

# FROG

## Complete Pulse Characterization with pulseCheck NX and FROG Option

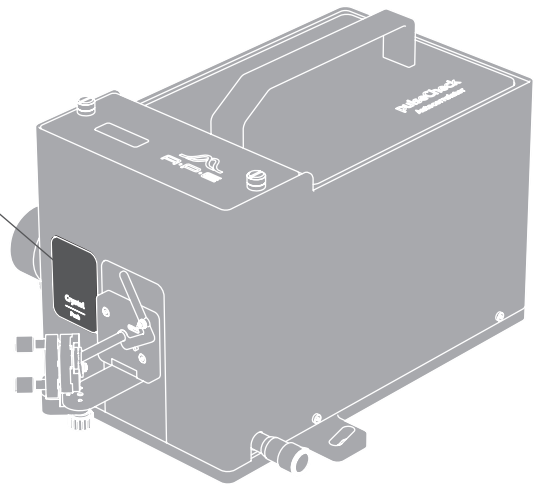
Second harmonic generation FROG is the most popular spectrometer-less Frequency Resolved Optical Gating method. The pulseCheck autocorrelators by APE optionally integrate FROG, giving access to complete pulse characterization. This option opens the door to complete spectral and temporal pulse characterization.



Crystal Module

### FROG Setup:

1. Crystal module within pulseCheck
2. Replacement focus mirror
3. FROG software upgrade



VIS I  
420-550



VIS II  
550-700



NIR  
700-900



IR I  
900-1200



IR II  
1200-1600



Ext. IR I  
1800-2200

*Different crystal modules for various wavelength ranges.*

- Complete spectral and temporal pulse characterization
- Different crystal modules available to cover wavelengths from 420 - 2200 nm
- FROG trace data processing and visualization with included software
- Pulse width ranges from as low as 20 fs up to 6 ps
- High spectral resolution up to 0.1 nm
- Available for the pulseCheck NX autocorrelator\*

\* Required laser rep. rate >10 kHz

## ... FROG Pulse Characterization Software

### FROG Trace

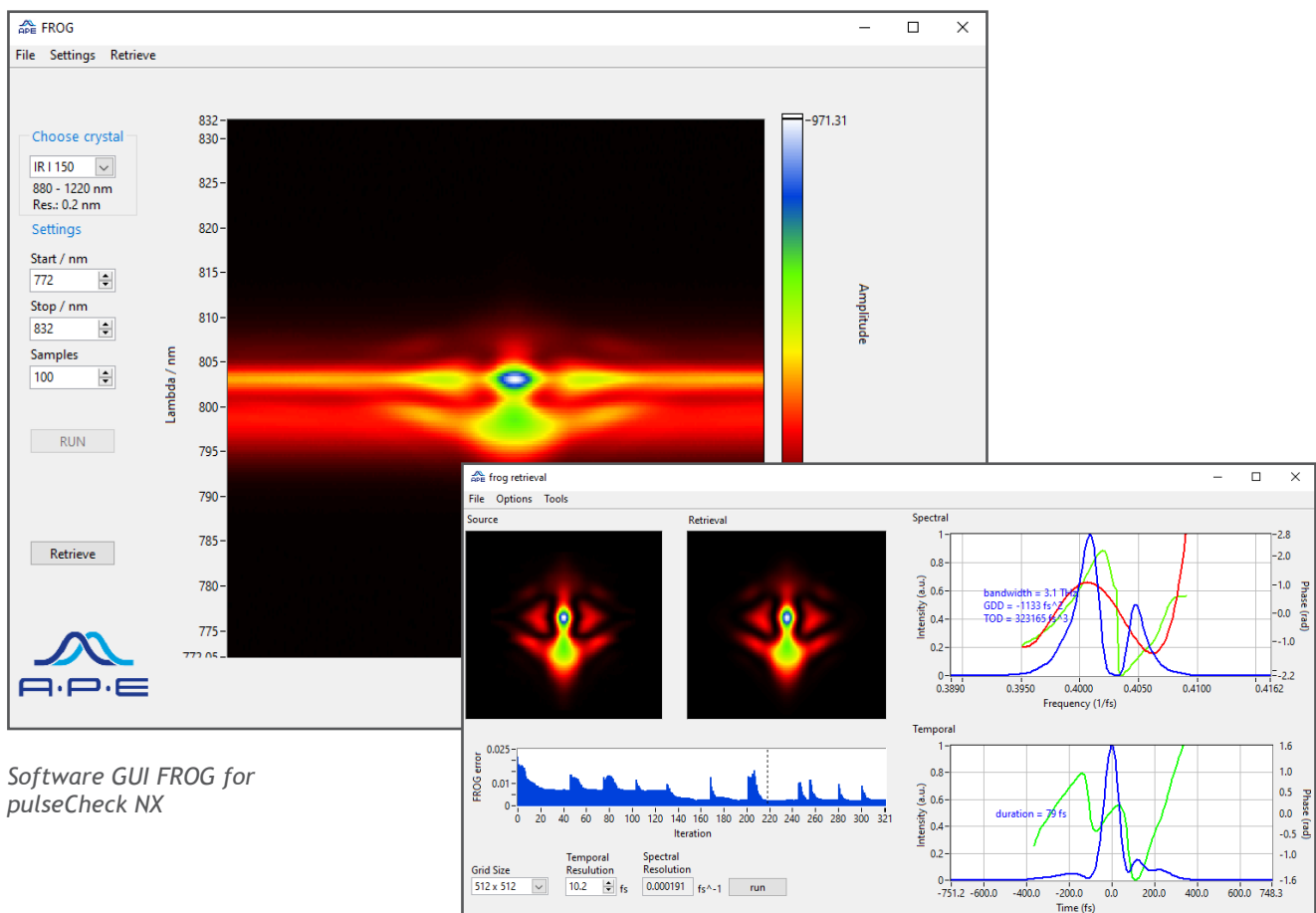
The software provides laser pulse intensity as a function of time and frequency (wavelength). Results are visualized in the form of a FROG trace diagram as well as pulse shape and spectrum.

It is a matter of seconds to automatically find the required phase matching tuning angle - thanks to the automated phase matching routine by pulseCheck.

### Wavelength and Pulse Width Coverage

Various crystals guarantee coverage of wavelengths from 420 nm up to 2200 nm and pulse widths from 20 fs to 6 ps (numbers given for fourier transform limited pulses). The spectral resolution starts as high as 0.1 nm.

The FROG option is designed for laser repetition rates above 10 kHz and is available for the pulseCheck NX autocorrelator series (except for pulseCheck SM 2000).



Software GUI FROG for pulseCheck NX

# FROG Crystals

FROG crystal is suitable if “Pulse Width Range” matches or if pulses are longer and the “Spectral Bandwidth” matches.

FROG Crystal	Wavelength Range	Spectral Resolution	Pulse Width Range	Spectral Bandwidth
VIS-I-200	420 ... 550 nm	0.1 nm	200 ... 6000 fs	> 1 nm
VIS-I-50	420 ... 550 nm	0.3 nm	50 ... 200 fs	> 3 nm
VIS-I-20	420 ... 550 nm	1 nm	20 ... 70 fs	> 10 nm
VIS-II-150	550 ... 700 nm	0.1 nm	150 ... 2000 fs	> 1 nm
VIS-II-50	550 ... 700 nm	0.3 nm	50 ... 200 fs	> 3 nm
VIS-II-20	550 ... 700 nm	2 nm	20 ... 60 fs	> 20 nm
NIR-200	700 ... 900 nm	0.1 nm	200 ... 5000 fs	> 1 nm
NIR-50	700 ... 900 nm	0.2 nm	50 ... 500 fs	> 2 nm
NIR-20	700 ... 900 nm	3 nm	20 ... 50 fs	> 30 nm
IR-I-150	900 ... 1200 nm	0.2 nm	150 ... 900 fs	> 2 nm
IR-I-60	900 ... 1200 nm	1 nm	60 ... 200 fs	> 10 nm
IR-I-30	900 ... 1200 nm	5 nm	30 ... 60 fs	> 50 nm
IR-II-100	1200 ... 1600 nm	0.5 nm	100 ... 700 fs	> 5 nm
IR-II-50	1200 ... 1600 nm	2 nm	50 ... 100 fs	> 20 nm
IR-II-30	1200 ... 1600 nm	9 nm	30 ... 50 fs	> 90 nm
Ext. IR-I-50	1800 ... 2200 nm	19 nm	50 ... 200 fs	> 190 nm

# Appendix Technical Drawings

All dimensions in mm

## pulseCheck NX

- Multitalent for any task

