



OG-B/F. Pulse Pickers with Fixed Gate Open Time

- Compatible with Ti:S and Yb-doped 20-150 MHz ultrafast oscillators
- Suitable for building Ti:S or Yb ultrafast regenerative amplifiers
- Possible operating wavelengths from 200 to 2700 nm
- Rise time down to 700 ps (OG-F model)
- Excellent contrast ratio of >1500:1
- Transmission of complete system >90%
- Multifunctional control unit with adjustable delay generator
- USB control, Windows software+LabView driver



OG-B Pockels cell head with a built-in HV generator

Product overview

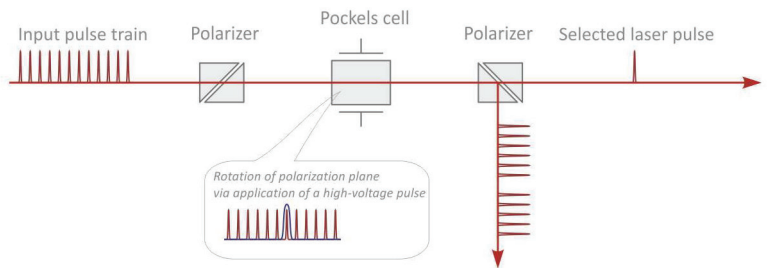
Electro-optic pulse pickers with fixed gate duration are widely used in the following applications:

- picking of single laser pulses from a train of pulses;
- reduction of repetition rate of laser pulses;
- building regenerative laser amplifiers: injection of seed pulses into amplifier cavity and ejection of amplified pulses out of amplifier cavity;
- pulse slicer, i.e. output amplified pulse contrast improvement via cleaning of "parasitic" pulses.

Optical setup of a pulse picker comprises two crossed

polarizers with a Pockels cell placed in between. Pulse selection is performed with the use of the Pockels effect — a short high-voltage electric pulse induces birefringence in the Pockels cell's optical crystal allowing precise rotation of the polarization plane of a certain laser pulse. Then this pulse may be separated from a train of consecutive pulses by using a polarizer. Since the response time of the Pockels effect is very short, such a unit is suitable for working with dense pulse trains and ultrashort laser pulses.

Half-wave, fixed gate, single-pulse layout



Electronic control unit of a pulse selector is built using programmable logic components and contains such built-in modules as optical and electronic synchronization, trigger pulse generation, frequency division, multi-channel delay signal generation, high-voltage drivers. The unit allows for multiple usage scenarios given below for integration in various laser setups:

- external or internal trigger;
- synchronization to optical (built-in photodetector) or electric signal;
- two independent delay channel groups, each with its trigger and synchronization signals; spare channels may be used as general purpose delay channels for triggering other experimental equipment (e.g. oscilloscopes, pump lasers, streak-cameras etc.);
- additional control modes with triggering by edge/level of an external signal or via a built-in burst generator allow formation of various output pulse patterns;
- up to 4 synchronized Pockels cells may be driven by a single electronic control unit.



	OG-F-D	OG-B-D	OG-B-B	OG-B-R/K
Electrooptic crystal	DKDP		BBO	RTP or KTP
Operational wavelength range (standard models)	510-540 nm / 700-1000 nm / 1000-1100 nm / 1250 nm		510-540 nm / 700-1000 nm / 1000-1100 nm / 1250 nm	1000-1100 nm / 1500-1600 nm / 1550+780 nm
Possible custom wavelengths	from 340 to 1280 nm		from 200 to 2200 nm	from 1000 to 2700 nm
Minimum repetition rate of picked pulses	single-shot			
Maximum repetition rate of picked pulses (standard models)	1 kHz	3 kHz / 10 kHz / 50 kHz / 100 kHz	3 kHz / 10 kHz / 50 kHz / 100 kHz / 200 kHz / 1 MHz	
Clear aperture	6 mm	6 mm (up to 20 mm upon request)	2.5 mm (up to 5 mm upon request)	3.5 mm (up to 10 mm upon request)
HV pulse (gate) shape	bell-shaped			
HV pulse (gate) length (at level 10%)	3 ns	8 ns		
Rise time (at level 10-90%)	700 ps	3.5 ns		
Fall time (at level 90-10%)	2 ns	3.5 ns		
Contrast⁽¹⁾	>1500:1		>700:1	>800:1
Pockels cell voltage	up to 10 kV		up to 4 kV	up to 3 kV
Optical scheme	half-wave (quarter-wave upon request)		half-wave/quarter-wave at $\lambda < 600$ nm; at $\lambda > 600$ nm - quarter-wave or half-wave with double crystal cell	half-wave (quarter-wave upon request)
Trigger	internal/external			
Complete system transmission at central wavelength	>85% (PC + two Glan-Taylor prisms, default package) >90% (PC + a Glan-Taylor and a Rochon prism, upon request) >98% (Pockels cell only)			
Input optical train repetition rate	2 MHz ... 150 MHz with internal or external trigger with optical or electric sync to input train; 1 Hz...2 MHz only with external trigger signal ⁽²⁾			
Sync source for internal trigger mode	optical/electric			
Additional control modes	by edge / by level / built-in burst generator with internal or external trigger			
Channel delay time	0...10 us (up to 1 ms upon request) ⁽³⁾		0...1 us (up to 5 us upon request) ⁽³⁾	
Cooling	passive at up to 3 kHz output rate, water-cooled ⁽⁴⁾ at 10 kHz and higher			
<p>(1) - energy ratio of a picked and any non-picked pulse. The given contrast values are valid for adjacent pulses;</p> <p>(2) - when operating with 1 Hz...2 MHz input pulse train, an external trigger signal must be used. Such a signal must lead the optical pulse by 0.25-3 us, must be rigidly in sync with the pulse to be picked and must have jitter of less than 200 ps;</p> <p>(3) - maximum channel delay time is defined by maximum repetition rate of picked pulses and cannot exceed the temporal distance between adjacent pulses at this frequency;</p> <p>(4) - the HV generator unit requires cooling to support operating temperature below 35°C. Water cooling is required when operating at output frequency of 10 kHz and more (water flow 1 L/min, water temp. 20-22°C, tap or building-scale supply may be also be used if permitted). Heating power to be dissipated does not exceed 80 W even at the highest frequencies (a water chiller is not included and may be supplied separately);</p>				