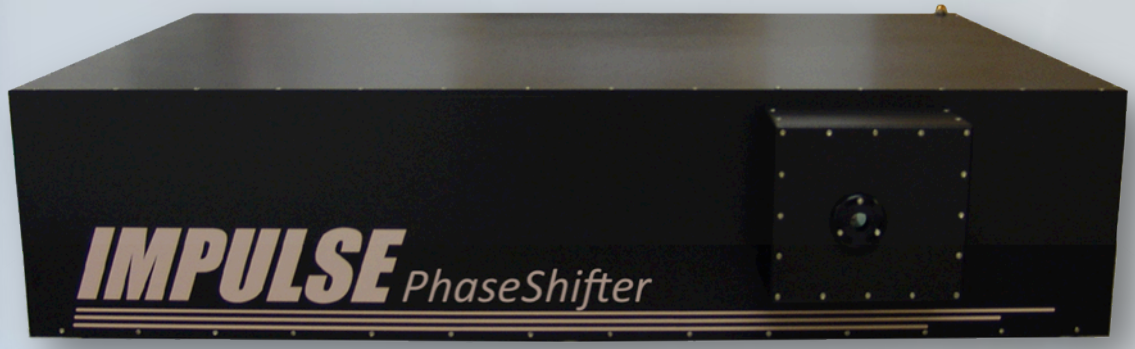
IMPULSE™ "PhaseShifter™" Synchronizable

High-Average-Power Femtosecond Laser



- Direct diode-pumped Yb-fiber oscillator/amplifier design
- All-diode-pumped, all-solid-state construction
- Robust, one-box design
- > 20 watts average power
- Repetition rate user-selectable from 200 kHz to 25 MHz
- High beam quality
- Low noise, cw-pumped
- High stability and longevity
- Complete computer control including iPhone/iPod App
- Available with electronic control of frequency and phase
- Ideal for:
    - Synchrotron and other synchronizing applications
    - Micromachining
    - Photopolymerization
    - Direct-write waveguides
    - High S/N pump/probe
    - OPA/NOPA pumping

Clark-MXR, Inc.

IMPULSE™ "*PhaseShifter™*" is an all-diode-pumped, direct-diode-pumped, Yb-doped fiber oscillator/amplifier system producing variable pulse energies up to 10 µJ with user-selectable repetition rate between 200 kHz[1] and 25 MHz. With 20 W average power output at 2 MHz, IMPULSE™ offers more than an order-of-magnitude higher power than has been traditionally available in a one-box ultrashort pulse laser design.

IMPULSE™ is based on a revolutionary new concept in mode-locked oscillator/amplifier technology. The Yb-doped fiber-oscillator/ fiber-amplifier design combines low noise performance of solid-state operation with high spatial mode quality of fiber lasers.

IMPULSE™ is a compact, robust, one-box source of femtosecond to picosecond pulses with ease-of-operation, stability and reliability expected from a fiber source. All major parameters are computer controlled, enabling easy interface to your experiment. It is even iPhone/iPod[2] App enabled.

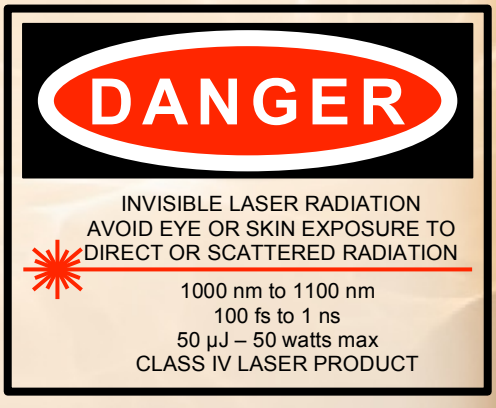
The *PhaseShifter™* version of IMPULSE™ is synchronizable to external reference through electronic control of both frequency and phase. The repetition rate of the oscillator is fine-tuned via an active element, and can be synchronized to the trigger signal of an external RF source. The phase can be varied continuously, allowing the amplified optical pulse to be locked to the external source. The electronics (phase adjustment and frequency offset) can also be used in asynchronous sampling mode.

Optional accessories include multi-photon photo-polymerization, waveguide writing, micromachining, harmonic generation, and OPA/NOPA wavelength conversion for high S/N and rapid data acquisition in pump/probe experiments.

Performance Parameters:

- Average power output: User adjustable via embedded computer up to 20 watts at ≥ 2 MHz repetition rate
- Repetition rate: User adjustable via computer from 200 kHz to 25 MHz (in increments of oscillator repetition rate divided by a whole number[1])
- Pulse energy: User adjustable via computer from 100nJ to 10µJ (eg., >0.8µJ at 25MHz, >10µJ at <2 MHz)
- Pulse width: User adjustable via computer between < 250 fs and > 8 ps
- Transverse mode: TEM_{00}
- M^2 < 1.2-1.5 depending on pulse energy
- Noise: < 1% rms
- Center Wavelength: 1.03 microns
- Electrical: 220VAC (110VAC Optional), 20A
- Head dimensions: 103Lx62.5Wx26H cm^3
- Control cabinet: 123Hx53.5Wx81D cm^3

[1]iPhone and iPod are Trademarks of Apple Inc.
[2]Optional pulse picker available to additionally adjust repetition rate in the range of 200 kHz to single shot.



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