Physics and Astronomy Dept.
UBC
SCUBA-2 Project

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SC2-ELE-S589-202
Version 1.1

Sync Box

Microcontroller Software Description

Revision History:

Rev. 1.a RJ Mar. 30, 2007 Draft

Rev. 1.1 MA Jun. 7, 2007 added document number and revision history

SyncoCmd is a Keil µVision3 project written in C for the Atmel AT89C5131. It forms the interface between a user and the firmware in the adjacent CPLD that generates a Manchester encoded synchronization bitstream which goes to the MCE over optical fibre links. SyncoCmd handles user RS-232 serial input commands to change or report back the operating mode and values being used by the CPLD firmware. For more information see the SyncBox User Guide.

(Valid for CPLD firmware SC2-SyncBox-6c and software SyncoCmd-1c)

Files:

File: SyncoCmd.c
Function: This is the top-level program file. It contains main(), the command io handling loop, the defines for the intial operating mode and values, and all the upper level command routines.

File: SyncoCmd.h
Function: This contains a few defines and the function prototypes for all program components.

File: cmddict.c
Function: Contains the command dictionary structure and the command line parsing and error handling functions.

File: piolib.c
Function: This module contains the defines and functions that implement the parallel io interface to the CPLD. Note that the AT89C5131 is a big-endian processor, while the CPLD registers are used and loaded as little-endian. A union is defined that makes an unsigned long or an unsigned int byte accessible, and functions are written so that the CPLD register get the bytes loaded in the correct order.

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A 32 bit big-endian value of 0x004A4F4E would be stored:

Byte Address	+0	+1	+2	+3
Contents	0x00	Ox4A	0x4F	0x4E

A 32 bit little-endian value of 0x57415244 would be stored:

Byte Address	+0	+1	+2	+3
Contents	0x44	Ox52	0x41	0x57

A 16 bit big-endian value of 0x1234 would be stored:

Byte Address	+0	+1
Contents	0x12	Ox34

A 16 bit little-endian value of 0x1234 would be stored:

Byte Address	+0	+1
Contents	0x34	Ox12

File: sio.c
Function: Contains the RS232 initialization and interrupt service routines.