3048. (Only affects fw 5.x.4.57 and 5.x.4.58) 4. Combitronics time sync needed improvement when traffic is busy, CANCTL(14,2) resets timer for consistency. #IR_3049 5. Fixed problems with a full Combitronics command that reads 4 values from Combitronics and writes result to Combitronics. For example: a:3=b:3+c:3+d:3+e:3 Issue # IR_3050 6. Fixed issue with Combitronics in a program and on the serial port at the same time causing serial port to hang. Issue #IR_3051 7. Scaling issue where RI, RJ commands were not properly handled in Combitronics. 8. Issue #IR_3052 the TWAIT could hang and get stuck sometimes when a fault occurs. 9. Fixed ability to report RSLM:addr (Combitronics read support) Issue: #IR_3055 10. Combitronics server order fixed to serve in order of arrival. Issue IR_3053. 11. Issues with CANCTL(1,0) reset causing CANbus to stop receiving packets CANOpen / Combitronics. This fixes how the CAN driver handles overflow situations which is why the reset triggers the problem because packets build-up while CAN stack is restarting. Issue #IR_3054. 12. PMT modulo target in positive direction (PMTN=) or negative direction (PMTN=). Issue #GR_3040 13. Added OSH(9) and O(9) to be able to adjust PMA independent of PA. #GR_3041 Includes also the ability to set just OSH(8) and O(8) to set PC/PA and not set PMA. 14. Fixed overflow issue when setting PMA with very large PML values. #IR_3058 	



Release Date	Software Version	Changes	Dependencies
		<ul style="list-style-type: none"> 15. Ability to set CTR(1) to any value using O/OSH(11). Also allows CTR(0) to be set to any value using O/OSH(10). #GR_3066 16. TMR(8,x) / RTMR(8) added to provide a cyclic auto-reload timer. Issue #GR_3028. 17. SYSCTL(7,x) options: GR_3004 KI stability/anti-windup. GR_3067 Zero KI at end of move. 18. SYSCTL(8,x) Ability to set PMA modulo counter to work relative to trajectory 1 so that trajectory 2 can be used as offset without confusing where modulo target is going. Issue #GR_3042 19. User program stack underflow/overflow issues that hang, leave 'program running' bit, and fail to report correctly. Also possibility of memory overrun in SWITCH and WAIT commands in that condition. #IR_3059, #IR_3060. 20. Changed where PositionFollow is cleared on restart to avoid drift issues. Issue #IR_3037 21. Cam resume G(9) command was getting stuck in some cases, need to have a bit cleared after use. Issue #IR_3063 22. GS acted on both trajectory 1 and 2. It only makes sense to act on trajectory 1, and is causing problems for a customer on trajectory 2. Issue #IR_3062 23. Implemented SRM=, SRR=, RSRM, RSRA, RSRR. Source ratio multiplier. #GR_3014 24. PTS special mode to support using PC(1) instead of PT as the starting position. (CANCTL(21,0)) #GR_3069. 25. Added check in PTS for small distances that were rounding-down and causing long completion times. #IR_3064 26. Combitronics heartbeat/fault handling. Issue #GR_3003 27. CANCTL(1,0) reset, then setting sync COB-ID would corrupt the SDO server's COB-ID. #IR_3065 	
3/20/2020	5.0.4.58		EDS files:



Release Date	Software Version	Changes	Dependencies
		<p>Engineering Build</p> <ol style="list-style-type: none"> 1. RERRC reset to 0 ("No error") when ZS, Z(2,14), Zs. Issue: #GR_3057 2. CANOpen: Made various objects write-only: 0x2100:1-0x2100:3, 0x2202, 0x2203, 0x220c, 0x220d. Removed PDO mappability: 0x2202, 0x2203, 0x605e. Add PDO mappability: 0x6402, 0x6502. 3. Command scaling: SCALEP, SCALEV, SCALEA, which affects commands like VT=, RPA, ADT=, etc. Includes support for PTS. See full list. #GR_3049 4. Issue #IR_3040 CANOpen objects 0x220a, 0x220b had an issue that prevented negative values from being written to MFMUL, MFDIV. 5. CANOpen remote bit wasn't totally masking the effects of controlword. Issue: # IR_3041. This change could have some repercussions on the way "target reached", and "setpoint ack" bits are reported, but should be a beneficial change overall. 6. CANOpen: Changed default value of quickstop decel to 0x7fffffe so that it is even because technically we require accel to be even. 7. RSP2: (Combitronics) support, RSP6 added, also with RSP6: (Combitronics) support, RFW: (Combitronics) support 8. IR_3042 PRINT statements that are too long will now consistently issue the error: LENGTH_VIOLATION and prevent random execution of the excess of the PRINT command. 9. Fixed recent regression where a Combitronics command could return a ParseErrorCode of 65535 in some rare cases. IR_3047 10. Fixed TSWAIT not handled when motor only commanding PTS to itself. #IR_3044 11. CANOpen: fixed encapsulation object 0x2500 doesn't report command error as it should when Combitronics is attempted. #IR_3045 	<p>CANopen: SM5_OV3R9.ed5</p>



Release Date	Software Version	Changes	Dependencies
		12. CANopen: changed EDS number to 0x00030009. 0x2201:2 DataType -> Data Type 0x2500:3 CommandStatus -> Command Status	
12/12/2019	5.0.4.57	Engineering Build <ol style="list-style-type: none"> Fixes issue with 0x1018:4 serial number getting cleared when NMT reset 0x82 "reset comms" issued. Issue #IR_3031. CTA command, etc. cam handling of large tables and address miscalculations (leading to watchdog in some cases.) #IR_3025 TSWAIT issues: was not working in cases of BRKTRJ or when master was not included in PTS axis list. #IR_3033 	<u>EDS files:</u> CANopen: SM5_OV3R8.eds
11/21/2019	5.0.4.56	Engineering Build <ol style="list-style-type: none"> Added CANCTL(21,x) to prevent DS2020 automatic transform of Animatics units to units/seconds. Fixed EDS issue with missing option to use CANopen dummy object types. (firmware supported it regardless.) EDS version number changed in EDS and firmware. Fixes problems with running step-trace with PTS command. (also fixes duplicate line displayed by step trace for SDORD and SDOWR commands.) Fixed potential issues with PTS command where a write-timeout can cause command to hang and/or transmit inordinate amount of traffic. IIC improved timing regularity. Issue #IR_3030. 	<u>EDS files:</u> CANopen: SM5_OV3R8.eds
10/28/2019	5.0.4.55	Engineering Build	<u>EDS files:</u> CANopen: SM5_OV3R7.eds



Release Date	Software Version	Changes	Dependencies
		<ol style="list-style-type: none"> 1. Compatibility added for DS2020 and PTS commands (assuming DS2020 set FD to same as Smartmotor's resolution.) Issue #GR_3046. 2. SMI lockup wizard support added via CANbus/Combitronics. Issue #GR_3047. 3. CADDR= command corrected range check, was allowing large numbers and truncating them. 4. Support added for DS2020 commands over Combitronics: RFAUSTS(arg1), FSAD(arg1, arg2), RFSAD(arg1) 5. Range-check of Combitronics array index. i.e. RW(65536) silently wraps to 0. Issue #IR_3021. 6. Range-check of Combitronics address. Issue #IR_3022. 7. Combitronics read wasn't handling remote error code number. (but writes do) Read just always showed RERRC 22 for any remote error besides timeout. New behavior: Combitronic read will indicate actual error message in the Smartmotor making request (readable via RERRC command), So incorrect error code responses in older firmware versions may change in new firmware to the correct error codes. Issue #IR_3023. 8. Closed potential loophole in how CLK= command was handled. No known bug reports, but it may have been a problem. 	
8/21/2019	5.0.4.54	<p>Engineering Build</p> <ol style="list-style-type: none"> 1. Changed EDS file for CANopen (now SM5_0V3R7.eds) removed the square brackets and added underscore from the names of sub-indicies under 0x2220 and 0x2221. Firmware EDS revision number updated accordingly as reported by object 0x1018, sub-index 3: value: 0x00030007. The reason is that certain PLC software can't parse the square brackets and prevents proper use of any PDO. 2. Fixed RSDO command which wasn't working in versions (5.x.4.51 – 4.x.4.53) 	<p><u>EDS files:</u> CANopen: SM5_0V3R7.eds</p>



Release Date	Software Version	Changes	Dependencies
7/11/2019	5.0.4.53	<p>Engineering Build</p> <ol style="list-style-type: none"> 1. I/O code refactored to save space and make code easier to understand. Intent is that most behavior is the same except for a few very obvious glitches that were fixed (listed below.) There is always the chance some small behavior difference might emerge. <ol style="list-style-type: none"> a. In D-series, CANopen object 0x60FE:1 digital outputs: when setting = 0, limit 2&3 (if enabled) did not show as 0 if that object is read back. Behavior change will be to simply mask off bits that are not set as outputs. i.e. x60fe:1 will be an indication of output AND set to 1. b. Fixed glitch that existing firmware has: EOBK(1), then write 0 to 0x60FE:1, EIGN(W,0) output 2 won't go low (but 3 does) Some type of logic is off by one. c. EOIDX(6): OS(W,0) does not override EOIDX(6), previous versions had inconsistent results. d. D-series: ROF(D,0) in previous firmware would respond with 0 (but ROF(S,0) ROF(L,0) do not), new firmware only responds to word 1. ROF(D,0) didn't produce any useful result, always 0. e. D-series: ROC(W,0) in previous firmware would respond with 0, new firmware only responds to word 1. ROC(W,0) didn't produce any useful result, always 0. f. D-series: ROC(bit) single-bit format of command wasn't working. g. D-series: EOIDX(6) sets output state even if EISM active, old firmware would ignore this request when EISM active 	<p><u>EDS files:</u> CANopen: SM5_OV3R6.ed5</p>



Release Date	Software Version	Changes	Dependencies
		<ul style="list-style-type: none"> h. D-series: OR(0) command (and similar outputs unrelated to input 6) could trigger a G if input 6 is low. Previous firmware did this (BUG) now firmware does not. - behavior change. 2. Added 0x60FE:2 bitmask object. Though object is optional, it would be a great help in controlling what bits are driven as outputs, especially in D-series. #GR_3021 3. Minor naming corrections to CANopen EDS file. 4. Added RFD and FD= commands for Casella. #GR_3020. 5. Modbus/Combitronics read/ write packets / GOSUB R2. #GR_3023. 6. Modbus handling of UART errors (framing and parity if enabled) to reject whole packet. #GR_3026. 	
4/10/2018	5.0.4.51	<p>Engineering Build</p> <ul style="list-style-type: none"> 1. Fixed problem with command ITR(1,1,2,0,IN) generating an error. 2. Various range-checks and error reporting improvements to certain commands serial and Combitronics: MINV, MF0, MS0, MFL, MFH, ADT, ATS, DTS, KS, KG, RBAUD, CTW, MFA, MFD, MFSLEW, MFSDC 3. Issue with CTW command allowable range of position differences. Redmine issue #1836. 4. removed ability to reset the reserved bit in status word 2, bit 5. 5. Added error generation for odd number of quotes PRINT(AA") 6. Fixed problem with downloading a program with PRINT("\$") through CAN 7. Changed handling CAN object 2500 to prevent command PRINT4 in a user program to have a continuous loop. 8. set limit to 0x60FB:5 "KS" to 0x00 to 0x03 to reflect actual behavior. 	<p><u>EDS files:</u> CANopen: SM5_OV3R5.eds</p>



Release Date	Software Version	Changes	Dependencies
		9. RATOF and RHEX commands correction to range check. Redmine issue #1882. 10. Added ability to PRINT #13 through CANopen object 0x2500. 11. Step +/- feature added. Software counting only, limited to 8kHz SYSCTL(5,x) to activate. #GR_3002 12. ADT=, AT=, DT= fixed bug where 2147483647 rounds up and overflows. #IR_3008.	
9/28/2018	5.0.4.50	Engineering Build 1. Allows 32kHz PWM in D-series through the SYSCTL command. 2. Improvements to RS485 timing. Added range checks to BAUD and OCHN command on baud rate settings. 3. improvements to Modbus RTU timing. Added COMCTL(10,x) and COMCTL(11,x) to adjust turn-around time. Redmine #1859.	<u>EDS files:</u> CANopen: SM5_0V3R5.ed5
7/18/2018	5.0.4.49	Engineering Build 1. CSP mode (CANopen) enhancements. CANopen: Added PLL lock bit to object 0x2400 (CSP mode), also underflow, overflow bit supported in CSP mode now. 2. CANopen sync: ability to suppress the sync prioritization for applications with timing issues when data arrives shortly before sync. This preserves the order of arrival. CANCTL(18,1) command. 3. Fixed: In CSP mode, fault occurs that makes it difficult to move off positive limit switch. Redmine issue #1550 4. Fix to PTS mode that prevent absurd values for VT, AT, DT when distance is 0. Redmine issue #1807. 5. Added check to UP, UPLOAD, LOAD commands to prevent any access from Modbus encapsulated interface.	<u>EDS files:</u> CANopen: SM5_0V3R5.ed5



Release Date	Software Version	Changes	Dependencies
6/13/2018	5.0.4.47	Engineering Build 1. Modbus encapsulation.	<u>EDS files:</u> CANopen: SM5_OV3R5.ed5
6/7/2018	5.0.4.46	Engineering Build 1. Fix to MV command error handling through Combitronics when incorrect argument given. 2. BRKENG command over Combitronics minor change to make more consistent with non-combitronics version of command. 3. RPT command over Combitronics minor improvement to avoid possible race condition. 4. Various improvements in error checking in commands. 5. Modbus problem with exception for write multiple function. Redmine issue #1769. 6. Modbus problem with address range checks, especially on GOSUB object 0x8004. Redmine issue #1772. 7. Updated CANopen, limits for objects 0x220c, 0x220d and 0x2208 sub-index 0 8. Fixed: OUT command interacting with EOBK producing wrong I/O output. Redmine issue #1776. 9. PML command limited to > 0. 10. Combitronics fix to cases where a write took place after a recent GOTO/GOSUB could have subtle timing issues resulting in a read operation taking place afterward getting stale data. Redmine issue #1792. 11. Sync producer when running a program is causing timing problems. Gave more priority to the CANopen handling within RunProgram. Redmine issue #1785. 12. CSP mode in CANopen enabled.	<u>EDS files:</u> CANopen: SM5_OV3R5.ed5



Release Date	Software Version	Changes	Dependencies
		13. Sync consumer timebase clock correction added reset when major difference (lost count) so that a reasonable recovery is possible.	
3/9/2018	5.0.4.43	Engineering Build 1. Various commands added additional syntax-checking 2. MC command corrected, was accepting the wrong arguments in () 3. MD command would set operation mode even when argument incorrect and error reported. 4. STACK command will reset any GOSUB called through CANopen object 0x2309 5. Fixed problem with GOTO through Combitronics resulting in GOSUB happening instead. 6. Fixed problem with EITR and DITR W options not being handled and generating an error. 7. Fixed problem with RSLN and RSLP through Combitronics being backwards.	<u>EDS files:</u> CANopen: SM5_OV3R4.ed5
1/9/2018	5.0.4.42	Production Release Various bug fixes. Improvements made to encoder index correction for incremental encoders. Added configurable functionality to map internal index mark to output. EOIDX()	<u>EDS files:</u> CANopen: SM5_OV3R4.ed5
8/29/2017	5.0.4.36	Various bug fixes.	<u>EDS files:</u> CANopen: SM5_OV3R4.ed5



Release Date	Software Version	Changes	Dependencies
		<p>Encoder index correction implemented for incremental internal encoders.</p> <p>Negative applications of MFMUL/MFDIV When MFSDC(x,0) or MFSDC(x,1) no longer toggles direction. (-) indicates the negative direction and (+) indicates the positive direction.</p>	
6/23/2016	5.0.4.31	<p>Various bug fixes.</p> <p>Allow MDB while in MDH commutation mode. (Only class 5 D-series supports MDH mode.)</p> <p>Low-resolution external encoder mode support.</p> <p>CANOpen Mastering added: RSDORD, x=SDORD, SDOWR, NMT, RCAN(4), x=CAN(4)</p> <p>Improvement to object 0x2209 that allows cam master from network to resume cam from current state instead of restart.</p> <p>Added special command SYSCTL(1,x) to control bootup MTB state.</p> <p>ENCCTL command was causing watchdog if ABS encoder not actually enabled. Added check to bypass the ENCCTL functions in this case.</p> <p>Combitronics support for RTRQ.</p> <p>Ping command support over Combitronics.</p> <p>Encoder-hall runaway check status bit moved to give its own status bit: status word 6, bit 5.</p>	<p><u>EDS files:</u> CANopen: SM5_OV3R4.eds</p>



Release Date	Software Version	Changes	Dependencies
		<p>Encrypted SMXE user program download over CANOpen.</p> <p>Misc improvements to downloading user program over CANOpen.</p> <p>Gearing over CANOpen (mode of operation -11). Object 0x2208 data</p> <p>Time sync over Combitronics.</p> <p>Cam mode start at arbitrary master values.</p> <p>Resume G(9) cam function.</p> <p>CANOpen timer tick moved to main ISR to maintain better alignment with motor timebase when a sync producer.</p> <p>Hybrid mode MDH, MDHV= for D-series only.</p> <p>Current limit improvements for D-series motors.</p>	
	5.0.4.8	<p>Removed restriction of RB and RW to status words locally available over Combitronics.</p> <p>IN command without parenthesis or SP2 is now allowed inside PRINT statements and array locations, i.e. PRINT(IN) and Ral[IN&3].</p>	<p><u>EDS files:</u> CANopen: SM5_OV3R2.eds</p>
	5.0.4.7	<p>Updated EDS file for CANOpen implementation.</p> <p>Repaired loss of G command functionality after switching from MFR to MP modes. Removed potential delay to GOTO command when using PAUSE or WAIT.</p> <p>Improved handling of simultaneous Combitronics commands through user program and serial port.</p>	<p><u>EDS files:</u> CANopen: SM5_OV3R2.eds</p>



Release Date	Software Version	Changes	Dependencies
		<p>Modified CANOpen object 2309h to return error when commanded to call a subroutine that doesn't exist.</p> <p>Set IO fault (Status Word 3, bit 7) if onboard 24V IO fails to initiate on startup.</p> <p>Improved robustness of encoder failure detection.</p> <p>Adjusted O= and OSH= functions to not trigger an encoder loss related position error.</p> <p>Increased buffer for CANOpen object 2500h.</p> <p>Added DMX setting COMCTL(4,x) to define the base aw[] array location for DMX.</p> <p>Implemented release of MTB in CANOpen through command -10 to object.</p> <p>Implemented slow to (X stop) when CANOpen object 6040h 15->7 (drive operation disable.)</p> <p>DMX support added on COM1.</p> <p>CAN object 6502h updated to show homing is supported.</p> <p>SmartMotor user status word 13 writable in CANOpen (Object 2304h, sub-index 14.)</p> <p>Added software limit objects: 2205h, 2206h.</p>	



Release Date	Software Version	Changes	Dependencies
		<p>Object 2309 expanded with commands for hardware and software limits.</p> <p>Implemented error in status word object 6041h when unsupported homing method selected.</p> <p>Improved handling of commands across several statements in IIC.</p> <p>Adjusted digital I/O access through 60FDh and 60FEh for CiA DS402 Compliance.</p> <p>Added support for asynchronous (event-driven) transmit PDO (type 255).</p> <p>Changed major rev number in object 1018, sub 3: Identity object, revision number from 00001000h to 00002000h.</p> <p>Implemented objects: 1001h, 2309, 6040h, 6041h, 6077h.</p> <p>Changed 2305h RUN/END bit to accommodate RUN? in user program.</p> <p>Removed unused objects: 1007, 1010, 1011, 1012, 1280, 605C, 6072, 607D, 607E.</p> <p>Implemented CANCTL(12,x) to allow user to set a status bit in CANopen status word.</p> <p>Implemented RCAN(x), where x is 1,2,3 in CANOpen to show the NMT state, Controlword, and Statusword.</p>	



Release Date	Software Version	Changes	Dependencies
		Adjusted CANopen Halt option to have the drive remain enabled. Changes to limits and default values of objects: 605Ah, 605Bh, 605Eh. Added CANopen homing mode support methods: 1, 2, 17, 18, 33, 34, 35.	
	5.0.3.61	Added Bit at Word 3, Bit 10 to show when motor is limiting current. Increased priority to current limiting algorithm.	<u>EDS files:</u> CANopen: SM5_OV2R4.eds
	5.0.3.60	Implemented runaway detection on internal encoder failure. Low voltage fault now only triggers when movement is commanded. Drive ready Word 0 Bit 0 will be low if any faults, or low bus voltage. BRKTRJ mode repaired where G command occasionally ignored. Increased speed of response from X and S stop commands, where there had been a slight delay. Repaired CANOpen object 6081 error where negative value reported.	<u>EDS files:</u> CANopen: SM5_OV2R4.eds
3/7/13	5.0.3.45	Returns functionality to position modulo report command RPMA.	<u>EDS files:</u> CANopen: SM5_OV2R4.eds
1/3/2012	5.0.3.44	Improved VL= (velocity limit) for velocity limit fault to allow wider range: 0 to 32767. Note that units are still in RPM. ECS(value) command added. SRC(0) null encoder so SRC updates immediately in all cases. (Traverse Mode, Follow Mode) Combitronic support created for Traverse and Take-Up Features:	<u>EDS files:</u> CANopen: SM5_OV2R4.eds



Moog Inc., Animatics
2581 Leghorn Street, Mountain View, CA 94043
Telephone: (650) 960-4215 • www.animatics.com

Release Date	Software Version	Changes	Dependencies
		MFLTP:axis= , MFHTTP:axis= , MFCTP(arg,arg):axis , MFL(arg,arg):axis , MFH(arg,arg):axis , MFSDC(arg,2):axis , ECS(arg):axis , SRC(arg):axis	
4/16/2012	5.0.3.41	Improved handling of data collisions enabling faster data throughput on any motor to motor communications without causing CANbus timeout errors	<u>EDS files:</u> CANopen: SM5_0V2R4.eds