

SNOBLEN & ASSOCIATES

Document
EV Charger-SDD0100

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20 June 2000

EV CHARGER

SOFTWARE DESIGN DOCUMENT PHASE 1

Snoblen & Associates
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Revision History

DOCUMENT	DATE	COMMENTS
EV Charger -SDD0100	20 June 2000	Original release.

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1. Introduction

This is the Software Design Document (SDD) for the EV Charger project.

1.1 Purpose

The purpose of this SDD is to specify the design to meet the requirements specified in the SRS.

1.2 Scope

This document shall contain all the design information for the EV Charger software.

1.3 Definitions, acronyms, and abbreviations

EV Electric Vehicle
SRS Software Requirements Specification
SDD Software Design Document
HDD Hardware Design Document

1.4 References

The following documents form a part of this specification to the extent specified. In the case of conflict between a cited document and this specification, this specification shall be considered a superseding document.

EV Charger SRS-0100

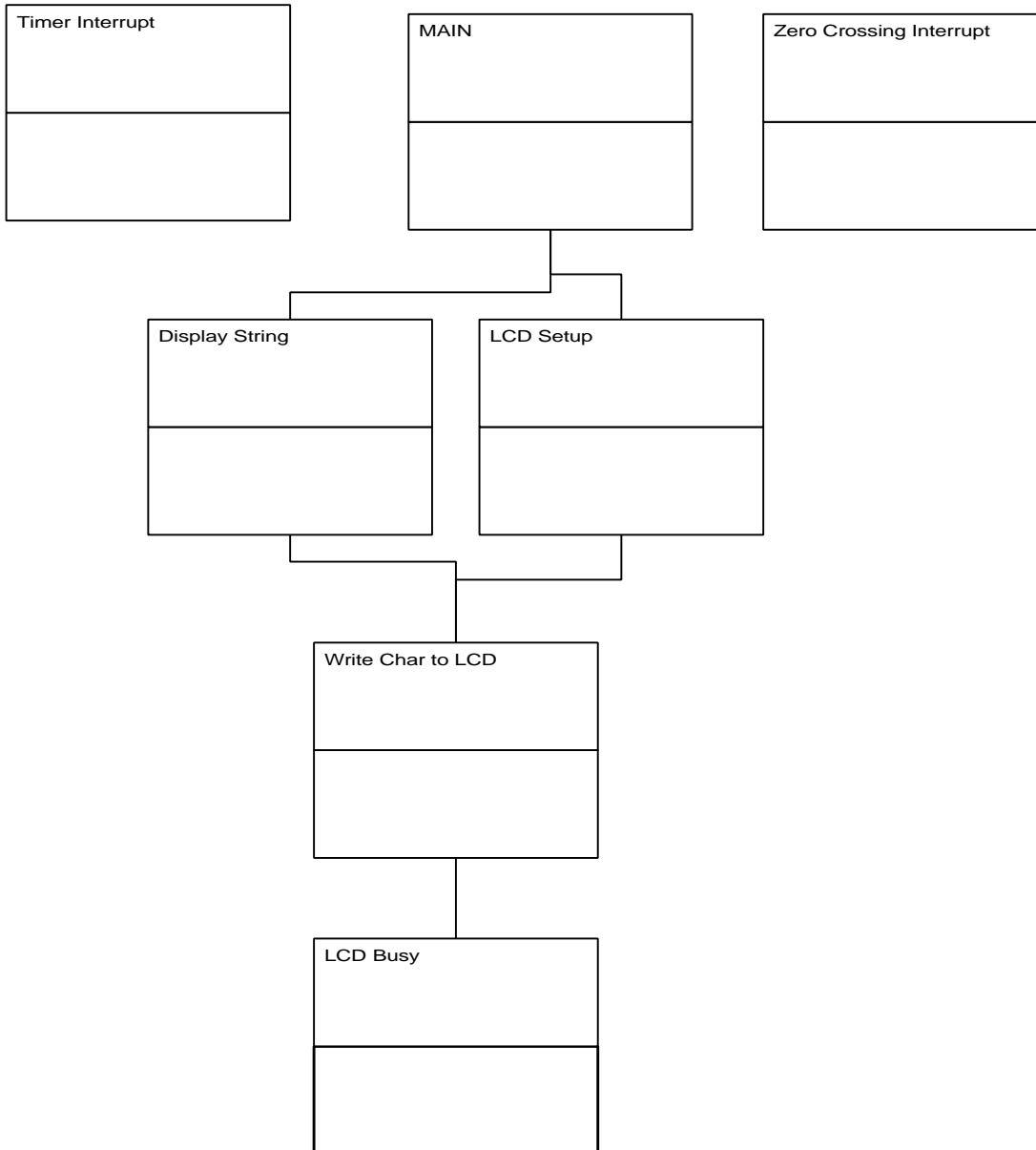
Data Sheets

 Maxim MAX110/MAX111 19-0283 Rev 3 3/96 data sheet

 Intel 8752 Manual

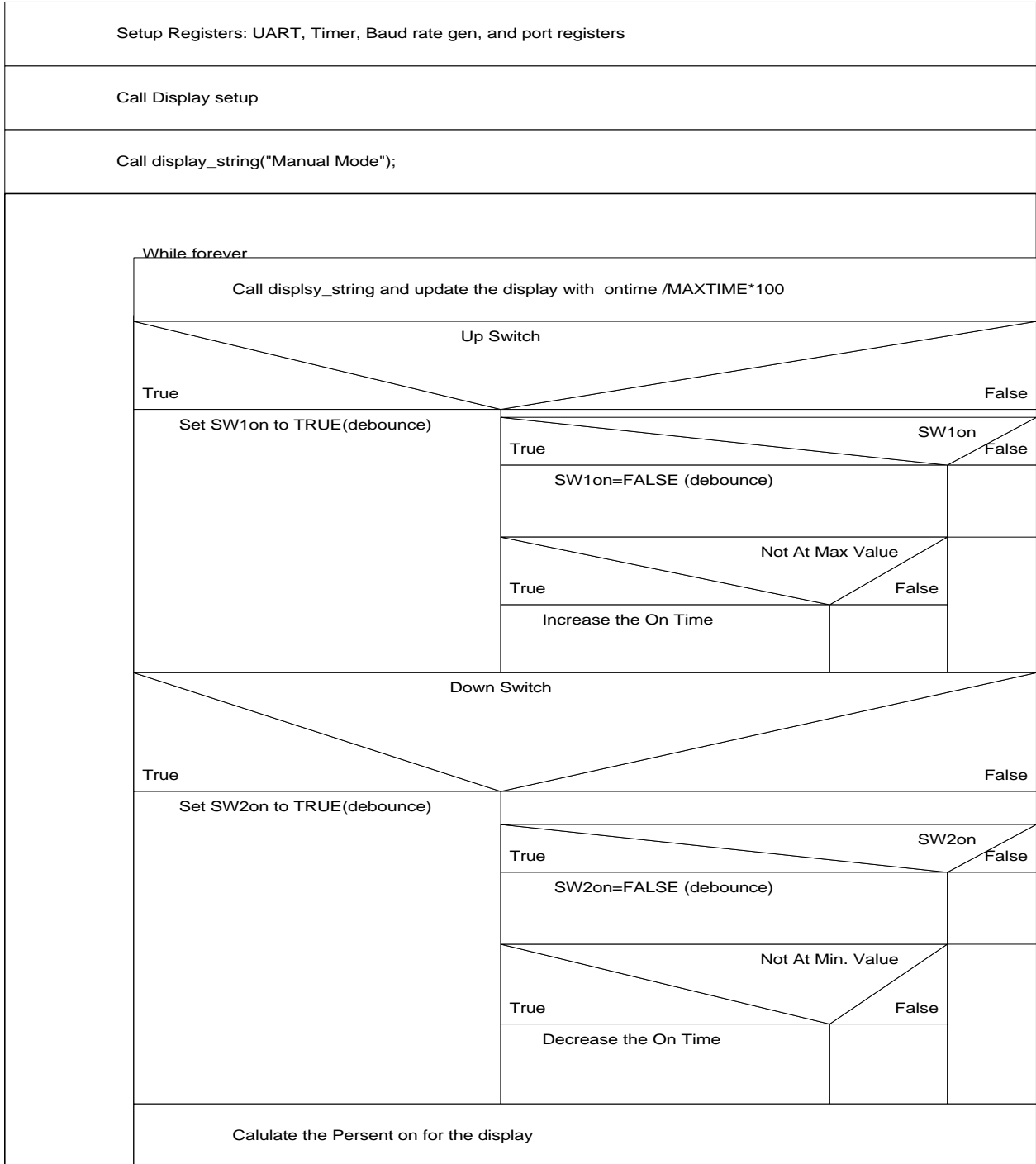
2. Design Description

The design is a straight foreword loop design, supplement with a zero crossing interrupt and a timer or tic counter interrupt. The call tree below show the structure between routines.



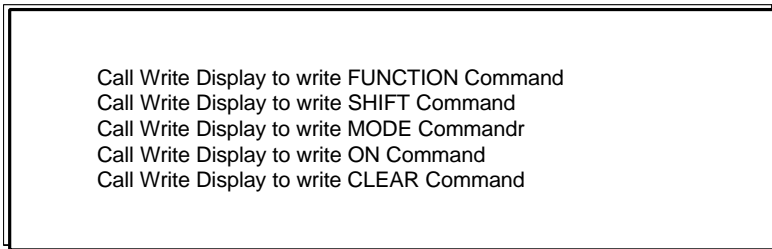
2.1 Main

This is the entry point of the program. First a linear section of code is used to initialize the system. It then enters an endless loop. I which it checks the condition of the switches and increases or decreases the On Time Value.



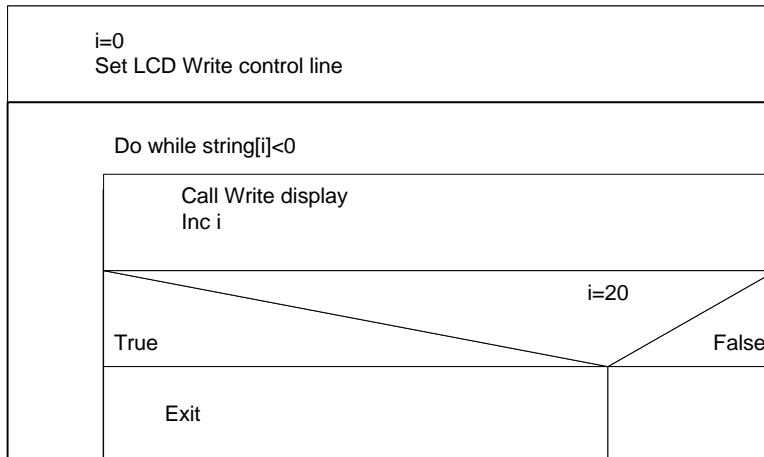
2.1.1 LCD Setup

A series of bytes is written to the LCD to set it up for operation



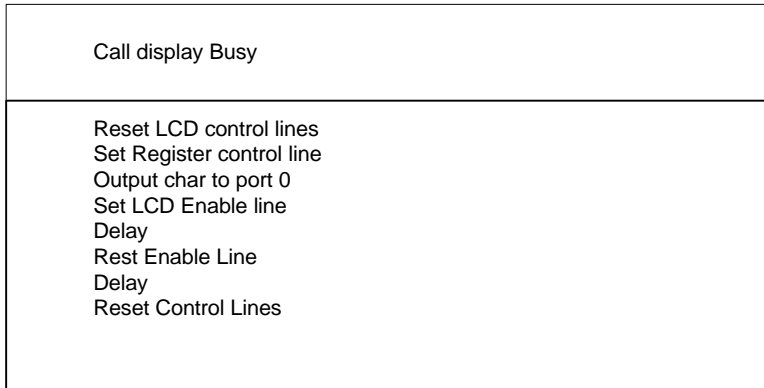
2.1.2 Display String

This routine outputs a string to the LCD until a zero character is encountered.



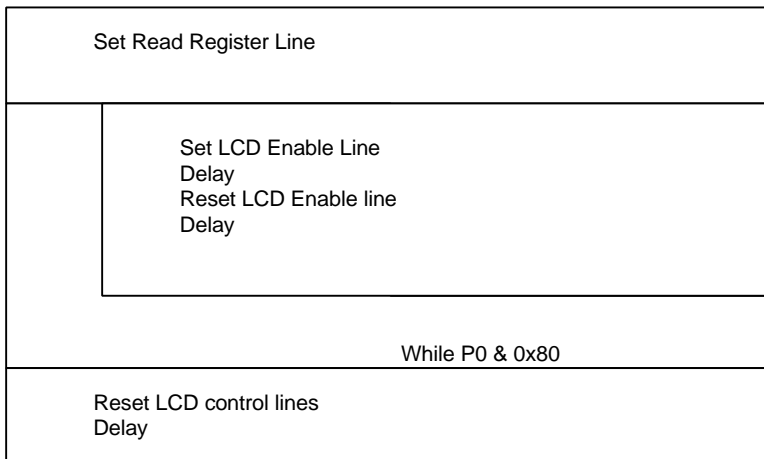
2.1.3 Display Char

Load a single character into the LCD.



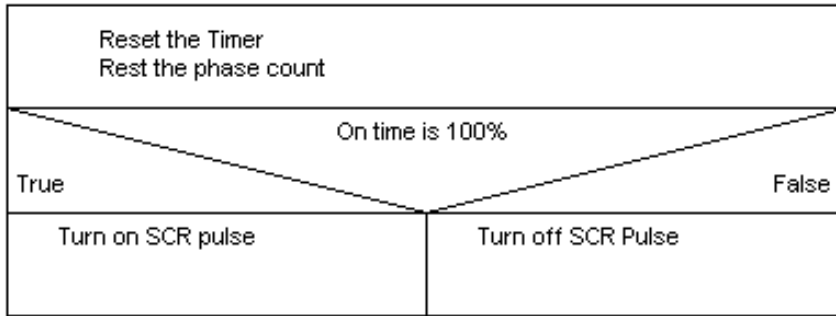
2.1.4 LCD Busy

Checks if the LCD is busy and waits till it is not.



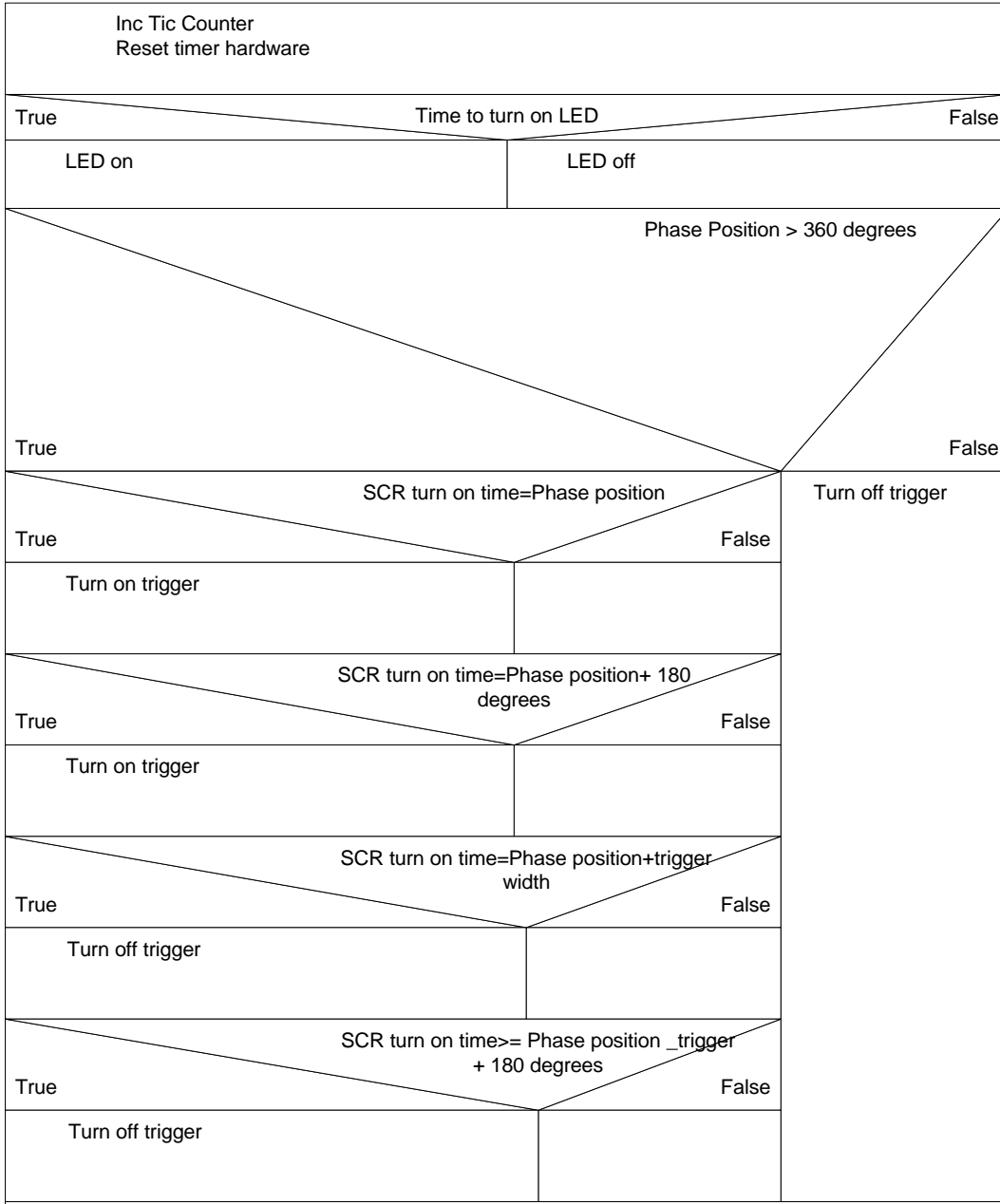
2.2 Zero Crossing Interrupt

This routine is executed when a zero cross occurs, it reset the clock and phase position to zero.



2.3 Timer Interrupt

This routine is executed when the tic time over runs, at which time it set the LED to either on or off and set the SCR trigger line to the proper state.



3. Short Falls

This design was kept simple so that a system could be implemented quickly. The following requirements where not satisfied:

- RS-232 communications

The following area could be improved:

- The LCD interface has many delays in the current design, a redesign to a state machine would greatly speed up the system.
- Change the tic timer to actual measure the on and off times would reduce overhead and give better control of the system

4. Appendices

I/O MAP

PORT	BIT	Function
0	0	i/o Bit 0 of the LCD data/reg input
	1	i/o Bit 1 of the LCD data/reg input
	2	i/o Bit 2 of the LCD data/reg input
	3	i/o Bit 3 of the LCD data/reg input
	4	i/o Bit 4 of the LCD data/reg input
	5	i/o Bit 5 of the LCD data/reg input
	6	i/o Bit 6 of the LCD data/reg input
	7	i/o Bit 7 of the LCD data/reg input
1	0	
	1	input from the AtoD data
	2	
	3	
	4	
	5	
	6	input SW2
	7	input SW1
2	0	Output LED
	1	Output LCD R/W
	2	Output LCD select
	3	Output LCD data/reg
	4	Output AtoD clock
	5	Output AtoD Select
	6	Output AtoD data
	7	Trigger
Int		input phase 0