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/*****************************************************************************************************
Project:    twi_xmple.c
Version:    1.0
Date:       09/15/2004
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Company:    MyRobot
Comments:   This program interfaces with the SRF-08 Sonar Ranging Module via the TWI (I2C) port and protocol.
            This also demonstrates the use of the TWI_MT and TWI_MR function calls.

Robot Type: MyRobot Mini-Computer
*****************************************************************************************************/
//Compiler Derectives

    //Includes
    #include <modelt.h>
    #include <twi.h>

    //Defines
    #define     SRF_08          0xE0
    #define     COMMAND_REG     0x00
    #define     RANGE_INCH      0x50
    #define     RANGE_CM        0x51
    #define     RESULT_REG      0x02

//Global Variables
    char t[16];         //Used for sending data to the LCD

//Sub-Function Prototypes
    void ERROR(uint8_t step);

//Main
    int main(void)
    {
    //Local Variables
    uint8_t temp[2];                //values to start a ranging session
    uint8_t srf_results[32];        //array that stores the range results

    //Initialization
        reset();            //Reset and all ports and peripherials
        lcd_init();         //Initialize the LCD
        init_twi();         //Initialize the TWI

    //Enable global interrupts (Keep this instruction at the end of initialization).
        asm volatile ("sei");

    //Main Exectution Code

        //Display something so that we know the LCD is working
//      sprintf(t,"Ready...");
//      line1(t);
//      ms_spin(1000);

        while (1) {
            //Write the command start start a ranging session in inches
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55              temp[0] = COMMAND_REG;
56              temp[1] = RANGE_INCH;
57              if(TWI_MT(SRF_08, 2, temp))
58                  ERROR(1);
59
60              //Delay 70 mS to wait for ranger to do it's thing before reading the results. Durring this
61              //time the SRF-08 will not respond to TWI protocol.
62  //          ms_spin(70);
63
64              //Retrieve the SRF-08 ranging results
65              temp[0] = RESULT_REG;
66              if(TWI_MT(SRF_08, 1, temp))     //Tell the SRF-08 which register we want to read
67                  ERROR(2);
68              if(TWI_MR(SRF_08, 4, srf_results))  //Read the first result
69                  ERROR(3);
70
71              //display recieved ranging data on LCD
72                  //clear LCD
73                  sprintf(t,"                ");
74                  line1(t);
75                  line2(t);
76
77                  //print output to LCD
78                  sprintf(t,"1st: %d\"   ", (srf_results[0]*256+srf_results[1]) );
79                  line1(t);
80                  sprintf(t,"2nd: %d\"   ", (srf_results[2]*256+srf_results[3]) );
81                  line2(t);
82
83  //          ms_spin(5000);
84          }
85      }
86
87      void ERROR(uint8_t step)
88      {
89          //clear line 1
90          sprintf(t, "              ");
91          line1(t);
92          line2(t);
93
94          //Display the contents of TWSR on line1
95          sprintf(t,"TWSR: %X", (TWSR & 0xF8) );
96          line1(t);
97          sprintf(t,"Error: %d", step);
98          line2(t);
99
100         //Loop forever
101         while (1)
102             ;
103
104     }
105
106
```