



# PLD Series Laser Driver Modulation & Wiring Recommendations

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## INTRODUCTION

When using a clean square wave on the PLD Series analog input, the current output to the laser can be deformed, distorted or have added noise on it. This can be due to several different factors such as a negative bias on the modulation input or by using long, unshielded cables.

## TYPICAL PLD $I_{MON}$ SIGNAL

Figure 1 illustrates a typical PLD  $I_{MON}$  signal at 20 kHz.

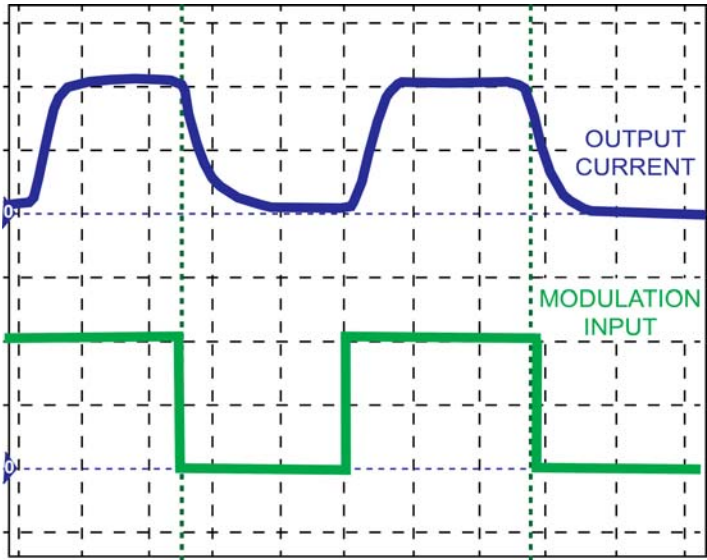


Figure 1. Typical 20 kHz Square Wave

## BIASING

If the square wave signal has a negative bias, it will look similar to the illustration below. To correct it, adjust the bias to be at ground or a positive bias of about 20 mV. Remember, each system is different and the bias level is dependent on the system noise.

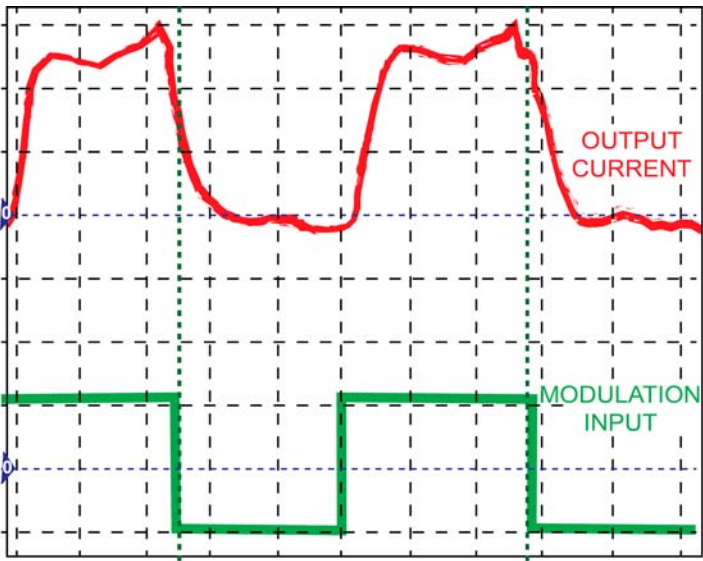
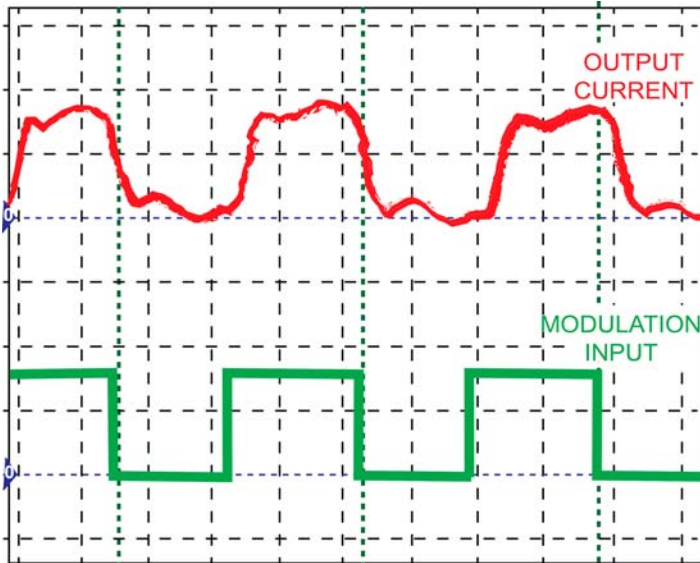


Figure 2. 20 kHz Square Wave, Negative Bias

## CABLING

**Higher Currents:** At higher currents (anything above 5 A), the power supply wire length plays a major role in whether the design will succeed. Wavelength recommends using a maximum of 2-feet, shielded, 14-16 AWG for the power supply cable. The cable needs to be twisted to reduce noise that is generated in a system.

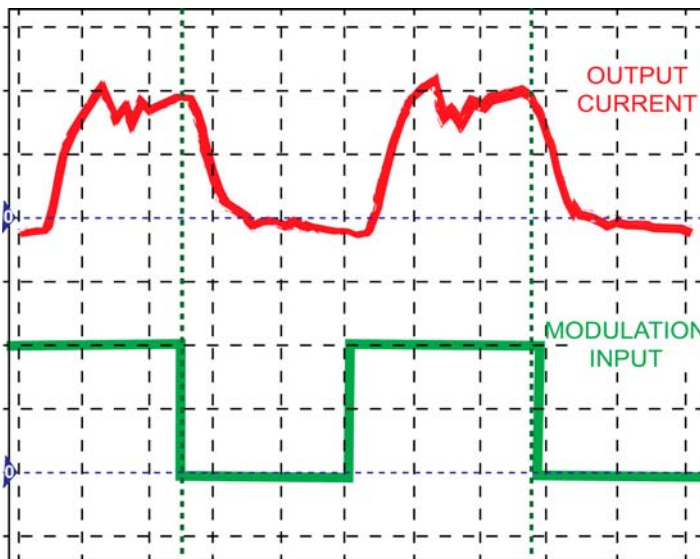
When wire length and configuration are less than ideal, the following waveforms can appear.



**Figure 3. Wires Longer Than 2 Feet**

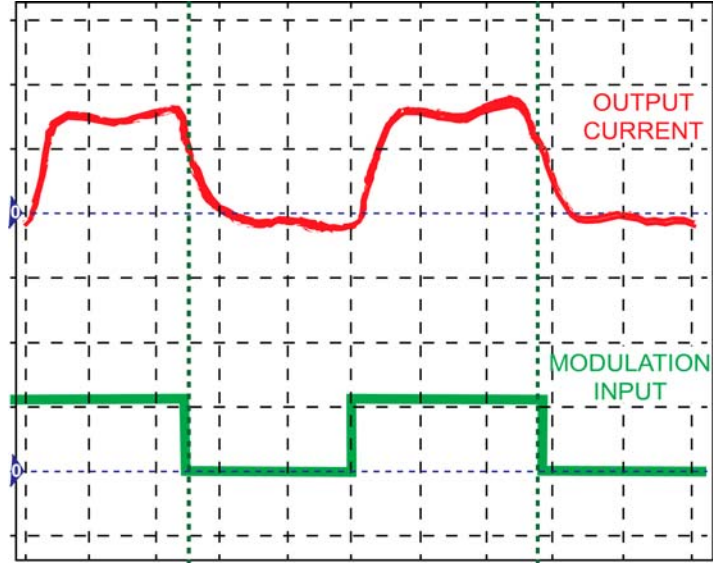
This signal was generated using a 4-foot twisted supply cable.

**Filtering:** Sometimes longer wires are necessary. While not ideal, Wavelength customers have been successful using 4-foot twisted 14 AWG wires with a 470  $\mu$ F filter capacitor at the power supply or PLD side. NOTE: How the PLD responds is very much dependent on the system noise and the routing of the wires.



**Figure 4. Unfiltered, Untwisted Wires**

This signal was generated using 2-foot untwisted 14 AWG supply cables.



**Figure 5. Filtered, Untwisted Wires**

This signal was generated using a 2-foot untwisted 14 AWG supply cable with a 470  $\mu$ F filter capacitor. at the supply end

**Current Limits:** When the power supply cables are over 24" long, more noise is generated. When noise increases, the current limit will trip several amps below the desired set point limit.

The supply voltage to the laser needs to be 1 to 2 volts above the forward voltage of the laser or lasers, otherwise the modulation signal will be distorted.

When using the PLD Series Laser Diode Drivers, it's recommended that the WCB308 Power / LD Cable Set be used.

## REVISION HISTORY

REV	DATE	NOTES
A	24-Jul-14	Release

## KEYWORDS

PLD, PLD-CH, analog input, laser modulation, laser diode driver modulation, laser driver modulation, signal noise, bias, twisted cable, shielded cable, power supply