FC1000

OPTICAL FREQUENCY SYNTHESIZER

MenloSystems

The FC1000 Optical Frequency Synthesizer is a compact, portable and flexible fiber-based femtosecond frequency comb system. The system provides a stabilized optical frequency comb for frequency metrology in both the visible and the near infrared regions of the spectrum. A wide range of optional units enables us to tailor this versatile system to customer specific metrology solutions.

BASE UNIT FC1000-250

Optical Unit
oscillator, amplifier with octave spanning output, f-2f interferometer

Electronic Control Tower
control units, phase-locked loops, displays, data acquisition

OPTIONAL UNITS

EOM-Phase Electro-optic Phase Modulator
is required for high-performance phase locking to an optical reference, allowing for sub-Hz comb linewidths.

ASTRO and ASTRO-VIS Extension Package
filters the repetition rate of the FC1000-250 to a user-defined frequency in the GHz range. Contains stabilized filter cavities, additional amplifier stages, and pulse compressor. A subsequent second harmonic generation unit converts the output to the visible spectral range. Spectral broadening and flattening stages generate the output in the user-defined wavelength regime.

P250 PULSE-YDFA Ytterbium-doped Fiber Amplifier
delivers high-power near infrared pulses. A combination of optional amplifiers can be added for multiple output ports with high-power output at 1050-1070 nm.

530 Measurement Port
frequency doubles the output of an additional amplifier to 530 nm.

BDU Beat Detection Unit
generates and measures the beat signal between the frequency comb and an external continuous wave (CW) laser. Available for various spectral ranges, with free space or fiber-coupled optics, matched to the laser frequencies of the customer.

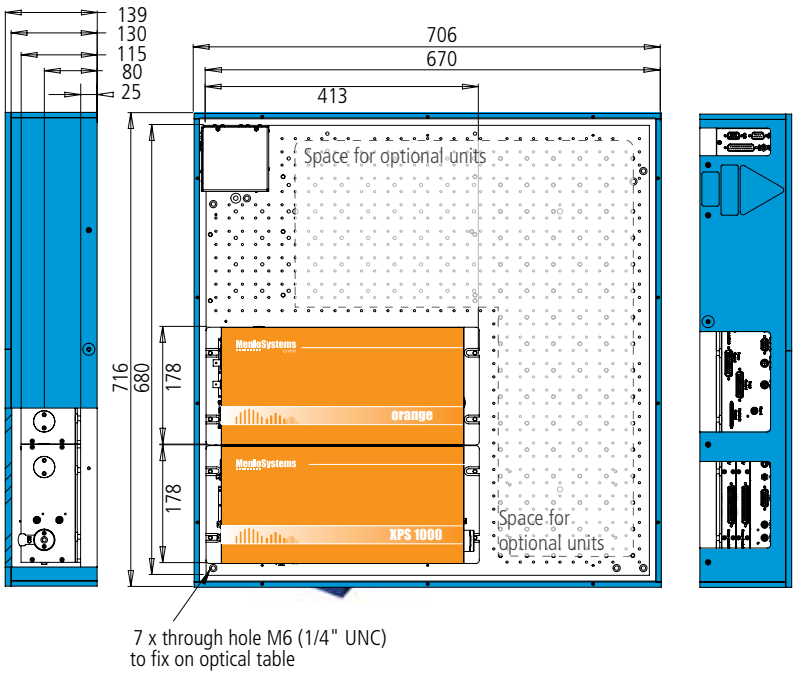
LLE-SYNCRO Locking Electronics Unit
allows the stabilization of an external CW laser to the stabilized frequency comb. Field tested performance with lasers from major suppliers. Contact us for details on your laser model.

GPS-10 10 MHz Frequency Reference
provides the RF reference input signal for the frequency comb, combining the superior short term stability of the quartz oscillator with the long term accuracy of the GPS.

System View

EU patent EP 1161782
US patent 6,785,303 B12
Japanese patent 2000-605290

Optical Unit of FC1000-250



FC1000

OPTICAL FREQUENCY SYNTHESIZER

SPECIFICATIONS

BASE UNIT	FC1000-250	
Comb Spacing	250 MHz	
Accuracy	10^{-14} or same as reference, whichever applies first	
Stability	$5 \cdot 10^{-13}$ in 1 sec. or same as reference, whichever applies first	
Tuning Range of Spacing Between Individual Comb Lines	> 2 MHz	
Tuning Range of CEO Frequency	> 250 MHz	
Optical Output Ports		
E2000/APC/PM Ports	two fiber-coupled	
Central Wavelength	1025 - 1050 nm	
Spectral Range	> 40 nm	
Average Output Power	> 10 mW from each port	
ASTRO and ASTRO-VIS EXTENSION PACKAGES		
User-defined Mode Spacing	e.g. 18 GHz	
Fundamental Output	1040 - 1080nm	
Spectral Bandwidth	> 10 nm	
Average Output Power	> 2 W	
Frequency Doubled Output	530 nm +/- 10nm	
Spectral Bandwidth	> 4 nm	
Average Output Power	> 100 mW	
User-defined Output	e.g. 200 nm broad flat top (+/- 1dB) spectrum centered at 530 nm	
ADDITIONAL AMPLIFIER	**ORANGE PULSE-YDFA-SC**	**ORANGE PULSE-YDFA-DC**
Central Wavelength	1025-1050 nm	1040 - 1080 nm
Spectral Range	> 25 nm	> 10 nm
Output Power	> 800 mW	> 2 W
OPTIONAL PORT AT 530 nm	**SHG530**	
Average Output Power	depending on amplifier configuration	

UTILITY AND ENVIRONMENTAL REQUIREMENTS

Input Requirements	10 MHz frequency reference, power level +7 dBm
Operating Voltage	100/115/230 VAC
Power Consumption*	< 500 W
Frequency	50 to 60 Hz
Cooling Requirements	no water cooling is required
Laser Head Stabilization	temperature stabilized with Peltier elements
Range of Operating Temperature	22 ± 5 °C
Dimensions*	
Optical Unit	706 x 716 x 139 mm^3
Control Electronics	mounted in a 19" rack cabinet, 800 x 600 x 1700 mm^3
Weight*	
Optical Unit	60 kg
Control Electronics	100 kg

*Given for standard system configuration

Last updated: January 28, 2013

MenloSystems

Menlo Systems GmbH
Am Klopferspitz 19a
D-82152 Martinsried
Germany

T+49 89 189 166 0
F+49 89 189 166 111
sales@menlosystems.com

Menlo Systems, Inc.
56 Sparta Avenue
Newton, NJ 07860
USA

T+1 973 300 4490
F+1 973 300 3600
ussales@menlosystems.com

Thorlabs, Inc.
56 Sparta Avenue
Newton, NJ 07860
USA

T+1 973 579 7227
F+1 973 300 3600
sales@thorlabs.com

Thorlabs Japan, Inc.
Higashi Ikebukuro
Q Building 2nd Floor 2-23-2
Toshima-ku, Tokyo 170-0013
Japan

T+81 3 5979 8889
F+81 3 5979 7285
sales@thorlabs.jp

Pinnacle Scientific
(China) Corporation
No. 100 Minxin Road
Winning International
Building, Suite 2404
Jianggan District
Hangzhou 310020, China

T+86 571 882 251 51
F+86 571 882 252 52
sales@psci.cn

Thorlabs China
Room A101, No. 100
Lane 2891,
South Qilianshan Road
Putuo District
Shanghai 200331
China

T+86 21 6056122
F+86 21 32513480
chinasales@thorlabs.com

www.menlosystems.com **www.frequencycomb.com**