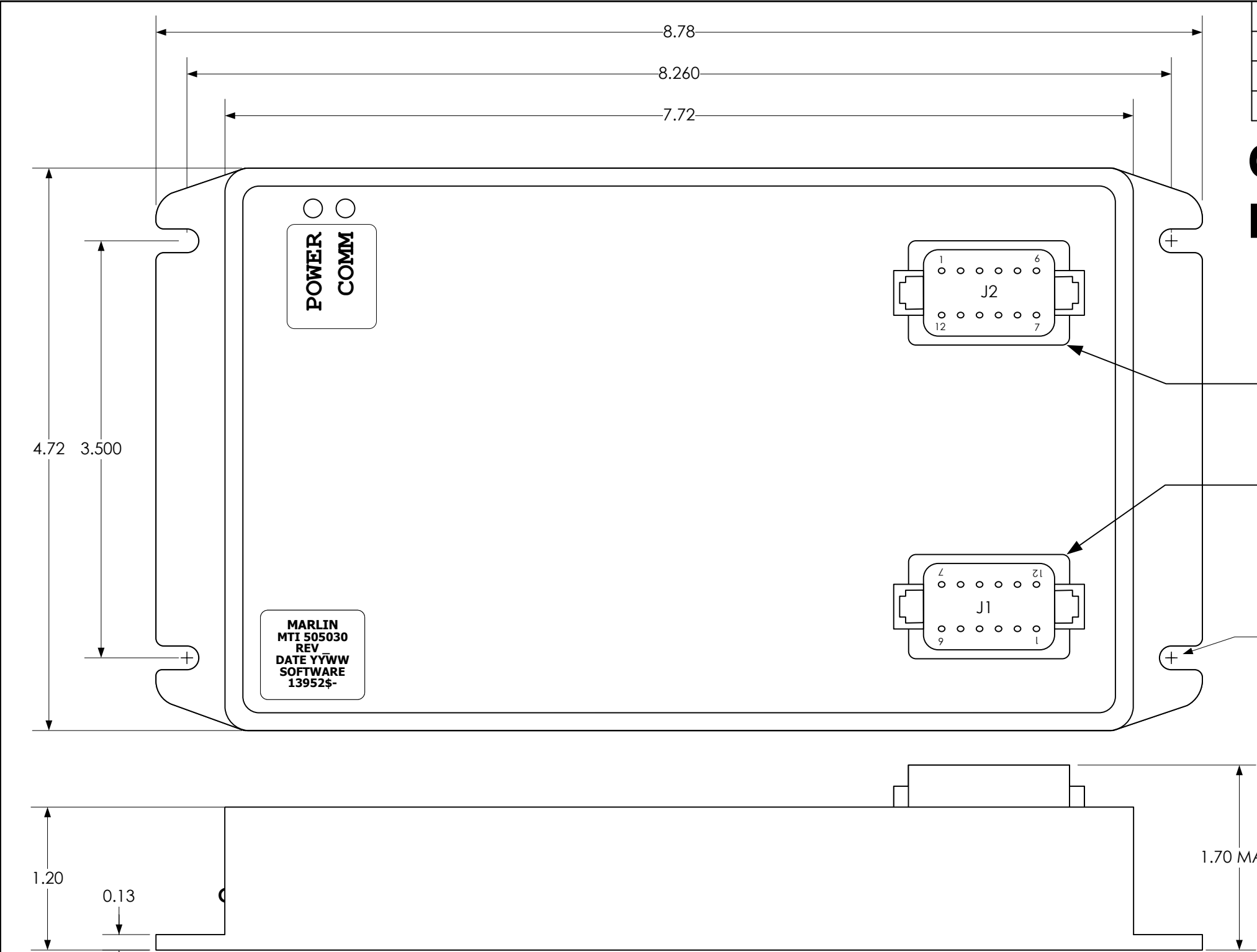




REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Overview: Module Physical Dimensions

J2
DEUTSCH DT15-12PB-B016 OR EQUIVALENT
MATES WITH
DEUTSCH DT06-12SB-B016 PLUG
(XXXX = ALL MODIFICATIONS)
OR EQUIVALENT.

J1
DEUTSCH DT15-12PA-B016 OR EQUIVALENT
MATES WITH
DEUTSCH DT06-12SA-B016 PLUG
(XXXX = ALL MODIFICATIONS)
OR EQUIVALENT.

R 0.100 (4X)

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ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
----------------------------------	-------------------------------------	---------------

DO NOT SCALE DRAWING

CHECKED	J. COOPER	DATE 02/10/2025
APPROVED	J. COOPER	DATE 02/10/2025

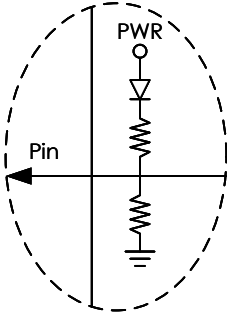
MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS			
SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
DRAWN M. PETZKE	DATE 04/13/22	SHEET 1 OF 25	

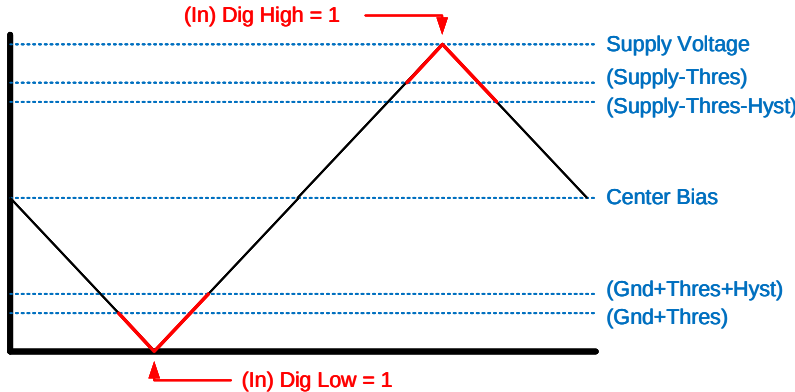
Overview: Input/Output Configurations

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

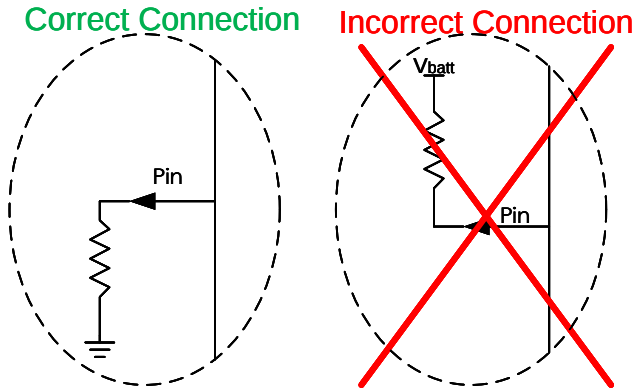
(* NOTE: Analog Input Circuit and Best Practices)



- Generated Analog Signal
- Analog Potentiometer (5k or less)
- On/Off Switch to Power (No Pull-Down)
- On/Off Switch to Gnd (No Pull-Up)
- 3-way Switch to Pwr/Gnd (No PU/PD)
- Frequency Input (0-5V, LS_Output)
- PWM Duty Cycle (0-5V, LS_Output)
- Quadrature Input (0-5V, LS_Output)

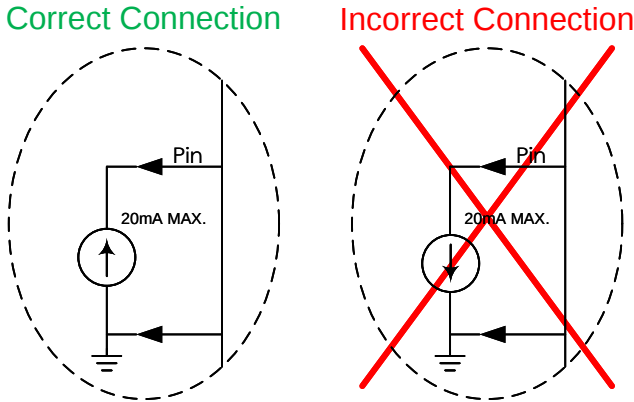


(* NOTE: Resistance Input Circuit and Best Practices)



- An improper resistor connection can damage the module.

(* NOTE: Current Input Circuit and Best Practices)



- Voltage on the input Pin must not exceed 6V when configured for current input.

- Improper wiring can damage the module.

Input/Output Configuration Options

Input Type	#1	#2	#3	#4	#5	#6	#7	#8
Digital Active High - Thres	•	•	•	•	•	•	•	•
Digital Active Low - Thres	•	•	•	•	•	•	•	•
Analog 0-36V	•	•	•	•	•	•	•	•
Frequency	•	•	•	•				
PWM Duty Cycle	•	•	•	•				
Resistance (0-65kΩ)	•	•	•	•				
Current (0-20mA)	•	•	•	•				
Quadrature – X1	•*	•*	•*	•*	•*	•*	•*	
Quadrature – X2	•*	•*	•*	•*	•*	•*	•*	
Quadrature – X4	•*	•*	•*	•*	•*	•*	•*	
Quadrature – B		•	•	•	•	•	•	•

*When configured as Quadrature, The next adjacent input is automatically configured as the channel B input. (i.e. If In1 = QuadX_, then In2 = Quad Channel B)

Output Type	#1	#2	#3	#4	#5	#6	#7	#8
00 - Disabled	•	•	•	•	•	•	•	•
01 – Active HI Digital	•	•	•	•	•	•	•	•
02 – Active LO Digital	•	•	•	•	•	•	•	•
03 – HS PWM Closed Loop	•	•	•	•	•	•	•	•
04 – HS PWM Open Loop	•	•	•	•	•	•	•	•
03 – LS PWM Closed Loop	•	•	•	•	•	•	•	•
04 – LS PWM Open Loop	•	•	•	•	•	•	•	•

In/Out Tolerances (@25C)	
Analog Input	+/-50mV
Resistance Input	+/-2%
Current Input (0-20mA)	+/-100uA
Current Control Output	+/-15mA

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
----------------------------------	-------------------------------------	---------------

DO NOT SCALE DRAWING

CHECKED	J. COOPER	DATE 02/10/2025
APPROVED	J. COOPER	DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
DRAWN M. PETZKE	DATE 04/13/22	SHEET 2 OF 25	

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Programming

Marlin IO XML Configurator - V1.12.6

MODULE:
505030 8 Input / 8 Output

ADDRESS:
B3

BAUD RATE:
250K

HWID: 0x0328

SWID: 0x0000

EEPROM START ADDR: 0x1000

Logic

ADD

DEL

COPY

MOVE UP

MOVE DOWN

A Type

A Index

Operator

Value

Comment

1

Physical

117

SET VARIABLE

= 0

0x03F50000

XML Mode

Module Mode Cnfg

A Type

A Index

Operator

Value

Comment

2

Physical

100

SET VARIABLE

= 1

0x03E40001

Output 1 = Digital Active High

Output1 Cnfg

A Type

A Index

Operator

B Type

B Index

C Type

C Index

Comment

3

Physical

10

(A) OR (B) -> (C)

Physical

11

Physical

46

0x000A8B2E

In1 -> Out 1

J1-3 (In1) Dig High

J1-3 (In1) Dig Low

J1-2 Out1 Cmd

Status...Add Complete...Ready
Lines: 3/500

Clear

Open XML

Save XML

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Programing/Updating XML Instruction Logic Marlin Tool

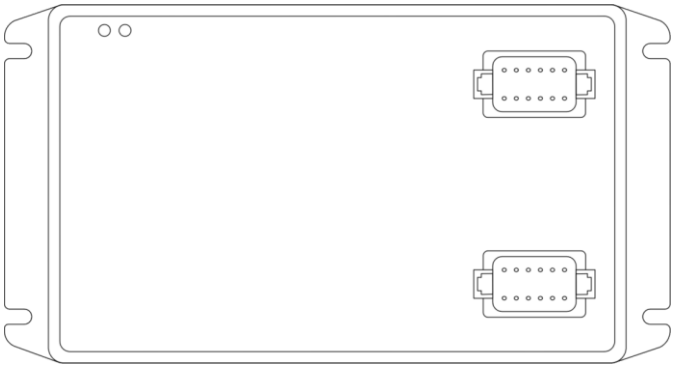
- 1) Select "XML>M-Flex-IO Config" to open the Configurator Tool Window
- 2) Create or change the XML Logic and save to an XML file
- 3) Select "XML>Single" to open the XML download window
- 4) Enter the Module Source Address that you are downloading to.
- 5) Download the XML logic
- 6) Cycle power to the module to complete the update

XML Logic File (*.XML)

Attribute	Value	Comment
1 Configured Source Address	179	
2 Configured BaudRate	25	
3 Block 0000 Byte 0000	3	XML Mode
4 Block 0000 Byte 0001	245	
5 Block 0000 Byte 0002	0	
6 Block 0000 Byte 0003	0	
7 Block 0001 Byte 0000	3	Output 1 = Digital Active High
8 Block 0001 Byte 0001	228	
9 Block 0001 Byte 0002	0	
10 Block 0001 Byte 0003	1	
11 Block 0002 Byte 0000	0	In1 -> Out 1
12 Block 0002 Byte 0001	10	
13 Block 0002 Byte 0002	139	
14 Block 0002 Byte 0003	46	
15 Block 0003 Byte 0000	0	

Updating Base Software via Marlin Tool (if required)

- 1) Select S19 Software file
- 2) Select Controller to Program
- 3) Program the Controller



Marlin CAN USB Programmer V2.7.0 - PREMIUM

File Tool XML Data EEPROM R/W CAN Log Help Security

0x0328 HWID in File

C:\Projects\505030\Software\505030_IOModule\bin\135925X3.s19

Browse

Selected Kvaser Tool: Kvaser Leaf Light v2, #83185

'Kvaser' Tool's CAN Bus Speed Was Previously Set @ 250 Kbps.

Searching For Available Controllers . . .
Total 1 modules found.

All modules on CAN bus were inspected.

Selected .s19 file information:
Size: 250,614 bytes
Number of hex records: 1,741

505030 0xB0 SX3 0328 013952

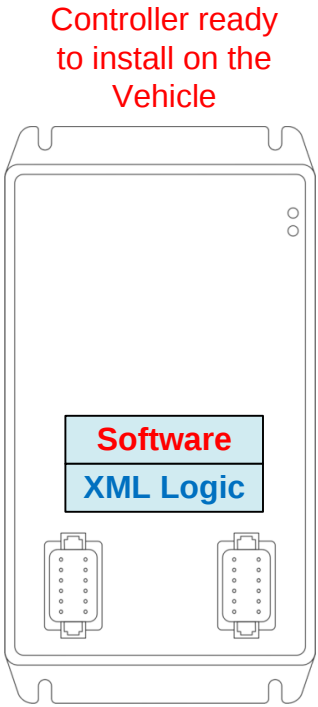
Search

Program

Prog All

Kvaser Leaf Light v2

Kvaser Leaf Light v2, #83185 @ 250 Kbps



MARLIN TECHNOLOGIES INC.				
TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS				
SIZE	DRAWING NUMBER		TYPE	REV
B	013953		S	E
CHECKED	J. COOPER	DATE	02/10/2025	
APPROVED	J. COOPER	DATE	02/10/2025	
DRAWN	M. PETZKE	DATE	04/13/22	SHEET 3 OF 25

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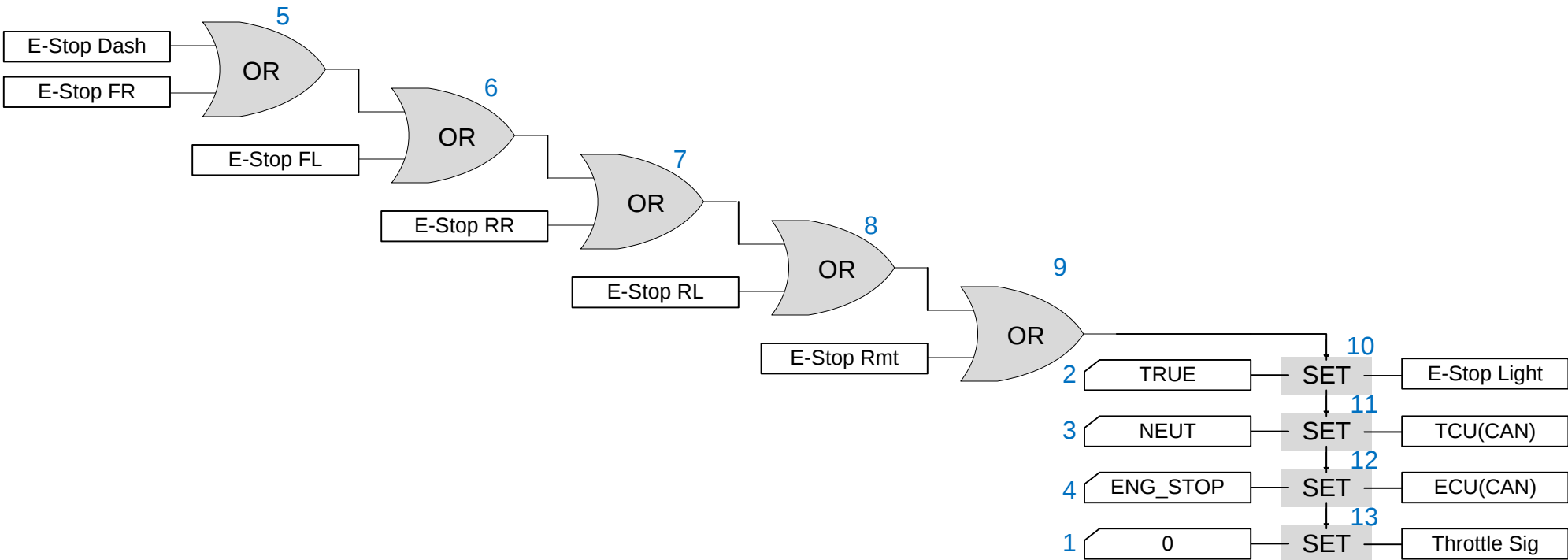
Programming

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Current Stacked User
Logic Builder Approach
(Closest to Actual Code)

	Var_A	Cmd	Var_B		Var_C
(*) 1	PHY #63	Set Var		=	XML Mode
(*) 2	CONST #1	Set Var		=	Zero
(*) 3	CONST #2	Set Var		=	True
(*) 4	CONST #3	Set Var		=	Neut Value
(*) 5	CONST #4	Set Var		=	EngStop Value
6	E-Stop Dash	OR	E-Stop FR	=	TEMP1
7	TEMP 1	OR	E-Stop FL	=	TEMP1
8	TEMP 1	OR	E-Stop RR	=	TEMP1
9	TEMP 1	OR	E-Stop RL	=	TEMP1
10	TEMP 1	OR	E-Stop Rmt	=	TEMP1
11	TEMP 1	IF (SET)	Const =True	=	E-Stop Light
12	TEMP 1	IF (SET)	Const =Neut	=	TCU (CAN)
13	TEMP 1	IF (SET)	Const =EngStop	=	ECM (CAN)
14	TEMP 1	ZERO	Zero	=	ThrottleSig

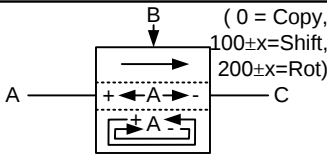
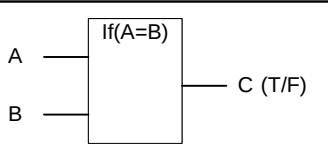
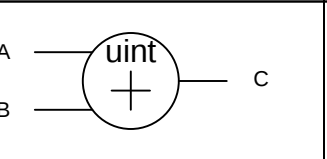
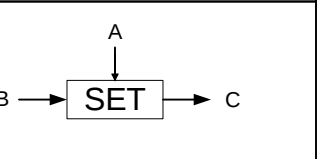
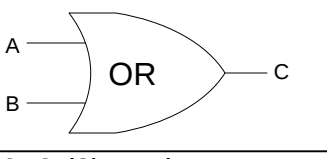
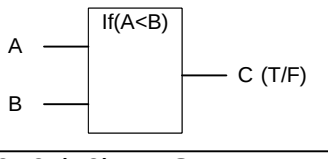
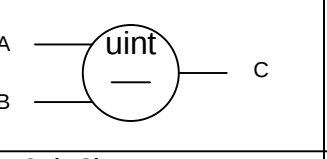
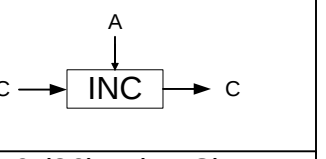
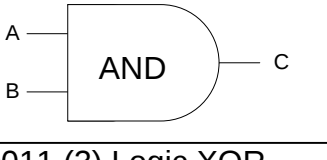
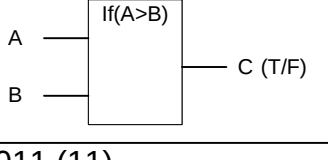
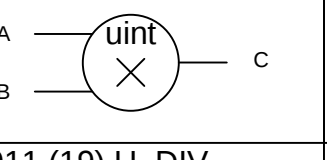
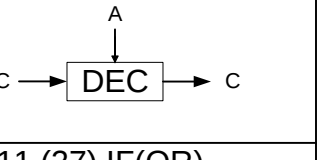
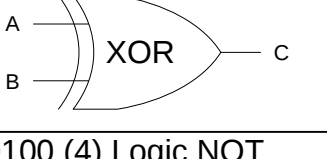
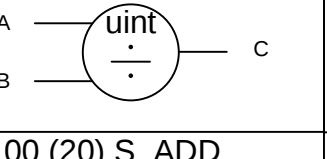
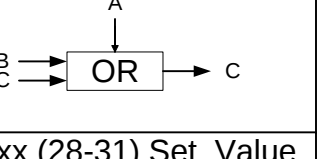
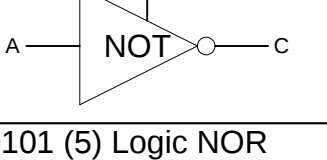
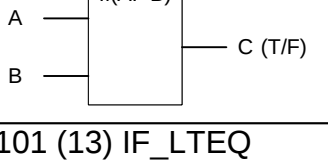
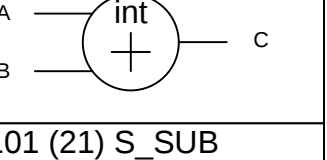
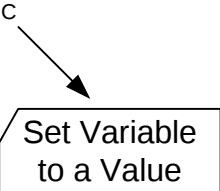
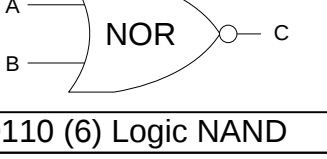
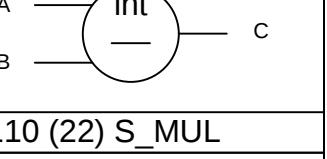
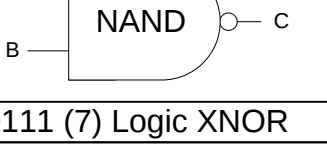
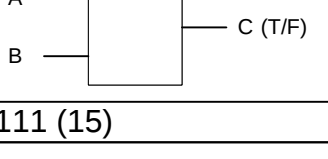
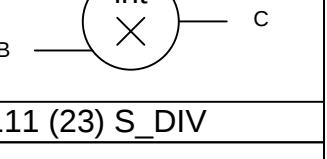
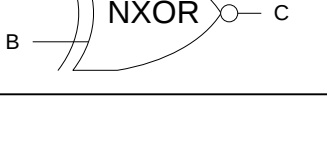
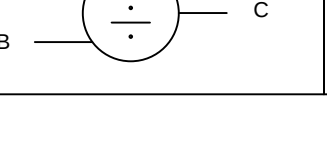
Future Graphical User Logic Builder Concept



(* NOTE: Ensure that all configurations and hard values to be used must be set at the beginning of the XML instructions list)

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TWO PLACE DECIMAL +/- 0.05			TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS			
DO NOT SCALE DRAWING			SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
CHECKED J. COOPER	DATE 02/10/2025	DRAWN M. PETZKE				
APPROVED J. COOPER	DATE 02/10/2025	DATE 04/13/22				
			SHEET 4 OF 25			

Logical Operands	Comparative Operands	Mathematical Operands	Output Action Operands
00000 (0) Logic Copy/Shift/Rot 	01000 (8) IF_EQ 	10000 (16) U_ADD 	11000 (24) IF(SET) 
00001 (1) Logic OR 	01001 (9) IF_LT 	10001 (17) U_SUB 	11001 (25) IF(INC) 
00010 (2) Logic AND 	01010 (10) IF_GT 	10010 (18) U_MUL 	11010 (26) IF(DEC) 
00011 (3) Logic XOR 	01011 (11) UNUSED AT THE MOMENT	10011 (19) U_DIV 	11011 (27) IF(OR) 
00100 (4) Logic NOT 	01100 (12) If_NEQ 	10100 (20) S_ADD 	111xx (28-31) Set_Value 
00101 (5) Logic NOR 	01101 (13) IF_LTEQ 	10101 (21) S_SUB 	
00110 (6) Logic NAND 	01110 (14) IF_GTEQ 	10110 (22) S_MUL 	
00111 (7) Logic XNOR 	01111 (15) UNUSED AT THE MOMENT	10111 (23) S_DIV 	

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Var Type Indexing				
	Physical(00)	Tmp/Const(01)	CAN info(10)	Params(11)
0	NULL	[FALSE / 0]	CAN_1	PARAM_1
		[TRUE / 1]		
	INPUT_x	CONST_2		
	OUTPUT_x			
	CNFG_x		CAN_79	
			Undefined at the current time of publication	
117				
118		Undefined at the current time of publication		
127		CONST_128		PARAM_128

505030 Indexing
Supports
128 variables

- Params type parameters are non-volatile. Values stored here are remembered after a module power cycle. SET VARIABLE operations on these parameters are ignored. Writes (see below) occur only when the stored value is changed.
- Temp type parameters are volatile. Values stored here are forgotten after a module power cycle.

Note: Params and Temp parameters should not be treated as interchangeable. Degradation of non-volatile memory will start after 1,000,000 writes. Writing to fully degraded memory will fail to properly store the written value. Reading has no effect on memory lifespan.
Use the below equation to estimate the lifespan of a single Params location:
 $1,000,000 / [\text{Number of writes per second}] = [\text{expected number of seconds before earliest memory failure}]$

Logic Commands

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TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-				
DO NOT SCALE DRAWING			SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
CHECKED	J. COOPER	DATE 02/10/2025				
APPROVED	J. COOPER	DATE 02/10/2025	DRAWN	M. PETZKE	DATE 04/13/22	SHEET 5 OF 25

505030 Physical Variables Listing

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Physical Variables Type (00b) – Index List of Values				
0	NULL	DO NOT USE!		
1	J1-8	Input	Analog	Battery Voltage [0-43,554 mV, 1mV/bit]
2	J1-3	Input	Analog	Input 1 Voltage/Amps/Ohms/Count (Mode Based) [1mV,uA,Ω/bit]*
3	J1-5	Input	Analog	Input 2 Voltage/Amps/Ohms/Count (Mode Based) [1mV,uA,Ω/bit]*
4	J2-6	Input	Analog	Input 3 Voltage/Amps/Ohms/Count (Mode Based) [1mV,uA,Ω/bit]*
5	J2-8	Input	Analog	Input 4 Voltage/Amps/Ohms/Count (Mode Based) [1mV,uA,Ω/bit]*
6	J1-11	Input	Analog	Input 5 Voltage/Count (Mode Based) [1mV/bit]*
7	J1-10	Input	Analog	Input 6 Voltage/Count (Mode Based) [1mV/bit]*
8	J2-9	Input	Analog	Input 7 Voltage/Count (Mode Based) [1mV/bit]*
9	J2-4	Input	Analog	Input 8 Voltage (Mode Based) [1mV/bit]*
10	J1-3	Input	Digital	Input 1 Digital High [1=Active High, 0=otherwise]
11	J1-3	Input	Digital	Input 1 Digital Low [1=Active Low, 0=otherwise]
12	J1-5	Input	Digital	Input 2 Digital High [1=Active High, 0=otherwise]
13	J1-5	Input	Digital	Input 2 Digital Low [1=Active Low, 0=otherwise]
14	J2-6	Input	Digital	Input 3 Digital High [1=Active High, 0=otherwise]
15	J2-6	Input	Digital	Input 3 Digital Low [1=Active Low, 0=otherwise]
16	J2-8	Input	Digital	Input 4 Digital High [1=Active High, 0=otherwise]
17	J2-8	Input	Digital	Input 4 Digital Low [1=Active Low, 0=otherwise]
18	J1-11	Input	Digital	Input 5 Digital High [1=Active High, 0=otherwise]
19	J1-11	Input	Digital	Input 5 Digital Low [1=Active Low, 0=otherwise]
20	J1-10	Input	Digital	Input 6 Digital High [1=Active High, 0=otherwise]
21	J1-10	Input	Digital	Input 6 Digital Low [1=Active Low, 0=otherwise]
22	J2-9	Input	Digital	Input 7 Digital High [1=Active High, 0=otherwise]
23	J2-9	Input	Digital	Input 7 Digital Low [1=Active Low, 0=otherwise]
24	J2-4	Input	Digital	Input 8 Digital High [1=Active High, 0=otherwise]
25	J2-4	Input	Digital	Input 8 Digital Low [1=Active Low, 0=otherwise]
26	J1-2	Input	Analog	Output 1 Current [0-4200mA, 1mA/bit]
27	J1-4	Input	Analog	Output 2 Current [0-4200mA, 1mA/bit]
28	J2-3	Input	Analog	Output 3 Current [0-4200mA, 1mA/bit]
29	J2-5	Input	Analog	Output 4 Current [0-4200mA, 1mA/bit]
30	J1-6	Input	Analog	Output 5 Current [0-4200mA, 1mA/bit]
31	J1-7	Input	Analog	Output 6 Current [0-4200mA, 1mA/bit]
32	J2-12	Input	Analog	Output 7 Current [0-4200mA, 1mA/bit]
33	J2-1	Input	Analog	Output 8 Current [0-4200mA, 1mA/bit]
34	J1-3	Input	D.C.	Digital Input 1 Duty Cycle [0-100%, 0.1%/bit]
35	J1-3	Input	Period	Digital Input 1 Period [0-65535uS, 1 uS/bit]

36	J1-3	Input	Freq	Digital Input 1 Frequency [32-6,553Hz, 0.1 Hz/bit]
37	J1-5	Input	D.C.	Digital Input 2 Duty Cycle [0-100%, 0.1%/bit]
38	J1-5	Input	Period	Digital Input 2 Period [0-65535uS, 1 uS/bit]
39	J1-5	Input	Freq	Digital Input 2 Frequency [32-6,553Hz, 0.1 Hz/bit]
40	J2-6	Input	D.C.	Digital Input 3 Duty Cycle [0-100%, 0.1%/bit]
41	J2-6	Input	Period	Digital Input 3 Period [0-65535uS, 1 uS/bit]
42	J2-6	Input	Freq	Digital Input 3 Frequency [32-6,553Hz, 0.1 Hz/bit]
43	J2-8	Input	D.C.	Digital Input 4 Duty Cycle [0-100%, 0.1%/bit]
44	J2-8	Input	Period	Digital Input 4 Period [0-65535uS, 1 uS/bit]
45	J2-8	Input	Freq	Digital Input 4 Frequency [32-6,553Hz, 0.1 Hz/bit]
46	J1-2	Output	Digital	Output 1 Digital Cmd [1=On, 0=Off]
47	J1-4	Output	Digital	Output 2 Digital Cmd [1=On, 0=Off]
48	J2-3	Output	Digital	Output 3 Digital Cmd [1=On, 0=Off]
49	J2-5	Output	Digital	Output 4 Digital Cmd [1=On, 0=Off]
50	J1-6	Output	Digital	Output 5 Digital Cmd [1=On, 0=Off]
51	J1-7	Output	Digital	Output 6 Digital Cmd [1=On, 0=Off]
52	J2-1	Output	Digital	Output 7 Digital Cmd [1=On, 0=Off]
53	J2-12	Output	Digital	Output 8 Digital Cmd [1=On, 0=Off]
54	J1-2	Output	DC/mA	Output 1 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
55	J1-4	Output	DC/mA	Output 2 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
56	J2-3	Output	DC/mA	Output 3 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
57	J2-5	Output	DC/mA	Output 4 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
58	J1-6	Output	DC/mA	Output 5 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
59	J1-7	Output	DC/mA	Output 6 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
60	J2-12	Output	DC/mA	Output 7 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
61	J2-1	Output	DC/mA	Output 8 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]

*When configured as Quadrature, the count is stored in the Channel A array location.
Reading Channel B location will always return 0.

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TWO PLACE DECIMAL +/- 0.05					TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS			
DO NOT SCALE DRAWING					SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
CHECKED	J. COOPER	DATE	02/10/2025		DRAWN	M. PETZKE	DATE	04/13/22
APPROVED	J. COOPER	DATE	02/10/2025		SHEET 6 OF 25			

505030 Physical Variables Listing

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Physical Variables Type (00b) – Index List of Values				
62	Cnfg	In1	Type	Input 1 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
63	Cnfg	In2	Type	Input 2 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
64	Cnfg	In3	Type	Input 3 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
65	Cnfg	In4	Type	Input 4 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
66	Cnfg	In5	Type	Input 5 [0=Analog/Digital, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
67	Cnfg	In6	Type	Input 6 [0=Analog/Digital, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
68	Cnfg	In7	Type	Input 7 [0=Analog/Digital, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
69	Cnfg	In8	Type	Input 8 [0=Analog/Digital, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
70	J1-2	Limit	mA	Output 1 Current Limit [1 mA /bit, 0-3000mA]
71	J1-4	Limit	mA	Output 2 Current Limit [1 mA /bit, 0-3000mA]
72	J2-3	Limit	mA	Output 3 Current Limit [1 mA /bit, 0-3000mA]
73	J2-5	Limit	mA	Output 4 Current Limit [1 mA /bit, 0-3000mA]
74	J1-6	Limit	mA	Output 5 Current Limit [1 mA /bit, 0-3000mA]
75	J1-7	Limit	mA	Output 6 Current Limit [1 mA /bit, 0-3000mA]
76	J2-1	Limit	mA	Output 7 Current Limit [1 mA /bit, 0-3000mA]
77	J2-12	Limit	mA	Output 8 Current Limit [1 mA /bit, 0-3000mA]
78	Cnfg	Thres	factor	Threshold Voltage for Digital inputs to be set to Active [65,535mV, 1mV/bit]
79	Cnfg	Hyst	factor	Hysteresis Voltage for Digital inputs to return to Inactive [65,535mV, 1mV/bit]
80	Cnfg	P-term	factor	P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
81	Cnfg	I-term	factor	I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
82	Cnfg	D-term	factor	D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
83	Cnfg	OnDly1	Time	Output 1 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
84	Cnfg	OnDly2	Time	Output 2 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
85	Cnfg	OnDly3	Time	Output 3 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
86	Cnfg	OnDly4	Time	Output 4 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
87	Cnfg	OnDly5	Time	Output 5 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
88	Cnfg	OnDly6	Time	Output 6 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
89	Cnfg	OnDly7	Time	Output 7 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
90	Cnfg	OnDly8	Time	Output 8 HW_InOut Mode On Delay [0-65,535mS, 1mS/bit]
91	Cnfg	OffDly1	Time	Output 1 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
92	Cnfg	OffDly2	Time	Output 2 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
93	Cnfg	OffDly3	Time	Output 3 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
94	Cnfg	OffDly4	Time	Output 4 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
95	Cnfg	OffDly5	Time	Output 5 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
96	Cnfg	OffDly6	Time	Output 6 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
97	Cnfg	OffDly7	Time	Output 7 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
98	Cnfg	OffDly8	Time	Output 8 HW_InOut Mode Off Delay [0-65,535mS, 1mS/bit]
99	Cnfg	PWMs	Freq	Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]

100	Cnfg	Out1	Type	Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
101	Cnfg	Out2	Type	Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
102	Cnfg	Out3	Type	Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
103	Cnfg	Out4	Type	Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
104	Cnfg	Out5	Type	Output 5 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
105	Cnfg	Out6	Type	Output 6 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
106	Cnfg	Out7	Type	Output 7 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
107	Cnfg	Out8	Type	Output 8 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
108	Cnfg	Kypd	B1	Output 1 Keypad Button Config – Index# [Refer to Spec 11713S__]
109	Cnfg	Kypd	B2	Output 2 Keypad Button Config – Index# [Refer to Spec 11713S__]
110	Cnfg	Kypd	B3	Output 3 Keypad Button Config – Index# [Refer to Spec 11713S__]
111	Cnfg	Kypd	B4	Output 4 Keypad Button Config – Index# [Refer to Spec 11713S__]
112	Cnfg	Kypd	B5	Output 5 Keypad Button Config – Index# [Refer to Spec 11713S__]
113	Cnfg	Kypd	B6	Output 6 Keypad Button Config – Index# [Refer to Spec 11713S__]
114	Cnfg	Kypd	B7	Output 7 Keypad Button Config – Index# [Refer to Spec 11713S__]
115	Cnfg	Kypd	B8	Output 8 Keypad Button Config – Index# [Refer to Spec 11713S__]
116	Cnfg	Kypd	SA	Keypad Source Address
117	Cnfg	Module	Mode	Config Module [0=XML, 1=CAN_I/O, 2=HW_I/O, 3=HW_Keypad]
118	<Blank>		Undefined at the current time of publication Reserved for future PHY Variable information	
119	<Blank>			
120	<Blank>			
123	<Blank>			
124	<Blank>			
125	<Blank>			
126	<Blank>			
127	<Blank>			

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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CHECKED	J. COOPER	DATE 02/10/2025
APPROVED	J. COOPER	DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
DRAWN M. PETZKE	DATE 04/13/22	SHEET 7 OF 25	

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505030 Temporary Variables Listing

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Tmp Variables Type (01b) – Index List of Values			
0	FALSE	Binary	FALSE / 0 value
1	TRUE	Binary	TRUE / 1 value
2	<Blank>	Variables are open and available for the User	
3	<Blank>		
4	<Blank>		
5	<Blank>		
6	<Blank>		
7	<Blank>		
8	<Blank>		
9	<Blank>		
10	<Blank>		
11	<Blank>		
12	<Blank>		
13	<Blank>		
14	<Blank>		
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19	<Blank>		
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22	<Blank>		
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25	<Blank>		
26	<Blank>		
27	<Blank>		
28	<Blank>		
29	<Blank>		
30	<Blank>		
31	<Blank>		

32	<Blank>	Variables are open and available for the User
33	<Blank>	
34	<Blank>	
35	<Blank>	
36	<Blank>	
37	<Blank>	
38	<Blank>	
39	<Blank>	
40	<Blank>	
41	<Blank>	
42	<Blank>	
43	<Blank>	
44	<Blank>	
45	<Blank>	
46	<Blank>	
47	<Blank>	
48	<Blank>	
49	<Blank>	
50	<Blank>	
51	<Blank>	
52	<Blank>	
53	<Blank>	
54	<Blank>	
55	<Blank>	
56	<Blank>	
57	<Blank>	
104	<Blank>	
105	<Blank>	

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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DO NOT SCALE DRAWING

CHECKED	J. COOPER	DATE 02/10/2025
APPROVED	J. COOPER	DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE	DRAWING NUMBER	TYPE	REV
B	013953	S	E
DRAWN M. PETZKE	DATE 04/13/22	SHEET 8 OF 25	

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505030 CAN-Bus Variables Listing

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

CAN Variables Type (10b) – Index List of Values			
0	Rx1 PGN	Rx CAN Msg #1	PGN of CAN Message to be received (*)
1	Rx1 SrcAddr		Source Address of CAN Message to be received (**)
2	Rx1 Data 1:0		Data Bytes 1[MSB] & 0[LSB] of message Received
3	Rx1 Data 3:2		Data Bytes 3[MSB] & 2[LSB] of message Received
4	Rx1 Data 5:4		Data Bytes 5[MSB] & 4[LSB] of message Received
5	Rx1 Data 7:6		Data Bytes 7[MSB] & 6[LSB] of message Received
6	Tx1 PGN	Tx CAN Msg #1	PGN of CAN Message to be Transmitted (*)
7	Tx1 MsgRate		Std/Ext ID Flag : Message Transmit Rate [10mS/bit, 0-32,000mS] (***)
8	Tx1 Data 1:0		Data Bytes 1[MSB] & 0[LSB] to send
9	Tx1 Data 3:2		Data Bytes 3[MSB] & 2[LSB] to send
10	Tx1 Data 5:4		Data Bytes 5[MSB] & 4[LSB] to send
11	Tx1 Data 7:6		Data Bytes 7[MSB] & 6[LSB] to send
12	Rx2 PGN	Rx CAN Msg #2	PGN of CAN Message to be received (*)
13	Rx2 SrcAddr		Source Address of CAN Message to be received (**)
14	Rx2 Data 1:0		Data Bytes 1[MSB] & 0[LSB] of message Received
15	Rx2 Data 3:2		Data Bytes 3[MSB] & 2[LSB] of message Received
16	Rx2 Data 5:4		Data Bytes 5[MSB] & 4[LSB] of message Received
17	Rx2 Data 7:6		Data Bytes 7[MSB] & 6[LSB] of message Received
18	Tx2 PGN	Tx CAN Msg #2	PGN of CAN Message to be Transmitted (*)
19	Tx2 MsgRate		Std/Ext ID Flag : Message Transmit Rate [10mS/bit, 0-32,000mS] (***)
20	Tx2 Data 1:0		Data Bytes 1[MSB] & 0[LSB] to send
21	Tx2 Data 3:2		Data Bytes 3[MSB] & 2[LSB] to send
22	Tx2 Data 5:4		Data Bytes 5[MSB] & 4[LSB] to send
23	Tx2 Data 7:6		Data Bytes 7[MSB] & 6[LSB] to send
24	Rx3 PGN	Rx CAN Msg #3	PGN of CAN Message to be received (*)
25	Rx3 SrcAdr		Source Address of CAN Message to be received (**)
26	Rx3 Data 1:0		Data Bytes 1[MSB] & 0[LSB] of message Received
27	Rx3 Data 3:2		Data Bytes 3[MSB] & 2[LSB] of message Received
28	Rx3 Data 5:4		Data Bytes 5[MSB] & 4[LSB] of message Received
29	Rx3 Data 7:6		Data Bytes 7[MSB] & 6[LSB] of message Received
30	Tx3 PGN	Tx CAN Msg #3	PGN of CAN Message to be Transmitted (*)
31	Tx3 MsgRate		Std/Ext ID Flag : Message Transmit Rate [10mS/bit, 0-32,000mS] (***)
32	Tx3 Data 1:0		Data Bytes 1[MSB] & 0[LSB] to send
33	Tx3 Data 3:2		Data Bytes 3[MSB] & 2[LSB] to send
34	Tx3 Data 5:4		Data Bytes 5[MSB] & 4[LSB] to send
35	Tx3 Data 7:6		Data Bytes 7[MSB] & 6[LSB] to send

(*) NOTE: 11-bit Std_ID: PGN is Message ID (Full Std ID range 0-2047 [0x000-0x7FF])
29-bit Ext_ID: PGN is PDU:Format and PDU:Specific of Message ID
Priority is ignored on Received messages, and default of 6 for Transmitted messages.

(**) NOTE: 11-bit Std_ID: Not Applicable, set as 65535.
29-bit Ext_ID: SourceAddress of Message ID

(***) NOTE: Add 32768 to the desired transmit rate to send the PGN value as a Standard ID.

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36	Rx4 PGN	Rx CAN Msg #4	PGN of CAN Message to be received (*)
37	Rx4 SrcAddr		Source Address of CAN Message to be received (**)
38	Rx4 Data 1:0		Data Bytes 1[MSB] & 0[LSB] of message Received
39	Rx4 Data 3:2		Data Bytes 3[MSB] & 2[LSB] of message Received
40	Rx4 Data 5:4		Data Bytes 5[MSB] & 4[LSB] of message Received
41	Rx4 Data 7:6		Data Bytes 7[MSB] & 6[LSB] of message Received
42	Tx4 PGN	Tx CAN Msg #4	PGN of CAN Message to be Transmitted (*)
43	Tx4 MsgRate		Std/Ext ID Flag : Message Transmit Rate [10mS/bit, 0-32,000mS] (***)
44	Tx4 Data 1:0		Data Bytes 1[MSB] & 0[LSB] to send
45	Tx4 Data 3:2		Data Bytes 3[MSB] & 2[LSB] to send
46	Tx4 Data 5:4		Data Bytes 5[MSB] & 4[LSB] to send
47	Tx4 Data 7:6		Data Bytes 7[MSB] & 6[LSB] to send

59	Tx1 Priority	Tx CAN Msg Pri	Tx1 Msg Priority bits [0-7]
60	Tx2 Priority		Tx2 Msg Priority bits [0-7]
61	Tx3 Priority		Tx3 Msg Priority bits [0-7]
62	Tx4 Priority		Tx4 Msg Priority bits [0-7]

81	Rx5 PGN	Rx CAN Msg #5	PGN of CAN Message to be received (*)
82	Rx5 SrcAddr		Source Address of CAN Message to be received (**)
83	Rx5 Data 1:0		Data Bytes 1[MSB] & 0[LSB] of message Received
84	Rx5 Data 3:2		Data Bytes 3[MSB] & 2[LSB] of message Received
85	Rx5 Data 5:4		Data Bytes 5[MSB] & 4[LSB] of message Received
86	Rx5 Data 7:6		Data Bytes 7[MSB] & 6[LSB] of message Received
87	Tx5 Priority	Priority	Tx5 Msg Priority bits [0-7]
88	Tx5 PGN	Tx CAN Msg #5	PGN of CAN Message to be Transmitted (*)
89	Tx5 MsgRate		Std/Ext ID Flag : Message Transmit Rate [10mS/bit, 0-32,000mS] (***)
90	Tx5 Data 1:0		Data Bytes 1[MSB] & 0[LSB] to send
91	Tx5 Data 3:2		Data Bytes 3[MSB] & 2[LSB] to send
92	Tx5 Data 5:4		Data Bytes 5[MSB] & 4[LSB] to send
93	Tx5 Data 7:6		Data Bytes 7[MSB] & 6[LSB] to send

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TWO PLACE DECIMAL +/- 0.05		THREE PLACE DECIMAL +/- 0.020		ANGLES +/-		TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS	
DO NOT SCALE DRAWING		SIZE B		DRAWING NUMBER 013953		TYPE S	REV E
CHECKED	J. COOPER	DATE 02/10/2025		DRAWN	M. PETZKE	DATE 04/13/22	SHEET 9 OF 25
APPROVED	J. COOPER	DATE 02/10/2025					

505030 CAN-Bus Variables Listing

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

CAN Variables Type (10b) – Index List of Values				
48	Cnfg	Tx Rate	Time	CAN Msg FF40 Tx Rate [10mS/bit, 0=Off]
49	Cnfg	Tx Rate	Time	CAN Msg FF41 Tx Rate [10mS/bit, 0=Off]
50	Cnfg	Tx Rate	Time	CAN Msg FF42 Tx Rate [10mS/bit, 0=Off]
51	Cnfg	Tx Rate	Time	CAN Msg FF43 Tx Rate [10mS/bit, 0=Off]
52	Cnfg	Tx Rate	Time	CAN Msg FF44 Tx Rate [10mS/bit, 0=Off]
53	Cnfg	Tx Rate	Time	CAN Msg FF60 Tx Rate [10mS/bit, 0=Off]
54	Cnfg	Tx Rate	Time	CAN Msg FF61 Tx Rate [10mS/bit, 0=Off]
55	Cnfg	Tx Rate	Time	CAN Msg FF63 Tx Rate [10mS/bit, 0=Off]
56	Cnfg	Tx Rate	Time	CAN Msg FF64 Tx Rate [10mS/bit, 0=Off]
57	Cnfg	Tx Rate	Time	CAN Msg FF65 Tx Rate [10mS/bit, 0=Off]
58	Cnfg	Tx Rate	Time	CAN Msg FF66 Tx Rate [10mS/bit, 0=Off]

63	Kypd	Input	Digital	Keypad Input 1 [0=Up,1=Down,2=Err,3=No Key]
64	Kypd	Input	Digital	Keypad Input 2 [0=Up,1=Down,2=Err,3=No Key]
65	Kypd	Input	Digital	Keypad Input 3 [0=Up,1=Down,2=Err,3=No Key]
66	Kypd	Input	Digital	Keypad Input 4 [0=Up,1=Down,2=Err,3=No Key]
67	Kypd	Input	Digital	Keypad Input 5 [0=Up,1=Down,2=Err,3=No Key]
68	Kypd	Input	Digital	Keypad Input 6 [0=Up,1=Down,2=Err,3=No Key]
69	Kypd	Input	Digital	Keypad Input 7 [0=Up,1=Down,2=Err,3=No Key]
70	Kypd	Input	Digital	Keypad Input 8 [0=Up,1=Down,2=Err,3=No Key]
71	Kypd	Output	6-bit	Keypad Out1 LEDs [0=Off,1=On,2=Blink,3=NoChg]
72	Kypd	Output	6-bit	Keypad Out2 LEDs [0=Off,1=On,2=Blink,3=NoChg]
73	Kypd	Output	6-bit	Keypad Out3 LEDs [0=Off,1=On,2=Blink,3=NoChg]
74	Kypd	Output	6-bit	Keypad Out4 LEDs [0=Off,1=On,2=Blink,3=NoChg]
75	Kypd	Output	6-bit	Keypad Out5 LEDs [0=Off,1=On,2=Blink,3=NoChg]
76	Kypd	Output	6-bit	Keypad Out6 LEDs [0=Off,1=On,2=Blink,3=NoChg]
77	Kypd	Output	6-bit	Keypad Out7 LEDs [0=Off,1=On,2=Blink,3=NoChg]
78	Kypd	Output	6-bit	Keypad Out8 LEDs [0=Off,1=On,2=Blink,3=NoChg]
79	Cnfg	TimeOut	Time	Cmd Message Timeouts [10mS/bit, 0=NoTimeout]
80	Cnfg	Tx Rate	Time	LED status Message Transmit Rate [10mS/bit, 0=No Transmit]

93	<Blank>	J1939 CAN Or Pre- Define Rx Values	Undefined at the current time of publication Reserved for future CAN message information
94	<Blank>		
⋮	⋮		
127	<Blank>		
128	<Blank>		

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE
DECIMAL
+/- 0.05

THREE PLACE
DECIMAL
+/- 0.020

ANGLES

+/-

DO NOT SCALE DRAWING

CHECKED J. COOPER

DATE 02/10/2025

APPROVED J. COOPER

DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE
B

DRAWING NUMBER
013953

TYPE
S

REV
E

DRAWN M. PETZKE

DATE 04/13/22

SHEET 10 OF 25

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505030 Parameter Variables Listing

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Parameters Variables Type (11b) – Index List of Values		
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DO NOT SCALE DRAWING			TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS			
CHECKED	J. COOPER	DATE 02/10/2025	SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
APPROVED	J. COOPER	DATE 02/10/2025	DRAWN M. PETZKE	DATE 04/13/22	SHEET 11 OF 25	

505030 Physical Config Variables for XML_Mode

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

List of Configurations used in XML_Mode					
---	--	--	--	--	--

Phy	78	Cnfg	Thres	factor	Threshold Voltage for Digital inputs to be set to Active [65.535mV, 1mV/bit]
Phy	79	Cnfg	Hyst	factor	Hysteresis Voltage for Digital inputs to return to Inactive [65.535mV, 1mV/bit]
Phy	80	Cnfg	P-term	factor	P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	81	Cnfg	I-term	factor	I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	82	Cnfg	D-term	factor	D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]

Phy	70	Cnfg	Limit	mA	Output 1 Current Limit [1 mA /bit, 0-3000mA]
Phy	71	Cnfg	Limit	mA	Output 2 Current Limit [1 mA /bit, 0-3000mA]
Phy	72	Cnfg	Limit	mA	Output 3 Current Limit [1 mA /bit, 0-3000mA]
Phy	73	Cnfg	Limit	mA	Output 4 Current Limit [1 mA /bit, 0-3000mA]
Phy	74	Cnfg	Limit	mA	Output 5 Current Limit [1 mA /bit, 0-3000mA]
Phy	75	Cnfg	Limit	mA	Output 6 Current Limit [1 mA /bit, 0-3000mA]
Phy	76	Cnfg	Limit	mA	Output 7 Current Limit [1 mA /bit, 0-3000mA]
Phy	77	Cnfg	Limit	mA	Output 8 Current Limit [1 mA /bit, 0-3000mA]

Phy	99	Cnfg	PWMs	Freq	Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]
Phy	100	Cnfg	Out1	Type	Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	101	Cnfg	Out2	Type	Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	102	Cnfg	Out3	Type	Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	103	Cnfg	Out4	Type	Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	104	Cnfg	Out5	Type	Output 5 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	105	Cnfg	Out6	Type	Output 6 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	106	Cnfg	Out7	Type	Output 7 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	107	Cnfg	Out8	Type	Output 8 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]

Phy	62	Cnfg	In1	Type	Input 1 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	63	Cnfg	In2	Type	Input 2 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	64	Cnfg	In3	Type	Input 3 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	65	Cnfg	In4	Type	Input 4 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	66	Cnfg	In5	Type	Input 5 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	67	Cnfg	In6	Type	Input 6 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	68	Cnfg	In7	Type	Input 7 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	69	Cnfg	In8	Type	Input 8 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]

Phy	117	Cnfg	Module	Mode	Config Module [0=XML, 1=CAN_I/O, 2=HW_I/O, 3=HW_Keypad]
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Can	79	Cnfg	TimeOut	Time	Cmd Message Timeouts [10mS/bit, 0=NoTimeout]
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Example XML Configuration

Operator	Variable		Value	
Set_Var	Phy	117	0	Mode = XML
Set_Var	Phy	100	1	Output1 = HS_Dig
Set_Var	Phy	101	2	Output2 = LS_Dig
Set_Var	Phy	102	4	Output3 = HS_DC
Set_Var	Phy	103	3	Output4 = HS_mA
Set_Var	Phy	104	1	Output5 = HS_Dig
Set_Var	Phy	105	2	Output6 = LS_Dig
Set_Var	Phy	106	5	Output7 = LS_mA
Set_Var	Phy	107	6	Output8 = LS_DC
Set_Var	Phy	99	100	PWM Freq = 100Hz
Set_Var	Phy	62	0	Input 1 = Analog/Digital/Freq
Set_Var	Phy	63	1	Input 2 = Current
Set_Var	Phy	64	2	Input 3 = Resistance
Set_Var	Phy	65	3	Input 4/5 = Quadrature X1
Set_Var	Phy	67	4	Input 6/7 = Quadrature X2
Set_Var	Phy	69	0	Input 8 = Analog/Digital
Set_Var	Phy	80	2500	P-Term Closed Loop Cnfg
Set_Var	Phy	81	750	I-Term Closed Loop Cnfg
Set_Var	Phy	82	0	D-Term Closed Loop Cnfg

XML Logic

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DO NOT SCALE DRAWING					SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
CHECKED	J. COOPER	DATE	02/10/2025		DRAWN	M. PETZKE	DATE	04/13/22
APPROVED	J. COOPER	DATE	02/10/2025		SHEET 12 OF 25			

505030 XML_Mode Additional Example

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Example XML for Custom Keypad Behavior

Operator	Variable		Value	
Set_Var	Phy	117	0	Mode = XML
Set_Var	Phy	116	192	Keypad SA = 0xC0
Set_Var	Phy	108	2	Output 1 controlled by Button 2; Type = Momentary
Set_Var	Phy	109	521	Output 2 controlled by Button 9; Type = Tri-State
Set_Var	Phy	100	1	Output1 = Dig Active Hi
Set_Var	Phy	101	1	Output2 = Dig Active Hi
Set_Var	Tmp	3	68	Constant for LED command (Reference Pg. 19 & 23)
Set_Var	Tmp	4	2	Constant for Button State that turns on output (Reference Pg. 19)

XML Logic							
Operator	A Variable		B Variable	C Variable			
Buf	Can	63		Phy	46	Output 1 state = Button 2 state	
Buf	Tmp	0		Tmp	5	Clear Flag before use	
IF(A = B)-> C=1	Can	64	Tmp	4	Tmp	5	If button 9 state is 2, then set flag
IF(A = 1) B->C	Tmp	5	Tmp	1	Phy	25	If flag is set, then turn ON output 2
Buf	Tmp	0		Can	71	Clear Button 1 LED command	
If A=true; B->C	Can	63	Tmp	3	Can	71	If Button 1 is pressed, Send custom LED command

*Button 9 will use standard LED command, not a custom one, so it doesn't need to be set.

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TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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DO NOT SCALE DRAWING

CHECKED	J. COOPER	DATE 02/10/2025
APPROVED	J. COOPER	DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE	DRAWING NUMBER	TYPE	REV
B	013953	S	E
DRAWN M. PETZKE	DATE 04/13/22	SHEET 13 OF 25	

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505030 Physical Config Variables for CAN_I/O Mode

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

List of Configurations used in CAN_I/O Mode					
Phy	78	Cnfg	Thres	factor	Threshold Voltage for Digital inputs to be set to Active [65.535mV, 1mV/bit]
Phy	79	Cnfg	Hyst	factor	Hysteresis Voltage for Digital inputs to return to Inactive [65.535mV, 1mV/bit]
Phy	80	Cnfg	P-term	factor	P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	81	Cnfg	I-term	factor	I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	82	Cnfg	D-term	factor	D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	70	Cnfg	Limit	mA	Output 1 Current Limit [1 mA /bit, 0-3000mA]
Phy	71	Cnfg	Limit	mA	Output 2 Current Limit [1 mA /bit, 0-3000mA]
Phy	72	Cnfg	Limit	mA	Output 3 Current Limit [1 mA /bit, 0-3000mA]
Phy	73	Cnfg	Limit	mA	Output 4 Current Limit [1 mA /bit, 0-3000mA]
Phy	74	Cnfg	Limit	mA	Output 5 Current Limit [1 mA /bit, 0-3000mA]
Phy	75	Cnfg	Limit	mA	Output 6 Current Limit [1 mA /bit, 0-3000mA]
Phy	76	Cnfg	Limit	mA	Output 7 Current Limit [1 mA /bit, 0-3000mA]
Phy	77	Cnfg	Limit	mA	Output 8 Current Limit [1 mA /bit, 0-3000mA]
Phy	62	Cnfg	In1	Type	Input 1 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	63	Cnfg	In2	Type	Input 2 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	64	Cnfg	In3	Type	Input 3 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	65	Cnfg	In4	Type	Input 4 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	66	Cnfg	In5	Type	Input 5 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	67	Cnfg	In6	Type	Input 6 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	68	Cnfg	In7	Type	Input 7 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	69	Cnfg	In8	Type	Input 8 [0=Analog/Digital/Freq, 1=Current, 2=Resistance, 3=QuadX1, 4=QuadX2, 5=QuadX4]
Phy	99	Cnfg	PWMs	Freq	Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]
Phy	100	Cnfg	Out1	Type	Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	101	Cnfg	Out2	Type	Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	102	Cnfg	Out3	Type	Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	103	Cnfg	Out4	Type	Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	104	Cnfg	Out5	Type	Output 5 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	105	Cnfg	Out6	Type	Output 6 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	106	Cnfg	Out7	Type	Output 7 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	107	Cnfg	Out8	Type	Output 8 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	117	Cnfg	Module	Mode	Config Module [0=XML, 1=CAN_I/O, 2=HW_I/O, 3=HW_Keypad]

Can	48	Cnfg	Tx Rate	Time	CAN Msg FF40 Tx Rate [10mS/bit, 0=Off]
Can	49	Cnfg	Tx Rate	Time	CAN Msg FF41 Tx Rate [10mS/bit, 0=Off]
Can	50	Cnfg	Tx Rate	Time	CAN Msg FF42 Tx Rate [10mS/bit, 0=Off]
Can	51	Cnfg	Tx Rate	Time	CAN Msg FF43 Tx Rate [10mS/bit, 0=Off]
Can	52	Cnfg	Tx Rate	Time	CAN Msg FF44 Tx Rate [10mS/bit, 0=Off]
Can	53	Cnfg	Tx Rate	Time	CAN Msg FF60 Tx Rate [10mS/bit, 0=Off]
Can	54	Cnfg	Tx Rate	Time	CAN Msg FF61 Tx Rate [10mS/bit, 0=Off]
Can	55	Cnfg	Tx Rate	Time	CAN Msg FF63 Tx Rate [10mS/bit, 0=Off]
Can	56	Cnfg	Tx Rate	Time	CAN Msg FF64 Tx Rate [10mS/bit, 0=Off]
Can	57	Cnfg	Tx Rate	Time	CAN Msg FF65 Tx Rate [10mS/bit, 0=Off]
Can	58	Cnfg	Tx Rate	Time	CAN Msg FF66 Tx Rate [10mS/bit, 0=Off]
Can	79	Cnfg	TimeOut	Time	Cmd Message Timeouts [10mS/bit, 0=NoTimeout]

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TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-					TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS
DO NOT SCALE DRAWING			SIZE B	DRAWING NUMBER 013953		TYPE S	REV E
CHECKED	J. COOPER	DATE 02/10/2025	DRAWN M. PETZKE		DATE 04/13/22	SHEET 14 OF 25	
APPROVED	J. COOPER	DATE 02/10/2025					

505030 Physical Config Variables for CAN_I/O Mode

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Example XML Configuration

Operator	Variable		Value						
Set_Var	Phy	117	1	Mode = CAN_I/O	Set_Var	Can	48	5	PGN 0xFF40 transmit rate = 50ms
Set_Var	Phy	100	1	Output1 = HS_Dig	Set_Var	Can	49	10	PGN 0xFF41 transmit rate = 100ms
Set_Var	Phy	101	2	Output2 = LS_Dig	Set_Var	Can	50	15	PGN 0xFF42 transmit rate = 150ms
Set_Var	Phy	102	4	Output3 = HS_DC	Set_Var	Can	51	20	PGN 0xFF43 transmit rate = 200ms
Set_Var	Phy	103	3	Output4 = HS_mA	Set_Var	Can	52	25	PGN 0xFF44 transmit rate = 250ms
Set_Var	Phy	104	1	Output5 = HS_Dig	Set_Var	Can	53	30	PGN 0xFF60 transmit rate = 300ms
Set_Var	Phy	105	2	Output6 = LS_Dig	Set_Var	Can	54	35	PGN 0xFF61 transmit rate = 350ms
Set_Var	Phy	106	5	Output7 = LS_mA	Set_Var	Can	55	45	PGN 0xFF63 transmit rate = 450ms
Set_Var	Phy	107	6	Output8 = LS_DC	Set_Var	Can	56	50	PGN 0xFF64 transmit rate = 500ms
Set_Var	Phy	99	100	PWM Freq = 100Hz	Set_Var	Can	57	750	PGN 0xFF65 transmit rate = 7.5s
Set_Var	Phy	62	1	Input 1 = Current	Set_Var	Can	58	100	PGN 0xFF66 transmit rate = 1s
Set_Var	Phy	63	2	Input 2 = Resistance					
Set_Var	Phy	64	0	Input 3 = Analog/Digital/Freq					
Set_Var	Phy	65	4	Input 4/5 = Quadrature X2					
Set_Var	Phy	67	5	Input 6/7 = Quadrature X4					
Set_Var	Phy	69	0	Input 8 = Analog/Digital					
Set_Var	Phy	80	2500	P-Term Closed Loop Cnfg					
Set_Var	Phy	81	750	I-Term Closed Loop Cnfg					
Set_Var	Phy	82	0	D-Term Closed Loop Cnfg					
Set_Var	Can	79	0	CAN Timeout = 0 (No timeout)					

Continued at Right

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TWO PLACE DECIMAL +/- 0.05			TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS			
THREE PLACE DECIMAL +/- 0.020			SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
ANGLES +/-			DO NOT SCALE DRAWING			
CHECKED	J. COOPER	DATE 02/10/2025	DRAWN	M. PETZKE	DATE 04/13/22	SHEET 15 OF 25
APPROVED	J. COOPER	DATE 02/10/2025				

505030 Physical Variables for HW_I/O Mode

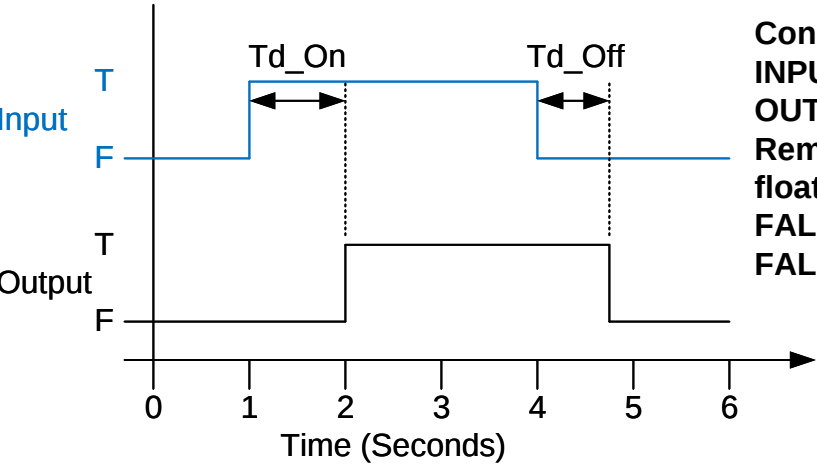
REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

List of Configurations used in HW_I/O Mode

Phy	54	J1-2	Output	DC/mA	Output 1 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	55	J1-4	Output	DC/mA	Output 2 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	56	J2-3	Output	DC/mA	Output 3 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	57	J2-5	Output	DC/mA	Output 4 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	58	J1-6	Output	DC/mA	Output 5 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	59	J1-7	Output	DC/mA	Output 6 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	60	J2-12	Output	DC/mA	Output 7 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	61	J2-1	Output	DC/mA	Output 8 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]

Phy	70	Cnfg	Limit	mA	Output 1 Current Limit [1 mA /bit, 0-3000mA]
Phy	71	Cnfg	Limit	mA	Output 2 Current Limit [1 mA /bit, 0-3000mA]
Phy	72	Cnfg	Limit	mA	Output 3 Current Limit [1 mA /bit, 0-3000mA]
Phy	73	Cnfg	Limit	mA	Output 4 Current Limit [1 mA /bit, 0-3000mA]
Phy	74	Cnfg	Limit	mA	Output 5 Current Limit [1 mA /bit, 0-3000mA]
Phy	75	Cnfg	Limit	mA	Output 6 Current Limit [1 mA /bit, 0-3000mA]
Phy	76	Cnfg	Limit	mA	Output 7 Current Limit [1 mA /bit, 0-3000mA]
Phy	77	Cnfg	Limit	mA	Output 8 Current Limit [1 mA /bit, 0-3000mA]

Phy	78	Cnfg	Thres	factor	Threshold Voltage for Digital inputs to be set to Active [65.535mV, 1mV/bit]
Phy	79	Cnfg	Hyst	factor	Hysteresis Voltage for Digital inputs to return to Inactive [65.535mV, 1mV/bit]
Phy	80	Cnfg	P-term	factor	P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	81	Cnfg	I-term	factor	I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	82	Cnfg	D-term	factor	D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]



Connecting the input to power OR ground will set the INPUT = TRUE. After the ON_DELAY time then the OUTPUT = TRUE (On if Digital or DC/mA Cmd if PWM). Remove the Power or Ground from the input and it floats at ½ system voltage which sets the INPUT = FALSE. After the OFF_DELAY time then the OUTPUT = FALSE.

Phy	83	Cnfg	OnDly1	Time	Output 1 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	84	Cnfg	OnDly2	Time	Output 2 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	85	Cnfg	OnDly3	Time	Output 3 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	86	Cnfg	OnDly4	Time	Output 4 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	87	Cnfg	OnDly5	Time	Output 5 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	88	Cnfg	OnDly6	Time	Output 6 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	89	Cnfg	OnDly7	Time	Output 7 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	90	Cnfg	OnDly8	Time	Output 8 Relay Style On Delay [0-655,350mS, 10mS/bit]
Phy	91	Cnfg	OffDly1	Time	Output 1 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	92	Cnfg	OffDly2	Time	Output 2 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	93	Cnfg	OffDly3	Time	Output 3 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	94	Cnfg	OffDly4	Time	Output 4 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	95	Cnfg	OffDly5	Time	Output 5 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	96	Cnfg	OffDly6	Time	Output 6 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	97	Cnfg	OffDly7	Time	Output 7 Relay Style Off Delay [0-655,350mS, 10mS/bit]
Phy	98	Cnfg	OffDly8	Time	Output 8 Relay Style Off Delay [0-655,350mS, 10mS/bit]

Phy	99	Cnfg	PWMs	Freq	Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]
Phy	100	Cnfg	Out1	Type	Output 1 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	101	Cnfg	Out2	Type	Output 2 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	102	Cnfg	Out3	Type	Output 3 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	103	Cnfg	Out4	Type	Output 4 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	104	Cnfg	Out5	Type	Output 5 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	105	Cnfg	Out6	Type	Output 6 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	106	Cnfg	Out7	Type	Output 7 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]
Phy	107	Cnfg	Out8	Type	Output 8 [0=Off,1=HS,2=LS,3=HS_ma,4=HS_DC,5=LS_ma,6=LS_DC,7=BiDir,8=Voltage]

Phy	117	Cnfg	Module	Mode	Config Module [0=XML, 1=CAN_I/O, 2=HW_I/O, 3=HW_Keypad]
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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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APPROVED	J. COOPER	DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
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DRAWN M. PETZKE	DATE 04/13/22	SHEET 16 OF 25
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*In HW I/O Mode, Inputs are not configurable and remain at default configuration.

505030 Physical Variables for HW_I/O Mode

Example XML Configuration

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Operator	Variable	Value		Operator	Variable	Value	
Set_Var	Phy 117	2	Mode = HW_I/O	Set_Var	Phy 78	2000	Input Voltage Threshold = 2V
Set_Var	Phy 100	1	Output1 = Active High Digital	Set_Var	Phy 79	1000	Input Voltage Hysteresis = 1V
Set_Var	Phy 101	2	Output2 = Active Low Digital	Set_Var	Phy 83	100	Out1 On Delay = 1.0s
Set_Var	Phy 102	4	Output3 = Actvie High Open Loop	Set_Var	Phy 91	150	Out1 Off Delay = 1.5s
Set_Var	Phy 103	3	Output4 = Active High Closed Loop	Set_Var	Phy 84	200	Out2 On Delay = 2.0s
Set_Var	Phy 104	1	Output5 = Active High Digital	Set_Var	Phy 92	250	Out2 Off Delay = 2.5s
Set_Var	Phy 105	2	Output6 = Active Low Digital	Set_Var	Phy 85	300	Out3 On Delay = 3.0s
Set_Var	Phy 106	6	Output7 = Actvie Low Open Loop	Set_Var	Phy 93	350	Out3 Off Delay = 3.5s
Set_Var	Phy 107	5	Output8 = Active Low Closed Loop	Set_Var	Phy 86	400	Out4 On Delay = 4.0s
Set_Var	Phy 87	100	PWM Freq = 100Hz	Set_Var	Phy 94	450	Out4 Off Delay = 4.5s
Set_Var	Phy 56	1000	Out3 DC/mA Cmd = 100%	Set_Var	Phy 95	500	Out5 On Delay = 5.0s
Set_Var	Phy 57	500	Out4 DC/mA Cmd = 500mA	Set_Var	Phy 79	550	Out5 Off Delay = 5.5s
Set_Var	Phy 60	250	Out7 DC/mA Cmd = 25%	Set_Var	Phy 96	600	Out6 On Delay = 6.0s
Set_Var	Phy 61	333	Out8 DC/mA Cmd = 333 mA	Set_Var	Phy 97	650	Out6 Off Delay = 6.5s
Set_Var	Phy 68	2500	P-Term Closed Loop Cnfg	Set_Var	Phy 89	700	Out7 On Delay = 7.0s
Set_Var	Phy 69	750	I-Term Closed Loop Cnfg	Set_Var	Phy 98	750	Out7 Off Delay = 7.5s
Set_Var	Phy 70	0	D-Term Closed Loop Cnfg	Set_Var	Phy 90	800	Out8 On Delay = 8.0s
				Set_Var	Phy 99	850	Out8 Off Delay = 8.5s

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TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-					TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS
DO NOT SCALE DRAWING			SIZE B	DRAWING NUMBER 013953		TYPE S	REV E
CHECKED	J. COOPER	DATE 02/10/2025	DRAWN M. PETZKE		DATE 04/13/22	SHEET 17 OF 25	
APPROVED	J. COOPER	DATE 02/10/2025					

505030 Physical Config Variables for HW_Keypad Mode

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

List of Configurations used in HW_Keypad_Mode

Phy	54	J1-1	Output	DC/mA	Output 1 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	55	J1-3	Output	DC/mA	Output 2 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	56	J2-4	Output	DC/mA	Output 3 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	57	J2-6	Output	DC/mA	Output 4 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	58	J1-5	Output	DC/mA	Output 5 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	59	J1-6	Output	DC/mA	Output 6 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	60	J2-2	Output	DC/mA	Output 7 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]
Phy	61	J2-3	Output	DC/mA	Output 8 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit]

Phy	80	Cnfg	P-term	factor	P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	81	Cnfg	I-term	factor	I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]
Phy	82	Cnfg	D-term	factor	D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]

Phy	70	Cnfg	Limit	mA	Output 1 Current Limit [1 mA /bit, 0-3000mA]
Phy	71	Cnfg	Limit	mA	Output 2 Current Limit [1 mA /bit, 0-3000mA]
Phy	72	Cnfg	Limit	mA	Output 3 Current Limit [1 mA /bit, 0-3000mA]
Phy	73	Cnfg	Limit	mA	Output 4 Current Limit [1 mA /bit, 0-3000mA]
Phy	74	Cnfg	Limit	mA	Output 5 Current Limit [1 mA /bit, 0-3000mA]
Phy	75	Cnfg	Limit	mA	Output 6 Current Limit [1 mA /bit, 0-3000mA]
Phy	76	Cnfg	Limit	mA	Output 7 Current Limit [1 mA /bit, 0-3000mA]
Phy	77	Cnfg	Limit	mA	Output 8 Current Limit [1 mA /bit, 0-3000mA]

Phy	99	Cnfg	PWMs	Freq	Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]
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Phy	100	Cnfg	Out1	Type	Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	101	Cnfg	Out2	Type	Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	102	Cnfg	Out3	Type	Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	103	Cnfg	Out4	Type	Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	104	Cnfg	Out5	Type	Output 5 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	105	Cnfg	Out6	Type	Output 6 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	106	Cnfg	Out7	Type	Output 7 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]
Phy	107	Cnfg	Out8	Type	Output 8 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC,7=BiDir,8=Voltage]

Phy	108	Cnfg	Kypd	B1	Output 1 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	109	Cnfg	Kypd	B2	Output 2 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	110	Cnfg	Kypd	B3	Output 3 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	111	Cnfg	Kypd	B4	Output 4 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	112	Cnfg	Kypd	B5	Output 5 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	113	Cnfg	Kypd	B6	Output 6 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	114	Cnfg	Kypd	B7	Output 7 Keypad Button Config – Index# [Refer to Spec 11713S__]
Phy	115	Cnfg	Kypd	B8	Output 8 Keypad Button Config – Index# [Refer to Spec 11713S__]

Phy	116	Cnfg	Kypd	SA	Keypad Source Address
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Phy	117	Cnfg	Module	Mode	Config Module [0=XML, 1=CAN_I/O, 2=HW_I/O, 3=HW_Keypad]
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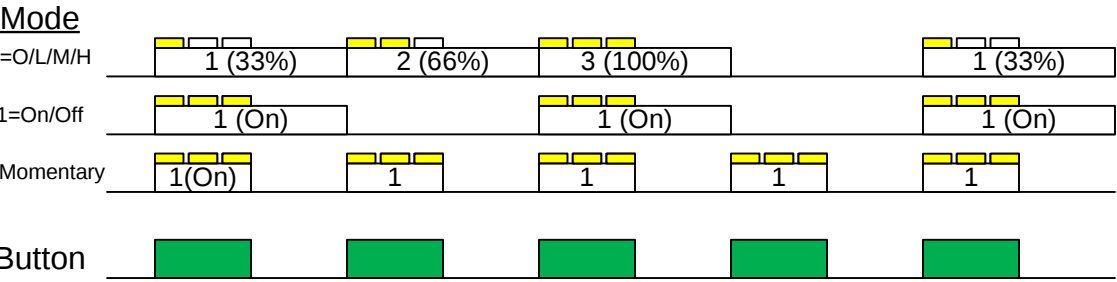
Can	79	Cnfg	TimeOut	Time	Cmd Message Timeouts [10mS/bit, 0=NoTimeout]
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Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Left LED		Middle LED		Right LED			

Note1)
Each LED cmd is a 2-bit flag 0=Off, 1=On, 2=Blink 2Hz, 3=No Change

Bit15:10	Bit 9:8	Bit 7:0
	Type	Index#

Note2)
Index# of Button per Marlin Spec 11713S_.
Type is 0=Momentary, 1=On/Off Toggle, 2=Off/Low/Med/High
Output is On if Digital or DC/mA Cmd if Type[0-1], else if [Type2] then the output is 33%(1/Low), 66%(2/Med), or 100%(3/High) of the DC/mA Cmd.



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TWO PLACE DECIMAL
+/- 0.05

THREE PLACE DECIMAL
+/- 0.020

ANGLES
+/-

DO NOT SCALE DRAWING

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APPROVED	J. COOPER	DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE	DRAWING NUMBER	TYPE	REV
B	013953	S	E

DRAWN M. PETZKE
DATE 04/13/22
SHEET 18 OF 25

505030 Physical Config Variables for HW_Keypad Mode

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Example XML Configuration

Operator	Variable		Value		Operator	Variable		Value	
Set_Var	Phy	117	3	Mode = Keypad	Set_Var	Phy	116	64	Keypad SourceAddr = 0x40(64)
Set_Var	Phy	100	1	Output1 = HS_Dig	Set_Var	Phy	108	1	Output1 controlled by Button1, Type = Momentary
Set_Var	Phy	101	2	Output2 = LS_Dig	Set_Var	Phy	109	34	Output2 controlled by Button2, Type = O/L/M/H
Set_Var	Phy	102	4	Output3 = HS_DC	Set_Var	Phy	110	259	Output3 controlled by Button3, Type = Toggle
Set_Var	Phy	103	3	Output4 = HS_mA	Set_Var	Phy	111	5	Output4 controlled by Button5, Type = Momentary
Set_Var	Phy	104	1	Output5 = HS_Dig	Set_Var	Phy	112	6	Output5 controlled by Button6, Type = Momentary
Set_Var	Phy	105	2	Output6 = LS_Dig	Set_Var	Phy	113	522	Output6 controlled by Button10, Type = O/L/M/H
Set_Var	Phy	106	4	Output7 = LS_DC	Set_Var	Phy	114	268	Output7 controlled by Button12, Type = Toggle
Set_Var	Phy	107	3	Output8 = LS_mA	Set_Var	Phy	115	8	Output8 controlled by Button8, Type = Momentary
Set_Var	Phy	99	100	PWM Freq = 100Hz					
Set_Var	Phy	56	1000	Out3 DC/mA Cmd = 100%					
Set_Var	Phy	57	500	Out4 DC/mA Cmd = 500mA					
Set_Var	Phy	60	250	Out7 DC/mA Cmd = 25%					
Set_Var	Phy	61	333	Out8 DC/mA Cmd = 333 mA					
Set_Var	Phy	80	2500	P-Term Closed Loop Cnfg					
Set_Var	Phy	81	750	I-Term Closed Loop Cnfg					
Set_Var	Phy	82	0	D-Term Closed Loop Cnfg					

Continued at Right

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TWO PLACE DECIMAL +/- 0.05			TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS			
THREE PLACE DECIMAL +/- 0.020			SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
ANGLES +/-			DO NOT SCALE DRAWING			
CHECKED	J. COOPER	DATE 02/10/2025	DRAWN	M. PETZKE	DATE 04/13/22	SHEET 19 OF 25
APPROVED	J. COOPER	DATE 02/10/2025				

Built-In Support for CAN I/O Mode of the Marlin 505030 Module

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Transmitted by 505030

	PGN	LSB								MSB		
Digital Status Msg	18FF40sa	In1-4(Hi)	In1-4(Lo)	In5-8(Hi)	In5-8(Lo)	0x00	0x00	0x00	0x00			
		2-bit Status Flags[00=False, 01=True, 10=Error, 11=Not Applicable]										
Analog Status Msg	18FF41sa	Input Analog 1			Input Analog 2			Input Analog 3			Input Analog 4	
		Voltage/Amps/Ohms/Count (Mode Based) [1mV,uA,Ω/bit]										
Analog Status Msg	18FF42sa	Input Analog 5			Input Analog 6			Input Analog 7			Input Analog 8	
		Voltage/Amps/Ohms/Count (Mode Based) [1mV,uA,Ω/bit]										
Analog Status Msg	18FF43sa	Input 1 Frequency			Input 2 Frequency			Input 1 Duty Cycle			Input 2 Duty Cycle	
		Frequency: 32.0-10,000.0Hz [0.1Hz/bit]						Duty Cycle: 0.0-100.0% [0.1%/bit]				
Analog Status Msg	18FF44sa	Input 3 Frequency			Input 4 Frequency			Input 3 Duty Cycle			Input 4 Duty Cycle	
		Frequency: 32.0-10,000.0Hz [0.1Hz/bit]						Duty Cycle: 0.0-100.0% [0.1%/bit]				
Module Status Msg	18FF60sa	Supply Voltage			System Temperature			Sys. Internal Ref V			Module HWID	
Output Fault Msg	18FF61sa	Out1Err	Out2Err	Out3Err	Out4Err	Out5Err	Out6Err	Out7Err	Out8Err			
Output Setpoint Msg	18FF63sa	Out 1 Cmd (16-bit)			Out 2 Cmd (16-bit)			Out 3 Cmd (16-bit)			Out 4 Cmd (16-bit)	
		Current: 0-3000 [0-3,000mA, 1mA/bit]										
Output Setpoint Msg	18FF64sa	Out 5 Cmd (16-bit)			Out 6 Cmd (16-bit)			Out 7 Cmd (16-bit)			Out 8 Cmd (16-bit)	
		Current: 0-3000 [0-3,000mA, 1mA/bit]										
Output Feedback Msg	18FF65sa	Output 1 Current			Output 2 Current			Output 3 Current			Output 4 Current	
		Current: 0-4200 [0-4,200mA, 1mA/bit]										
Output Feedback Msg	18FF66sa	Output 5 Current			Output 6 Current			Output 7 Current			Output 8 Current	
		Current: 0-4200 [0-4,200mA, 1mA/bit]										

sa = Source Address of the 5050XX Module
xx = Source Address of the controller commanding the 505030 Module

Beacon: Flashes the status LED so you can identify which Module you are sending Command/Config Messages to.

*All multi-byte status feedback data is little endian

Binary Active Hi/Lo Status – Detailed View

In1-4(Hi)	In1-4(Lo)	In5-8(Hi)	In5-8(Lo)	0x00	0x00	0x00	0x00
Note: Each input has a 2-bit flag: 00 – Input is Digital Low 01 – Input is Digital High 1X – Error							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Input 4		Input 3		Input 2		Input 1	

Fault Status – Detailed View

Out1Err	Out2Err	Out3Err	Out4Err	Out5Err	Out6Err	Out7Err	Out8Err
*All 1's (0xFF) means output is inactive (not configured) **If Bit 6 is a 1, then Bit 0 is a short circuit fault. If Bit 6 is 0, then Bit 0 is an over-current fault.							
Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Timeout	Fault Flag	Output Over-voltage Fault	Output Under-voltage Fault	Power Under Voltage Fault	Over Temperature Fault	Over Temperature Warning	Over-Current/Short Circuit Fault

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

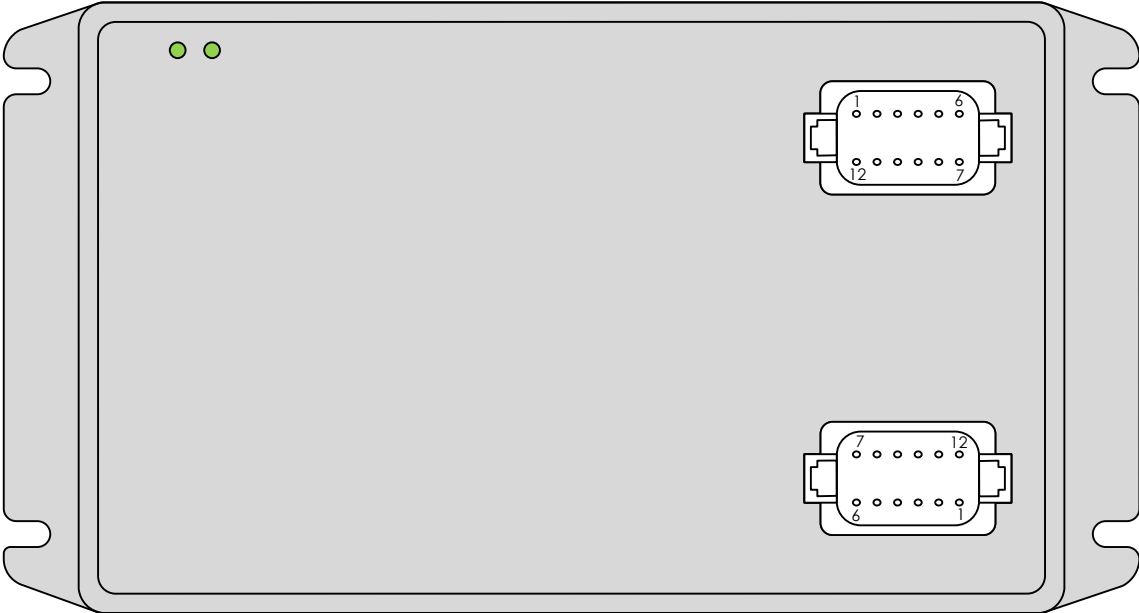
SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
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DRAWN M. PETZKE	DATE 04/13/22	SHEET 20 OF 25
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Built-In Support for CAN I/O Mode of the Marlin 505030 Module

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

505030
(8i8o Module)



*Not to scale

Received by 505030

Reserved by 000000		PGN	LSB								MSB		
Cmd Msg: Outputs	18EFsaxx		0x60	0xFF	0x00	0x00	Out 1-4	Out 5-8	Reserved	Reserved			
			0x61	0xFF	0x00	0x00	Out1 Cmd	Out2 Cmd	Out3 Cmd	Out4 Cmd			
						0x01	Out5 Cmd	Out6 Cmd	Out7 Cmd	Out8 Cmd			
							DC: 0-250 [0-100.0%, 0.4%/bit]						
			0x62	0xFF	0x00	0x00	Out 1 Cmd (16-bit)*		Out 2 Cmd (16-bit)*				
						0x01	Out 3 Cmd (16-bit)*		Out 4 Cmd (16-bit)*				
						0x02	Out 5 Cmd (16-bit)*		Out 6 Cmd (16-bit)*				
						0x03	Out 7 Cmd (16-bit)*		Out 8 Cmd (16-bit)*				
						DC: 0-1000 [0-100.0%, 0.1%/bit] mA: 0-3000 [0-3000mA, 1mA/bit]							
		0x70	0xFF	0x00	0x00	In 1 Quad Cnt Cmd*		In 2 Quad Cnt Cmd*					
					0x01	In 3 Quad Cnt Cmd*		In 4 Quad Cnt Cmd*					
					0x02	In 5 Quad Cnt Cmd*		In 6 Quad Cnt Cmd*					
					0x03	In 7 Quad Cnt Cmd*		Reserved (leave as 0x00)					
						Count Setpoint [0-65535]							
Cmd Msg: Beacon On	18EFsaF9	0x15	0xFF	0xF9	0xB0	0x44	0x55	0x66	0x77				
Cmd Msg: Beacon Off	18EFsaF9	0x16	0xFF	0xF9	0xB0	0x44	0x55	0x66	0x77				

sa = Source Address of the 505030 Module
xx = Source Address of the controller commanding the 505030 Module

Beacon: Flashes the comm LED so you can identify which Module you are sending Command/Config Messages to.

*Multi-byte command data is read little endian

Binary Active Hi/Lo Control – Detailed View

0x60	0xFF	0x00	0x00	Out 1-4	Out 5-8	Reserved	Reserved
------	------	------	------	---------	---------	----------	----------

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Output 4		Output 3		Output 2		Output 1	

Note: Each output cmd is a 2-bit flag: 00 – OFF
01 – ON
10 – Reserved
11 – Reserved

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TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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DO NOT SCALE DRAWING

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APPROVED	J. COOPER	DATE 02/10/2025

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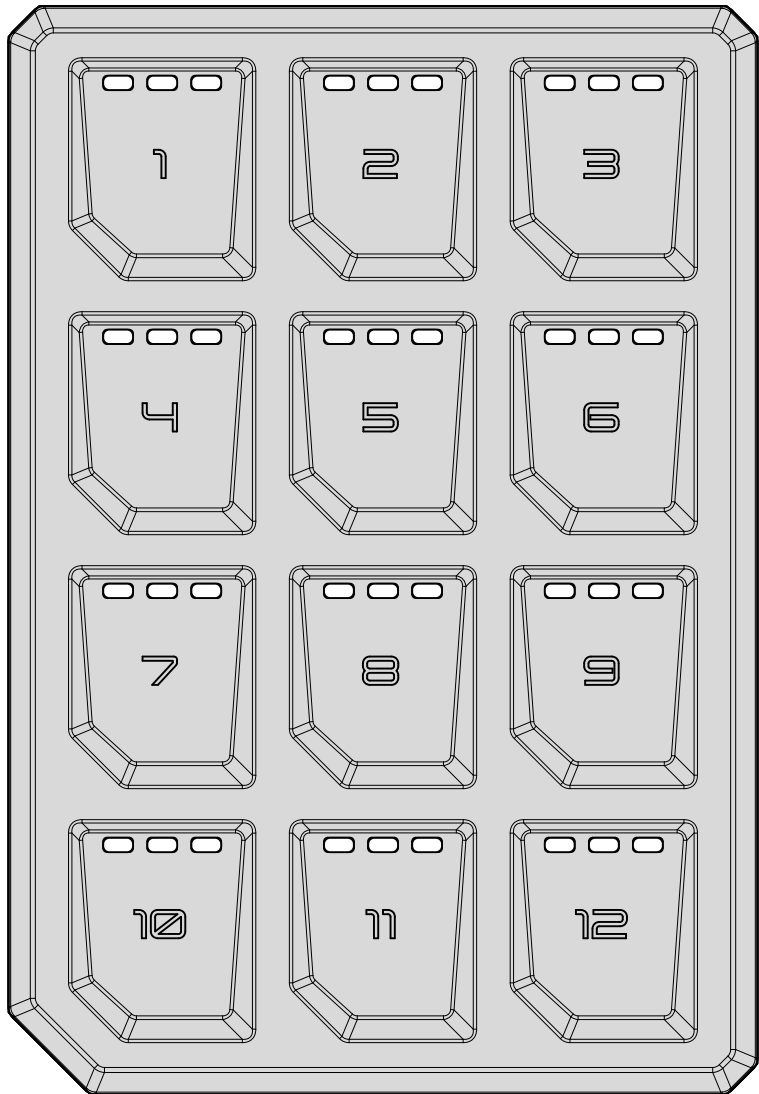
TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE	DRAWING NUMBER	TYPE	REV
B	013953	S	E
DRAWN M. PETZKE	DATE 04/13/22	SHEET 21 OF 25	

Built-In Support for Marlin 5052xx Keypad Module (via CAN)

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

Example of 3x4 Keypad shown



Transmitted by 505030

Indicator LED Msg

18A7kksa

LED1-4

LED5-8

LED9-12

LED13-16

LED17-20

LED21-24

LED25-28

LED29-32

2-bit flags [00=Off, 01=On, 10=Blink 2Hz, 11=No Change]

Indicator LED Msg

18A6kksa

LED33-36

LED37-40

LED41-44

LED45-48

LED49-52

LED53-56

LED57-60

LED61-64

2-bit flags [00=Off, 01=On, 10=Blink 2Hz, 11=No Change]

LED1-4

LED5-8

LED9-12

LED13-16

LED17-20

LED21-24

LED25-28

LED29-32

Bit 7

Bit 6

Bit 5

Bit 4

Bit 3

Bit 2

Bit 1

Bit 0

LED 1

LED 2

LED 3

LED 4

Refer to page 19 for clarification on format of LED commands

Received by 505030

Button Status Msg

18FED9kk

Btn1-4

Btn5-8

Btn9-12

Btn13-16

Btn17-20

Btn21-24

Btn25-28

Btn29-32

2-bit Status Flags[00=False, 01=True, 10=Error, 11=Not Applicable]

Btn1-4

Btn5-8

Btn9-12

Btn13-16

Btn17-20

Btn21-24

Btn25-28

Btn29-32

Bit 7

Bit 6

Bit 5

Bit 4

Bit 3

Bit 2

Bit 1

Bit 0

BTN 1

BTN 2

BTN 3

BTN 4

Indicator LED Status Messages are sent every 100mS
sa = Source Address of the 505030 Module
kk = Source Address of the Keypad Module

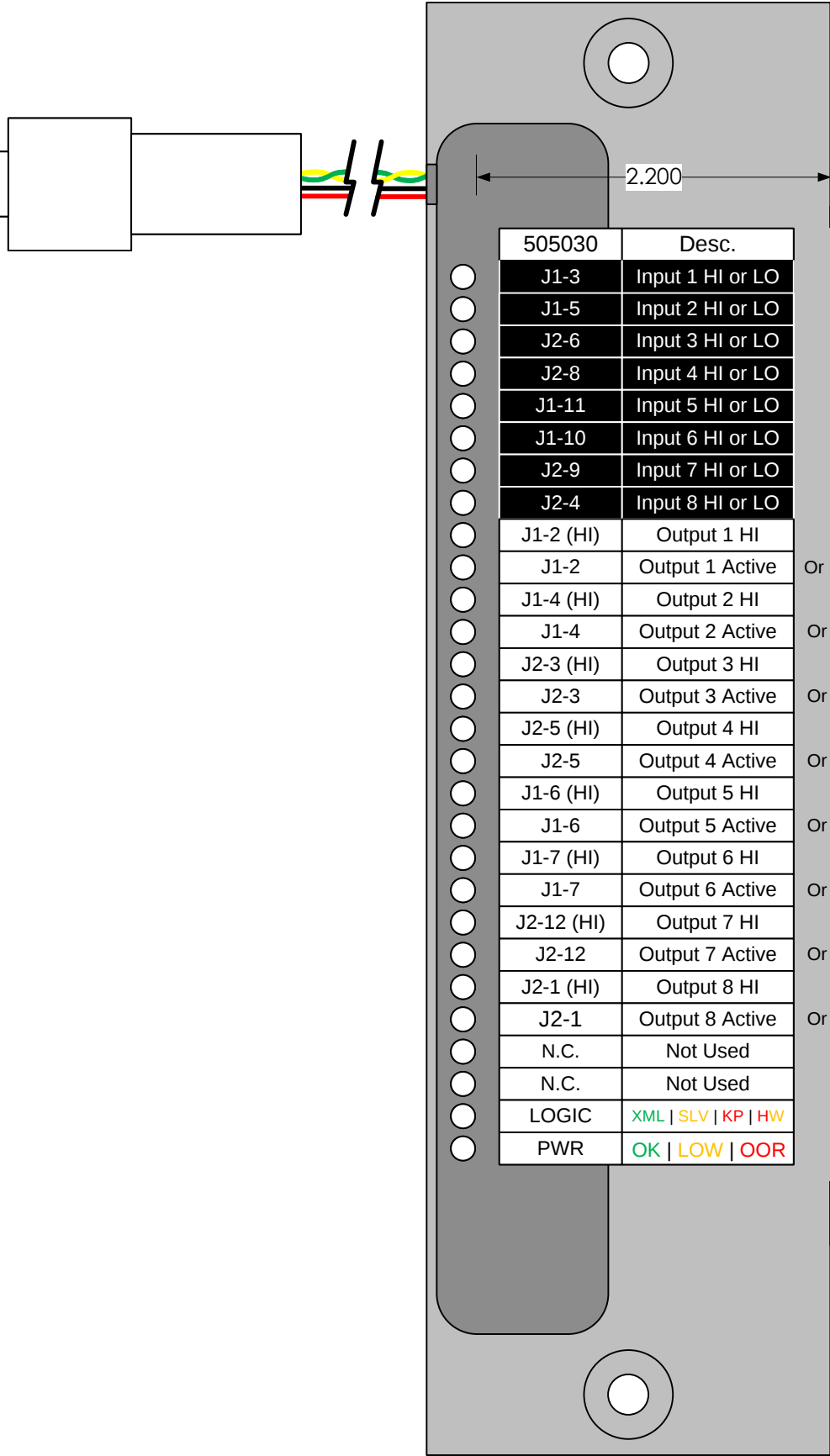
Based on Marlin 11713S__ spec for Keypad Modules

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE			MARLIN TECHNOLOGIES INC.				
TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-					TITLE SPECIFICATION, 505030 CONFIGURABLE INSTRUCTIONS
DO NOT SCALE DRAWING			SIZE B	DRAWING NUMBER 013953		TYPE S	REV E
CHECKED	J. COOPER	DATE 02/10/2025	DRAWN	M. PETZKE	DATE 04/13/22	SHEET 22	OF 25
APPROVED	J. COOPER	DATE 02/10/2025					

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Built-In Support for Marlin 5010xx LED Module (via CAN)

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX



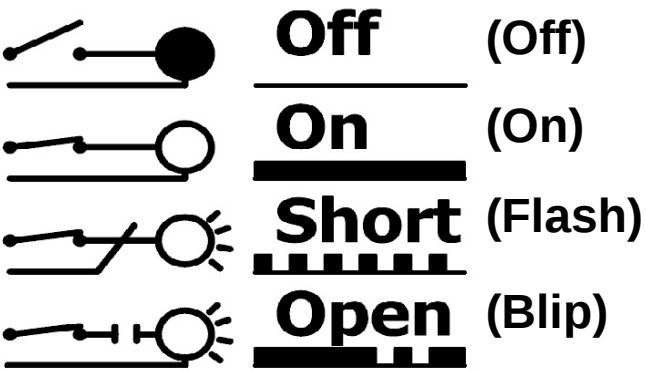
505030	Desc.
J1-3	Input 1 HI or LO
J1-5	Input 2 HI or LO
J2-6	Input 3 HI or LO
J2-8	Input 4 HI or LO
J1-11	Input 5 HI or LO
J1-10	Input 6 HI or LO
J2-9	Input 7 HI or LO
J2-4	Input 8 HI or LO
J1-2 (HI)	Output 1 HI
J1-2	Output 1 Active
J1-4 (HI)	Output 2 HI
J1-4	Output 2 Active
J2-3 (HI)	Output 3 HI
J2-3	Output 3 Active
J2-5 (HI)	Output 4 HI
J2-5	Output 4 Active
J1-6 (HI)	Output 5 HI
J1-6	Output 5 Active
J1-7 (HI)	Output 6 HI
J1-7	Output 6 Active
J2-12 (HI)	Output 7 HI
J2-12	Output 7 Active
J2-1 (HI)	Output 8 HI
J2-1	Output 8 Active
N.C.	Not Used
N.C.	Not Used
LOGIC	XML SLV KP HW
PWR	OK LOW OOR

T
R
A
N
S
M
I
T
T
E
D

I/O Status Msg	18FFD7sa	ON 1-8	ON 9-16	ON 17-24	ON 25-28	Flash1-8	Flash9-16	Flash17-24	Flash25-28
		LED Status [0=Off, 1=On]				LED Status Flash [1=Flash, 0=No Flash]*			

Status Messages are sent every 1 Sec (or on Status Change)
sa = Source Address of the 505030 Module

*Flash pattern determined by LED Status bit. Refer to the below chart for more information.



LED xx FLASH bit	LED xx STAT bit
0	0
0	1
1	0
1	1

GRN=XML Logic, YEL = CAN I/O Mode, RED= Keypad Mode, RED/YEL=HW Mode
GRN=Batt Ok, YEL = Batt <10V, RED= Batt Out of Range

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE DECIMAL
+/- 0.05

THREE PLACE DECIMAL
+/- 0.020

ANGLES
+/-

DO NOT SCALE DRAWING

CHECKED J. COOPER

DATE 02/10/2025

APPROVED J. COOPER

DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE B

DRAWING NUMBER 013953

TYPE S

REV E

DRAWN M. PETZKE

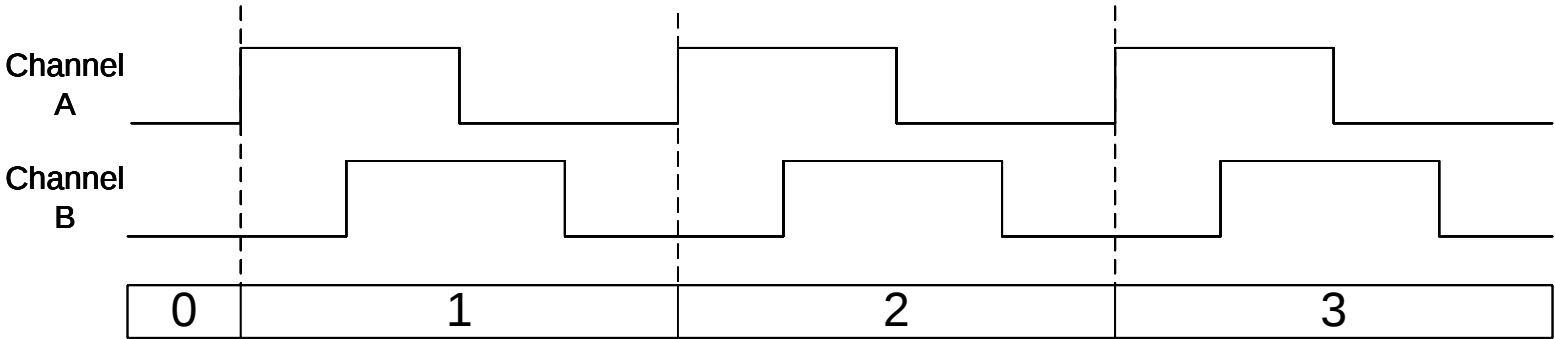
DATE 04/13/22

SHEET 23 OF 25

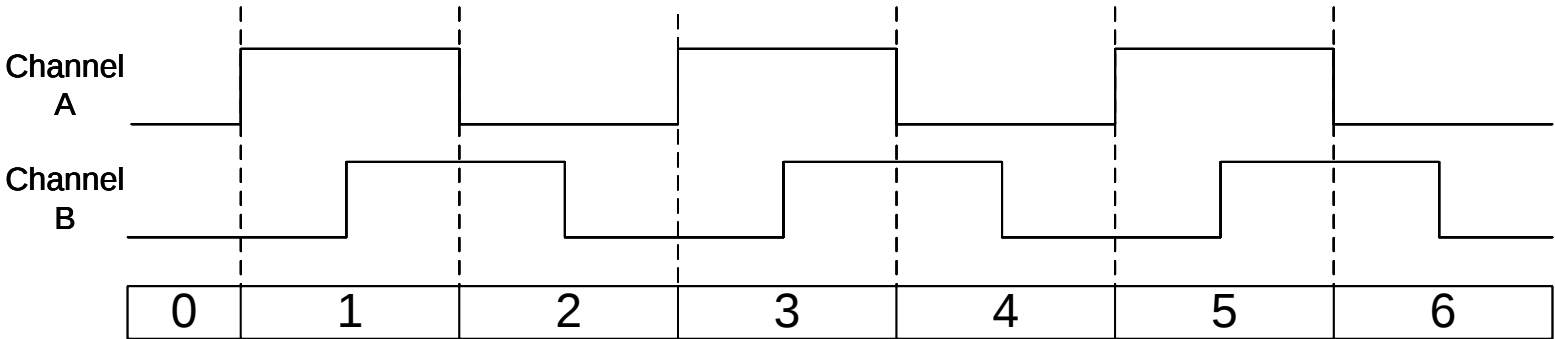
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505030 Quadrature Input Type Information

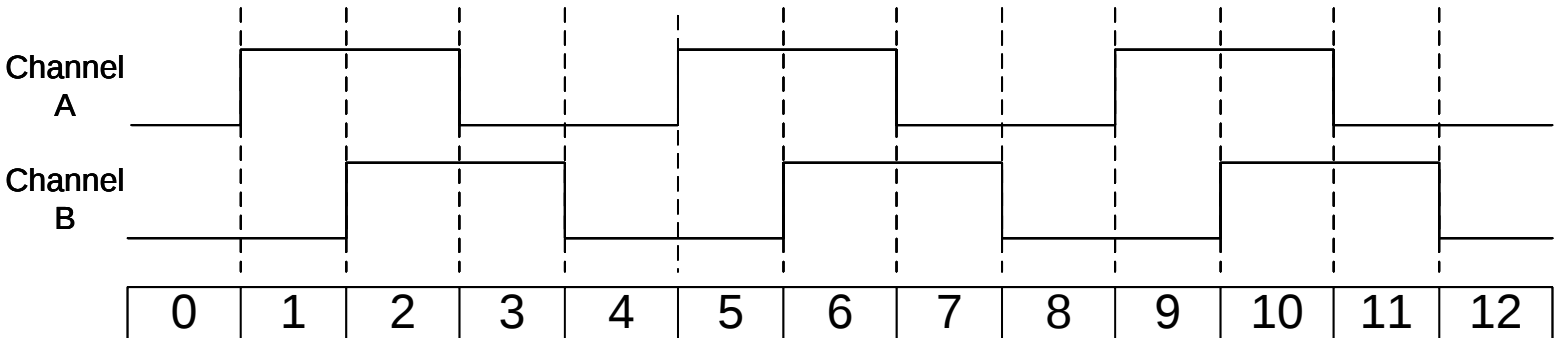
REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX



X1 Encoding:
Counting occurs on the rising edge of Channel A



X2 Encoding:
Counting occurs on the rising and falling edges of channel A



X4 Encoding:
Counting occurs on rising and falling edges of both Channel A and B

*Counting direction in relation to clockwise direction can be encoder specific and is not always consistent. If counting direction in relation to clockwise direction is wrong, try swapping the A & B channel connections.

**In the provided example, inputs 1 & 3 are configured as Quadrature. Information pertaining to inputs 2 & 4 are overridden and not transmitted as they are operating as quadrature channel B inputs.

Quadrature Inputs in CAN I/O Mode

Analog Status Msg	18FF41sa	Input 1 Total Count	Input 1 Interval Count	Input 3 Total Count	Input 3 Interval Count
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When configured in CAN I/O mode, the total quadrature count and the interval count are transmitted in place of Input ‘n’ & Input ‘n+1’ Analog data respectively. The interval count calculation rate is equal to the transmit rate of the 0xFF41 Input Status message.

Cmd Msg: Inputs	18EFsaxx	0x70	0xFF	0x00	0x00	In 1 Quad Cnt Cmd	In 2 Quad Cnt Cmd
						Count Setpoint [0-65535]	

When configured for CAN I/O mode, the total quadrature count can be commanded to a specified value using the output command PGN 0xEF00 with the command operation of 0x70. This is useful for initializing the count after power up or zeroing of the count without power cycling the module. The interval count is not resettable and will reflect any change in count associated with this command in the next 0xFF41 transmission. Additionally, commanding the count of an input operating as Quadrature channel B will have no effect on the total count.

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TWO PLACE DECIMAL +/- 0.05	THREE PLACE DECIMAL +/- 0.020	ANGLES +/-
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APPROVED	J. COOPER	DATE 02/10/2025

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TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE B	DRAWING NUMBER 013953	TYPE S	REV E
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DRAWN M. PETZKE	DATE 04/13/22	SHEET 24 OF 25
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Document Release Notes

Rev	Revision Changes
A	- Production Release of Document
B	- Adjusted tolerance of current input
C	- Adjusted tolerance of current input
D	- Adjusted tolerance of current input. Was +/-50mA. Now +/-15mA. - Fixed Typo on page 20.
E	Pg 6: Input frequency range is now correct for what can actually be reported. - Pg9,10: Updated for new messages and changes to CAN messaging - Added 2 additional Rx and Tx message - Status messages no longer locked behind CAN I/O mode - XML mode message priority is now configurable - LED message is now configurable

REVISIONS				
REV	DATE	ECN	DESCRIPTION	APVD
D	05/06/24	17856E	VARIOUS	JC
E	02/07/25	18375E	VARIOUS	XX

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

TWO PLACE
DECIMAL
+/- 0.05

THREE PLACE
DECIMAL
+/- 0.020

ANGLES

+/-

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DATE 02/10/2025

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DATE 02/10/2025

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505030
CONFIGURABLE INSTRUCTIONS

SIZE
B

DRAWING NUMBER
013953

TYPE
S

REV
E

DRAWN M. PETZKE

DATE 04/13/22

SHEET 25 OF 25