AC SERIES

Scanning Autocorrelator

FEATURES

- ▶ Designed for **5–400 ps** pulse duration range
- ▶ **1064 nm** or **532 nm** wavelength, other wavelengths by request
- ▶ Single thin nonlinear crystal (for single wavelength models)
- ▶ Background-free measurements
- ▶ Simple alignment
- ▶ LabVIEW™ based software, LabVIEW™ source code by request

APPLICATIONS

- ▶ Measurement of pulse duration of mode-locked or SBS-compressed solid-state lasers

Autocorrelators of AC series are designed for the measurement of pulse duration of ultrafast lasers using the non-collinear second harmonic generation technique. The incoming pulse is split into two identical copies and overlapped spatially in non-linear crystal. The intensity of the generated second harmonic wave depends on the temporal overlap of the two pulses. By scanning the delay of one of the pulses, the shape of the autocorrelation function is measured, and then the pulse duration is calculated, assuming a Gaussian or sech² incoming pulse shape.

Standard AC series models are targeted to work with mode-locked or SBS-compressed Nd:YAG or Nd:YLF lasers at fundamental or second harmonic wavelength. A double-wavelength model is available as well. The autocorrelator can be built to accept input wavelengths in the 420–2000 nm range on request.

The scanning range can be extended from standard ±300 ps to ±1200 ps for longer pulse duration measurements or for more detailed pulse shape characterisation (for example, the measurement of satellites of the main pulse).

Software supplied together with the autocorrelator allows for automated, hands-free measurement. The user can set the scanning step and range, the number of pulses averaged, and other parameters. The installed input pulse energy monitor allows the user to gate incoming pulses by their energy, making sure that laser instabilities do not influence the result.

The software requires a desktop or a laptop computer with Windows XP/Vista/7 operating system and one USB port. Please note: the computer is not supplied with the unit, and should be provided by the user.

Measurement range extending add-ons

Option	Features
-P200	For measurement up to 200 ps FWHM pulse duration. The scan range is ±600 ps
-P400	For measurement up to 400 ps FWHM pulse duration. The scan range is ±1200 ps

AC SERIES

SPECIFICATIONS [1]

Model	AC532	AC1064	AC532/1064 [2]
Input wavelength [3]	530–535 nm	1047–1079 nm	530–535 nm; 1047–1079 nm
Min. measurable pulse duration [4]	5 ps		
Max. measurable pulse duration [4] [6]	100 ps		
Scan range [5]	±300 ps		
Temporal resolution	33.3 fs/step		
Dynamic range	>1:10^4		
Min. pulse energy required [7]	50 nJ for 100 ps pulses / 2.5 nJ for 5 ps pulses		
Pulse repetition rate	1–1000 Hz		
Input light polarization	vertical or horizontal		
Triggering	requires triggering pulse with at least 30 ns lead in respect to optical pulse		

PHYSICAL CHARACTERISTICS			
Size (W × H × L)	450 × 270 × 450 mm		

OPERATING REQUIREMENTS [8]			
Ambient temperature	15–25 ºC		
Relative humidity (non-condensing)	10–80 %		
Mains requirements	90–240 V AC, 2A, single phase, 50/60 Hz		

[1] All specifications are subject to change without notice. Parameters marked typical are not specifications. They are indications of typical performance and will vary with each unit we manufacture. Unless stated otherwise, all specifications are measured at 1064 nm.

[2] For a change of input wavelength, the manual reconfiguration of the optical layout is necessary.

[3] Inquire about other available input wavelengths in the 420 nm to 2 µm range.

[4] At FWHM level assuming Gaussian pulse shape.

[5] The scan range is extended to ±600 ps for the P200 option and to ±1200 ns for the P400 option. Inquire about custom scan ranges.

[6] The maximum measurable pulse duration is 200 ps for the P200 option and 400 ps for the P400 option.

[7] The typical laser output pulse energy and repetition rate range should be specified when ordering.

[8] A desktop or a laptop computer with one USB port is required to run measurement software.
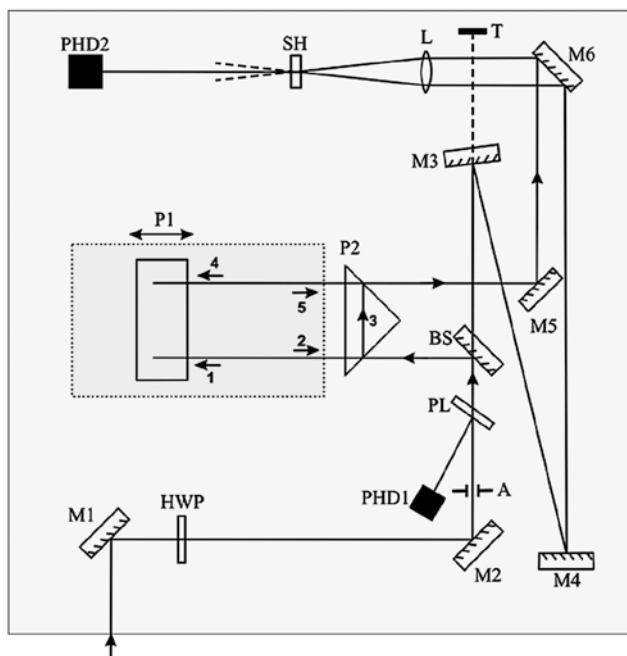
OPTICAL LAYOUT

Fig. 1. Optical layout of AC1064 autocorrelator
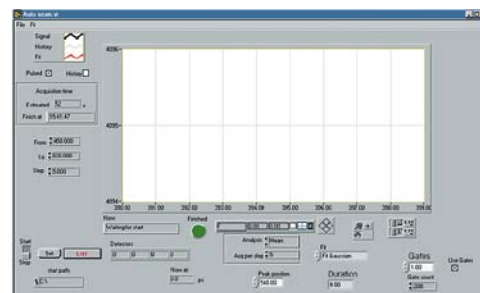
SOFTWARE
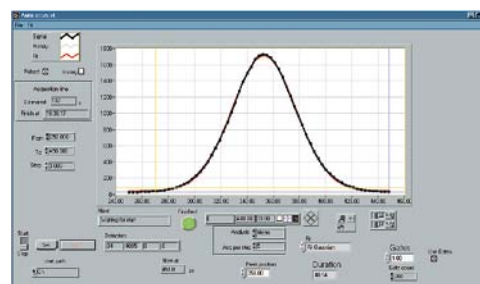

Fig. 2. Software window of AC1064/AC532 autocorrelator

Fig. 3. Autocorrelation trace of 40 ps pulse from PL2251 series laser