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1 ' -----[ Title ]-----
2 ' Applied Sensors - AD592TempProbe.bs2
3 ' Reading the AD592 temperature sensor using the RCTIME command.
4 '
5 '{$STAMP BS2}
6 '{$PBASIC 2.5}
7 '
8 '
9 ' -----[ Program Information about StampDAQ ]-----
10 '
11 '
12 ' SEROUT Sends serial data from programming port (P16)
13 '   [ ] defines data to be sent.
14 '
15 ' StampDAQ directives used:
16 '   DATA   Places data into the next row of Excel spreadsheet
17 '           Up to 10 comma-separated values may be stored.
18 '           Each value following "DATA," must be separated by comma-strings ",", "
19 '           DATA, val1, val2, val3, ..., val10
20 '           DATA, SDEC val1, ",", SDEC val2
21 '
22 '           Ex: SEROUT sPin, Baud, ["DATA, TIME,", SDEC TK,", SDEC TC, CR] ***
23 '
24 '   LABEL  Places headings on the columns for rows A-J using up to
25 '           10 comma-separated labels.
26 '           LABEL, label1, label2, ... label10
27 '
28 '           Ex: SEROUT sPin, Baud, [CR, "LABEL, Time, K, C", CR] ***
29 '
30 '   MSG     Places a user-defined message in the StampDAQ message box
31 '           MSG, messages string (no commas in string)
32 '
33 '           Ex: SEROUT sPin,Baud, ["MSG, Temp Probe Data", CR] ***
34 '
35 '   CMD?    Queries StampDAQ for an instruction.
36 '           If "Download Data" is checked, "11" will be returned serially
37 '           If "Clear Stored Data" is checked, "22" will be returned serially
38 '
39 '           Ex: SEROUT sPin, Baud, ["CMD?", CR] ***
40 '
41 '           Must be followed by a SERIN command to retrieve the answer
42 '           in a variable
43 '
44 '           Ex: SERIN sPin, Baud, 500, timeout, [DEC CMD] ***
45 '
46 '   DUMPING Informs StampDAQ a data dump is starting.
47 '           StampDAQ clears rows in preperation.
48 '
49 '           Ex: SEROUT sPin, Baud, ["DUMPING", CR] ***
50 '
51 '   DONE    Informs StampDAQ a data dump is complete.
52 '
53 '           Ex: SEROUT sPin, Baud, ["DONE", CR] ***
54 '
55 '   RESET   Informs StampDAQ that a reset of data is complete.
56 '
57 '           Ex: SEROUT sPin, Baud, ["RESET", CR] ***
58 '
59 '   TIME    Replaced by StampDAQ with real system time (DATE may also be used)
60 '           in DATA directive columns A and B only
61 '
62 '           Ex: SEROUT sPin, Baud, ["DATA, TIME,", SDEC TK,", SDEC TC, CR]***
63 '
64 '   CLEARSHEET Clears columns A-J, rows 2 and on. (labels remain).
65 '

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66 '
67 ' -----[ Variables/Constants/Pins ]-----
68
69 TempProbe      PIN  15 ' pin 5 in the book
70
71 PiezoSp        PIN   4           ' Speaker
72
73 Kal            CON  15300        ' Constant to be determined.
74 rct            VAR   Word        ' A word variable.
75 TK            VAR   Word        ' Kelvin temperature.
76 TC            VAR   Word        ' Degrees Celsius.
77
78 FreqDetectable CON    3000
79
80 ' Stuff for StampDAQ
81 counter       VAR   Byte        'Variable to represent data
82 sPin          CON   16          'Serial Pin - P16, Programming port
83 Baud          CON   84          'Baud mode for a rate of 9600, 8-N-1
84              'BS2P, BS2SX use 240 for 9600, 8-N-1
85
86 ' -----[ Initialization ]-----
87
88 FREQOUT PiezoSp, 2000, FreqDetectable      'Signal program start/reset.
89
90 SEROUT sPin, Baud, [CR]                   'Send a lone CR to ensure StampDAQ buffer is ready
91
92 Configure:
93
94 SEROUT sPin, Baud, [CR, "LABEL, Time, K, C", CR] 'Label 3 columns with Time, K, and C
95
96 SEROUT sPin, Baud, ["CLEARDATA", CR]      'Clear all data columns (A-J) in Excel
97
98 ' -----[ Program Code ]-----
99
100 SEROUT sPin,Baud,["MSG, Temp Probe Data", CR]
101
102 FOR counter = 0 TO 100
103
104     LOW TempProbe           ' Discharge the capacitor.
105     RCTIME TempProbe, 0, rct ' Time for the volts to rise to 1.3 V.
106
107     TK = Kal/rct*10 + (Kal//rct*10/rct) ' Calculate Kelvin
108     TC = TK - 273                    ' and Celsius.
109
110     SEROUT sPin, Baud,["DATA, TIME,", SDEC TK,",", SDEC TC, CR]
111
112     PAUSE 500
113
114 NEXT ' Back to the beginning of the loop.
115
```