

Zephyrus Series High Speed Detector

Specially designed for transient absorption spectroscopy

The Zephyrus series is specifically developed for detecting subtle intensity changes of strong pulses in transient absorption spectroscopy. Its large full-well capacity enables accurate detection of high-intensity probe light. With sampling rates up to 100 kHz, nanosecond-level synchronous exposure, and a dual-line-array architecture, the detector significantly improves the signal-to-noise ratio while effectively reducing dark-current noise and suppressing interference caused by probe-intensity fluctuations. These features greatly enhance the accuracy and stability of transient absorption measurements.

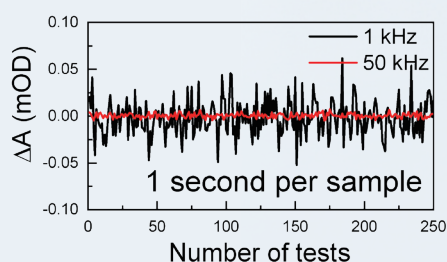


Detection sensitivity:
down to 10^{-6} ΔOD

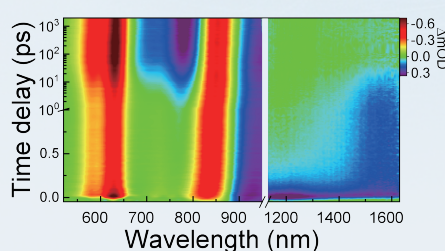
Ultra-high sampling rate:
up to 100 kHz

Multiple wavelengths available:
from visible to near-infrared

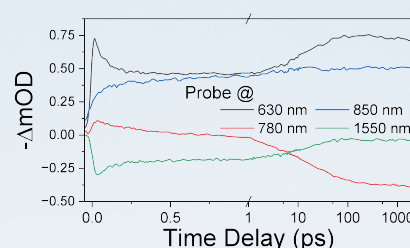
Optimized solutions available for
Ti: sapphire and Yb-based laser systems



TA measurement precision
(1-second acquisition per test)



TA 2D contour plot of
organic photovoltaic thin-film



Corresponding kinetic trace of
organic photovoltaic thin-film



Literature
References

nature

Nature **652**, 1204 (2026)

AAAS

Sci. Adv. **11**, eadr5973 (2025)

nature energy

Nat. Energy **7**, 1076 (2022)

nature communications

Nat. Commun. **13**, 2369 (2022)

nature chemistry

Nat. Chem. **13**, 559 (2021)

JACS

J. Am. Chem. Soc. **143**, 4359 (2021)

JACS

J. Am. Chem. Soc. **142**, 12751 (2020)

nature communications

Nat. Commun. **10**, 398 (2019)

Designed for 1 kHz/2 kHz, 800 nm Ti: Sapphire systems

Model	Zephyrus V4D-2048	Zephyrus V10D-1024	Zephyrus N16D-256
Wavelength Band (nm)	200 - 1100	200 - 1000	500 - 1700
Maximum Line Rate (kHz)	4	10	16
Single-line Array Pixels	2048	1024	256
Dual-array separation (mm)	19	19	19

Designed for 50 kHz, 1030 nm Yb-based systems

Model	Zephyrus V100D-128	Zephyrus V50D-384	Zephyrus N50D-1024
Wavelength Band (nm)	400 - 1100	400 - 1100	950 - 1700
Maximum Line Rate (kHz)	100	50	50
Single-line Array Pixels	128	384	1024
Dual-array separation (mm)	19	19	19

Main Specifications

Model	Zephyrus V4S/D-2048	Zephyrus V10S/D-1024	Zephyrus N16S/D-256
Detector Linear Array Version	Single-line array, Dual-line array		
Wavelength Band (nm)	200 - 1100	200 - 1100	500 - 1700
Photosensitive Area Length (mm)	28.7	25.6	12.8
Single-line Array Pixels	2048	1024	256
Pixel Size (μm)	14 × 500	25 × 500	50 × 500
Peak Quantum Efficiency	75% @ 570 nm	70% @ 600 nm	83% @ 1300 nm
Typical Dynamic Range	6300	2800 (High Gain) 5000 (Low Gain)	4000 (High Gain) 6300 (Low Gain)
Full Well Capacity (Me ⁻)	0.2	5.8 (High Gain) 25.4 (Low Gain)	17.5 (High Gain) 175 (Low Gain)
Conversion Efficiency (μV/e ⁻)	10	0.56 (High Gain) 0.13 (Low Gain)	0.16 (High Gain) 0.016 (Low Gain)
Maximum Line Rate (kHz)	4	10	16
Minimum Exposure Time (μs)	2	1	2
Heat Dissipation Method	Passive Cooling		
Synchronous Signal Input	External trigger, Pump-Probe Synchronization		
Size (mm)	100 × 100 × 58		

Model	Zephyrus V100S/D-128	Zephyrus V50S/D-384	Zephyrus N50S/D-1024
Detector Linear Array Version	Single-line array, Dual-line array		
Wavelength Band (nm)	400 - 1100	400 - 1100	950 - 1700
Photosensitive Area Length (mm)	16.3	48.8	12.8
Single-line Array Pixels	128	384	1024
Pixel Size (μm)	127 × 127	127 × 127	12.5 × 250
Peak Quantum Efficiency	70% @ 600 nm	70% @ 600 nm	65% @ 1500 nm
Typical Dynamic Range	6300	6300	187 (High Gain) 600 (Medium Gain) 1500 (Low Gain)
Full Well Capacity (Me ⁻)	11	11	0.15 (High Gain) 0.38 (Medium Gain) 1.22 (Low Gain)
Conversion Efficiency (μV/e ⁻)	0.35	0.35	10.0 (High Gain) 4.0 (Medium Gain) 1.23 (Low Gain)
Maximum Line Rate (kHz)	100	50	50
Minimum Exposure Time (μs)	2	2	16
Heat Dissipation Method	Passive Cooling		
Synchronous Signal Input	External trigger, Pump-Probe Synchronization		
Size (mm)	100 × 100 × 51.7	100 × 100 × 51.7	100 × 100 × 58