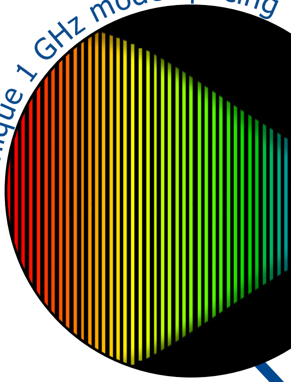
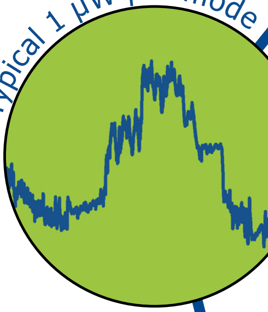
taccor comb

High-power frequency comb with 1 GHz mode spacing

- Turn-key GHz femtosecond **taccor** laser
- Extension module for CEO frequency detection and stabilisation
- Repetition rate stabilisation via **TL-1000**
- Large mode spacing of 1 GHz
- High-power per mode (typ. 1 µW)
- Large modulation bandwidth for feedback loop (typ. 250 kHz)
- Stable and robust





Overview

To support applications of the **taccor** as a frequency comb, Laser Quantum has added the comb extension module to its successful range of 1 GHz lasers, now making the **taccor comb** available to the market. It consists of a matched dispersion compensation module, supercontinuum generation, and a nonlinear f-to-2f interferometer, all sealed in a compact housing which is attached to the turn-key femtosecond **taccor** laser system. The extension module consumes around 800 mW of the **taccor**'s output power so that up to 1 W can be made available for experiments via a dedicated exit port or can be further broadened to a supercontinuum spectrum using an optional second extension module.

In addition to the repetition rate RF signal at f_R, the **taccor comb** provides a long-term stable RF signal at the carrier-envelope offset (CEO) frequency f_{CEO} (Fig. 1) with more than 40 dB signal-to-noise ratio (Fig. 2). Feedback electronics to stabilise f_R and f_{CEO} are provided in the form of Laser Quantum's **TL-1000** unit and the XPS800-E from our partner, Menlo Systems. The **taccor comb** provides the ideal solution for customers who seek to have a comb source with easy access to the visible and NIR spectral range at a high mode power level in a sealed, plug and play architecture. The high repetition rate of 1 GHz leads to a large mode spacing and high power per mode on the order of typically 1 µW after broadening (Fig. 3). The repetition rate of the **taccor comb** also enables generation of significantly more supercontinuum average power in a PCF compared to systems at 100 MHz (100 x more) or 250 MHz (16 x more) before significant coherence loss via nonlinear noise amplification is suffered (Fig. 4). This leads to a significantly enhanced signal to noise ratio for heterodyne beat measurements or direct frequency comb spectroscopy applications.