

OFC Engine

Optical Frequency Comb
Clockwork for OEM integrators

MenloSystems



Performance meets low-SWaP

Menlo Systems' OFC Engine: A low SWaP (Size, Weight, and Power) clockwork for OEM integrators. The OFC Engine builds on Menlo's decades-long experience with robust and compact frequency combs. Built upon Menlo's unrivaled figure 9® fiber mode-locked oscillator technology, the OFC engine combines the high performance required for transportable optical atomic clocks and a low-SWaP design.

With a focus on OEM integrators, it is optimized for flawless integration and volume manufacturing. Integration is as easy as it gets: Driving and mode locking electronics as well as pump modules are included. Interfacing is provided for user-generated phase lock loops to lock f_{rep} and f_{CEO} . Ready for deployment.

KEY SPECIFICATIONS

- Comb Mode Spacing 100 MHz
- 100 MHz Phase Noise
 $< -150 \text{ dBc/Hz}$ at 1 kHz Offset
- Stability $< 1 \times 10^{-15}$ in 1 s
- 15 - 50 °C Operating Temperature
- Pump Diodes Included

LOW SWaP

- $< 4 \text{ l}$ Volume
- $< 4 \text{ kg}$ Weight
- $< 25 \text{ W}$ Power Consumption

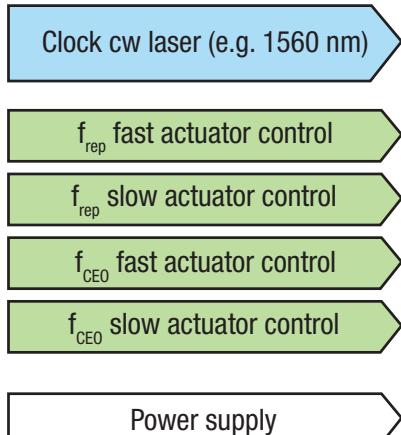
APPLICATIONS

- Low-SWaP Optical Atomic Clocks
- Microwave Atomic Clocks Local Oscillators
- Photonic Microwave Local Oscillators
- Mobile Radar

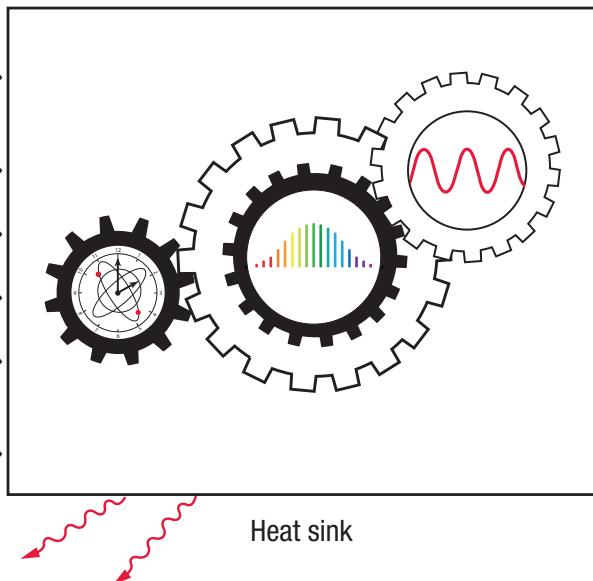
OPTIONS

- Integrated Second Harmonic Generation Unit
- Customization on Request

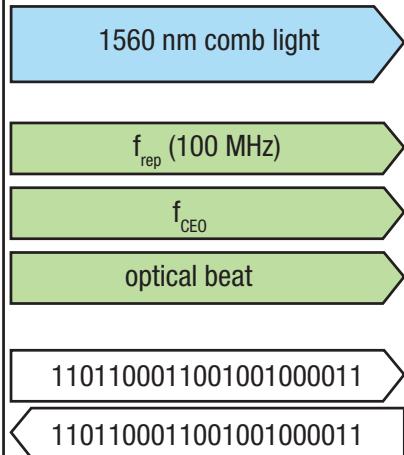
Inputs



OFC ENGINE INTERFACING



Outputs



OFC Engine

Optical Frequency Comb Clockwork for OEM integrators

MenloSystems

PROPERTY	VALUE
OPTICAL SPECIFICATIONS (COMB)	
Central Wavelength	1560 nm
Average Power	> 50 mW
Spectral Width	> 40 nm (FWHM)
Stability* (MDEV)	< 1 x 10 ⁻¹⁵ in 1 s, < 1 x 10 ⁻¹⁶ in 1000 s
Comb Mode Spacing	100 MHz
Comb Mode Spacing Tunability	± 5 kHz
f_{CEO} Tunability	Fully Flexible (> 1 x Free Spectral Range)
LOW SWaP	
Form Factor	< 4 l (204 x 216 x 75 mm ³)
Weight	< 4 kg
Power Consumption	< 25 W
OPTICAL CW INPUT (E.G. FROM CLOCK LASER)	
Wavelength Range	1540 – 1580 nm (others on request)
RF INTERFACING	
Actuator Control Inputs for f_{rep} and f_{CEO} fast/slow	± 15 V differential
Coarse f_{rep} Actuator Control	Software Setpoint
RF Outputs	f_{rep} , f_{CEO} , $f_{optical beat}$
Phase Noise f_{rep} (100 MHz)	< -100 dBc/Hz at 1 Hz Offset < -150 dBc/Hz at 1 kHz Offset
Stability f_{rep} (100 MHz)	< 1 x 10 ⁻¹³ in 1 s
Integrated Phase Noise f_{CEO}	< 100 mrad [100 Hz – 2 MHz]
OTHERS	
Operating Temperature	15 - 50 °C
Power Input	24 V DC
Software Communication	CAN

*out-of-loop comb-comb-comparison, qualified with Menlo Systems phase lock loops

ORDERING INFORMATION

Product Code	OFC Engine
--------------	------------

Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire.

MenloSystems

Menlo Systems GmbH
T+49 89 189 166 0
sales@menlosystems.com

Menlo Systems US
T+1 303 635 6406
ussales@menlosystems.com

Menlo Systems Japan
T+81 907 409 20 21
jpsales@menlosystems.com

Menlo Systems China
T+86 21 6071 1678
chinasales@menlosystems.com



Invisible laser radiation
avoid exposure to beam
Class 3B laser

