
FASTPULSE TECHNOLOGY, INC.

LASERMETRICS® Division

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SERIES 5100ERW HIGH REPETITION RATE

10 kHz, 20 kHz, 50 kHz, 100 kHz
LASER PULSE GATING SYSTEMS

- Repetition Rates up to 100 kHz
- ≤ 4 nanosecond Rise & Fall Times
- Adjustable Output Voltage
- Pulse Width Range 6 ns to $> 1 \mu\text{s}$
- EMI/RFI Suppressed
- Wavelength Range: 200 nm to 1650 nm



Designed for regenerative laser amplifier seeding and pulse extraction, 5100ERW Systems are valuable for laser pulse picking/chopping, mode locked pulse gating, Q-switching and cavity dumping. The systems are effective in both intracavity and extracavity applications and exhibit rise and fall times as fast as 3 ns. They offer the latest technology in reliable, solid state, high voltage switching design and superior electro-optic Pockels cells.

Series 5100ERW Systems, available in 4 repetition rate/voltage ranges, utilize high speed, HV MOSFET switching circuits and Pockels cell technology developed and refined at FastPulse Technology through decades of manufacturing and improving its Laser Pulse Gating Systems. These systems are noted for convenience, longevity, reliability, and noise-free operation.

5100ERW System High Voltage MOSFET Switching Modules are configured for operation at voltages suitable for half wave operation of RTP (Rubidium Titanyl Phosphate) E-O modulators over their useful spectral range of about 550 nm to 2000 nm. The systems will also accommodate BBO (β Barium Borate) modulators operating in the range of 200 nm to approximately 532 nm. By simply adjusting the front panel HV control, the user can operate the system over the full range of voltages - from less than the quarter wave voltage to more than the half wave voltage - without loss of efficiency or increased rise or fall times. Half wave retardation corresponds to 90° rotation of the incoming polarization plane. Operation in the half wave mode may obviate the usual requirement for a quarter or half wave plate in the optical train in many regenerative amplifier configurations.

Series 1147 Pockels cells utilize RTP (Rubidium Titanyl Phosphate), noted for its ability to produce optical switching without superimposing photoelastic ringing on the transmitted beam. RTP modulators use two crystals, a configuration that provides excellent thermal compensation and stability with low operating voltages.

Series 1150 BBO Pockels cells utilizing Beta Barium Borate crystals are currently available in aperture sizes of 3 and 4 mm diameters. BBO is noted for its very low piezoelectric response, ability to tolerate high average power and operate in the UV spectrum. Since BBO requires significantly higher voltages than RTP, aperture sizes are limited to about 4 mm.

The Model 5100ER Power Supply/Timing Generator provides all of the voltages and timing functions necessary for controlling time delay, pulse width and operating voltage. It accepts trigger signals for a variety of sources including PIN photodiodes. All controls are located in the PS/TG cabinet which can be mounted in a rack or used on a bench top.

The 5100EMW Optical Head Assembly contains the Pockels cell mounted on a gimbal for precision pitch and azimuth positioning and the HV MOSFET Switch Modules. The OHA is virtually noise-free which makes it very desirable in applications that cannot tolerate radiated or conducted EMI/RFI. The OHA is provided with two water connections which can be used in conjunction with the laser cooling system.

5100ERW Systems are shipped with a Users Manual and a set of interconnecting cables.

CONTINUED - OVER

SERIES 5100ERW SYSTEMS

5100ERW Systems are self-contained. The Optical Head Assembly and HV Power Supply/Timing Generator are packaged in EMI shielded enclosures. Unshielded, open configurations for OEM and end user packaging are also available. A typical system consists of the following elements:

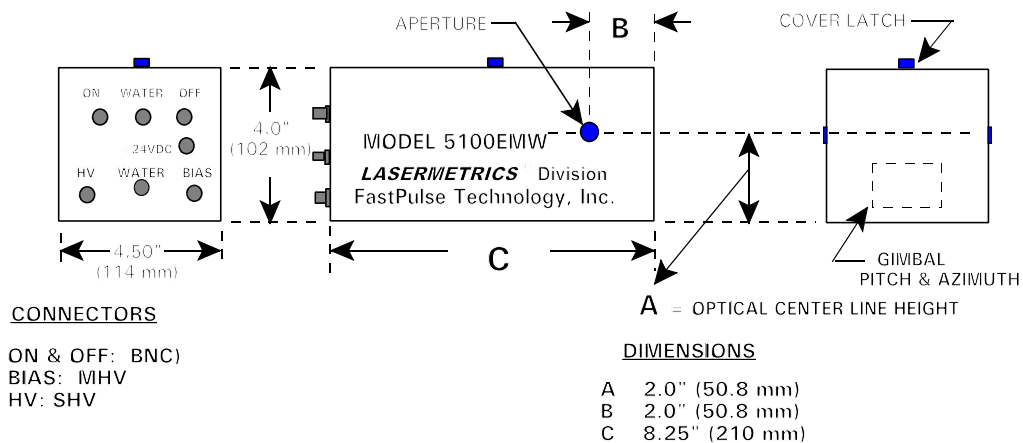
- 5100ER HV Power Supply/Timing Generator & Cable Set
- 5100EMW Optical Head Assembly (OHA) containing: Baseplate, Cover, Gimbal & Pockels cell
- 5100-PRF High Voltage Switching Modules (located in the OHA)
- Pockels cell with AR coatings: RTP- Series 1147 or BBO-Series 1150 or KD*P-Series Q1059P or CF1042
- Optional Mounted Glan-Air polarizers and thin film polarizers are available

Contact our Engineering Sales Group for alternatives and options to match your application

NOMINAL SPECIFICATIONS

Useful Optical Wavelength Range:*	200 to 2200 nm (Depends on crystal material)
Maximum Output Pulse Amplitude@PRF:	Model #5100ERW-10: 5 kV @ 10 kHz
	" #5100ERW-20: 3.8 kV @ 20 kHz
	" #5100ERW-50: 3.2 kV @ 50 kHz
	" #5100ERW-100: 2.5 kV @ 100 kHz
Optical Rise and Fall Times (10 to 90%):	3-4 ns
Optical Pulse Width Range:	< 10 ns to > 1 μ s
Repetition Rate, single shot to:	10kHz, 20 kHz, 50 kHz or 100 kHz
Jitter, System Input to Output:	< 1 ns
Input-Output Delay Time, adjustable:	50 ns to 1 μ s
Input-Output Delay Time:	40 ns (TTL triggers signals applied directly to OHA)
Trigger Input Pulse @ 50 Ω impedance:	
CW Trigger Input: (for extraction of CW/ML pulses)	+ 2 to 10 volts, 1 ns to 1 μ s width
Trigger/Photo Input: (for extraction of Q-SW/ML pulses)	+/- 100 mV to 3 volts, \leq 1 ns to 1 μ s width
Dimensions:	
Optical Head Assembly	5100EMW: 4H X 4.5W X 8.25L inches
Power Supply/Timing Generator Cabinet	5100ER: 4.75H X 19W X 17.1L
Power Requirement:	100/115/230 VAC, 50/60 Hz, 60 watts
Water Flow Requirement:	0.5 liter / minute at 22 $^{\circ}$ C

* Wavelength range is dependent on choice of electro-optic modulator and crystal material. For instance, for operation at 1064 nm with 20 watts average power and peak power densities of more than 500 MW/cm², the Series 1147 RTP modulators would be likely candidates.



Model 5100EMW OPTICAL HEAD ASSEMBLY

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