

# RF Oscillator Source

## Description

The RF oscillator source integrates an oven-stabilized crystal oscillator (OCXO) mounted in a magnetic shield in a 2U rack mount unit. The oscillator is locked to GPS through a phase locked loop (PLL) provided by the advanced LIGO timing system. It integrates a timing slave with the daughter board for 1 PPS locking. The RF frequency is mainly determined by the installed OCXO. However, it can be fine tuned through a set of push wheels on the front panel. The output power can be varied using a manual step attenuator in offsets of 1 dB over range of 10 dB. There is no input for modulating either frequency or amplitude. To investigate the propagation of phase and amplitude noise a general purpose frequency synthesizer (for instance, Aeroflex 2023A) has to be used. There is no dedicated interface to EPICS. A TTL signal through a front panel BNC is available which indicates whether the oscillator is locked. The selected frequency, the PLL error signal, the PLL control signal and the lock indicator are also available as status through the timing link. The unit requires +12 VDC at 1 A maximum for the digital part and  $\pm 24$  VDC at 1 A maximum for the analog part.

## Specifications

Frequency range:

- 5 MHz - 200 MHz minimum

Oscillator:

- Wenzel OCXO
- +/-50ppm electrical tuning
- magnetic shielding

Output (1):

- +2 dBm to +12 dBm variable
- N female

1PPS locking integrated

Phase noise:

Frequency	Phase noise spec
10 Hz	-110 dBc/Hz
100 Hz	-140 dBc/Hz
1 kHz	-160 dBc/Hz

10 kHz	-165 dBc/Hz
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Amplitude noise:

Frequency	AM noise spec
10 Hz	-140 dBc/Hz
100 Hz	-150 dBc/Hz
1 kHz	-150 dBc/Hz
10 kHz	-150 dBc/Hz