Optical Chopper

SR540 — Optical chopper

The SR540 chopper will handle all your optical chopping requirements—from simple measurements to dual-beam and intermodulation experiments. The SR540 has a 4-digit frequency display, front-panel frequency control, analog voltage frequency control, and two reference outputs with selectable operating modes. Two anodized aluminum blades are provided: a 5/6 slot blade for frequencies up to 400 Hz and a 25/30 slot blade for frequencies up to 3.7 kHz. Reference outputs are provided for frequencies corresponding to each row of slots, as well as the sum and difference frequencies.

SR540 Specifications

- **4 Hz to 3.7 kHz chopping frequencies**
- **Low phase jitter**
- **Single and dual beam experiments**
- **Sum & difference reference outputs**
- **Bolt clamp or rod mounting**

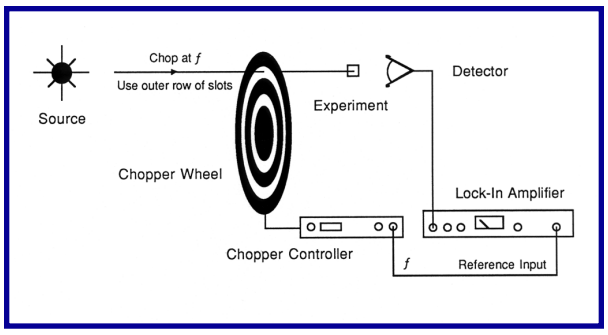
Chop frequency	4 Hz to 400 Hz (5/6 slot blade) 400 Hz to 3.7 kHz (25/30 slot blade)
Frequency stability	250 ppm/°C (typ.)
Frequency drift	<2 %, 100 Hz < f < 3700 Hz
Phase jitter (rms)	0.2° (50 Hz to 400 Hz) 0.5° (400 Hz to 3.7 kHz)
Frequency display	4-digit, 1 Hz resolution and accuracy
Frequency control	10-turn pot with 3 ranges: 4 Hz to 40 Hz 40 Hz to 400 Hz 400 Hz to 3.7 kHz
Input control voltage	0 to 10 VDC for 0 to 100 % of full scale. Control voltage overrides frequency dial.
Reference modes	f_{inner}, f_{outer}, $5 \times f_{outer}$, $f_{inner} + f_{outer}$, $f_{outer} - f_{inner}$
Dimensions	Controller: 7.7" × 1.8" × 5.1" (WHD) Head: 2.8" × 2.1" × 1.0" (WHD)
Blade diameter	4.04" ± 0.002"
Cable length	6 ft.
Power	12 W, 100/120/220/240 VAC, 50/60 Hz
Warranty	One year parts and labor on materials and workmanship, 90 days on motor

Ordering Information

SR540	Optical chopper
O5402530	25/30 dual-slot replacement blade
O54056	5/6 dual-slot replacement blade
O5405	5-slot replacement blade
O54030	30-slot replacement blade
O540RCH	Replacement chopper head

Single Beam Experiment

In this application, a single optical beam is chopped by the outer row of slots, and the reference output from the right BNC is used to lock the lock-in amplifier to the chop frequency. The inner row of slots could also be used, in which case the left BNC would be the reference output. In either case, the REFERENCE MODE switch is in the "up" position.



Dual Beam Experiment

In this arrangement, the output from a single source is split and chopped at two different frequencies by the two rows of chopper slots. One beam passes through the experiment while the other is used as a reference beam. The beams are recombined and sent to the same detector. Two lock-ins are used to detect the signals at f_{inner}, corresponding to the experimental signal, and f_{outer}, corresponding to the reference beam. If the detected signal in the experimental arm is ratioed to the detected signal in the control arm, then effects due to changing source intensity and detector efficiency are removed.