

SmartComb

Compact Optical Frequency Comb



All your comb applications at your fingertips:

SmartComb is an optical metrology system in a revolutionary compact package. In just 19" 3U it features the first fully automated turn-key optical frequency comb designed and built for use both in- and outside the optics lab. It measures your optical frequency anywhere between 530-2000 nm. Feed in your laser and get the frequency with 14 digits. Alternatively, it provides you with optical reference lines in the same spectral range (choose wavelength on ordering).

With its internal RF-reference, SmartComb can be used as a standalone device. For highest precision measurements, a radio frequency or an optical reference input is available to stabilize the SmartComb.

Due to its modular design, SmartComb is one of the most versatile frequency comb system on the market: Internal units can be adapted to measure different wavelengths or be replaced with amplifiers to provide up to 8 output ports. Additional external modules are retrofittable, to provide higher powers, customized spectra and pulse lengths. SmartComb has a robust design. Its underlying proprietary technology based on figure 9[®] lasers has already been verified onboard of aircraft and sounding rockets, proving it is well-suited even for demanding environments.

MenloSystems

KEY SPECIFICATIONS

- Accuracy Better 10^{-14} (>100 s)
- Stability Better 2×10^{-13} in 1 s
- Wavelengths in the 530-2000 nm Range
- Class 1 Laser

APPLICATIONS

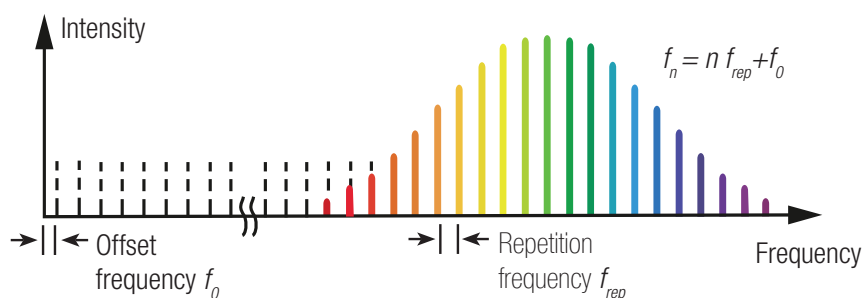
- High Precision CW Laser Stabilization
- Calibration of CW Lasers
- Length Metrology
- Cold Atoms and Ions
- Optical Fiber Links
- LIDAR
- and more

FEATURES

- Touch Panel Control
- LAN-Interface (full Remote Control)
- Full Automation
- Optical Measurement Input (1.5 μm)
- One Integrated Measurement Port for CW-Lasers (530 - 2000 nm)
- CSAC Chip-Scale-Atomic-Clock

OPTIONS

- Up to 8 Output Ports (1.5 μm)
- GPS-based 10 MHz Frequency Reference
- Locking Electronics to Stabilize CW Lasers
- NEW: External Amplifiers at Wavelengths between 530 and 2000 nm
- NEW: Rack- and Table-Mounted Extensions



The optical comb frequencies f_n are defined by the repetition frequency $f_{\text{rep}} = 100$ MHz, the offset frequency $f_0 = 10$ MHz and an integer number n .



SmartComb



Compact Optical Frequency Comb

COMPLETE SOLUTION:

The turn-key, fully hands-off optical setup is integrated into a 19" 3U rack, and offers unprecedented compactness. It includes an atomic clock as reference. Up to two lasers are simply connected to the SmartComb, and a 10^{-14} level accuracy reading is given. Additionally, the SmartComb can provide stabilized comb output as a seed, thereby extending the range from 530 to 2000 nm with optional retrofittable extensions.

| SPECIFICATIONS (BASIC VERSION) | SMARTCOMB (CLASS 1 LASER) |
|--------------------------------|---|
| Comb Spacing | 100 MHz |
| Accuracy | 10^{-14} (>100 s*) |
| Stability (ADEV) | 2×10^{-13} in 1 s* |
| Laser Input | up to two fiber-coupled, linearly polarized SC/APC PM input ports |
| Center Wavelength | 1.5 μ m |
| Spectral Range @ 1.5 μ m | >25 nm |
| Measurement Wavelength | choose one in the 530 - 2000 nm range |

| SPECIAL OPTIONS | SMARTCOMB (CLASS 3 LASER) |
|-----------------------|---|
| Laser Outputs | Up to 8 (up to 15 mW each) |
| Additional Extensions | Rack- or table-mounted amplifiers and beat detection units in the 530 - 2000 nm range |

* or same as reference, whichever applies first. Internal atomic clock supports 3×10^{-10} stability in 1 s and accuracy 10^{-9} , which is subject to aging. Recalibration is available.

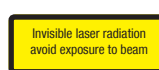
REQUIREMENTS

| | |
|---|---|
| RF Input Requirements (from External Reference) | 10 MHz frequency reference, power level +7 dBm or internal atomic clock |
| Operating Voltage | 100/115/230 VAC |
| Frequency | 50 to 60 Hz |
| Power Consumption | <100 W |
| Cooling Requirements | none |
| Operating Temperature | 22 ± 5 °C |
| Optical Unit Dimensions/Weight | 19" x 3U, 17 kg |

ORDERING INFORMATION

| | |
|--------------|-----------|
| Product Code | SmartComb |
|--------------|-----------|

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



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

Menlo Systems, Inc.
T+1 973 300 4490
ussales@menlosystems.com

Thorlabs, Inc.
T+1 973 579 7227
sales@thorlabs.com

