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/*****
/*
/*  FILENAME:    mandec.h
/*
/*
/*  ABSTRACT:
/*      Header file for manchester decoder functions.
/*
/*
/*  CHANGE LOG:
/*      DATE      AUTHOR      SDR      DESCRIPTION
/*  28-jan-12    M.Karas      ---      Original setup C language
/*                                          with SiLabs C8051F340 processor.
/*
/*
*****/

#ifndef _MANDEC_H
#define _MANDEC_H

/* timing definitions taken from the timing_calc_F340 spreadsheet included */
/* in the source code directory. These based upon the timer getting its clock */
/* at the crystal/12 rate */

/* Manchester 1T, 2T, and 3T pulse widths with 12% margins */
#define T1_LO      1622      /* 0.88 * TMR_1000uS */
#define T1_HI      2064      /* 1.12 * TMR_1000uS */
#define T2_LO      3465      /* 1.88 * TMR_1000uS */
#define T2_HI      3908      /* 2.12 * TMR_1000uS */
#define T3_LO      5308      /* 2.88 * TMR_1000uS */
#define T3_HI      5751      /* 3.12 * TMR_1000uS */

/* global manchester decoder variables */
extern bit decode_enable; /* flag used to enable/disable the manchester decoder */
extern bit hilo_bit; /* flag used to tracks the high or low pulse interrupt */
/* state 1=just captured high width (H->L interrupt */
/*          0=just captured low width (H->H interrupt */

extern unsigned int width; /* captured width of a timer pulse */
extern unsigned char xdata bit_buf[32]; /* 256 bits buffer to hold serial bit stream */
extern unsigned char xdata bit_idx; /* index to bit position in the bit_buf[] array */
extern unsigned char code bit_masks[8]; /* bit level access masks */
extern unsigned char man_state; /* manchester decoder state machine state variable */

/* decoder function prototypes */
extern void manch_init(void); /* manchester state machine initialize routine */
extern void init_x0(void); /* initialize / enable external interrupt 0 */
extern void init_x1(void); /* initialize / enable external interrupt 1 */
extern void init_t1(void); /* initialize the timer 1 for pulse width measure */
extern void x0_isr(void); /* external interrupt 0 service routine */
extern void x1_isr(void); /* external interrupt 1 service routine */
extern void man_init(void); /* manchester decoder state machine initialize */
extern void man_decode(void); /* manchester decoder state machine routine */
extern void put_bit(unsigned char index, bit bitval); /* store bit value into bit array */

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extern bit get_bit(unsigned char index); /* retrieve bit value from bit array */

/* manchester decoder machine state variable values */
/* see visio drawing ManchesterTiming.vsd in display master */
/* for the protocol definition and explanations */
enum man_decode_states
{
    MAN_STATE_IDLE,           /* idle state waiting for decode enable */
    MAN_STATE_SYNC_HI,        /* state waiting for 3T.Hi sync pulse */
    MAN_STATE_SYNC_LO,        /* state waiting for 3T.Lo sync pulse */
    MAN_STATE_FAKE_0,          /* state waiting for 1T.Hi part of Fake 0 bit */
    MAN_STATE_1T2T_LO,         /* state waiting for 1T.Lo or 2T.Lo */
    MAN_STATE_1T_HI,           /* state waiting for 1T.Hi */
    MAN_STATE_1T2T_HI,         /* state waiting for 1T.Hi of 2T.Hi */
    MAN_STATE_1T_LO            /* state waiting for 1T.Lo */
};

#endif /* end of _MANDEC_H */
```