

**QPD Whitening Board – Quick Start Guide**  
**LIGO-T060254-00-C**  
**B. Abbott, Caltech**  
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**Hardware Revision Applicability – Rev. B**

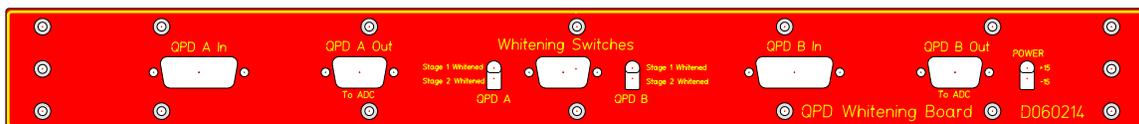
**1. Overview**

- 1.1. The Quadrant Photodiode (QPD) Whitening chassis serves as an interface between up to two Optical Lever (OpLev) QPDs (LIGO D980325-C1) and the Anti-Alias Interface Chassis (D050374) and Binary I/O Module or Anti-Image Module that interact with it.
- 1.2. Each Oplev QPD is given power (+/- 15V and GND) from the Female 15-pin D-sub connectors on the front panel labeled **QPD A (B) In**.
- 1.3. Signals from the four quadrants are also brought back on the 15-pin D-sub connectors.
- 1.4. Each stage of the whitening can be turned on or off by computer control via a Binary Output module or a Digital to Analog Converter (DAC) connected to the 9-pin D-sub connector in the middle of the front panel, labeled **Whitening Switches**.

**2. Electrical Interfaces**

- 2.1. All **Front Panel Outputs** are shipped differentially to an Anti-Alias Interface Chassis (D050374) on a 9-pin D-sub cable assembly.
- 2.2. All **Front Panel QPD Inputs** come from direct connection to an OpLev QPD (LIGO D980325-C1).
- 2.3. **Whitening Switches inputs** can come from either a Binary I/O Interface chassis, or an Anti-Alias Interface Chassis with channels that toggle between 0V and 10V.
- 2.4. The required **Power Supply Voltages** are nominally +/- 18VDC with supplies capable of delivering ~1A. A range of voltages from +/-16V to +/-19V is acceptable.

**3. Front Panel Diagram**

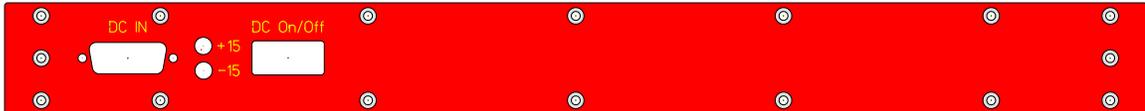


- 3.1. **QPD A (B) In** is a 15-pin Female D-sub connector which connects to an Optical lever QPD.
- 3.2. **QPD A (B) Out** is a 9- pin Female D-sub connector which connects to an Anti-Alias Chassis, and eventually an ADC, and goes into the computer.
- 3.3. **QPD A (B) Stage 1 (2) Whitened** are LEDs that give the status of the whitening filters for each QPD. There are two stages of whitening for each QPD, and each one has its own LED indicator. If the green LED is lit, it

signifies that the corresponding whitening filter is engaged. A dark LED means that the whitening filter stage has been bypassed.

- 3.4. **Whitening Switches** Is a 9-pin Male D-sub connector that gets switching signals for the four **Whitening Stages** from a DAC or Binary Output Module.
- 3.5. **The POWER LEDs** Indicate that regulated +/- 15V is being applied to the board by internal voltage regulators.

#### 4. Back Panel Diagram



- 4.1. **DC In** is the three-pin power connector for supplying DC power to the board. The nominal voltage is +/- 18VDC with supplies capable of delivering ~1A. A range of voltages from +/-16V to +/-19V is acceptable.
- 4.2. + (-) **15** are LEDs that signify that +/- 15 Volts are coming from the internal Voltage Regulators.
- 4.3. **DC ON/OFF** is a switch that disconnects the input power from the input to the internal voltage regulators.