

Advanced LIGO Engineering Change Request (ECR)

ECR Title: ECR:

DCC No: E12xxxxx-vx

DC Photodiodes for laser power measurement

Date: 10/2/2012

Requester:

Impacted Subsystem(s):

Daniel Sigg

ISC

Description of Proposed Change(s):

Add DC photodiodes to the ISC/ALS system to aid the slow controls logic. We propose to add DC photodiodes (Thorlabs SM05PD1A or SM1PD1A) to: (1) the beam leaving the fiber in the correct polarization, (2) the corresponding rejected beam, (3) the IR beam of the ALS laser, (4) the PSL beam reaching ISCHT1L, (5) the green beam after the SHG, (6) and the green beam of coming back from each arm. We also propose to add 1-2 spare readout channels to each ISC table. This requires a total of 4 new auxiliary concentrators (D1201345, D1201349 and D1201352) with either 2 or 3 dual DC photodiode amplifiers (D1200543).

Reason for Change(s):

A computer controlled auto-locker is at a disadvantage when it has not enough basic information. To have well defined state transitions and error conditions we need to record the laser power at the ALS laser (IR), the output of the fiber for both polarization states, the PSL beam reaching ISCHT1L, the beam after the SHG as well as both green beams returned from the arms.

Estimated Cost:

10 photodiodes/ifo (plus feedthroughs, cabling & mounting): \$2500

4 concentrators/ifo (plus EtherCAT terminals): \$4000

Total (3 ifos): \$19500

Schedule Impact Estimate:

None.

Nature of Change (check all that apply):

- Safety
- Correct Hardware
- Correct Documentation

- Improve Hardware
- Improve/clarify Documentation
- Change Interface
- Change Requirement

Importance:

- Desirable for ease of use, maintenance, safety
- Desirable for improved performance, reliability
- Essential for performance, reliability
- Essential for function
- Essential for safety

Urgency:

- no urgency
- desirable by date/event: Feb 2013
- 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.):

D1100683, T1100472, D1002803, D1001423,
D1100670, D1100170, D1101904, D1200196,
D1200666, D1101126

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Disposition (to be completed by Systems Engineering):

TRB

CCB

Approved

Additional information required. Define:

[Requester re-submits with new information with the same DCC E-number for the ECR but the next version number.]

Concurrence by Project Management: (Acknowledged Electronically in DCC)

Project Systems Engineer: Dennis Coyne

Project Systems Scientist: Peter Fritschel