PulseCheck

AUTOCORRELATOR

The autocorrelator **PulseCheck** is a versatile instrument for measuring the pulse width of different fs and ps laser systems with the ability to cover a broad wavelength range. Depending on the wavelength range and repetition rate, additional options such as FROG measurement and separate spectrometers are available.

The wavelength range can be upgraded in the field – please ask which upgrades are possible. APE also offers customer specific modifications.

As with all of the APE autocorrelators the **PulseCheck** is easy to install and easy to use.

- fs resolution
- All reflective optics
- Measurement of background free and interferometric autocorrelation functions
- PC interface
- Windows control software included
- Wide measuring range
- Display of width of autocorrelation function

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SPECIAL DELAY LINE

The **PulseCheck** has a specially designed, spring loaded linear delay drive which allows to choose the scan range according to the pulse duration. This offers high accuracy and large duty cycle. Because of the friction-free movement scan ranges up to 150 ps are possible.

ONLINE POSITION MEASUREMENT

The delay is measured online with high resolution to stabilize scan amplitude and to ensure a linear, calibrated time scale. This also provides the capability to measure interferometric autocorrelation functions.

UNIQUE OPTICAL DESIGN

The **PulseCheck** optics is designed using high precision all-reflective optical elements in a very compact way. It comes factory aligned, which means minimal adjustment efforts and easy beam handling for the user. Minimal dispersion guarantees highest possible resolution. The optics unit incorporates beam shutters for convenient SHG signal check and motorized angle tuning of the SHG crystal. The **PulseCheck** offers a simple and continuous adjustment of the interaction angle between replica beams making it easy to switch between collinear and background-free autocorrelation mode. For lasers with low repetition rate a triggered mode allows for synchronization and accumulation of the autocorrelation function.

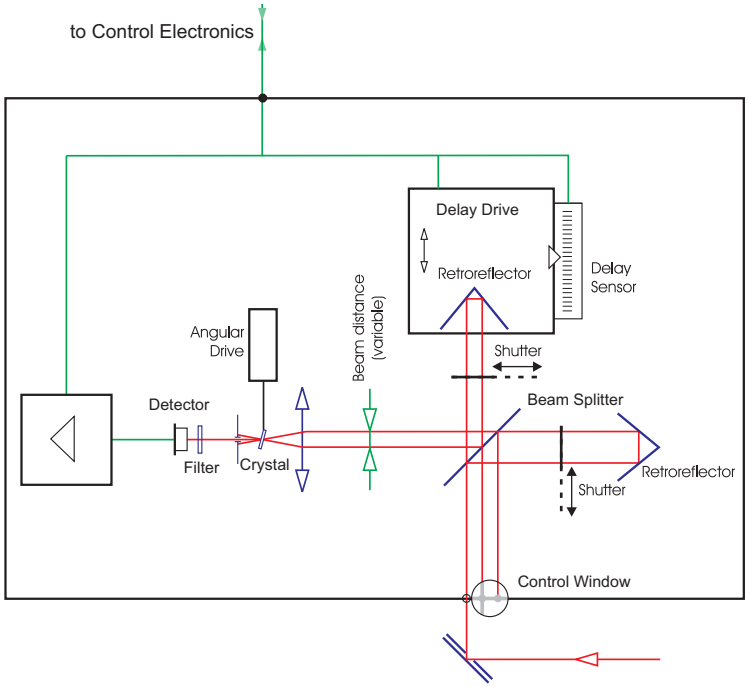
MENU SELECTABLE FUNCTIONS AND INTEGRATED DISPLAY

The **PulseCheck** control unit provides menu selectable functions including averaging and data storage. A bright graphical colour display shows the autocorrelation function together with an alphanumerical readout and analog bargraph indication of the autocorrelation half width. The autocorrelator comes standard with a RS232 serial port.

PULSELINK – CONTROLLER WITH HIGH RESOLUTION READOUT

The **PulseLink** is a new controller for the **PulseCheck** as an upgrade option replacing the standard control unit of the **PulseCheck**. It controls the optical head while being connected via USB to the control software running on the customer's computer. The **PulseLink** offers high resolution digitizing and high speed readout of the autocorrelation function for further use. The scanning of the optical head can be synchronized to an external trigger which makes it ideal for the measurement of e.g. low repetition rate amplifier systems.

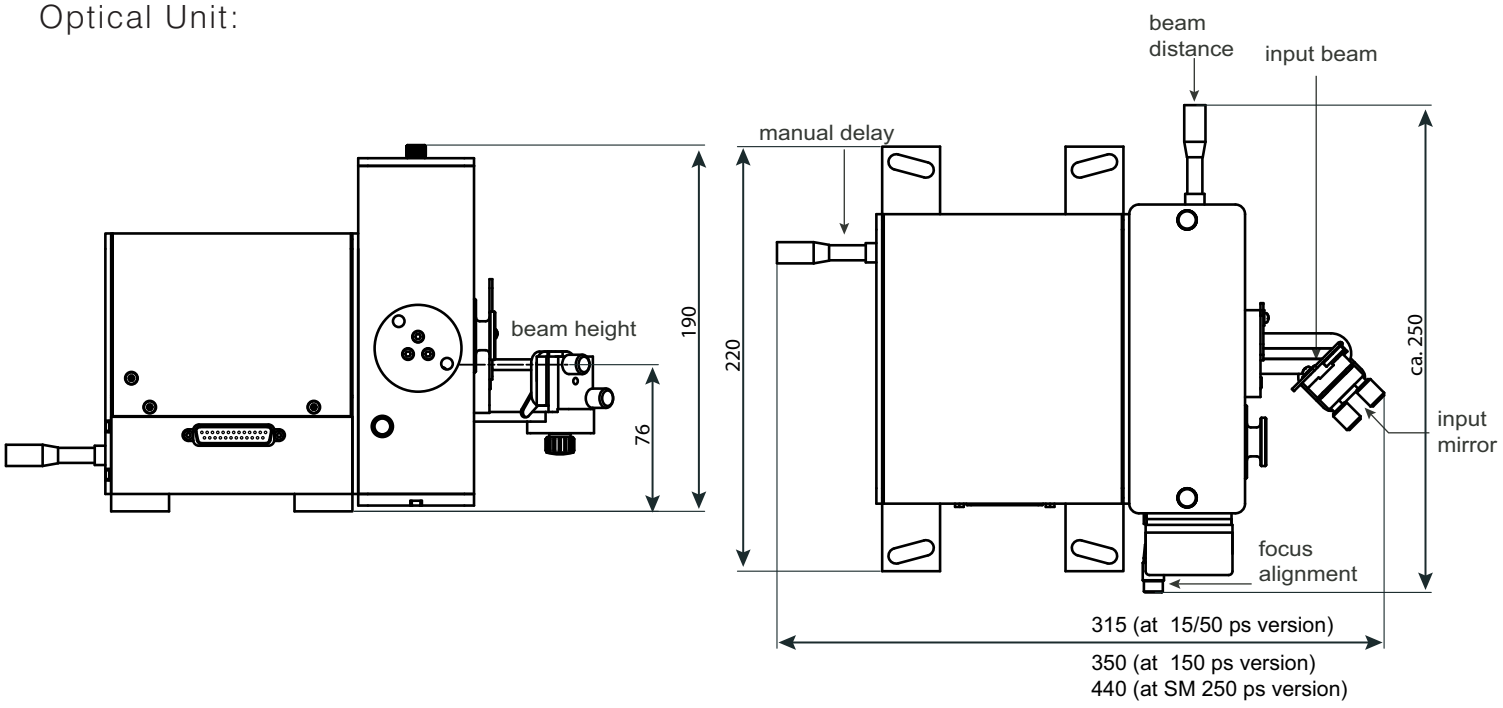
AUTOCORRELATOR OPTICS SCHEME



DIMENSIONS (in mm)

Control Unit (W*L*H in mm³): 275*279*240

Optical Unit:



PulseCheck

SPECIFICATIONS

Version	**15**	**50**	**150**	**SM**
Scan ranges	150 fs...15 ps	500 fs...50 ps	1.5 ps...150 ps	2.5 ps...250 ps
Delay resolution	<1 fs	2 fs	6 fs	10 fs
Measurable pulse width	< 50 fs ... 3.5 ps	< 50 fs ... 12 ps	< 120 fs ... 35 ps	< 120 fs ... 60 ps
Scan rate	~13 Hz	~10 Hz	~7.5 Hz	~10 ps/s
Laser repetition rate	(depending on optics set)			
Linearity of position signal	Better 1% of actual scan range			
Sensitivity[1)]	Photomultipler tube (PMT): 10^{-4} W ^{2} (higher sensitivity optional)			
	Photodiode: 1 W ^{2}			
Wavelength ranges	VIS 1	420 ... 550 nm		
	VIS 2	540 ... 750 nm		
	NIR	700 ... 1100 nm		
	IR	1000 ... 1600 nm		
	Cross 1	360 ... 450 nm (interaction with 720 ... 900 nm)		
	Cross 2	260 ... 320 nm (interaction with 780 ... 960 nm)		
	(others optional)			
Input polarization	Linear / horizontal			
Laser repetition rate	Any (optional photodiode detector recommended for repetition rates < 500 kHz)			
Interaction	Collinear / Non-collinear (fringe resolved and intensity ACF)			
Power supply	95 ... 240 V, 50 ... 60 Hz, 60 W			
Readout	Color graphical display			
Outputs	Delay: analog	0 ... 10 V		
	Signal: analog	0 ... 10 V		
	RS232 serial interface			
Input	Trigger: TTL, < 10 kHz			

OPTIONS

- Spectrometer
- FROG upgrade (phase resolved measurement)
- PulseLink - USB controller
- Additional optics sets
- Fiber input
- Measurement of pulses < 50 fs (ShortPulse option)
- Special scan mode for measuring pulses with a repetition rate between 10 Hz and < 300 Hz (SlowScan option)
- Logarithmic preamplifier
- Enhanced Sensitivity
- Customized wavelength ranges
- IEEE488 and USB interfaces
- Input polarization rotator

[1)] Sensitivity is defined as average power times peak power of the incident pulses $P_{AV} * P_{Peak}$

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