

Revised Software Requirements for Apgar Timer

Further to the Project Meeting on 4th January 05, where a prototype of the Apgar Timer was reviewed, the functional requirements were revised and the latest specification is detailed in this document. Should the proposed revisions be impossible or impractical to implement, then they may be subject to further review.

Modes of Operation

The timer will, at all times, be in 1 of 4 modes of operation:

Standby Mode: No digits displayed, colon flashing.

Lo Batt Mode: Flashing from "Lo" to "Batt" in 1 second intervals, with decimal points indicating approximate remaining life battery life.

Counting Mode: Digits counting up in seconds, colon static.




Freeze Mode: Digits static, displaying count at time *Freeze Mode* entered, colon flashing.

Additionally a *Reset Function* will be incorporated, it is to consist of illuminating all segments of the LCD for 1 second, then re-entering *Standby Mode* or *Lo Batt Mode*.

Note: *Lo Batt Mode* can only be entered from *Standby Mode*. The software is to treat *Lo Batt Mode* in the same way as *Standby Mode* and the key-presses from each mode will have the same actions, with the exception that the *Reset Function* will return the unit to *Lo-Batt Mode*.

After the timer has reached 59:59 in *Counting Mode* or *Freeze Mode*, the device should re-enter *Standby Mode* or *Lo Batt Mode*.

Matrix Detailing Key-Press Functions

Action Resulting from Keypress During Different Modes of Operation				
Key	Standby Mode	Lo Batt Mode	Counting Mode	Freeze Mode
	Enters <i>Counting Mode</i> from 0:00	Enters <i>Counting Mode</i> from 0:00	No action	Re-enters <i>Counting Mode</i> from accumulated time
	No action	No action	Enters <i>Freeze Mode</i>	Re-enters <i>Counting Mode</i> from accumulated time
	Perform <i>Reset Function</i> , enters <i>Standby Mode</i>	Perform <i>Reset Function</i> , enters <i>Lo Batt Mode</i>	Perform <i>Reset Function</i> , enters <i>Standby Mode</i> or <i>Lo Batt Mode</i>	Perform <i>Reset Function</i> , enters <i>Standby Mode</i> or <i>Lo Batt Mode</i>

The software should ignore multiple simultaneous key presses if possible.

Low Battery Indications

A low battery condition is to be displayed using 2 methods of indication, firstly the message "Lo Batt" is to be displayed on the LCD, flashing at 1 second intervals between the message "Lo" and "Batt". In all other respects *Lo Batt Mode* is the same as *Standby Mode*.

Additionally, the 3 decimal points are to be used to indicate the approximate level of battery life remaining, to be displayed during *Lo Batt Mode*, but not during *Counting Mode*.

All 3 points lit indicates a higher remaining life than 2 points or 1, when the points are switched off they should disappear from the left, hence the last remaining point will be the rightmost one.

It is accepted that this 'life remaining' indicator is for indication only and may not correspond directly to a linear decay of the remaining battery life.

Following battery replacement, or interruption of the electrical supply for any reason, the unit should run the *Reset Function*.

Audio Indications

Each button press requires a positive click or beep sound to be generated by the internal sounder, applicable to every button press regardless of whether that press has an associated action. The exact sound is to be decided during the implementation, but provisionally a 10th second beep was suggested as an example.

Timing indications are to be in the form of an audible signal in bursts of approximately 1 second in duration, with a period of approximately 1 second of trailing silence in the case of multiple signals. The indication is to occur in the following format:

- At 1 minute: 1 beep
- At 5 minutes: 2 beeps
- At 10 minutes: 3 beeps

The audible timing indications are still to occur should the timer be in *Freeze Mode* when the actual count reaches an alarm threshold.

If possible the volume of the Audio Indications is to be software adjustable.