Software Design Description

for

AmpV2

Version 1.0

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

This SDD describes the software for the Amp-V2 Project

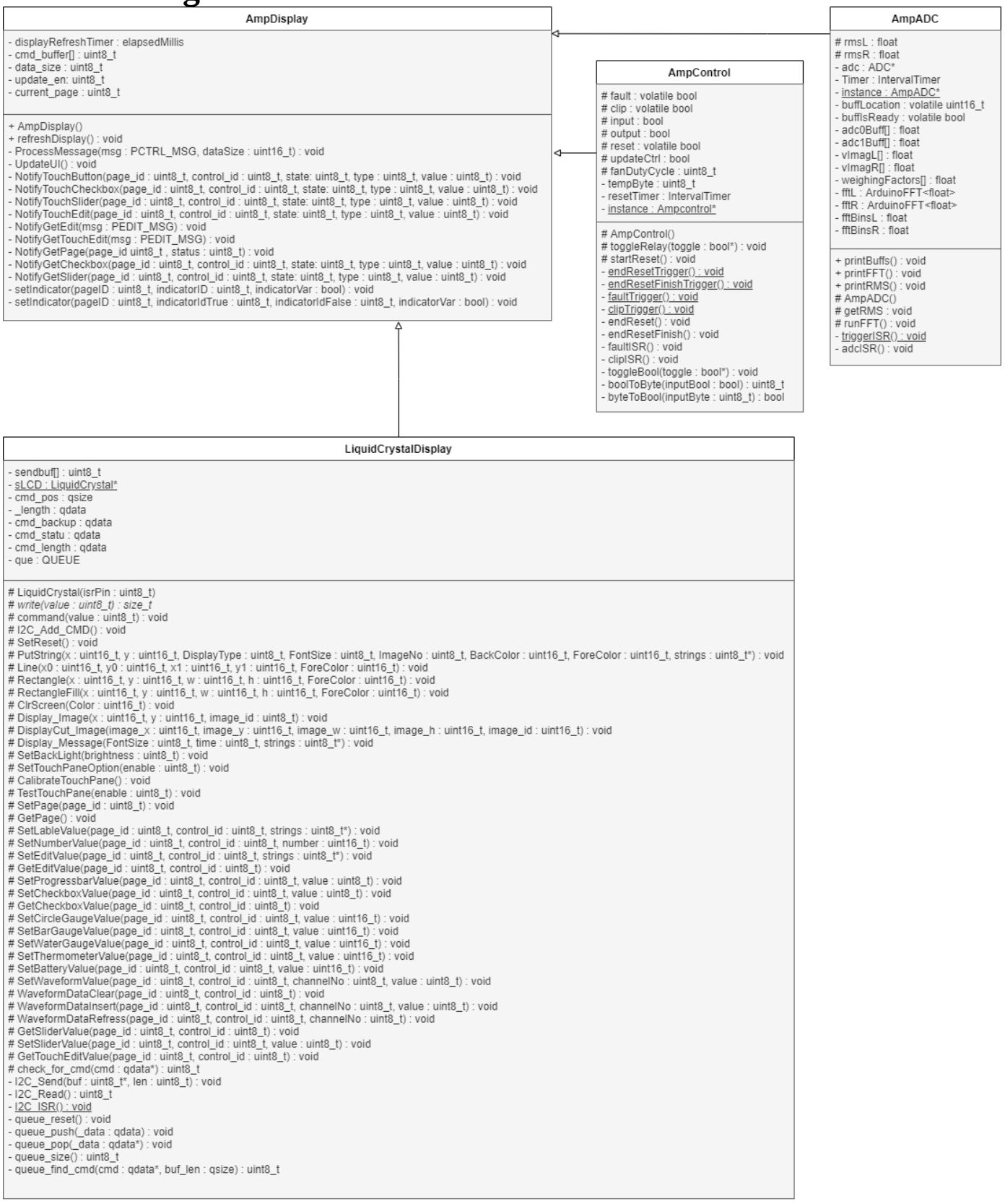
1.2 Scope

This software runs on a Teensy microcontroller and is mainly used to control inputs/outputs for the amplifier and display relevant information from the amplifier such as clip/fault states and rms audio levels.

1.3 Overview

This document consists of the introduction (above), a class diagram to show the relationship between classes and their included functions, and an interface design chart to document relevant functions.

2. Class Diagram



3. External Interface Requirements

Function Name	Class	Parameters	Return	Description
printBuffs	AmpADC	void	void	Print out the ADC buffers directly onto the Arduino serial plotter.
printFFT	AmpADC	void	void	Print out the Fourier Transform of the ADC buffers to the Arduino serial plotter. Calls runFFT() internally.
printRMS	AmpADC	void	void	Print out the RMS level of the ADC buffers to the Arduino serial plotter. Calls getRMS() internally.
getRMS	AmpADC	void	void	Checks the ADC buffers are full and computes the RMS value of the buffers in dB. Results are stores in rmsL and rmsR.
runFFT	AmpADC	void	void	Checks the ADC buffers are full and computes the Fourier Transform on them. Results are stored directly onto the ADC buffers.
toggleRelay	AmpControl	bool *toggle	void	Input parameter is the address of the variable that stores either the state of the input or the output relay. It then starts a reset and swaps the input or output relay (depending on which one was passed in) and updates the value of the bool.
startReset	AmpControl	void	void	Pulls the reset pin low and starts an IntervalTimer to end the reset after a specified delay.
refreshDisplay	AmpDisplay	void	void	Tries to refresh the display at a specific frequency (set by MAX_REFRESH_RATE). Checks the display's command queue for any new data from the display. If on the main page, this handles updating the RMS meters as well. If on the FFT page, this handles displaying FFT data.
SetCircleGuageValue	LiquidCrystalDisplay	uint8_t page_id, uint8_t control_id, uint16_t value	void	Sets the circle gauge with object ID = control_id on page number = page_id to value in degrees.
SetSliderValue	LiquidCrystalDisplay	uint8_t page_id, uint8_t control_id, uint8_t value	void	Sets the slider with object ID = control_id on page number = page_id to value from 0 to 100.
SetProgressBarValue	LiquidCrystalDisplay	uint8_t page_id, uint8_t control_id, uint8_t value	void	Sets the progress bar with object ID = control_id on page number = page_id to value from 0 to 100.
SetPage	LiquidCrystalDisplay	uint8_t page_id	void	Sets the page on the display to page_id

NOTE: Only relevant LiquidCrystalDisplay functions listed