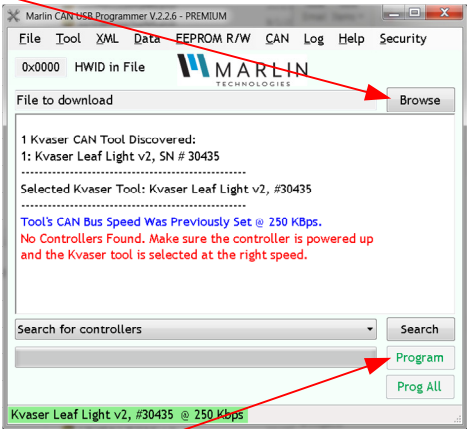


Save to XML File

XML Logic File (\*.XML)

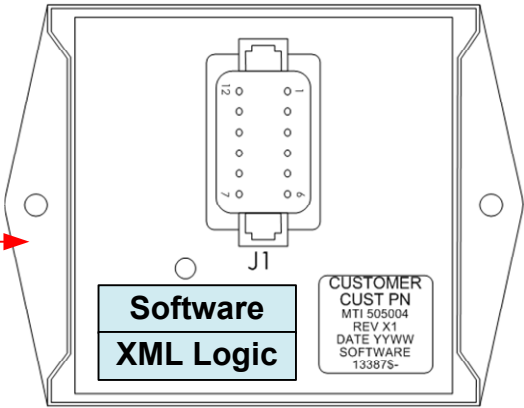
Base Software File (\*.S19)



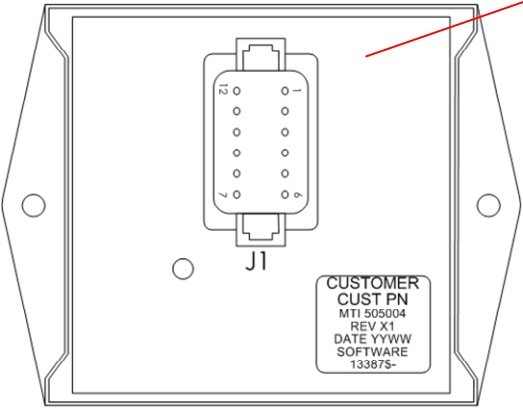
Download Logic via Marlin Tool



Controller ready to install on the Vehicle



Program Base Software via Marlin Tool



| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

|                                  |                                     |               |
|----------------------------------|-------------------------------------|---------------|
| TWO PLACE<br>DECIMAL<br>+/- 0.05 | THREE PLACE<br>DECIMAL<br>+/- 0.020 | ANGLES<br>+/- |
|----------------------------------|-------------------------------------|---------------|

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TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

|           |                          |           |           |
|-----------|--------------------------|-----------|-----------|
| SIZE<br>B | DRAWING NUMBER<br>013388 | TYPE<br>S | REV<br>X1 |
|-----------|--------------------------|-----------|-----------|

|           |               |               |
|-----------|---------------|---------------|
| DRAWN RAS | DATE xx-xx-xx | SHEET 2 OF 11 |
|-----------|---------------|---------------|

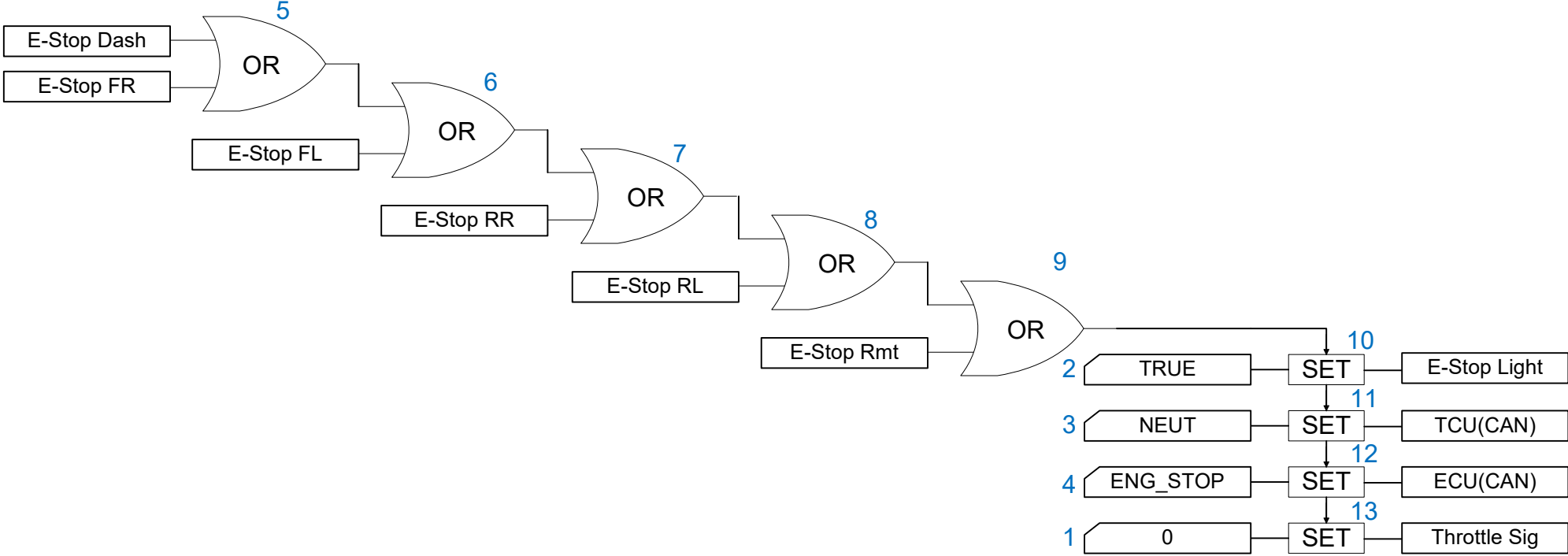
| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

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

|       |             |          |                 |                |
|-------|-------------|----------|-----------------|----------------|
| (*) 1 | CONST       | PHY #63  | =               | XML Mode       |
| (*) 2 | CONST       | CONST #1 | =               | Zero           |
| (*) 3 | CONST       | CONST #2 | =               | True           |
| (*) 4 | CONST       | CONST #3 | =               | Neut Value     |
| (*) 5 | CONST       | CONST #4 | =               | EngStop Value  |
| 6     | E-Stop Dash | OR       | E-Stop FR       | = TEMP 1       |
| 7     | TEMP 1      | OR       | E-Stop FL       | = TEMP 1       |
| 8     | TEMP 1      | OR       | E-Stop RR       | = TEMP 1       |
| 9     | TEMP 1      | OR       | E-Stop RL       | = TEMP 1       |
| 10    | TEMP 1      | OR       | E-Stop Rmt      | = TEMP 1       |
| 11    | TEMP 1      | SET      | Const =True     | = E-Stop Light |
| 12    | TEMP 1      | SET      | Const =Neut     | = TCU (CAN)    |
| 13    | TEMP 1      | SET      | Const =EngS ton | = ECM (CAN)    |
| 14    | TEMP 1      | ZERO     | Zero            | = Throttl eSig |

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

Future Graphical User Logic Builder Concept



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

|                                  |                                     |               |
|----------------------------------|-------------------------------------|---------------|
| TWO PLACE<br>DECIMAL<br>+/- 0.05 | THREE PLACE<br>DECIMAL<br>+/- 0.020 | ANGLES<br>+/- |
|----------------------------------|-------------------------------------|---------------|

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MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

SIZE

B

DRAWING NUMBER

013388

TYPE

S

REV

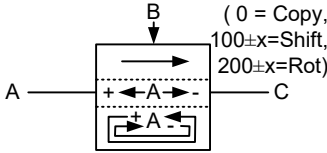
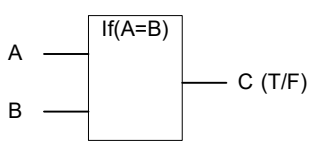
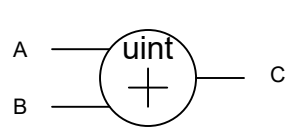
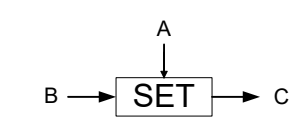
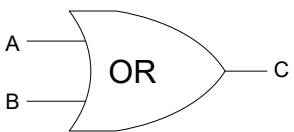
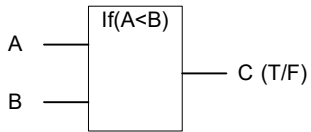
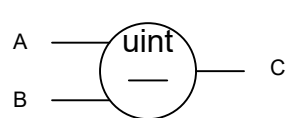
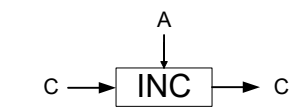
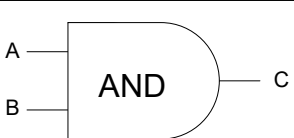
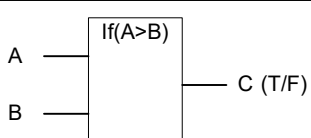
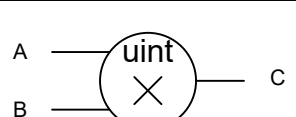
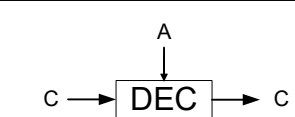
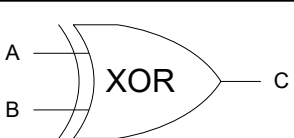
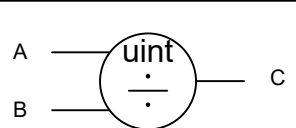
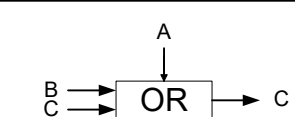
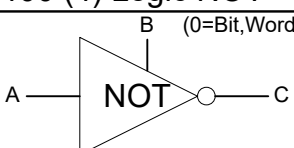
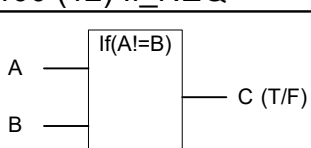
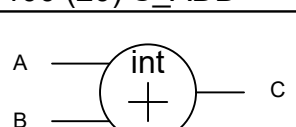
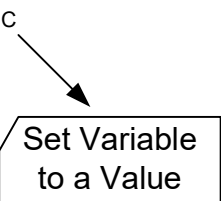
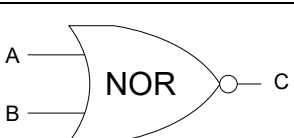
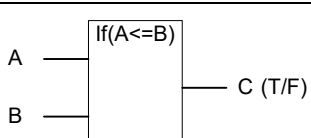
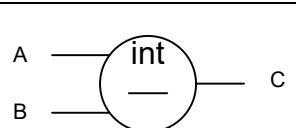

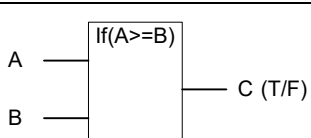
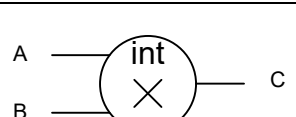
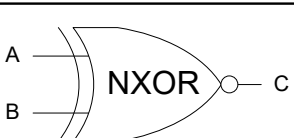
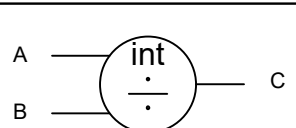
X1

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DATE xx-xx-xx

SHEET 3 OF 11

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

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| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

| Var Type Indexing |              |               |              |            |
|-------------------|--------------|---------------|--------------|------------|
|                   | Physical(00) | Tmp/Const(01) | CAN info(10) | Params(11) |
| 0                 | NULL         | [ FALSE / 0 ] | Rx1_Info     | PARAM_1    |
| 1                 | INPUT_1      | [ TRUE / 1 ]  | Tx1_Info     | PARAM_2    |
| 2                 | INPUT_2      | CONST_2       | Rx2_Info     | PARAM_3    |
|                   |              |               | Tx2_Info     |            |
|                   |              |               | Rx3_Info     |            |
|                   |              |               | Tx3_Info     |            |
|                   |              |               | CAN_x        |            |
| 62                |              |               | CAN_y        | PARAM_62   |
| 63                | CNFG_x       | CONST_63      | KYPD_Info    | PARAM_63   |
| 64                |              |               |              |            |
|                   |              |               |              |            |
| 128               | CNFG_128     | CONST_128     | CAN_128      | PARAM_128  |

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE  
  
TWO PLACE DECIMAL    THREE PLACE DECIMAL    ANGLES  
+/- 0.05    +/- 0.020    +/-

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MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

SIZE B

DRAWING NUMBER 013388

TYPE S

REV X1

DRAWN RAS

DATE xx-xx-xx

SHEET 4 OF 11

505004 Physical Variables Listing

| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

| Physical Variables Type (00b) – Index List of Values |       |             |         |                                                                  |
|------------------------------------------------------|-------|-------------|---------|------------------------------------------------------------------|
| 0                                                    | NULL  | DO NOT USE! |         |                                                                  |
| 1                                                    | J1-12 | Input       | Analog  | Battery Voltage [0-43,554 mV, 1mV/bit]                           |
| 2                                                    | J1-6  | Input       | Analog  | Input 1 Voltage [0-43,554 mV, 1mV/bit]                           |
| 3                                                    | J1-5  | Input       | Analog  | Input 2 Voltage [0-43,554 mV, 1mV/bit]                           |
| 4                                                    | J1-9  | Input       | Analog  | Input 3 Voltage [0-43,554 mV, 1mV/bit]                           |
| 5                                                    | J1-10 | Input       | Analog  | Input 4 Voltage [0-43,554 mV, 1mV/bit]                           |
| 6                                                    | J1-6  | Input       | Digital | Input 1 Digital High [1=Active High, 0=otherwise]                |
| 7                                                    | J1-6  | Input       | Digital | Input 1 Digital Low [1=Active Low, 0=otherwise]                  |
| 8                                                    | J1-5  | Input       | Digital | Input 2 Digital High [1=Active High, 0=otherwise]                |
| 9                                                    | J1-5  | Input       | Digital | Input 2 Digital Low [1=Active Low, 0=otherwise]                  |
| 10                                                   | J1-9  | Input       | Digital | Input 3 Digital High [1=Active High, 0=otherwise]                |
| 11                                                   | J1-9  | Input       | Digital | Input 3 Digital Low [1=Active Low, 0=otherwise]                  |
| 12                                                   | J1-10 | Input       | Digital | Input 4 Digital High [1=Active High, 0=otherwise]                |
| 13                                                   | J1-10 | Input       | Digital | Input 4 Digital Low [1=Active Low, 0=otherwise]                  |
| 14                                                   | J1-7  | Input       | Analog  | Output 1 Current [1mA/bit]                                       |
| 15                                                   | J1-8  | Input       | Analog  | Output 2 Current [1mA/bit]                                       |
| 16                                                   | J1-4  | Input       | Analog  | Output 3 Current [1mA/bit]                                       |
| 17                                                   | J1-3  | Input       | Analog  | Output 4 Current [1mA/bit]                                       |
| 18                                                   | J1-6  | Input       | D.C.    | Digital Input 1 Duty Cycle [0.1%/bit]                            |
| 19                                                   | J1-6  | Input       | Period  | Digital Input 1 Period [1 uS/bit]                                |
| 20                                                   | J1-6  | Input       | Freq    | Digital Input 1 Frequency [0.1 Hz/bit]                           |
| 21                                                   | J1-5  | Input       | D.C.    | Digital Input 2 Duty Cycle [0.1%/bit]                            |
| 22                                                   | J1-5  | Input       | Period  | Digital Input 2 Period [1 uS/bit]                                |
| 23                                                   | J1-5  | Input       | Period  | Digital Input 2 Frequency [0.1 Hz/bit]                           |
| 24                                                   | J1-7  | Output      | Digital | Output 1 Digital Cmd [1=On, 0=Off]                               |
| 25                                                   | J1-8  | Output      | Digital | Output 2 Digital Cmd [1=On, 0=Off]                               |
| 26                                                   | J1-4  | Output      | Digital | Output 3 Digital Cmd [1=On, 0=Off]                               |
| 27                                                   | J1-3  | Output      | Digital | Output 4 Digital Cmd [1=On, 0=Off]                               |
| 28                                                   | J1-7  | Output      | DC/mA   | Output 1 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 29                                                   | J1-8  | Output      | DC/mA   | Output 2 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 30                                                   | J1-4  | Output      | DC/mA   | Output 3 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 31                                                   | J1-3  | Output      | DC/mA   | Output 4 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |

|    |      |         |        |                                                                                 |
|----|------|---------|--------|---------------------------------------------------------------------------------|
| 32 | Cnfg | Load    | mΩ     | Output 1 Closed Loop PWM Nominal Load Resistance [10mΩ/bit]                     |
| 33 | Cnfg | Load    | mΩ     | Output 2 Closed Loop PWM Nominal Load Resistance [10mΩ/bit]                     |
| 34 | Cnfg | Load    | mΩ     | Output 3 Closed Loop PWM Nominal Load Resistance [10mΩ/bit]                     |
| 35 | Cnfg | Load    | mΩ     | Output 4 Closed Loop PWM Nominal Load Resistance [10mΩ/bit]                     |
| 36 | Cnfg | Limit   | mA     | Output 1 Current Limit [1 mA /bit]                                              |
| 37 | Cnfg | Limit   | mA     | Output 2 Current Limit [1 mA /bit]                                              |
| 38 | Cnfg | Limit   | mA     | Output 3 Current Limit [1 mA /bit]                                              |
| 39 | Cnfg | Limit   | mA     | Output 4 Current Limit [1 mA /bit]                                              |
| 40 | Cnfg | Thres   | factor | Threshold Voltage for Digital inputs to be set to Active [65,535mV, 1mV/bit]    |
| 41 | Cnfg | Hyst    | factor | Hysteresis Voltage for Digital inputs to return to Inactive [65,535mV, 1mV/bit] |
| 42 | Cnfg | P-term  | factor | P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 43 | Cnfg | I-term  | factor | I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 44 | Cnfg | D-term  | factor | D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 45 | Cnfg | OnDly1  | Time   | Output 1 Relay Style On Delay [0-65,535mS, 1mS/bit]                             |
| 46 | Cnfg | OnDly2  | Time   | Output 2 Relay Style On Delay [0-65,535mS, 1mS/bit]                             |
| 47 | Cnfg | OnDly3  | Time   | Output 3 Relay Style On Delay [0-65,535mS, 1mS/bit]                             |
| 48 | Cnfg | OnDly4  | Time   | Output 4 Relay Style On Delay [0-65,535mS, 1mS/bit]                             |
| 49 | Cnfg | OffDly1 | Time   | Output 1 Relay Style Off Delay [0-65,535mS, 1mS/bit]                            |
| 50 | Cnfg | OffDly2 | Time   | Output 2 Relay Style Off Delay [0-65,535mS, 1mS/bit]                            |
| 51 | Cnfg | OffDly3 | Time   | Output 3 Relay Style Off Delay [0-65,535mS, 1mS/bit]                            |
| 52 | Cnfg | OffDly4 | Time   | Output 4 Relay Style Off Delay [0-65,535mS, 1mS/bit]                            |
| 53 | Cnfg | PWMs    | Freq   | Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]                      |
| 54 | Cnfg | Out1    | Type   | Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]                      |
| 55 | Cnfg | Out2    | Type   | Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]                      |
| 56 | Cnfg | Out3    | Type   | Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]                      |
| 57 | Cnfg | Out4    | Type   | Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]                      |
| 58 | Cnfg | Kypd    | B1     | Keypad Button 1 – Index# [Refer to Spec 11713S__]                               |
| 59 | Cnfg | Kypd    | B2     | Keypad Button 2 – Index# [Refer to Spec 11713S__]                               |
| 60 | Cnfg | Kypd    | B3     | Keypad Button 3 – Index# [Refer to Spec 11713S__]                               |
| 61 | Cnfg | Kypd    | B4     | Keypad Button 4 – Index# [Refer to Spec 11713S__]                               |
| 62 | Cnfg | Kypd    | SA     | Keypad Source Address                                                           |
| 63 | Cnfg | Module  | Mode   | Config Module [0=XML, 1=Slave, 2=HW-InOut, 3=HW-Keypad]                         |

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

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

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APPROVED    S. JOHNSON    DATE xx/xx/xx

MARLIN TECHNOLOGIES INC.

TITLE    SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

|      |                |      |     |
|------|----------------|------|-----|
| SIZE | DRAWING NUMBER | TYPE | REV |
| B    | 013388         | S    | X1  |

|       |     |               |               |
|-------|-----|---------------|---------------|
| DRAWN | RAS | DATE xx-xx-xx | SHEET 5 OF 11 |
|-------|-----|---------------|---------------|

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| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

| 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> |                                               |                 |
| 15                                              | <Blank> |                                               |                 |
| 16                                              | <Blank> |                                               |                 |
| 17                                              | <Blank> |                                               |                 |
| 18                                              | <Blank> |                                               |                 |
| 19                                              | <Blank> |                                               |                 |
| 20                                              | <Blank> |                                               |                 |
| 21                                              | <Blank> |                                               |                 |
| 22                                              | <Blank> |                                               |                 |
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| 24                                              | <Blank> |                                               |                 |
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| 26                                              | <Blank> |                                               |                 |
| 27                                              | <Blank> |                                               |                 |
| 28                                              | <Blank> |                                               |                 |
| 29                                              | <Blank> |                                               |                 |
| 30                                              | <Blank> |                                               |                 |
| 31                                              | <Blank> |                                               |                 |

| Parameters Variables Type (11b) – Index List of Values |         |                                               |
|--------------------------------------------------------|---------|-----------------------------------------------|
| 32                                                     | <Blank> | Variables are open and available for the User |
| 33                                                     | <Blank> |                                               |
| 34                                                     | <Blank> |                                               |
| 35                                                     | <Blank> |                                               |
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| 42                                                     | <Blank> |                                               |
| 43                                                     | <Blank> |                                               |
| 44                                                     | <Blank> |                                               |
| 45                                                     | <Blank> |                                               |
| 46                                                     | <Blank> |                                               |
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| 48                                                     | <Blank> |                                               |
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| 52                                                     | <Blank> |                                               |
| 53                                                     | <Blank> |                                               |
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| 55                                                     | <Blank> |                                               |
| 56                                                     | <Blank> |                                               |
| 57                                                     | <Blank> |                                               |
| 58                                                     | <Blank> |                                               |
| 59                                                     | <Blank> |                                               |
| 60                                                     | <Blank> |                                               |
| 61                                                     | <Blank> |                                               |
| 62                                                     | <Blank> |                                               |
| 63                                                     | <Blank> |                                               |

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

|                                  |                                     |               |
|----------------------------------|-------------------------------------|---------------|
| TWO PLACE<br>DECIMAL<br>+/- 0.05 | THREE PLACE<br>DECIMAL<br>+/- 0.020 | ANGLES<br>+/- |
|----------------------------------|-------------------------------------|---------------|

DO NOT SCALE DRAWING

|          |            |               |
|----------|------------|---------------|
| CHECKED  | S. JOHNSON | DATE xx/xx/xx |
| APPROVED | S. JOHNSON | DATE xx/xx/xx |

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

|           |                          |               |               |
|-----------|--------------------------|---------------|---------------|
| SIZE<br>B | DRAWING NUMBER<br>013388 | TYPE<br>S     | REV<br>X1     |
| DRAWN RAS |                          | DATE xx-xx-xx | SHEET 6 OF 11 |

THE INFORMATION CONTAINED ON THIS DRAWING IS PROPRIETARY AND CONFIDENTIAL TO MARLIN TECHNOLOGIES INC. UNAUTHORIZED USE OR DISTRIBUTION WITHOUT CONSENT IS PROHIBITED.



| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

| CAN Variables Type (10b) – Index List of Values |              |                        |                                                                            |
|-------------------------------------------------|--------------|------------------------|----------------------------------------------------------------------------|
| 0                                               | Rx1 PGN      | Rx<br>CAN<br>Msg<br>#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<br>CAN<br>Msg<br>#1 | PGN of CAN Message to be Transmitted                                       |
| 7                                               | Tx1 MsgRate  |                        | Transmission Rate of CAN Message to send <b>[Currently fixed at 100mS]</b> |
| 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<br>CAN<br>Msg<br>#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<br>CAN<br>Msg<br>#2 | PGN of CAN Message to be Transmitted                                       |
| 19                                              | Tx2 MsgRate  |                        | Transmission Rate of CAN Message to send <b>[Currently fixed at 100mS]</b> |
| 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<br>CAN<br>Msg<br>#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<br>CAN              | PGN of CAN Message to be Transmitted                                       |
| 31                                              | Tx3 MsgRate  |                        | Transmission Rate of CAN Message to send <b>[Currently fixed at 100mS]</b> |

|    |              |        |                                                      |                                                                                             |  |
|----|--------------|--------|------------------------------------------------------|---------------------------------------------------------------------------------------------|--|
| 32 | Tx3 Data 1:0 |        | Msg<br>#3                                            | 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                                                          |  |
| 36 | <Blank>      |        | J1939<br>CAN<br>Or<br>Pre-<br>Define<br>Rx<br>Values | Rx4 PGN                                                                                     |  |
| 37 | <Blank>      |        |                                                      | Rx4 SrcAdr                                                                                  |  |
| 38 | <Blank>      |        |                                                      | Rx4 Data 1:0                                                                                |  |
| 39 | <Blank>      |        |                                                      | Rx4 Data 3:2                                                                                |  |
| 40 | <Blank>      |        |                                                      | Rx4 Data 5:4                                                                                |  |
| 41 | <Blank>      |        |                                                      | Rx4 Data 7:6                                                                                |  |
| 42 | <Blank>      |        |                                                      | Tx4 PGN                                                                                     |  |
| 43 | <Blank>      |        |                                                      | Tx4 Rate                                                                                    |  |
| 44 | <Blank>      |        |                                                      | Tx4 Data 1:0                                                                                |  |
| 45 | <Blank>      |        |                                                      | Tx4 Data 3:2                                                                                |  |
| 46 | <Blank>      |        |                                                      | Tx4 Data 5:4                                                                                |  |
| 47 | <Blank>      |        |                                                      | Tx4 Data 7:6                                                                                |  |
| 48 | <Blank>      |        |                                                      | Undefined at the current time of publication<br>Reserved for future CAN message information |  |
| 49 | <Blank>      |        |                                                      |                                                                                             |  |
| 50 | <Blank>      |        |                                                      |                                                                                             |  |
| 51 | <Blank>      |        |                                                      |                                                                                             |  |
| 52 | <Blank>      |        |                                                      | J1939 CAN – Brake Controller Wheel Speed                                                    |  |
| 53 | <Blank>      |        |                                                      | J1939 CAN – Transmission Vehicle Speed                                                      |  |
| 54 | <Blank>      |        |                                                      | J1939 CAN – Transmission Gear Speed                                                         |  |
| 55 | <Blank>      |        |                                                      | J1939 CAN – Engine RPM                                                                      |  |
| 56 | Kypd         | Input  | Digital                                              | Input Keypad Button 1 [0=Up, 1=Down, 2=Error, 3=No Key]                                     |  |
| 57 | Kypd         | Input  | Digital                                              | Input Keypad Button 2 [0=Up, 1=Down, 2=Error, 3=No Key]                                     |  |
| 58 | Kypd         | Input  | Digital                                              | Input Keypad Button 3 [0=Up, 1=Down, 2=Error, 3=No Key]                                     |  |
| 59 | Kypd         | Input  | Digital                                              | Input Keypad Button 4 [0=Up, 1=Down, 2=Error, 3=No Key]                                     |  |
| 60 | Kypd         | Output | 6-bit                                                | Output Keypad Button 1 LEDs [0=Off, 1=On, 2=Blink(2Hz), 3=NoChange]                         |  |
| 61 | Kypd         | Output | 6-bit                                                | Output Keypad Button 2 LEDs [0=Off, 1=On, 2=Blink(2Hz), 3=NoChange]                         |  |
| 62 | Kypd         | Output | 6-bit                                                | Output Keypad Button 3 LEDs [0=Off, 1=On, 2=Blink(2Hz), 3=NoChange]                         |  |
| 63 | Kypd         | Output | 6-bit                                                | Output Keypad Button 4 LEDs [0=Off, 1=On, 2=Blink(2Hz), 3=NoChange]                         |  |

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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  
+/-

DO NOT SCALE DRAWING

CHECKED S. JOHNSON

DATE xx/xx/xx

APPROVED S. JOHNSON

DATE xx/xx/xx

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

SIZE  
B

DRAWING NUMBER  
013388

TYPE  
S

REV  
X1

DRAWN RAS

DATE xx-xx-xx

SHEET 7 OF 11

| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

| Tmp Variables Type (01b) – Index List of Values |         |                                               |
|-------------------------------------------------|---------|-----------------------------------------------|
| 0                                               | <Blank> | Variables are open and available for the User |
| 1                                               | <Blank> |                                               |
| 2                                               | <Blank> |                                               |
| 3                                               | <Blank> |                                               |
| 4                                               | <Blank> |                                               |
| 5                                               | <Blank> |                                               |
| 6                                               | <Blank> |                                               |
| 7                                               | <Blank> |                                               |
| 8                                               | <Blank> |                                               |
| 9                                               | <Blank> |                                               |
| 10                                              | <Blank> |                                               |
| 11                                              | <Blank> |                                               |
| 12                                              | <Blank> |                                               |
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| 28                                              | <Blank> |                                               |
| 29                                              | <Blank> |                                               |
| 30                                              | <Blank> |                                               |
| 31                                              | <Blank> |                                               |

| Parameters Variables Type (11b) – Index List of Values |         |                                               |
|--------------------------------------------------------|---------|-----------------------------------------------|
| 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> |                                               |
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| 61                                                     | <Blank> |                                               |
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| 63                                                     | <Blank> |                                               |

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

|                                  |                                     |               |
|----------------------------------|-------------------------------------|---------------|
| TWO PLACE<br>DECIMAL<br>+/- 0.05 | THREE PLACE<br>DECIMAL<br>+/- 0.020 | ANGLES<br>+/- |
|----------------------------------|-------------------------------------|---------------|

DO NOT SCALE DRAWING

|         |            |               |
|---------|------------|---------------|
| CHECKED | S. JOHNSON | DATE xx/xx/xx |
|---------|------------|---------------|

|          |            |               |
|----------|------------|---------------|
| APPROVED | S. JOHNSON | DATE xx/xx/xx |
|----------|------------|---------------|

MARLIN TECHNOLOGIES INC.

|       |                                                    |
|-------|----------------------------------------------------|
| TITLE | SPECIFICATION, 505004<br>CONFIGURABLE INSTRUCTIONS |
|-------|----------------------------------------------------|

|           |                          |           |           |
|-----------|--------------------------|-----------|-----------|
| SIZE<br>B | DRAWING NUMBER<br>013388 | TYPE<br>S | REV<br>X1 |
|-----------|--------------------------|-----------|-----------|

|           |               |               |
|-----------|---------------|---------------|
| DRAWN RAS | DATE xx-xx-xx | SHEET 8 OF 11 |
|-----------|---------------|---------------|

THE INFORMATION CONTAINED ON THIS DRAWING IS PROPRIETARY AND CONFIDENTIAL TO MARLIN TECHNOLOGIES INC.. UNAUTHORIZED USE OR DISTRIBUTION WITHOUT CONSENT IS PROHIBITED.



505004 Physical Variables for Slave\_Mode

| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

Physical Variables Type (00) – Index List of Values

|    |      |        |        |                                                                                 |
|----|------|--------|--------|---------------------------------------------------------------------------------|
| 40 | Cnfg | Thres  | factor | Threshold Voltage for Digital inputs to be set to Active [65.535mV, 1mV/bit]    |
| 41 | Cnfg | Hyst   | factor | Hysteresis Voltage for Digital inputs to return to Inactive [65.535mV, 1mV/bit] |
| 42 | Cnfg | P-term | factor | P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 43 | Cnfg | I-term | factor | I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 44 | Cnfg | D-term | factor | D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |

|    |      |      |    |                                                             |
|----|------|------|----|-------------------------------------------------------------|
| 32 | Cnfg | Load | mΩ | Output 1 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 33 | Cnfg | Load | mΩ | Output 2 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 34 | Cnfg | Load | mΩ | Output 3 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 35 | Cnfg | Load | mΩ | Output 4 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |

|    |      |      |      |                                                            |
|----|------|------|------|------------------------------------------------------------|
| 53 | Cnfg | PWMs | Freq | Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit] |
| 54 | Cnfg | Out1 | Type | Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |
| 55 | Cnfg | Out2 | Type | Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |
| 56 | Cnfg | Out3 | Type | Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |
| 57 | Cnfg | Out4 | Type | Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |

|    |      |        |      |                                                        |
|----|------|--------|------|--------------------------------------------------------|
| 63 | Cnfg | Module | Mode | Config Module [0=XML, 1=Slave 2=HW-InOut, 3=HW-Keypad] |
|----|------|--------|------|--------------------------------------------------------|

Refer to the Marlin 11697S\_\_ spec for details of operation

Example XML Configuration

Operator

Set\_Var

Set\_Var

Set\_Var

Set\_Var

Set\_Var

Set\_Var

Variable

Phy 63

Phy 53

Phy 54

Phy 55

Phy 56

Phy 57

Value

1

100

1

2

4

6

Mode = Slave

PWM Freq = 100Hz

Output1 = HS\_Dig

Output2 = LS\_Dig

Output3 = HS\_DC

Output4 = LS\_DC

●

XML Logic

▼

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 S. JOHNSON

DATE xx/xx/xx

APPROVED S. JOHNSON

DATE xx/xx/xx

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

SIZE  
B

DRAWING NUMBER  
013388

TYPE  
S

REV  
X1

DRAWN RAS

DATE xx-xx-xx

SHEET 9 OF 11

THE INFORMATION CONTAINED ON THIS DRAWING IS PROPRIETARY AND CONFIDENTIAL TO MARLIN TECHNOLOGIES INC. UNAUTHORIZED USE OR DISTRIBUTION WITHOUT CONSENT IS PROHIBITED.

505004 Physical Variables for HW\_InOut Mode

| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

Physical Variables Type (00) – Index List of Values

|    |      |        |       |                                                                  |
|----|------|--------|-------|------------------------------------------------------------------|
| 28 | J1-7 | Output | DC/mA | Output 1 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 29 | J1-8 | Output | DC/mA | Output 2 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 30 | J1-4 | Output | DC/mA | Output 3 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 31 | J1-3 | Output | DC/mA | Output 4 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |

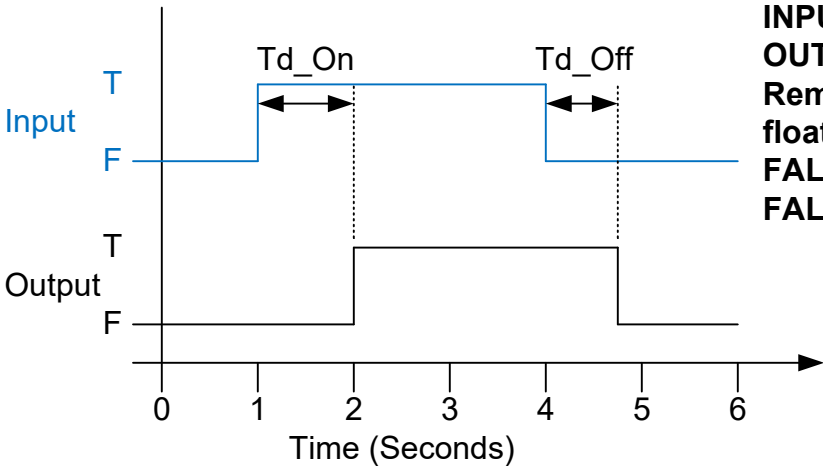
|    |      |      |    |                                                             |
|----|------|------|----|-------------------------------------------------------------|
| 32 | Cnfg | Load | mΩ | Output 1 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 33 | Cnfg | Load | mΩ | Output 2 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 34 | Cnfg | Load | mΩ | Output 3 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 35 | Cnfg | Load | mΩ | Output 4 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |

|    |      |        |        |                                                                                 |
|----|------|--------|--------|---------------------------------------------------------------------------------|
| 40 | Cnfg | Thres  | factor | Threshold Voltage for Digital inputs to be set to Active [65.535mV, 1mV/bit]    |
| 41 | Cnfg | Hyst   | factor | Hysteresis Voltage for Digital inputs to return to Inactive [65.535mV, 1mV/bit] |
| 42 | Cnfg | P-term | factor | P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 43 | Cnfg | I-term | factor | I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |
| 44 | Cnfg | D-term | factor | D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit]                    |

|    |      |         |      |                                                        |
|----|------|---------|------|--------------------------------------------------------|
| 45 | Cnfg | OnDly1  | Time | Output 1 Relay Style On Delay [0-655,350mS, 10mS/bit]  |
| 46 | Cnfg | OnDly2  | Time | Output 2 Relay Style On Delay [0-655,350mS, 10mS/bit]  |
| 47 | Cnfg | OnDly3  | Time | Output 3 Relay Style On Delay [0-655,350mS, 10mS/bit]  |
| 48 | Cnfg | OnDly4  | Time | Output 4 Relay Style On Delay [0-655,350mS, 10mS/bit]  |
| 49 | Cnfg | OffDly1 | Time | Output 1 Relay Style Off Delay [0-655,350mS, 10mS/bit] |
| 50 | Cnfg | OffDly2 | Time | Output 2 Relay Style Off Delay [0-655,350mS, 10mS/bit] |
| 51 | Cnfg | OffDly3 | Time | Output 3 Relay Style Off Delay [0-655,350mS, 10mS/bit] |
| 52 | Cnfg | OffDly4 | Time | Output 4 Relay Style Off Delay [0-655,350mS, 10mS/bit] |

|    |      |      |      |                                                            |
|----|------|------|------|------------------------------------------------------------|
| 53 | Cnfg | PWMs | Freq | Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit] |
| 54 | Cnfg | Out1 | Type | Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |
| 55 | Cnfg | Out2 | Type | Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |
| 56 | Cnfg | Out3 | Type | Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |
| 57 | Cnfg | Out4 | Type | Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC] |

|    |      |        |      |                                                         |
|----|------|--------|------|---------------------------------------------------------|
| 63 | Cnfg | Module | Mode | Config Module [0=XML, 1=Slave, 2=HW-InOut, 3=HW-Keypad] |
|----|------|--------|------|---------------------------------------------------------|



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.

Example XML Configuration

| Operator | Variable |    | Value |                       |
|----------|----------|----|-------|-----------------------|
| Set_Var  | Phy      | 63 | 2     | Mode = HW_IO          |
| Set_Var  | Phy      | 53 | 100   | PWM Freq = 100Hz      |
| Set_Var  | Phy      | 28 | 1000  | OutCmd1 = 100%        |
| Set_Var  | Phy      | 29 | 1000  | OutCmd2 = 100%        |
| Set_Var  | Phy      | 30 | 1000  | OutCmd3 = 100%        |
| Set_Var  | Phy      | 31 | 1000  | OutCmd4 = 100%        |
| Set_Var  | Phy      | 54 | 1     | Output1 = HS_Dig      |
| Set_Var  | Phy      | 55 | 2     | Output2 = LS_Dig      |
| Set_Var  | Phy      | 56 | 4     | Output3 = HS_DC       |
| Set_Var  | Phy      | 57 | 6     | Output4 = LS_DC       |
| Set_Var  | Phy      | 45 | 100   | Out1 On Delay = 1.0s  |
| Set_Var  | Phy      | 49 | 150   | Out1 Off Delay = 1.5s |
| Set_Var  | Phy      | 46 | 200   | Out2 On Delay = 2.0s  |
| Set_Var  | Phy      | 50 | 250   | Out2 Off Delay = 2.5s |
| Set_Var  | Phy      | 47 | 300   | Out3 On Delay = 3.0s  |
| Set_Var  | Phy      | 51 | 350   | Out3 Off Delay = 3.5s |
| Set_Var  | Phy      | 48 | 400   | Out4 Onf Delay = 4.0s |
| Set_Var  | Phy      | 52 | 450   | Out4 Off Delay = 4.5s |

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES AND TOLERANCES ARE

|                                  |                                     |               |
|----------------------------------|-------------------------------------|---------------|
| TWO PLACE<br>DECIMAL<br>+/- 0.05 | THREE PLACE<br>DECIMAL<br>+/- 0.020 | ANGLES<br>+/- |
|----------------------------------|-------------------------------------|---------------|

DO NOT SCALE DRAWING

|          |            |               |
|----------|------------|---------------|
| CHECKED  | S. JOHNSON | DATE xx/xx/xx |
| APPROVED | S. JOHNSON | DATE xx/xx/xx |

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

|           |                          |           |           |
|-----------|--------------------------|-----------|-----------|
| SIZE<br>B | DRAWING NUMBER<br>013388 | TYPE<br>S | REV<br>X1 |
|-----------|--------------------------|-----------|-----------|

|           |               |                |
|-----------|---------------|----------------|
| DRAWN RAS | DATE xx-xx-xx | SHEET 10 OF 11 |
|-----------|---------------|----------------|

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505004 Physical Variables for HW\_Keypad Mode

| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

Physical Variables Type (00) – Index List of Values

|    |      |        |       |                                                                  |
|----|------|--------|-------|------------------------------------------------------------------|
| 28 | J1-7 | Output | DC/mA | Output 1 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 29 | J1-8 | Output | DC/mA | Output 2 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 30 | J1-4 | Output | DC/mA | Output 3 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |
| 31 | J1-3 | Output | DC/mA | Output 4 DutyCycle/Current Cmds (Mode based) [1 mA or 0.1% /bit] |

|    |      |      |    |                                                             |
|----|------|------|----|-------------------------------------------------------------|
| 32 | Cnfg | Load | mΩ | Output 1 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 33 | Cnfg | Load | mΩ | Output 2 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 34 | Cnfg | Load | mΩ | Output 3 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |
| 35 | Cnfg | Load | mΩ | Output 4 Closed Loop PWM Nominal Load Resistance [10mΩ/bit] |

|    |      |        |        |                                                              |
|----|------|--------|--------|--------------------------------------------------------------|
| 42 | Cnfg | P-term | factor | P-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit] |
| 43 | Cnfg | I-term | factor | I-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit] |
| 44 | Cnfg | D-term | factor | D-term for Closed-Loop of all outputs [0-655.35%, 0.01%/bit] |

|    |      |        |      |                                                              |
|----|------|--------|------|--------------------------------------------------------------|
| 53 | Cnfg | PWMs   | Freq | Set Base Frequency of all PWM Outputs [30-1000Hz, 1Hz/bit]   |
| 54 | Cnfg | Out1   | Type | Output 1 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]   |
| 55 | Cnfg | Out2   | Type | Output 2 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]   |
| 56 | Cnfg | Out3   | Type | Output 3 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]   |
| 57 | Cnfg | Out4   | Type | Output 4 [0=Off,1=HS,2=LS,3=HS_mA,4=HS_DC,5=LS_mA,6=LS_DC]   |
| 58 | Cnfg | Kypd   | B1   | Keypad Button 1 Cnfg – Index# [Spec 11713S_] & Type (Note 2) |
| 59 | Cnfg | Kypd   | B2   | Keypad Button 2 Cnfg – Index# [Spec 11713S_] & Type (Note 2) |
| 60 | Cnfg | Kypd   | B3   | Keypad Button 3 Cnfg – Index# [Spec 11713S_] & Type (Note 2) |
| 61 | Cnfg | Kypd   | B4   | Keypad Button 4 Cnfg – Index# [Spec 11713S_] & Type (Note 2) |
| 62 | Cnfg | Kypd   | SA   | Keypad Source Address                                        |
| 63 | Cnfg | Module | Mode | Config Module [0=XML, 1=Slave, 2=HW-InOut, 3=HW-Keypad]      |

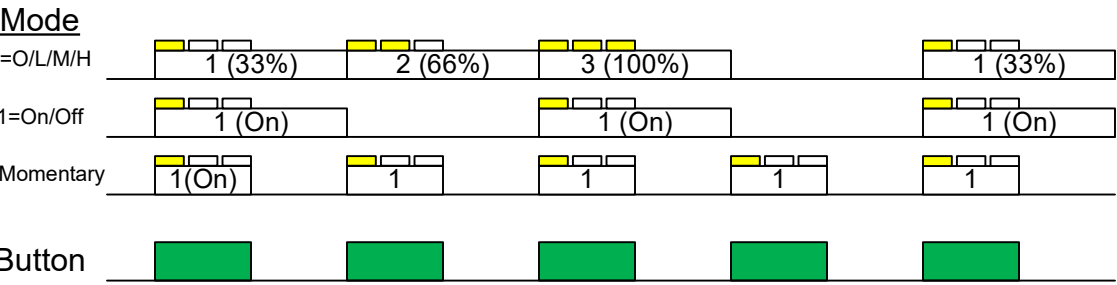
|          |       |            |       |           |       |       |       |
|----------|-------|------------|-------|-----------|-------|-------|-------|
| Bit 7    | Bit 6 | Bit 5      | Bit 4 | Bit 3     | Bit 2 | Bit 1 | Bit 0 |
| Left LED |       | Middle LED |       | Right LED |       |       |       |

**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#  |
| <b>Note2)</b><br>Index# of Button per Marlin Spec 11713S_.<br>Type is 0=Momentary, 1=On/Off Toggle, 2=Off/Low/Med/High<br>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. |         |         |

Example XML Configuration

| Operator | Variable |    | Value |                       |
|----------|----------|----|-------|-----------------------|
| Set_Var  | Phy      | 63 | 3     | Mode = Keypad         |
| Set_Var  | Phy      | 62 | 64    | SourceAddr = 0x40(64) |
| Set_Var  | Phy      | 53 | 100   | PWM Freq = 100Hz      |
| Set_Var  | Phy      | 28 | 1000  | OutCmd1 = 100%        |
| Set_Var  | Phy      | 29 | 1000  | OutCmd2 = 100%        |
| Set_Var  | Phy      | 30 | 1000  | OutCmd3 = 100%        |
| Set_Var  | Phy      | 31 | 1000  | OutCmd4 = 100%        |
| Set_Var  | Phy      | 54 | 1     | Output1 = HS_Dig      |
| Set_Var  | Phy      | 55 | 2     | Output2 = LS_Dig      |
| Set_Var  | Phy      | 56 | 4     | Output3 = HS_DC       |
| Set_Var  | Phy      | 57 | 6     | Output4 = LS_DC       |
| Set_Var  | Phy      | 58 | 1     | Input1 = Button1      |
| Set_Var  | Phy      | 59 | 2     | Input2 = Button2      |
| Set_Var  | Phy      | 60 | 3     | Input3 = Button3      |
| Set_Var  | Phy      | 61 | 4     | Input4 = Button4      |



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TWO PLACE DECIMAL  
+/- 0.05

THREE PLACE DECIMAL  
+/- 0.020

ANGLES  
+/-

DO NOT SCALE DRAWING

CHECKED S. JOHNSON

DATE xx/xx/xx

APPROVED S. JOHNSON

DATE xx/xx/xx

MARLIN TECHNOLOGIES INC.

TITLE SPECIFICATION, 505004  
CONFIGURABLE INSTRUCTIONS

SIZE  
B

DRAWING NUMBER  
013388

TYPE  
S

REV  
X1

DRAWN RAS

DATE xx-xx-xx

SHEET 11 OF 11

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

| REVISIONS |          |        |                       |      |
|-----------|----------|--------|-----------------------|------|
| REV       | DATE     | ECN    | DESCRIPTION           | APVD |
| A         | 04-17-20 | 13379E | RELEASE TO PRODUCTION | xxx  |
|           |          |        |                       |      |

