Advanced LIGO Engineering Change Request (ECR)

ECR Title: Timing System: 0.5Hz LED Fix

DCC No: E1600261-v1

Date: 8/17/2016

Requester: Daniel Sigg   **Impacted Subsystem(s): DAQ   Timing**

Description of Proposed Change(s): We propose to upgrade the FPGA code in the timing system to eliminate the blinking LEDs during normal operations. The current LED typically have 3 states: off, on and blinking. This will be changed to off, blinking and on. We will also add a diagnostics capabilities to request individual timing boards to blink at a specified frequency.

Reason for Change(s): 0.5Hz and harmonics were seen in the GW spectrum and the blinking LEDs are the most likely culprit.

Estimated Cost: No significant hardware changes.

Schedule Impact Estimate: requires full reboot of all front ends.

Nature of Change (check all that apply):
- [ ] **Hardware Safety**
- [ ] **Correct Hardware**
- [ ] **Correct Documentation**
- [x] **Improve Hardware**
- [ ] **Improve/Clarify Documentation**
- [ ] **Change Interface**
- [ ] **Change Requirement**

Importance:
- [ ] **Desirable for ease of use, maintenance, safety**
- [ ] **Desirable for improved performance, reliability**
- [x] **Essential for performance, reliability**
- [ ] **Essential for function**
- [ ] **Essential for hardware safety**

Urgency:
- [ ] **No urgency**
- [x] **Desirable by date/event: _before O2 ____**
- [ ] **Essential by date/event: _____**
- [ ] **Immediately (ASAP)**

Impacted Hardware (select all that apply):
- [ ] **Repair/Modify. List part & SNs: _____**
- [ ] **Scrap & Replace. List part & SNs:_____**
- [ ] **Installed units? List IFO, part & SNs: _____**
- [ ] **Future units to be built**

Impacted Documentation (list all dwgs, design reports, test reports, specifications, etc.): E1200032, E1200033, E1200034, E1200035, E1200036

Wiki: https://awiki.ligo-wa.caltech.edu/aLIGO/TimingFpgaCode

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Disposition of the proposed change(s):

The disposition of this proposed engineering change request is to be completed by Systems Engineering and indicated in the "Notes and Changes" metadata field in the DCC entry for this ECR. The typical dispositions are as follows:

- **Additional Information Required**: in which case the additional information requested is defined. The ECR requester then re-submits the ECR with the new information using the same DCC number for the ECR but with the next version number.
- **Rejected**: in which case the reason(s) for the rejection are to be given
- **Approved**
- **Approved with Caveat(s)**: in which case the caveat(s) are listed
- **TRB**: the ECR is referred to an ad-hoc Technical Review Board for further evaluation and recommendation. It is the System Engineer's (or designee's) responsibility to organize the TRB. The System Engineer (or designee) then makes a technical decision based on the TRB's recommendation. Links to the TRB's documentation (charge, memos, final report, etc.) are to be added to the "Related Documents" field for this ECR.
- **CCB**: a change request for approval of additional funds or schedule impact is to be submitted to the Configuration Control Board. Links to the CCB's documentation (CR, etc.) are to be added to the "Related Documents" field for this ECR.

Concurrence by Project Management:

Acknowledgement/acceptance/approval of the disposition is to be indicated by the electronic "signature" feature in the DCC entry for this ECR, by one the following personnel:

- Systems Scientist
- Systems Engineer
- Deputy Systems Engineer