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1  PROGRAM LTC2619
2  VAR
3      LTC2619_DATAIN1 : ARRAY [ 0 .. 40 ] OF BYTE ;
4      LTC2619_DATAOUT1 : ARRAY [ 0 .. 40 ] OF BYTE ;
5      LTC2619_DATAOUT_old1 : ARRAY [ 0 .. 40 ] OF BYTE ;
6
7      LTC2619_COMMAND : ARRAY [ 0 .. 3 ] OF BYTE := [ 32 , 33 , 34 , 35 ] ;
8      LTC2619_MSB : ARRAY [ 0 .. 3 ] OF BYTE ;
9      LTC2619_LSB : ARRAY [ 0 .. 3 ] OF BYTE ;
10     LTC2619_DATA : ARRAY [ 0 .. 3 ] OF WORD ;
11
12     Data1 : MEM . UnpackWord ;
13     Data2 : MEM . UnpackWord ;
14     Data3 : MEM . UnpackWord ;
15     Data4 : MEM . UnpackWord ;
16
17     LTC2619_Scan_Delay : TON ;
18
19     LTC2619_State : INT ;
20     LTC2619_Scan_Start : BOOL ;
21     LTC2619_Scan_Time : TIME := T#5MS ;
22     LTC2619_Scan_Done : BOOL ;
23     LTC2619_Scan_Elapsed : TIME ;
24     test : ARRAY [ 0 .. 3 ] OF BYTE := [ 1 , 2 , 3 , 4 ] ;
25
26     test1 : REAL := 20.0 ;
27     test2 : REAL ;
28
29     LTC2619_CH1_Enabled : BOOL := TRUE ;
30     LTC2619_CH2_Enabled : BOOL := TRUE ;
31     LTC2619_CH3_Enabled : BOOL := FALSE ;
32     LTC2619_CH4_Enabled : BOOL := FALSE ;
33 END_VAR
34
35 VAR_INPUT
36     Analog1 : REAL := 2.55 ;
37     Analog2 : REAL := 2.55 ;
38     Analog3 : REAL := 2.55 ;
39     Analog4 : REAL := 2.55 ;
40 END_VAR
41

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1  //Setup Number of Registers IN and OUT for I2C device (this is the LSM303 sensor
   on the IMU, looking at the accel data)
2  //Setup Number of Registers IN and OUT for I2C device (this is the Teensy)
3  i2c_multiple_1 . REGNUM_IN := 0 ;
4  i2c_multiple_1 . REGNUM_OUT := 3 ;
5
6  LTC2619_DATA [ 0 ] := REAL_TO_WORD ( SCALE_R ( X := Analog1 , I_LO := 0.0 , I_HI :=
   5.0 , O_LO := 0.0 , O_HI := 65535 ) ) ;
7  LTC2619_DATA [ 1 ] := REAL_TO_WORD ( SCALE_R ( X := Analog2 , I_LO := 0.0 , I_HI :=

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5.0 , O_LO := 0.0 , O_HI := 65535 ) ) ;
8 LTC2619_DATA [ 2 ] := REAL_TO_WORD ( SCALE_R ( X := Analog3 , I_LO := 0.0 , I_HI :=
5.0 , O_LO := 0.0 , O_HI := 65535 ) ) ;
9 LTC2619_DATA [ 3 ] := REAL_TO_WORD ( SCALE_R ( X := Analog4 , I_LO := 0.0 , I_HI :=
5.0 , O_LO := 0.0 , O_HI := 65535 ) ) ;
10
11 //Limit to max and min
12 IF Analog1 > 5.0 THEN
13     Analog1 := 5.0 ;
14 END_IF
15
16 IF Analog1 < 0.0 THEN
17     Analog1 := 0.0 ;
18 END_IF
19
20 //Limit to max and min
21 IF Analog2 > 5.0 THEN
22     Analog2 := 5.0 ;
23 END_IF
24
25 IF Analog2 < 0.0 THEN
26     Analog2 := 0.0 ;
27 END_IF
28
29 //Limit to max and min
30 IF Analog3 > 5.0 THEN
31     Analog3 := 5.0 ;
32 END_IF
33
34 IF Analog3 < 0.0 THEN
35     Analog3 := 0.0 ;
36 END_IF
37
38 //Limit to max and min
39 IF Analog4 > 5.0 THEN
40     Analog4 := 5.0 ;
41 END_IF
42
43 IF Analog4 < 0.0 THEN
44     Analog4 := 0.0 ;
45 END_IF
46
47
48 Data1 ( wValue := LTC2619_DATA [ 0 ] , byLowByte => LTC2619_LSB [ 0 ] , byHighByte
=> LTC2619_MSB [ 0 ] ) ;
49 Data2 ( wValue := LTC2619_DATA [ 1 ] , byLowByte => LTC2619_LSB [ 1 ] , byHighByte
=> LTC2619_MSB [ 1 ] ) ;
50 Data3 ( wValue := LTC2619_DATA [ 2 ] , byLowByte => LTC2619_LSB [ 2 ] , byHighByte
=> LTC2619_MSB [ 2 ] ) ;
51 Data4 ( wValue := LTC2619_DATA [ 3 ] , byLowByte => LTC2619_LSB [ 3 ] , byHighByte
=> LTC2619_MSB [ 3 ] ) ;
52
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53   LTC2619_Scan_Delay ( IN := LTC2619_Scan_Start , PT := LTC2619_Scan_Time , Q =>
54   LTC2619_Scan_Done , ET => LTC2619_Scan_Elapsed ) ;
55   //State machine to send DAC data to DAC channels A-D
56   //only channels 1,2 enabled
57   CASE LTC2619_State OF
58     0 :
59       LTC2619_Scan_Start := 1 ;
60       LTC2619_DATAOUT1 [ 0 ] := LTC2619_COMMAND [ 0 ] ;
61       LTC2619_DATAOUT1 [ 1 ] := LTC2619_MSB [ 0 ] ;
62       LTC2619_DATAOUT1 [ 2 ] := LTC2619_LSB [ 0 ] ;
63
64       IF LTC2619_CH1_Enabled = FALSE THEN
65         LTC2619_State := 40 ;
66       END_IF
67
68       IF LTC2619_Scan_Done THEN
69         LTC2619_Scan_Start := 0 ;
70
71         IF LTC2619_CH2_Enabled = TRUE THEN
72           LTC2619_State := 10 ;
73         ELSE
74           LTC2619_State := 40 ;
75         END_IF
76       END_IF
77
78     10 :
79       LTC2619_Scan_Start := 1 ;
80       LTC2619_DATAOUT1 [ 0 ] := LTC2619_COMMAND [ 1 ] ;
81       LTC2619_DATAOUT1 [ 1 ] := LTC2619_MSB [ 1 ] ;
82       LTC2619_DATAOUT1 [ 2 ] := LTC2619_LSB [ 1 ] ;
83
84       IF LTC2619_Scan_Done THEN
85         LTC2619_Scan_Start := 0 ;
86
87         IF LTC2619_CH3_Enabled = TRUE THEN
88           LTC2619_State := 20 ;
89         ELSE
90           LTC2619_State := 40 ;
91         END_IF
92
93       END_IF
94
95     20 :
96       LTC2619_Scan_Start := 1 ;
97       LTC2619_DATAOUT1 [ 0 ] := LTC2619_COMMAND [ 2 ] ;
98       LTC2619_DATAOUT1 [ 1 ] := LTC2619_MSB [ 2 ] ;
99       LTC2619_DATAOUT1 [ 2 ] := LTC2619_LSB [ 2 ] ;
100
101       IF LTC2619_Scan_Done THEN
102         LTC2619_Scan_Start := 0 ;
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103
104         IF LTC2619_CH4_Enabled = TRUE THEN
105             LTC2619_State := 30 ;
106         ELSE
107             LTC2619_State := 40 ;
108         END_IF
109     END_IF
110
111
112     30 :
113         LTC2619_Scan_Start := 1 ;
114         LTC2619_DATAOUT1 [ 0 ] := LTC2619_COMMAND [ 3 ] ;
115         LTC2619_DATAOUT1 [ 1 ] := LTC2619_MSB [ 3 ] ;
116         LTC2619_DATAOUT1 [ 2 ] := LTC2619_LSB [ 3 ] ;
117
118         IF LTC2619_Scan_Done THEN
119             LTC2619_Scan_Start := 0 ;
120             LTC2619_State := 40 ;
121         END_IF
122
123     40 :
124         LTC2619_State := 0 ;
125 END_CASE
126
127 //Write the data to the output registers on change only
128 IF LTC2619_DATAOUT_old1 [ 0 ] <> LTC2619_DATAOUT1 [ 0 ] THEN
129     i2c_multiple_1 . DATAOUT [ 0 ] := LTC2619_DATAOUT1 [ 0 ] ;
130     LTC2619_DATAOUT_old1 [ 0 ] := LTC2619_DATAOUT1 [ 0 ] ;
131 END_IF
132
133 //Write the data to the output registers on change only
134 IF LTC2619_DATAOUT_old1 [ 1 ] <> LTC2619_DATAOUT1 [ 1 ] THEN
135     i2c_multiple_1 . DATAOUT [ 1 ] := LTC2619_DATAOUT1 [ 1 ] ;
136     LTC2619_DATAOUT_old1 [ 1 ] := LTC2619_DATAOUT1 [ 1 ] ;
137 END_IF
138
139 //Write the data to the output registers on change only
140 IF LTC2619_DATAOUT_old1 [ 2 ] <> LTC2619_DATAOUT1 [ 2 ] THEN
141     i2c_multiple_1 . DATAOUT [ 2 ] := LTC2619_DATAOUT1 [ 2 ] ;
142     LTC2619_DATAOUT_old1 [ 2 ] := LTC2619_DATAOUT1 [ 2 ] ;
143 END_IF
144
145
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