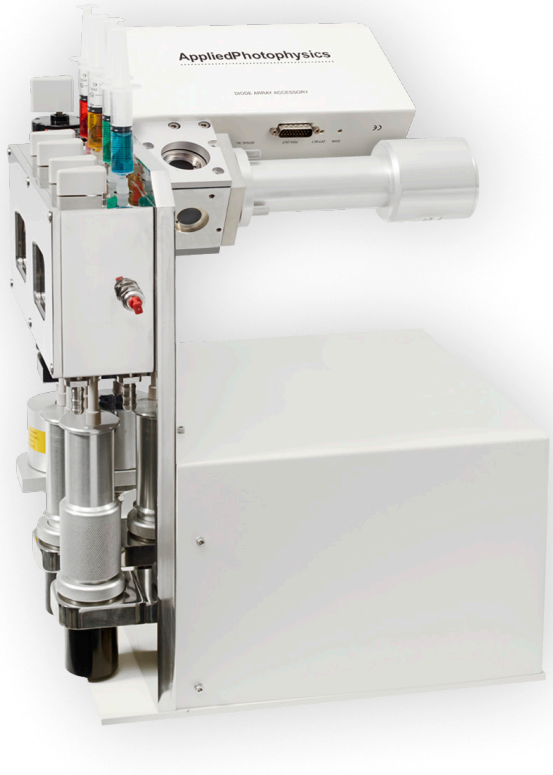
AppliedPhotophysics
More Time for Science

SX SERIES - UPGRADE INFORMATION

High Sensitivity PDA Upgrade

KEY BENEFITS

- Higher sensitivity from direct mounting of PDA to sample handling unit
- Lower gain settings deliver improved signal-to-noise ratio
- Improved signal quality and accuracy in the UV region of the spectrum
- Compatible with xenon and deuterium light sources
- New 16000 spectra per drive with latest software
- Reduced 0.68ms intergration time for faster data acquisition
- Simple to install
- Low cost upgrade option for older model PDAs



Applied Photophysics has recently introduced a new photodiode array detector delivering higher sensitivity than older models for time-resolved spectral measurements.

The new PDA features a detector that is mounted directly to the cell block of the sample handling unit rather than via a fibre-optic light guide common to previous models. This high efficiency coupling provides a significant improvement of light throughput which results in lower noise than on older fibre-optic coupled models and increased sensitivity.

Users of earlier models of PDA may benefit from these developments in the form of an affordable upgrade that transplants the existing PDA spectrometer into the new detector housing.

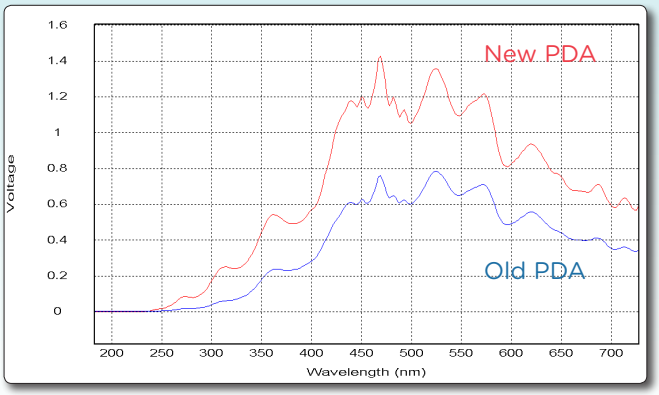


Figure 1: Comparison of xenon lamp voltage output under identical conditions when using the old fibre optic (blue trace) and new direct mount (red trace) PDA accessory.

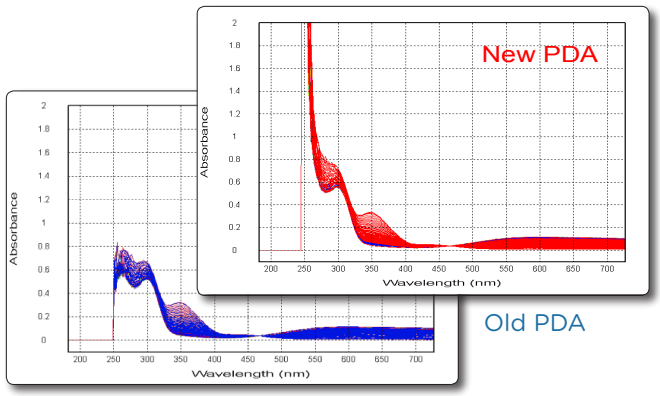


Figure 2: The new direct mount PDA offers significant signal-to-noise improvements as well as increased photometric accuracy over the old fibre optic PDA accessory.

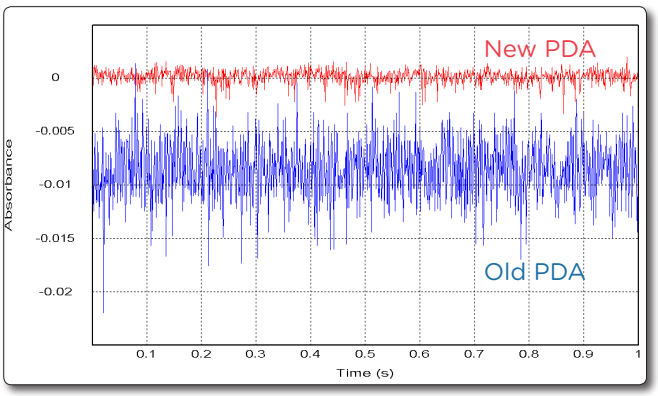


Figure 3: The increased light throughput of the new direct mount PDA allows the use of a much lower gain setting, offering a significant reduction in noise levels. This data shows the comparison at 350nm.

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Applied Photophysics was established in 1971 by The Royal Institution of Great Britain

XENON LAMP REFERENCE COMPARISON

The sensitivity comparison of the old fibre optic and new direct coupled PDA is displayed opposite in Figure 1 for a xenon lamp reference spectrum. The typical light throughput increase is in the order of x1.5-2 across the wavelength range 300 - 730nm for the UV model PDA with greater improvement in the UV region. Replacement of old fibre optics light guides will yield a further light throughput increase.

PDA PERFORMANCE COMPARISON - SPECTRA

The higher light throughput in spectrum mode is demonstrated at the UV end of the spectra where signal noise is decreased and photometric accuracy improved as shwn in Figure 2.

PDA PERFORMANCE COMPARISON - KINETICS

Increased light throughput allows the detector to be operated with a lower gain setting. This results in lower noise in the kinetic traces as illustrated in Figure 3.

FASTER SCANNING (0.68MS PER SCAN)

The higher light intensity may permit the standard integration speed (1.00ms) to be reduced (as low as 0.68ms), allowing for faster scanning at comparable noise levels and more spectra to be acquired for the fastest reactions.

UPGRADE PROCEDURE

It is recommended that the PDA upgrade is carried out at the same time as a PM service by an Applied Photophysics engineer. The upgrade involves transplanting the existing PDA unit from the old to the new detector housing. The new detector will also require the latest electronics, which can be reused from some PDAs supplied from 2008 onwards.

An additional modification of the sample handling unit may be required for pre-2001 SX instruments (SX17 and SX18 models).

To further discuss the upgrade with our support team, please contact us at
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