

Comb Lock Box

All-in-one locking system for optical frequency

Overview

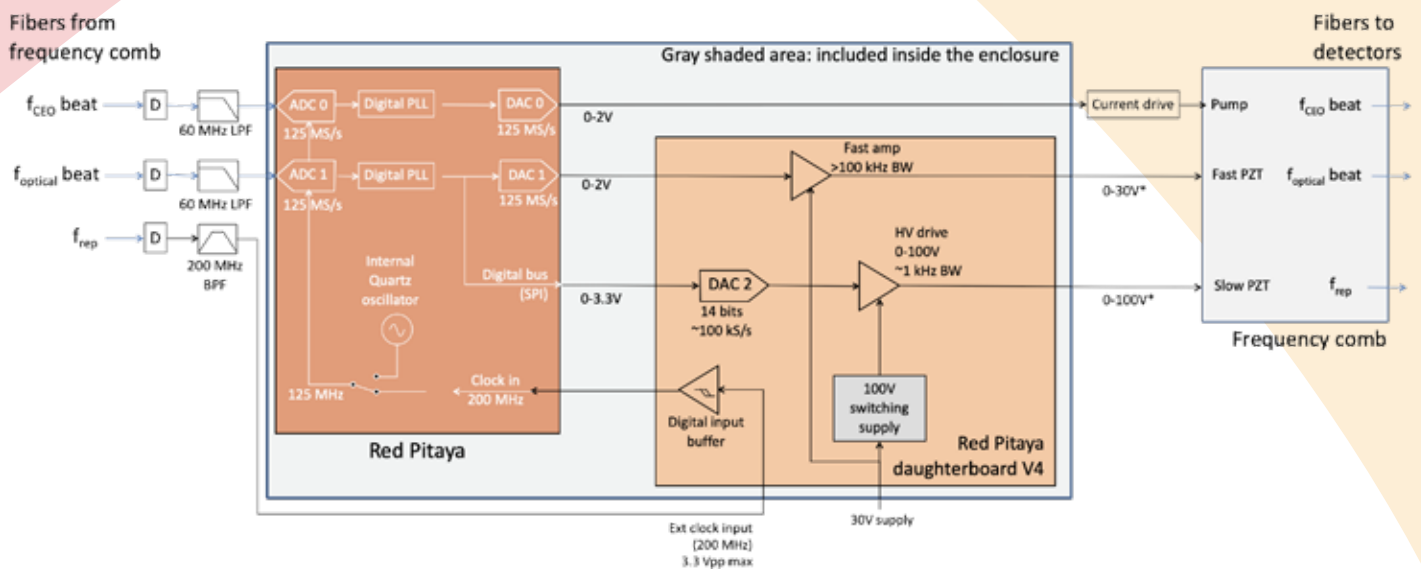
Waxwing instruments' comb lock box (CLB) is designed to greatly simplify the stabilization of optical frequency combs. Using all digital processing, carrier-envelope-offset and optical heterodyne signals are used to generate piezoelectric transducers (PZTs) and drive current control signals. Provided sufficient SNR, the probability of phase slips becomes negligible, making the system suitable for experiments requiring high frequency and phase stability.

Features

- 30 V fast amp for fast PZT
- 100 V slow amp for slow PZT
- 2nd DAC channel for slow PZT
- 5-250 MHz external clock input
- Can be modified via software to accept different frequencies
- On-board 100 V switching supply for wide range PZT control
- Power supplies requirements (both provided with purchase):
- 5V external brick for Red Pitaya
- 30V external brick for PZT amps
- Two additional general purpose digital IOs on SMA connectors (unbuffered, not shown on block diagram)
- One additional general purpose digital input on SMA connector



Block diagram



*All voltage ranges are nominal, outputs usually can swing to within a few volts of the nominal range.

** The red and green boxes represent the Red Pitaya and the Daughterboard V4

Connectors details



Accompanying hardware (not included)

Item	Recommended model
Various SM A/BNC cables	Various
2x Lowpass filters	BLP-100+
1x Bandpass filter	BPF-200+ and TB-695+
Pump current drive	Wavelength Electronics LDTC-1020 (recommended)
Detector for Optical beat	New Focus 1811-FC-AC
Detector for CEO beat	Thorlabs PDB-425C
Detector for repetition rate	New Focus 1611-FC-AC