Biblioteca

1. #ifdef USE\_MPU6050\_SOFT\_I2C
2. #define MPU6050\_I2C\_Wr Soft\_I2C\_Write
3. #define MPU6050\_I2C\_Rd Soft\_I2C\_Read
4. #define MPU6050\_I2C\_Stop Soft\_I2C\_Stop
5. #define MPU6050\_I2C\_Start Soft\_I2C\_Start
6. #else
7. #define MPU6050\_I2C\_Wr I2C1\_Wr
8. #define MPU6050\_I2C\_Rd I2C1\_Rd
9. #define MPU6050\_I2C\_Stop I2C1\_Stop
10. #define MPU6050\_I2C\_Start I2C1\_Start
11. #endif
12. #define MPU6050\_ADDRESS 0xD0
13. #define MPU6050\_RA\_XG\_OFFS\_TC 0x00
14. #define MPU6050\_RA\_YG\_OFFS\_TC 0x01
15. #define MPU6050\_RA\_ZG\_OFFS\_TC 0x02
16. #define MPU6050\_RA\_X\_FINE\_GAIN 0x03
17. #define MPU6050\_RA\_Y\_FINE\_GAIN 0x04
18. #define MPU6050\_RA\_Z\_FINE\_GAIN 0x05
19. #define MPU6050\_RA\_XA\_OFFS\_H 0x06
20. #define MPU6050\_RA\_XA\_OFFS\_L\_TC 0x07
21. #define MPU6050\_RA\_YA\_OFFS\_H 0x08
22. #define MPU6050\_RA\_YA\_OFFS\_L\_TC 0x09
23. #define MPU6050\_RA\_ZA\_OFFS\_H 0x0A
24. #define MPU6050\_RA\_ZA\_OFFS\_L\_TC 0x0B
25. #define MPU6050\_RA\_XG\_OFFS\_USRH 0x13
26. #define MPU6050\_RA\_XG\_OFFS\_USRL 0x14
27. #define MPU6050\_RA\_YG\_OFFS\_USRH 0x15
28. #define MPU6050\_RA\_YG\_OFFS\_USRL 0x16
29. #define MPU6050\_RA\_ZG\_OFFS\_USRH 0x17
30. #define MPU6050\_RA\_ZG\_OFFS\_USRL 0x18
31. #define MPU6050\_RA\_SMPLRT\_DIV 0x19
32. #define MPU6050\_RA\_CONFIG 0x1A
33. #define MPU6050\_RA\_GYRO\_CONFIG 0x1B
34. #define MPU6050\_RA\_ACCEL\_CONFIG 0x1C
35. #define MPU6050\_RA\_FF\_THR 0x1D
36. #define MPU6050\_RA\_FF\_DUR 0x1E
37. #define MPU6050\_RA\_MOT\_THR 0x1F
38. #define MPU6050\_RA\_MOT\_DUR 0x20
39. #define MPU6050\_RA\_ZRMOT\_THR 0x21
40. #define MPU6050\_RA\_ZRMOT\_DUR 0x22
41. #define MPU6050\_RA\_FIFO\_EN 0x23
42. #define MPU6050\_RA\_I2C\_MST\_CTRL 0x24
43. #define MPU6050\_RA\_I2C\_SLV0\_ADDR 0x25
44. #define MPU6050\_RA\_I2C\_SLV0\_REG 0x26
45. #define MPU6050\_RA\_I2C\_SLV0\_CTRL 0x27
46. #define MPU6050\_RA\_I2C\_SLV1\_ADDR 0x28
47. #define MPU6050\_RA\_I2C\_SLV1\_REG 0x29
48. #define MPU6050\_RA\_I2C\_SLV1\_CTRL 0x2A
49. #define MPU6050\_RA\_I2C\_SLV2\_ADDR 0x2B
50. #define MPU6050\_RA\_I2C\_SLV2\_REG 0x2C
51. #define MPU6050\_RA\_I2C\_SLV2\_CTRL 0x2D
52. #define MPU6050\_RA\_I2C\_SLV3\_ADDR 0x2E
53. #define MPU6050\_RA\_I2C\_SLV3\_REG 0x2F
54. #define MPU6050\_RA\_I2C\_SLV3\_CTRL 0x30
55. #define MPU6050\_RA\_I2C\_SLV4\_ADDR 0x31
56. #define MPU6050\_RA\_I2C\_SLV4\_REG 0x32
57. #define MPU6050\_RA\_I2C\_SLV4\_DO 0x33
58. #define MPU6050\_RA\_I2C\_SLV4\_CTRL 0x34
59. #define MPU6050\_RA\_I2C\_SLV4\_DI 0x35
60. #define MPU6050\_RA\_I2C\_MST\_STATUS 0x36
61. #define MPU6050\_RA\_INT\_PIN\_CFG 0x37
62. #define MPU6050\_RA\_INT\_ENABLE 0x38
63. #define MPU6050\_RA\_DMP\_INT\_STATUS 0x39
64. #define MPU6050\_RA\_INT\_STATUS 0x3A
65. #define MPU6050\_RA\_ACCEL\_XOUT\_H 0x3B
66. #define MPU6050\_RA\_ACCEL\_XOUT\_L 0x3C
67. #define MPU6050\_RA\_ACCEL\_YOUT\_H 0x3D
68. #define MPU6050\_RA\_ACCEL\_YOUT\_L 0x3E
69. #define MPU6050\_RA\_ACCEL\_ZOUT\_H 0x3F
70. #define MPU6050\_RA\_ACCEL\_ZOUT\_L 0x40
71. #define MPU6050\_RA\_TEMP\_OUT\_H 0x41
72. #define MPU6050\_RA\_TEMP\_OUT\_L 0x42
73. #define MPU6050\_RA\_GYRO\_XOUT\_H 0x43
74. #define MPU6050\_RA\_GYRO\_XOUT\_L 0x44
75. #define MPU6050\_RA\_GYRO\_YOUT\_H 0x45
76. #define MPU6050\_RA\_GYRO\_YOUT\_L 0x46
77. #define MPU6050\_RA\_GYRO\_ZOUT\_H 0x47
78. #define MPU6050\_RA\_GYRO\_ZOUT\_L 0x48
79. #define MPU6050\_RA\_EXT\_SENS\_DATA\_00 0x49
80. #define MPU6050\_RA\_EXT\_SENS\_DATA\_01 0x4A
81. #define MPU6050\_RA\_EXT\_SENS\_DATA\_02 0x4B
82. #define MPU6050\_RA\_EXT\_SENS\_DATA\_03 0x4C
83. #define MPU6050\_RA\_EXT\_SENS\_DATA\_04 0x4D
84. #define MPU6050\_RA\_EXT\_SENS\_DATA\_05 0x4E
85. #define MPU6050\_RA\_EXT\_SENS\_DATA\_06 0x4F
86. #define MPU6050\_RA\_EXT\_SENS\_DATA\_07 0x50
87. #define MPU6050\_RA\_EXT\_SENS\_DATA\_08 0x51
88. #define MPU6050\_RA\_EXT\_SENS\_DATA\_09 0x52
89. #define MPU6050\_RA\_EXT\_SENS\_DATA\_10 0x53
90. #define MPU6050\_RA\_EXT\_SENS\_DATA\_11 0x54
91. #define MPU6050\_RA\_EXT\_SENS\_DATA\_12 0x55
92. #define MPU6050\_RA\_EXT\_SENS\_DATA\_13 0x56
93. #define MPU6050\_RA\_EXT\_SENS\_DATA\_14 0x57
94. #define MPU6050\_RA\_EXT\_SENS\_DATA\_15 0x58
95. #define MPU6050\_RA\_EXT\_SENS\_DATA\_16 0x59
96. #define MPU6050\_RA\_EXT\_SENS\_DATA\_17 0x5A
97. #define MPU6050\_RA\_EXT\_SENS\_DATA\_18 0x5B
98. #define MPU6050\_RA\_EXT\_SENS\_DATA\_19 0x5C
99. #define MPU6050\_RA\_EXT\_SENS\_DATA\_20 0x5D
100. #define MPU6050\_RA\_EXT\_SENS\_DATA\_21 0x5E
101. #define MPU6050\_RA\_EXT\_SENS\_DATA\_22 0x5F
102. #define MPU6050\_RA\_EXT\_SENS\_DATA\_23 0x60
103. #define MPU6050\_RA\_MOT\_DETECT\_STATUS 0x61
104. #define MPU6050\_RA\_I2C\_SLV0\_DO 0x63
105. #define MPU6050\_RA\_I2C\_SLV1\_DO 0x64
106. #define MPU6050\_RA\_I2C\_SLV2\_DO 0x65
107. #define MPU6050\_RA\_I2C\_SLV3\_DO 0x66
108. #define MPU6050\_RA\_I2C\_MST\_DELAY\_CTRL 0x67
109. #define MPU6050\_RA\_SIGNAL\_PATH\_RESET 0x68
110. #define MPU6050\_RA\_MOT\_DETECT\_CTRL 0x69
111. #define MPU6050\_RA\_USER\_CTRL 0x6A
112. #define MPU6050\_RA\_PWR\_MGMT\_1 0x6B
113. #define MPU6050\_RA\_PWR\_MGMT\_2 0x6C
114. #define MPU6050\_RA\_BANK\_SEL 0x6D
115. #define MPU6050\_RA\_MEM\_START\_ADDR 0x6E
116. #define MPU6050\_RA\_MEM\_R\_W 0x6F
117. #define MPU6050\_RA\_DMP\_CFG\_1 0x70
118. #define MPU6050\_RA\_DMP\_CFG\_2 0x71
119. #define MPU6050\_RA\_FIFO\_COUNTH 0x72
120. #define MPU6050\_RA\_FIFO\_COUNTL 0x73
121. #define MPU6050\_RA\_FIFO\_R\_W 0x74
122. #define MPU6050\_RA\_WHO\_AM\_I 0x75
123. typedef struct
124. {
125. struct
126. {
127. signed int X;
128. signed int Y;
129. signed int Z;
130. }Accel;
131. signed int Temperatura;
132. struct
133. {
134. signed int X;
135. signed int Y;
136. signed int Z;
137. }Gyro;
138. }MPU6050;
139. void MPU6050\_Init()
140. {
141. MPU6050\_I2C\_Start();
142. MPU6050\_I2C\_Wr( MPU6050\_ADDRESS );
143. MPU6050\_I2C\_Wr( MPU6050\_RA\_PWR\_MGMT\_1 );
144. MPU6050\_I2C\_Wr( 2 ); //Sleep OFF
145. MPU6050\_I2C\_Wr( 0 );
146. MPU6050\_I2C\_Stop();
147. MPU6050\_I2C\_Start();
148. MPU6050\_I2C\_Wr( MPU6050\_ADDRESS );
149. MPU6050\_I2C\_Wr( MPU6050\_RA\_GYRO\_CONFIG );
150. MPU6050\_I2C\_Wr( 0 ); //gyro\_config, +-250 °/s
151. MPU6050\_I2C\_Wr( 0 ); //accel\_config +-2g
152. MPU6050\_I2C\_Stop();
153. }
154. void MPU6050\_Read( MPU6050 \*Sensor )
155. {
156. MPU6050\_I2C\_Start();
157. MPU6050\_I2C\_Wr( MPU6050\_ADDRESS );
158. MPU6050\_I2C\_Wr( MPU6050\_RA\_ACCEL\_XOUT\_H );
159. MPU6050\_I2C\_Start();
160. MPU6050\_I2C\_Wr( MPU6050\_ADDRESS | 1 );
161. Sensor->Accel.X = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(1);
162. Sensor->Accel.Y = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(1);
163. Sensor->Accel.Z = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(1);
164. Sensor->Temperatura = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(1);
165. Sensor->Gyro.X = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(1);
166. Sensor->Gyro.Y = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(1);
167. Sensor->Gyro.Z = ( MPU6050\_I2C\_Rd(1) << 8 ) | MPU6050\_I2C\_Rd(0);
168. MPU6050\_I2C\_Stop();
169. Sensor->Temperatura += 12421;
170. Sensor->Temperatura /= 340;
171. }

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Exemplo

1. //Habilitar as seguintes bibliotecas:
2. // - Soft\_I2C
3. // - Lcd
4. // - Conversions e C\_String
5. #define USE\_MPU6050\_SOFT\_I2C
6. //Copie e cole a biblioteca aqui!!
7. sbit MPU6050\_Scl at RB6\_Bit;
8. sbit MPU6050\_Sda at RB7\_Bit;
9. sbit MPU6050\_Scl\_Direction at TRISB6\_Bit;
10. sbit MPU6050\_Sda\_Direction at TRISB7\_Bit;
11. sbit LCD\_RS at RB5\_bit;
12. sbit LCD\_EN at RB4\_bit;
13. sbit LCD\_D4 at RB3\_bit;
14. sbit LCD\_D5 at RB2\_bit;
15. sbit LCD\_D6 at RB1\_bit;
16. sbit LCD\_D7 at RB0\_bit;
17. sbit LCD\_RS\_Direction at TRISB5\_bit;
18. sbit LCD\_EN\_Direction at TRISB4\_bit;
19. sbit LCD\_D4\_Direction at TRISB3\_bit;
20. sbit LCD\_D5\_Direction at TRISB2\_bit;
21. sbit LCD\_D6\_Direction at TRISB1\_bit;
22. sbit LCD\_D7\_Direction at TRISB0\_bit;
23. MPU6050 Sensor;
24. char msg[12];
25. void main()
26. {
27. CMCON = 7;
29. Soft\_SPI\_Init();
30. Lcd\_Init();
31. Lcd\_Cmd( \_LCD\_CURSOR\_OFF );
32. Soft\_I2C\_Init();
33. MPU6050\_Init();
35. while(1)
36. {
37. MPU6050\_Read( &Sensor );
39. IntToStr( Sensor.Gyro.X, msg );
40. Lcd\_Out( 1, 1, msg );
42. IntToStr( Sensor.Gyro.Y, msg );
43. Lcd\_Out( 1, 8, msg );
44. IntToStr( Sensor.Gyro.Z, msg );
45. Lcd\_Out( 2, 1, msg );
47. Delay\_ms( 500 );
48. }
49. }