

# Kentech Instruments Ltd.

## Regenerative Driver for an Acousto-Optic Mode Locked Laser

This device is used to drive an acousto-optic mode locker. The drive signal is derived from the laser pulse train and a phase locked loop fixes the output phase with respect to the input phase. The unit can operate over a wide frequency range, has adjustable “Q” and has enough output power to drive mode lockers either resonantly or non resonantly.

### SPECIFICATIONS:-

- 1 Frequency coverage, 60MHz to 110MHz input, the main output is half of these values.
- 2 Output power ~1 watt (the amplifier delivers 2 watts but there is a reverse terminating network which reduces this to ~1 watt).
- 3 Input sensitivity, approximately 4 $\mu$  Watts will lock the unit. (The unit needs about 2 $\mu$  Watts in the fundamental frequency).
- 4 Maximum sweep width, typically 665kHz @ 60MHz, 530kHz @ 80MHz and 677kHz @ 110MHz. At least 500kHz over the operating band.
- 5 Maximum sweep speeds are typically:-
  - 580kHz $s^{-1}$  at 60MHz
  - 400kHz $s^{-1}$  at 80MHz
  - 300kHz $s^{-1}$  at 110MHz
- 6 Minimum sweep width is nominally zero but the unit actually just sweeps very fast between the start and stop values. The width is then similar to the oscillator bandwidth.
- 7 Adjustable Q, 5,7,10,15,20,50, 70 &100.
- 8 Delay 10 steps of 2.5ns plus fine delay of 4ns.
- 9 Input gain adjustment >40dB diode voltage or >20dB referred to optical power. I.e. better than 100:1 on optical power.
- 10 The output can be adjusted and also an attenuator can be switched in to give both a lower output and a reverse termination. Output purity is better at higher output powers.
- 11 There is a frequency meter with 6 digit 1kHz resolution. The reading is updated at 8Hz.
- 12 There is an indicator of the locked and sweep conditions. When it is sweeping slowly the indicator tells you which way it is sweeping, green/up, red/down.
- 13 There are controls for the start frequency, stop frequency and rate of sweep when it is scanning the drive and looking for a signal on which to lock.
- 14 Ancillary output, approximately 2 volts into 50 $\Omega$  at the frequency of the local oscillator. This output does not go through the delay circuitry and is intended as an additional metering point.
- 15 There is an output inhibit, both manual and external. The latter is intended for use with a thermistor. There is a potentiometer to set the threshold level. This can be used to stop the driver when the mode locker overheats.
- 16 Mains input is universal.
- 17 It has a fibre optic input and is supplied with a 2 meter length of 200 $\mu$ m fibre and a focussing lens.
- 18 Size 330mm wide, 140mm high, 250mm deep
- 19 Connectors, Input fibre optic SMA (cable provided with a focusing lens). Main output SMA, ancillary output BNC. Thermal trip input, Lemo “00”. Power IEC (Lead supplied)

