ClearView Firmware Revision History

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Purpose

The purpose of this document is to describe revision history of the ClearView Firmware starting from project implementation through the current version of the software.

1.0 ClearView Firmware Revision History

The revision history contained in this document is an overview. The pre-release versions (all versions before R04.00.00) were controlled by EPIC's software development consultant. For any of the released versions (version R04.00.00 and newer) listed in the table below, the exact files changed as well as the exact changes can be viewed using the Source Code Control System (SCCS) tool. The versions are listed from oldest to newest in the table below:

Version #	Date Established	Changes Made to Codebase
R04.00.00	6-Mar-12	Initial release for clinical trials General comment cleanup. Removed unused developmental code. Same as R03.99.29 except for version number
R03.99.29	11-Jan-12	Gated PWM0 development test firmware. All compiler optimizations are disabled. The PWM timer is always running. The PWM0 pulses are controlled by configuring the pin as an input or output. When the PWM0 pin is configured as an input, the pulses are inhibited. When the PWM0 pin is configured as an output, the pulses are output. Before disabling the PWM0 output, the output is tested to ensure it is inactive before disabling the output. The "width" command was removed. The host is no longer able to change the width of the PWM0 pulse.

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		General cleanup of unused and commented out code. Revision R03.99.29 is based on R03.99.27
R03.99.27	10-Jan-12	Same as R03.99.26 with the addition of gating the PWM0 pin The gating function is accomplished by configuring the PWM0 pin as an input to prevent PWM0 pulses, or as an output to allow PWM0 pulses
R03.99.26	10-Jan-12	PWM0 'test software' Same as R03.99.25 with the exception: - The NOP instructions were replaces with the actual PWM0 deasserted code.
R03.99.25	10-Jan-12	PWM0 'test software' Same as R03.99.24 with the following exceptions. - All compiler optimization was turned off - The PWM0 pin deasserted code was replaced with NOP instructions. This was to keep the binary image as similar as possible.
R03.99.24	9-Jan-12	PWM0 'event' fix: Added same PWM0 pin deasserted test code to the fatal Boost overvoltage code.
R03.99.23	5-Jan-12	PWM0 'event' fix:Added code to exposure.c to ensure the PWM0 pin is deasserted beforeturning off the PWM timer and forcing the PWM0 to the deasserted state.This is to prevent a short PWM0 pulse from causing an EMI event that causesthe MCU to reset. During the reset event, the PWM0 pin appears to become assertedand causes the high voltage to exceed the desired value
R03.99.21	12-Dec-11	PWM0 workaround: Changed the initialization code to run the PWM peripheral with the PWM0

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		pin configured as an input. This prevents the PWM waveform from appearing on the PWM0 pin. This workaround was added to prevent an extremely long pulse for the 1st PWM pulse of the 1st exposure after power up. This was observed at PWM0 frequencies of 750, 800, and 850 Hz.
R03.99.19	12-Aug-11	Bug fix: Changed the SPI interrupt to high priority to prevent host command interrupts from clobbering a SPI transaction in progress. This bug caused errors; 0x90, 0x91, 0xB0, or 0xB1 to be reported when issuing host commands. Also added a wait loop to wait for SPI writes to the digital pot to complete before continuing. Revision reporting change: If the firmware is compiled for a debug target, the revision identification starts with a 'X', instead of the 'R' used for release targets. Example: X03.99.19 -> eXperimental revision 03.99.19 R03.99.19 -> Release revision 03.99.19 Linker change: Incorporated diagnosticsOnly.c directly into as a source module instead of linking it as a library. This was done because the diagnosticsOnly module is now used for release builds as well as debug builds. General code cleanup: Removed conditional compiled developmental code, and commented out code. Removed diagnostic code used in revisions RX3.99.11 though

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		RX3.99.18.
R03.99.09	3-Aug-11	Bug fix: Sometimes Boost power failed to turn on after reset. Found: Logic for averaging Boost ADC reading could hang if 0 volts was returned. Changed average ready signature from 0 to BAD_ADC.
R03.99.08	3-Aug-11	Operation change:In revision 04.99.06 it was decided to include the diagnostic mode commandsto the release. This has a side effect of enforcing the 0.5 secondinter-character host command timeout. This timeout makes communication withthe ClearView by typing on a terminal difficult.The firmware was changed to disable the inter-character timeout when the diagnostic mode 'Terminal' is entered. Enter T=1<cr> to enter terminal mode.
R03.99.07	1-Aug-11	Bug fix: The lookup table value to set the PWM0 frequency to 950 Hz was incorrect. The value was corrected to 0x84 from the incorrect 0x94 Bug fix: The 5 ms firmware clock was running at 5.117 ms due to ISR overhead. Timer0 was changed 16-bit counter from an 8-bit counter. The timer0 prescalar was changed to 2:1 from 64:1. The timer0 reset value (time period) was change to 0xECEC from 0x63
R03.99.06	26-Jul-11	Logic added to prevent use of the averaged Boost Voltage ADC reading until the averaging array has been filled and the average value is valid. Added the diagnostic only command to the release.
R03.99.05	13-Jun-11	Work in progress. Not for use. Boost voltage ADC test are enabled.
R03.99.04	13-Jun-11	Same as 03.99.03 with the addition of using a simple moving average of

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		the Boost voltage ADC readings. The ADC raw readings are averaged over 16 samples. For diagnostic purposes, all tests of the Boost voltage ADC readings have been disabled. These changes are marked with verbose comments. These changes are only effective in DEBUG builds.
R03.99.03	11-Jun-11	For diagnostic purposes, all tests of the Boost voltage ADC readings have been disabled. These changes are marked with verbose comments. These changes are only effective in DEBUG builds.
R03.99.02	4-Feb-11	Initial development

EPIC™ RESEARCH DIAGNOSTICS

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Document Revision History

Version Number:	Description of Change:	Date:	Updated by:
000	Introduction	5/21/12	A. Mason