MLL-100 Mode-Locked Laser

The MLL-100 Mode-Locked Laser from Vescent Photonics is a stand-alone femtosecond laser designed for ease of use and high performance. Built around an Er:doped fiber and an EDFA, it will reliably deliver sub-100 fs pulses with a bandwidth of over 40 nm. The heart of the MLL-100 is our fiber oscillator including a gain fiber and mode-locker, built using our unique cavity length adjustment tool for exact repetition rate control and precise matching of multiple systems. The MLL-100 includes the oscillator, the pump diodes (oscillator and amplifier), current sources, temperature control, and now the high-voltage amplifier for cavity length control. It also incorporates the requisite drive electronics and user interface as well.

MLL-100 Mode-Locked Laser

Designed for low SWaP *and* high performance, the MLL-100's combination of touch screen interface and rotary knob input makes for simple set up and control. Modulation and control of the pump power as well as fast (via PZT) and slow (via temperature) tuning of the repetition rate makes the MLL-100 ideal as the engine for your frequency comb development. The slow integrator controlling the precise temperature set point allows long-term repetition rate locking when combined with the fast PZT loop. Precise control over the cavity length and oscillator pump power provide the stability and flexibility necessary for developing frequency comb performance.

The simple design of the oscillator results in successful mode locking at start up every time and the passive SESAM mode-locker is specially designed for a robust, long life. Repetition rates from 80 to 250 MHz conveniently addresses a number of applications.

Features:

- Turn-key operation
- 1560 nm center wavelength
- >100 mW of mode locked power
- Low phase & amplitude noise
- 2U 19" rack-mounted enclosure
- f_{rep} monitoring, control, and matching
- Repetition rates from 100 to 20 0 MHz
- Kilowatt peak power
- Nanojoule pulse energy
- Short pulses & broad bandwidth
- Low temperature drift
- Made in America

Applications:

- Timing & frequency measurements
- Frequency comb development
- Dual-comb spectroscopy
- Quantum sensing, computing, & cryptography
- Low-phase noise rf generation

VESCENT

MLL-100 Performance Specifications

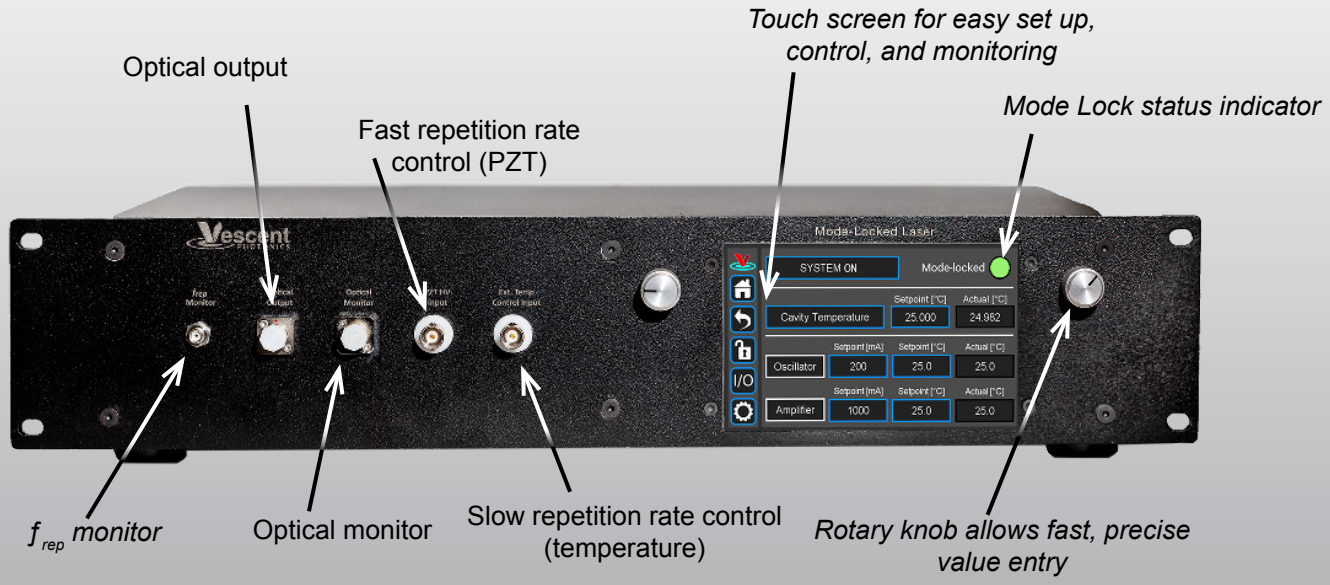
Performance	
Center Wavelength	1560 ±10 nm
Output Power[1]	>100 mW
Pulse Width	≤100 fs
Bandwidth	≥40 nm
Nominal Repetition Rate[2]	100, 125, 200 MHz
Electrical Pump Power Modulation Bandwidth[3]	1 MHz
Polarization Extinction Ratio	≥20 dB
Output Format	FC/APC PM1550 fiber (key aligned to slow axis)
Repetition Rate Control	
PZT Control Range[4,5]	0.3 - 1.0 ppm
PZT Control Transfer Function[4,5]	15 - 50 ppb/V
PZT Control Bandwidth[4,5]	>100 kHz
Temperature Control Range[5]	300 ppm
Temperature Control Transfer Function[5]	10 ppm/°C
Temperature Set Point Resolution	<0.1 mK
Repetition Rate Stability[6]	<1 ppm/°C
Monitor Outputs	
Repetition Rate (f_{rep})	Electrical
Optical Output	Oscillator and/or amplifier power
Physical Properties	
Power Input	100 - 240 VAC; 50 - 60 Hz
Power Consumption	<40 W
Dimensions	19” x 10” x 2U

All specifications subject to change without notice.
[1]With EDFA
[2]Can be factory tuned to within 5 kHz
[3]The bandwidth of the control electronics. f_{CEO} stabilization bandwidth limited by Er:fiber to ~30 kHz
[4]±10 V input. Now includes SLICE-DHV high-voltage amplification capabilities.
[5]Depends on nominal repetition rate
[6]With respect to room temperature

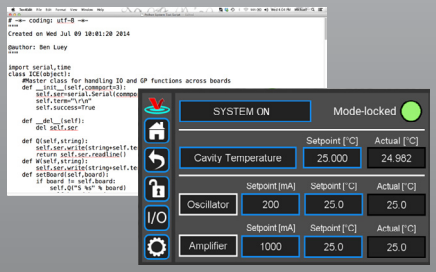
US Patent 11,462,881

VESCENT

Meet the MLL-100



MLL-100 Interface



Control the MLL-100 via a touch screen and a serial command API

Made in America!

Vescent Photonics, LLC
14998 W. 6th Ave., Suite 700
Golden, CO 80401
USA
+1 (303) 296-6766
www.vescent.com
230505

VESCENT