

Ecomb systems

Rack-mounted, ultra-low noise comb systems

IMRA America offers high performance frequency comb systems for optical clocks, quantum computing, precision microwaves and comb spectroscopy. The rack-mounted comb systems provide a maximum in flexibility, ease of use and robustness. Based on IMRA's all-erbium platform, Ecomb systems come with fiber-coupled outputs, provide ultra-low phase noise, timing jitter, and world record frequency transfer stability.



Features

- 200, or 250 MHz repetition rate
- 600 kHz repetition rate tuning range
- High coherence 950 - 2200 nm continuum
- High coherence visible 500 – 1100 nm continuum
- $<3 \cdot 10^{-18}$ optical/optical transfer stability in 1 second
- $<2 \cdot 10^{-16}$ optical/microwave transfer stability in 1 second
- Selectable, multiple PM fiber-coupled outputs
- Integrated f_{ceo} detection
- Compatible with IMRA analog and digital locking electronics
- Temperature and vibration insensitive
- Remote operation via Ethernet

Available Extensions

- 100 W Yb comb
- 5 W Er comb
- Integration with Hz level reference cavities

| Ecomb systems Specifications | |
|-------------------------------------|--|
| Rep. rate | 250 or 200 MHz \pm 0.5 MHz (factory selectable) |
| Tuning range | > \pm 600 kHz |
| F _{rep} control bandwidth | >500 kHz |
| Free running f _{ceo} SN | >35 dB at 100 kHz resolution |
| IR supercontinuum output | 950 – 2200 nm |
| Visible supercontinuum output | 500 – 1100 nm |
| Outputs via PM FC/APC-coupled Fiber | 2.0 meter |
| Number of output ports | 10 |
| Power per port | > 1 mW |
| Center Wavelength per Port | 1560 \pm 20 nm |
| Monitor Port Power | > 0.1 mW |
| Er high power option | > 2 - 5 W (with separate table unit) |
| Yb high power option | > 10 - 100 W (with separate table unit) |
| Relative stability | < 3 \times 10 ⁻¹⁶ /tau |
| Ultra-high stability option | < 3 \times 10 ⁻¹⁸ /tau |
| Accuracy | 1 \times 10 ⁻¹⁸ in 100 sec |
| Microwave output | up to 10 GHz |
| Storage Temperature | -20 °C to +50 °C |
| Warm up time | < 2 hours |
| Operational temperature | 20 \pm 2.5 °C |
| Interlock | via Limo connector |
| Laser On/Off | via PC |

Compatible with IMRA's digital comb and Universal Locking Electronics (Pictured)



Product Features

- Up to 10 PM fiber-coupled outputs
- Tunable repetition rate via PC
- 50 - 250 MHz available
- > 300 kHz f_{ceo} control bandwidth



* Ecomb-system is currently not certified to the Laser Product Performance Standard from the U.S. FDA/Center for Devices and Radiological Health (CDRH). U.S. federal regulations require that lasers that are not certified to the CDRH standard be sold only to manufacturers of electronic products for use as components in such products.

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