

Firmware Release Notes: Class 5 M-series CANopen

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Moog Animatics Firmware Update Revision History

Release Date	Software Version	Changes	Functions and items effected
1/9/2018	5.98.4.42	<p>Various bug fixes.</p> <p>Improvements made to encoder index correction for incremental encoders.</p> <p>Added configurable functionality to map internal index mark to output.</p>	EOIDX()
8/29/2017	5.98.4.36	<p>Various bug fixes.</p> <p>Encoder index correction implemented for incremental internal encoders.</p> <p>Negative applications of MFMUL/MFDIV no longer toggles direction. (-) indicates the negative direction and (+) indicates the positive direction.</p>	MFMUL, MFDIV (When MFSDC(x,0) or MFSDC(x,1))
6/23/2016	5.98.4.31	<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>	

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		<p>CANOpen Mastering added.</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>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).</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>CANOpen EDS file now: SM5_0V3R4.eds</p> <p>RSDORD, x=SDORD, SDOWR, NMT, RCAN(4), x=CAN(4)</p> <p>SYSCTL()</p> <p>ENCCTL()</p> <p>RTRQ over Combitronics</p> <p>Status word 6, bit 5</p> <p>Object 0x2208 data</p>

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		<p>Hybrid mode MDH, MDHV= for D-series only.</p> <p>Current limit improvements for D-series motors.</p>	
	5.98.4.8	<p>Removed restriction of RB and RW to status words locally available over Combitronics.</p> <p>IN command without parenthesis is now allowed inside PRINT statements and array locations, i.e. PRINT(IN) and RaI[IN&3].</p>	<p>RB and RW over Combitronics</p> <p>PRINT and array variables with IN or SP2 as arguments</p>
	5.98.4.7	<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>Repaired reading of analog inputs across Combitronics on M-series motors.</p> <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>CANOpen master configuration</p> <p>Following Mode</p> <p>Combitronic commands over serial</p> <p>Analog inputs over Combitronics</p> <p>CANOpen object 2309h</p> <p>24V IO and Status Word 3, bit 7</p> <p>Encoder failure detection</p> <p>Encoder failure detection</p> <p>CANOpen object 2500h</p>

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		<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> <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>DMX</p> <p>CANOpen and MTB</p> <p>CANOpen object 6040h</p> <p>DMX</p> <p>CANOpen object 6502h and homing</p> <p>CANOpen writing to user status word</p> <p>CANOpen objects: 2205h, 2206h</p> <p>CANOpen object 2309</p> <p>CANOpen object 6041h</p> <p>IIC</p> <p>CANOpen I/O access using 60FDh and 60FEh</p> <p>CANOpen PDO support</p> <p>CANOpen revision in object 1018</p>

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		<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.</p> <p>Implemented RCAN(x), where x is 1,2,3 in CANOpen to show the NMT state, Controlword, and Statusword.</p> <p>Adjusted Halt option to have the drive remain enabled.</p> <p>Changes to limits and default values of objects: 605Ah, 605Bh, 605Eh.</p> <p>Added homing mode support methods: 1, 2, 17, 18, 33, 34, 35.</p>	<p>CANOpen obejcts: 1001h, 2309, 6040h, 6041h, 6077h</p> <p>CANOpen object 2305h and RUN? command</p> <p>CANOpen objects: 1007, 1010, 1011, 1012, 1280, 605C, 6072, 607D, 607E</p> <p>User program control of CANOpen</p> <p>CANOpen status reporting</p> <p>CANOpen Halt</p> <p>CANOpen objects: 605Ah, 605B, 605Eh</p> <p>CANOpen homing</p>
	5.98.3.61	<p>Added Bit at Word 3, Bit 10 to show when motor is limiting current.</p> <p>Increased priority to current limiting algorithm.</p>	<p>Current limit improved and tied to Status Word 3 Bit 10</p>
	5.98.3.60	<p>Implemented runaway detection on internal encoder failure.</p> <p>Low voltage fault now only triggers when movement is commanded.</p> <p>Drive ready Word 0 Bit 0 will be low if any faults, or low bus voltage.</p> <p>BRKTRJ mode repaired where G command occasionally ignored.</p>	<p>Internal encoder</p> <p>Voltage status bits</p> <p>Status Word 0 Bit 0</p> <p>BRKTRJ command in conjunction with G</p> <p>Stop commands X and S</p>

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		<p>Increased speed of response from X and S stop commands, where there had been a slight delay.</p> <p>Repaired CANOpen object 6081 error where negative value reported.</p>	CANOpen messaging
3/7/13	5.98.3.45	Returns functionality to position modulo report command RPMA.	Position Modulo Report RPMA
1/3/2012	5.98.3.44	<p>Improved VL= (velocity limit) to allow wider range: 0 to 32767. Note that units are still in RPM.</p> <p>ECS(value) command added. SRC(0) null encoder so SRC updates immediately in all cases.</p> <p>Combitronic support created for:</p> <p>MFLTP:axis= , MFHTP:axis= , MFCTP(arg,arg):axis , MFL(arg,arg):axis , MFH(arg,arg):axis , MFSDC(arg,2):axis , ECS(arg):axis , SRC(arg):axis</p> <p>This version serves to releases the improved traverse and take-up features.</p>	<p>VL= command, velocity limit fault</p> <p>Traverse Mode, Follow Mode, SRC Command</p> <p>Traverse and Take-Up Features</p>
4/16/2012	5.98.3.41	Improved handling of data collisions enabling faster data throughput without causing CANbus timeout errors	This affects CAN data collision on any motor to motor communications