

# AFT SHG FROG models for $\sim 1064\text{nm}$ pulses the most powerful ultrashort-laser-pulse measurement device

An **AFT(Advanced Femto Technology) SHG FROG** yields the **complete pulse intensity and phase vs. time and spectrum and spectral phase vs. wavelength** with great accuracy and reliability, **making no assumptions about the pulse.**

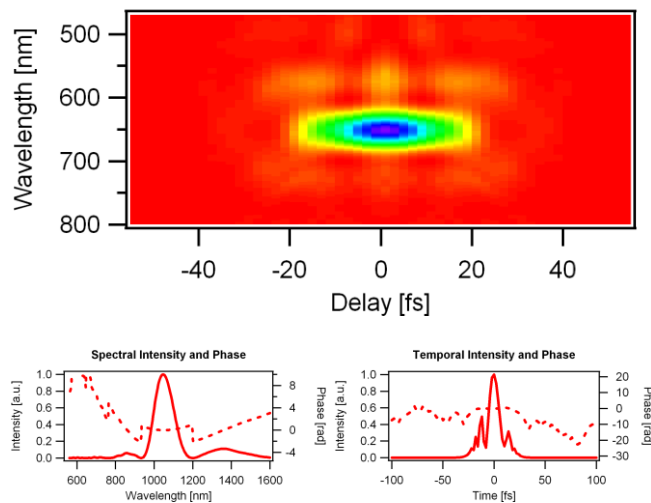
With accompanying the AFT pulse-retrieval software, it does all this in **real time!**

Two **AFT SHG FROG** models measure pulses with wavelengths from **900nm to 1100nm.**

An **AFT SHG FROG** can measure pulses from a wide variety of sources, from the lowest-energy **oscillator** to the highest-intensity **amplifier.**

AFT SHG FROGs employ a **single shot geometry**, and so they can give some idea about the other pulse distortions such as **pulse-front tilt, spatial chirp**, and etc.

The models of AFT-1064LPS and AFT-1064SFS are available to use a fiber coupler (**FC/PC**) connector which can carry the beam to the devices directly from a fiber laser system.



It shows a typical FROG trace. The pulse is from a fiber laser and the center wavelength is 1050nm. The pulse is suffering from a couple of chirp. After retrieving it, the program shows the temporal intensity and phase, and the spectral intensity and phase.

- **The pulse intensity and phase vs. time**
- **The pulse spectrum and spectral phase vs. wavelength**
- **The beam spatial profile**
- **The first order Spatial Chirp**
- **The first order Pulse-Front Tilt**
- **The autocorrelation**
- **No assumptions of pulse shape**
- **High sensitivity**
- **Real-time pulse monitoring**
- **Fast Retrieval Algorithm**
- **User-friendly interface**
- **Laptop-friendly**
- **Just connect the USB cable and go!**
- **Fiber connector available (FC/PC)**
- **Very easy to align**
- **Compact and light**
- **Solid Packaging**

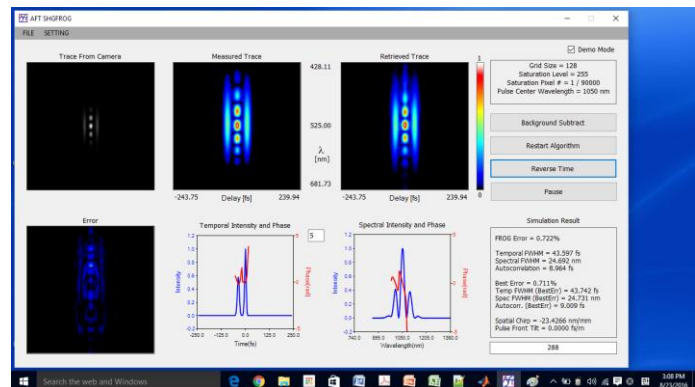
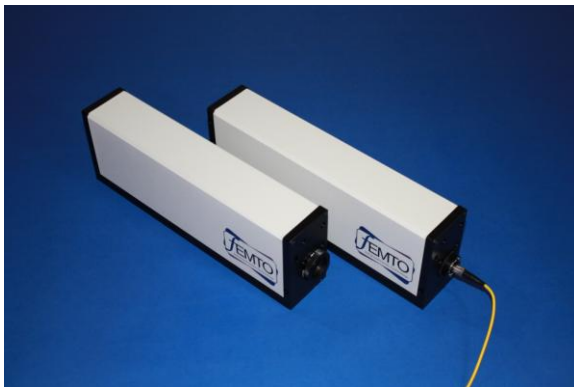
## Devices for measuring pulses in IR range

The models use a single-shot FROG geometry and so they can measure pulses from a laser system with any rep. rate frequency, from  $\sim$ Hz to  $\sim$ GHz. Comparison of the retrieved and measured traces confirms the measurement. Background subtraction is very important to measure pulses accurately and can be performed in the FROG retrieval software. The models use USB camera. Just connect to your computer's USB port; no power supply needed.

## Models and Specifications for $\sim$ 1064nm pulses

model:	AFT-1064SFS	AFT-1064LPS
Wavelength range:	900 – 1100 nm	
Pulse-length range @ 1064 nm:	$\sim$ 70fs – $\sim$ 1000 fs	$\sim$ 200fs – $\sim$ 3 ps
Delay increment <sup>1</sup> :	$\sim$ 2.5 fs/pixel	6.5 fs/pixel
Temporal range <sup>2</sup> :	$\sim$ 3 ps	$\sim$ 9 ps
Spectral resolution @ 1064 nm:	0.45 nm	0.17 nm
Spectral range @ 1064 nm <sup>3</sup> :	70 nm	25 nm
Pulse complexity:	Time-bandwidth product $< \sim$ 10	
Intensity accuracy:	2%	
Phase accuracy:	0.01 rad (intensity-weighted phase error)	
Sensitivity for single-shot:	1 $\mu$ J	
Sensitivity at 1 kHz rep:	100 $\mu$ W (100nJ)	
Sensitivity at 100 MHz rep:	10 mW (100pJ)	
Required input polarization:	Horizontal or vertical polarization	
Required input-beam diameter:	2 – 4 mm (collimated)	
Dimensions (L x W x H):	37 cm x 10 cm x 16.5 cm	
Weight:	2.5 kg	

1. A temporal step for a pixel in the camera, which is  $\sim$  the temporal resolution of the device.
2. 'Temporal range' is the full-scale range. Typically, the device can measure 1/3 of the range,  $\sim$  FWHM pulse.
3. 'Spectral range' is the full-scale range. Typically, the device can measure 1/3 of the range,  $\sim$  FWHM pulse.



On the left, the model AFT-1064SFS and AFT-1064LPS are shown. The fiber coupler is an option for both models. On the right, the picture shows retrieving a double pulse by AFT SHG FROG software. Even though the pulse is complicated, the results are good. The center wavelength is 1050nm.