```
1    PROGRAM  Teensy
2    VAR
3        Teensy_DATAIN  : ARRAY [ 0 .. 40 ] OF BYTE ;
4        Teensy_DATAOUT  : ARRAY [ 0 .. 40 ] OF BYTE ;
5        Teensy_DATAOUT_old  : ARRAY [ 0 .. 40 ] OF BYTE ;
6        Teensy_Analog : ARRAY [ 0 .. 3 ] OF REAL ;
7
8        s_time_date  : STRING ;
9
10       t_enable : BOOL ;
11       test1 : BOOL ;
12       test2 : BOOL ;
13
14       ANALOG : ARRAY [ 0 .. 10 ] OF INT ;
15       Counter1 : R_TRIG ;
16
17       T_hour : BYTE ;
18       T_minute : BYTE ;
19       T_second : BYTE ;
20       T_day : BYTE ;
21       T_month : BYTE ;
22       T_year : int ;
23
24       s_hour : STRING ;
25       s_minute : STRING ;
26       s_second : STRING ;
27       s_day : STRING ;
28       s_month : STRING ;
29       s_year : STRING ;
30       s_hm : STRING ;
31       s_hms : STRING ;
32       s_dm : STRING ;
33       s_dmy : STRING ;
34       T_hour12 : byte ;
35       ampm : INT ;
36       s_ampm : STRING ;
37       s_time_date1 : STRING ;
38       s_time_date2 : STRING ;
39       SW1 : BOOL ;
40       SW2 : BOOL ;
41       SW3 : BOOL ;
42       SW4 : BOOL ;
43       DST_ENABLE : BOOL := false ;
44   END_VAR
45
```

```
1    //Setup Number of Registers IN and OUT for I2C device (this is the Teensy)
2    i2c_multiple . REGNUM_IN := 16 ;
3    i2c_multiple . REGNUM_OUT := 10 ;
4
5    //Data from the Teensy
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 6        Teensy_DATAIN [ 0 ] := i2c_multiple . DATAIN [ 0 ] ;
 7        Teensy_DATAIN [ 1 ] := i2c_multiple . DATAIN [ 1 ] ;
 8        Teensy_DATAIN [ 2 ] := i2c_multiple . DATAIN [ 2 ] ;
 9        Teensy_DATAIN [ 3 ] := i2c_multiple . DATAIN [ 3 ] ;
10        Teensy_DATAIN [ 4 ] := i2c_multiple . DATAIN [ 4 ] ;
11        Teensy_DATAIN [ 5 ] := i2c_multiple . DATAIN [ 5 ] ;
12        Teensy_DATAIN [ 6 ] := i2c_multiple . DATAIN [ 6 ] ;
13        Teensy_DATAIN [ 7 ] := i2c_multiple . DATAIN [ 7 ] ;
14        Teensy_DATAIN [ 8 ] := i2c_multiple . DATAIN [ 8 ] ;
15        Teensy_DATAIN [ 9 ] := i2c_multiple . DATAIN [ 9 ] ;
16        Teensy_DATAIN [ 10 ] := i2c_multiple . DATAIN [ 10 ] ;
17        Teensy_DATAIN [ 11 ] := i2c_multiple . DATAIN [ 11 ] ;
18        Teensy_DATAIN [ 12 ] := i2c_multiple . DATAIN [ 12 ] ;
19        Teensy_DATAIN [ 13 ] := i2c_multiple . DATAIN [ 13 ] ;
20        Teensy_DATAIN [ 14 ] := i2c_multiple . DATAIN [ 14 ] ;
21        Teensy_DATAIN [ 15 ] := i2c_multiple . DATAIN [ 15 ] ;
22
23        //Teensy sensors
24        analog [ 0 ] := WORD_TO_INT ( Mem . PackBytesToWord ( Teensy_DATAIN [ 1 ] ,
          Teensy_DATAIN [ 0 ] ) ) ;          //from pot on PPDB
25        analog [ 1 ] := WORD_TO_INT ( Mem . PackBytesToWord ( Teensy_DATAIN [ 3 ] ,
          Teensy_DATAIN [ 2 ] ) ) ;          //from pot on PPDB
26        analog [ 2 ] := WORD_TO_INT ( Mem . PackBytesToWord ( Teensy_DATAIN [ 5 ] ,
          Teensy_DATAIN [ 4 ] ) ) ;          //from pot on PPDB
27        analog [ 3 ] := WORD_TO_INT ( Mem . PackBytesToWord ( Teensy_DATAIN [ 7 ] ,
          Teensy_DATAIN [ 6 ] ) ) ;          //from pot on PPDB
28
29        Teensy_Analog [ 0 ] := SCALE_R ( X :=  analog [ 0 ] ,  I_LO := 15.0 ,  I_HI :=  100.0 ,
          O_LO :=  0.0 ,  O_HI :=  7.0 ) ;
30        Teensy_Analog [ 1 ] := SCALE_R ( X :=  analog [ 1 ] ,  I_LO := 15.0 ,  I_HI :=  100.0 ,
          O_LO :=  0.0 ,  O_HI :=  7.0 ) ;
31        Teensy_Analog [ 2 ] := SCALE_R ( X :=  analog [ 2 ] ,  I_LO := 15.0 ,  I_HI :=  6600 ,
          O_LO :=  0.0 ,  O_HI :=  50.0 ) ;
32        Teensy_Analog [ 3 ] := SCALE_R ( X :=  analog [ 3 ] ,  I_LO := 0.0 ,  I_HI :=  65535.0 ,
          O_LO :=  0.0 ,  O_HI :=  100.0 ) ;
33
34        SW1 := NOT  Teensy_DATAIN [ 8 ] . 0 ;
35        SW2 := NOT  Teensy_DATAIN [ 8 ] . 1 ;
36        SW3 := NOT  Teensy_DATAIN [ 8 ] . 2 ;
37        SW4 := NOT  Teensy_DATAIN [ 8 ] . 3 ;
38
39        T_hour :=  Teensy_DATAIN [ 9 ] ;
40        T_minute :=  Teensy_DATAIN [ 10 ] ;
41        T_second :=  Teensy_DATAIN [ 11 ] ;
42        T_day :=  Teensy_DATAIN [ 12 ] ;
43        T_month :=  Teensy_DATAIN [ 13 ] ;
44        T_year := WORD_TO_INT ( Mem . PackBytesToWord ( Teensy_DATAIN [ 15 ] , Teensy_DATAIN [
          14 ] ) ) ;
45
46        //Is it am or pm time?
47        IF  T_hour  > 12  THEN
```

```
48          IF DST_Enable THEN
49              T_hour12 := T_hour - 12 ;
50          ELSE
51              T_hour12 := T_hour - 12 - 1 ;
52          END_IF
53          s_ampm := 'pm' ;
54      ELSE
55          IF T_hour = 0 THEN
56              T_hour12 := 12 ;
57          ELSE
58              T_hour12 := T_hour ;
59          END_IF
60          s_ampm := 'am' ;
61      END_IF
62
63      //Make hms string
64      s_hour := CONCAT ( BYTE_TO_STRING ( T_hour12 ) , ':' );
65
66      IF T_hour12 < 10 THEN
67          s_hour := CONCAT ( '0' , s_hour ) ;
68      END_IF
69
70      s_minute := CONCAT ( BYTE_TO_STRING ( T_minute ) , ':' );
71
72      //add a zero to the front if under 10
73      IF T_minute < 10 THEN
74          s_minute := CONCAT ( '0' , s_minute ) ;
75      END_IF
76
77      s_second := CONCAT ( BYTE_TO_STRING ( T_second ) , s_ampm );
78
79      //add a zero to the front if under 10
80      IF T_second < 10 THEN
81          s_second := CONCAT ( '0' , s_second ) ;
82      END_IF
83
84      s_hm := CONCAT ( s_hour , s_minute ) ;
85      s_hms := CONCAT ( s_hm , s_second ) ;
86
87      //Make Day month year string
88      s_day := CONCAT ( BYTE_TO_STRING ( T_day ) , '/' );
89      s_month := CONCAT ( BYTE_TO_STRING ( T_month ) , '/' );
90      s_year := CONCAT ( INT_TO_STRING ( T_year ) , ' ' );
91      s_dm := CONCAT ( s_month , s_day ) ;
92      s_dmy := CONCAT ( s_dm , s_year ) ;
93
94      //Combine into full time and date string
95      s_time_date1 := CONCAT ( s_hms , ' ' );
96      s_time_date2 := CONCAT ( s_time_date1 , s_dmy );
97
98      //Data to Teensy
```

```
 99        Teensy_DATAOUT [ 0 ] := plc_ctr ;
100        Teensy_DATAOUT [ 2 ] := plc_ctr ;
101
102        //Teensy_DATAOUT[1].0
103        Teensy_DATAOUT [ 1 ] . 0 := Relay1 ;
104        Teensy_DATAOUT [ 1 ] . 1 := Relay2 ;
105        Teensy_DATAOUT [ 1 ] . 2 := Relay3 ;
106        Teensy_DATAOUT [ 1 ] . 3 := Relay4 ;
107
108        //Write the data to the output registers
109        IF Teensy_DATAOUT_old [ 0 ] <> Teensy_DATAOUT [ 0 ] THEN
110                i2c_multiple . DATAOUT [ 0 ] := Teensy_DATAOUT [ 0 ] ;
111                Teensy_DATAOUT_old [ 0 ] := Teensy_DATAOUT [ 0 ] ;
112        END_IF
113
114        //Write the data to the output registers
115        IF Teensy_DATAOUT_old [ 1 ] <> Teensy_DATAOUT [ 1 ] THEN
116                i2c_multiple . DATAOUT [ 1 ] := Teensy_DATAOUT [ 1 ] ;
117                Teensy_DATAOUT_old [ 1 ] := Teensy_DATAOUT [ 1 ] ;
118        END_IF
119
120        //Write the data to the output registers
121        IF Teensy_DATAOUT_old [ 2 ] <> Teensy_DATAOUT [ 2 ] THEN
122                i2c_multiple . DATAOUT [ 2 ] := Teensy_DATAOUT [ 2 ] ;
123                Teensy_DATAOUT_old [ 2 ] := Teensy_DATAOUT [ 2 ] ;
124        END_IF
125
126        //Write the data to the output registers
127        IF Teensy_DATAOUT_old [ 3 ] <> Teensy_DATAOUT [ 3 ] THEN
128                i2c_multiple . DATAOUT [ 3 ] := Teensy_DATAOUT [ 3 ] ;
129                Teensy_DATAOUT_old [ 3 ] := Teensy_DATAOUT [ 3 ] ;
130        END_IF
131
132        //Write the data to the output registers
133        IF Teensy_DATAOUT_old [ 4 ] <> Teensy_DATAOUT [ 4 ] THEN
134                i2c_multiple . DATAOUT [ 4 ] := Teensy_DATAOUT [ 4 ] ;
135                Teensy_DATAOUT_old [ 4 ] := Teensy_DATAOUT [ 4 ] ;
136        END_IF
137
138        //Write the data to the output registers
139        IF Teensy_DATAOUT_old [ 5 ] <> Teensy_DATAOUT [ 5 ] THEN
140                i2c_multiple . DATAOUT [ 5 ] := Teensy_DATAOUT [ 5 ] ;
141                Teensy_DATAOUT_old [ 5 ] := Teensy_DATAOUT [ 5 ] ;
142        END_IF
143
144        //Write the data to the output registers
145        IF Teensy_DATAOUT_old [ 6 ] <> Teensy_DATAOUT [ 6 ] THEN
146                i2c_multiple . DATAOUT [ 6 ] := Teensy_DATAOUT [ 6 ] ;
147                Teensy_DATAOUT_old [ 6 ] := Teensy_DATAOUT [ 6 ] ;
148        END_IF
149
```

```
150      //Write the data to the output registers
151      IF  Teensy_DATAOUT_old [ 7 ]  <>  Teensy_DATAOUT [ 7 ]  THEN
152              i2c_multiple . DATAOUT [ 7 ] := Teensy_DATAOUT [ 7 ] ;
153              Teensy_DATAOUT_old [ 7 ] := Teensy_DATAOUT [ 7 ] ;
154      END_IF
155
156      //Write the data to the output registers
157      IF  Teensy_DATAOUT_old [ 8 ]  <>  Teensy_DATAOUT [ 8 ]  THEN
158              i2c_multiple . DATAOUT [ 8 ] := Teensy_DATAOUT [ 8 ] ;
159              Teensy_DATAOUT_old [ 8 ] := Teensy_DATAOUT [ 8 ] ;
160      END_IF
161
162      //Write the data to the output registers
163      IF  Teensy_DATAOUT_old [ 9 ]  <>  Teensy_DATAOUT [ 9 ]  THEN
164              i2c_multiple . DATAOUT [ 9 ] := Teensy_DATAOUT [ 9 ] ;
165              Teensy_DATAOUT_old [ 9 ] := Teensy_DATAOUT [ 9 ] ;
166      END_IF
167
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