ABET TECHNOLOGIES

Function Focused Innovation™

Digital Light Detector

Pyroelectric and Photodiode Detector UV-IR Systems

Dual Phase Digital Lock-in Amplifier models

TE Cooled versions

USB 2.0 connectivity with ActiveX controls

Numerous Software Applications

16 bit A/D; independent signal channels for sandwich

DLD-100-P-2 Pyroelectric detector with digital lock-in amplifier

Introducing the DLD family of detectors: Innovative and highly flexible self contained instruments. Optimized for stand alone and scanning monochromator applications.

Innovative

All the light detection power and convenience of modern technology in a package slightly larger than your cell phone. FPGA technology allows all the power of a DLD to be packed into this compact, integrated package.
Basic and built-in digital lock-in amplifier models include a large selection of pyroelectric, photodiode and photodiode sandwich detector options to suit your application. A galvanically isolated DC/DC converter protects your signal from line frequency noise problems.
TE cooled models include a built-in controller.
Easy USB connectivity, ActiveX controls and an extensive complement of software applications let you use this instrument right out of the box or easily integrate it into your Windows compliant application, be it based on LabView, MatLab, Excel, Visual Basic or similar platform.

Adaptable

Abet Technologies offers a number of accessories to adapt the DLD detection systems to your needs. However, if you would like to use components offered by other manufacturers go right ahead and mix and match. The front face of the DLD instruments comes equipped with a C-mount thread and accepts mounting rods for 30 mm cage systems. Inexpensive adapters to various other industry standard and major photonic supplier proprietary mounting schemes allow easy adaptation to your metrology needs If you need or already have accessories from other manufacturers like Thor Labs, Newport-Oriel, Linos, Edmund, PI-Acton, etc., putting your system together is very straightforward.

Abet Technologies, Inc. 168 Old Gate Lane Milford CT. 06460 Tel: 203-540-9990 Fax: 203-874-6257
www.abet-technologies.com sales@abet-technologies.com

ABET TECHNOLOGIES
Function Focused Innovation™

Compact, Integrated, Powerful, Functional, Versatile

A DLD family detector, even with TE cooling and lock-in options included, is housed in a conveniently compact enclosure, less than 160X90X50 mm.

Having the complete system in a single enclosure assures high level of EMI immunity.

Opto-mechanical adaptable

C-mount, 30 mm cage system (6 mm rods), Thor Labs, PI-Acton, Edmund, Linos, Newport-Oriel – whatever your preferred optical mounting system, Abet Technologies' products easily integrate with all of them either directly or with the available inexpensive adapters.

Advanced electronics and software

Flexible and reliable data acquisition performance is assured by high quality detector elements, software controlled analog gain, 375 kHz 16 bit Analog to Digital converters for each channel, FPGA based digital filtering and data processing and USB 2.0 compliant communications.

Software controlled transimpedance gain switching optimizes S/N of signal acquisition. The Sync feature enables a robust digital data filtering, especially with the optional Lock-in amplifier with 8-tap digital filters.

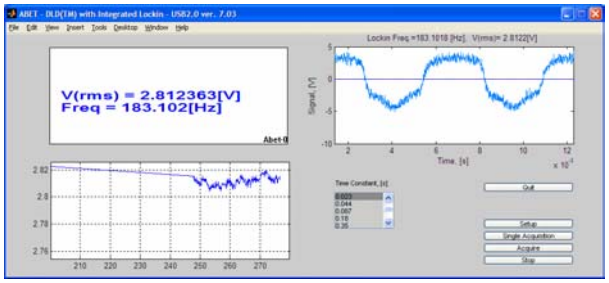
ActiveX based software interface allows straight forward integration into your application, be it in LabView, MatLab, Visual Basic, Excel…

Numerous included application packages allow out of the box utilization of these detectors for simple metrology, data logging, or spectral data acquisition with the supported monochromator models.

Highly Functional Software

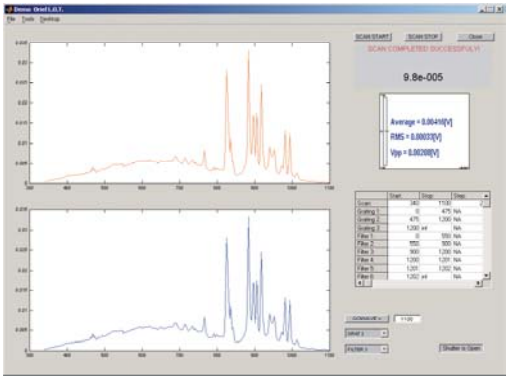
At the end of the day, PC-centric instruments live or die by the reliability of their use when connected to your computer. Fully Windows compliant ActiveX controls and USB 2.0 connectivity is Abet Technologies' way of assuring that reliability.

A number of ready to use stand alone software applications are included with each shipment to enable out of the box utility of the DLD instruments. Simple signal monitoring, data logging or taking spectral scans with a number of supported scanning monochromators does not require any additional programming. The lock-in data logger window below is an example of such an application:

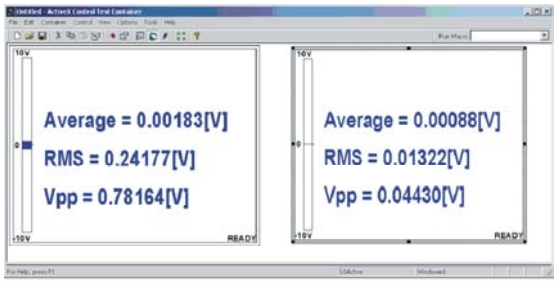


Shown are the measured signal value, lock-in frequency, the measured waveform and data log graph. A copy of the data log graph can be captured at any time and additional data added to it from consecutive acquisitions for comparison, saving and graphical manipulations are enabled by a MatLab run time engine.

Spectrally resolved data acquisition software, included, interfacing with a DLD system and a supported scanning monochromator is shown below:



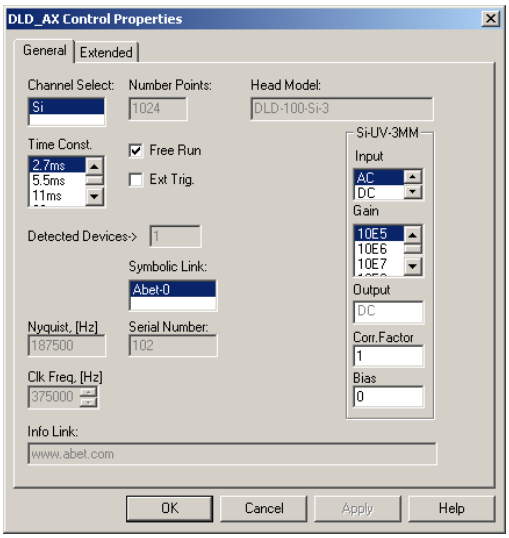
Custom applications can be created using the included Active X control, an example is shown below with two instances of it running (and two DLD's measuring signals).



Abet Technologies, Inc. 168 Old Gate Lane Milford CT. 06460 Tel: 203-540-9990 Fax: 203-874-6257
www.abet-technologies.com sales@abet-technologies.com

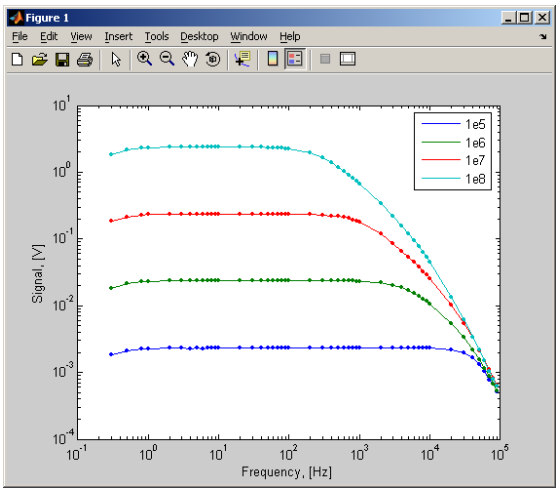
DLD ActiveX software supports multiple instances allowing related signals can be measured simultaneously and appropriate signal ratios calculated.

Right clicking on a DLD ActiveX control brings up a detector specific properties window that contains detector information and allows setting of all the pertinent parameters.



Individual Model Specifications

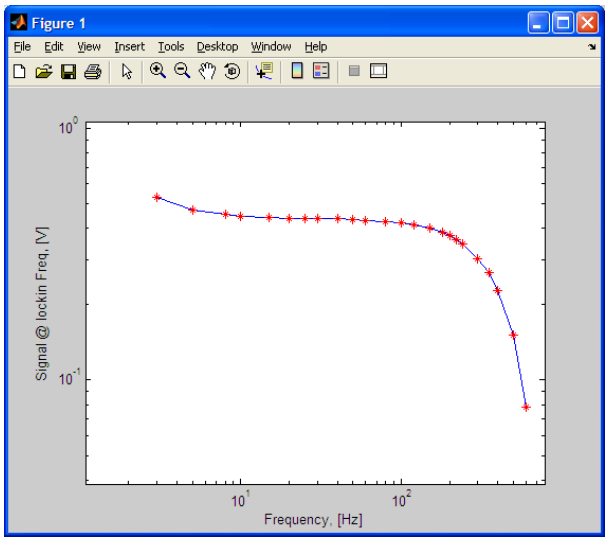
The **DLD-100-Si-0.5, DLD-100-Si-3**, **DLD-100-InGaAs-2, DLD-100-InGaAs-3** digital detectors share most of their characteristics except for detector type and size. A typical frequency response behavior of a 3 mm Si system is shown below.



The **DLD-100-P-2** pyroelectric detector with digital lock-in amplifier offers low, routinely measurable NEP values:

Time const	44 ms	350 ms	2.8 s
NEP	100 nW	30 nW	12 nW

These can be easily improved upon with some acoustical shielding (helpful in any low signal pyroelectric detector measurements). It is preset to a single gain setting of approximately 10^4 V/W at 90 Hz, 630 nm. A BaF_2 window assures wide spectral coverage. Typical frequency response of a DLD-100-P-2 lock-in detector is shown below:



The **DLD-100-Si-2.4-InGaAs-1-TE** uses a Hamamatsu K3413-09 Si/InGaAs two color detector, Si 2.4x2.4 mm, InGaAs 1 mm diameter, and adds TE cooling control, two individual 375 kHz 16 bit Analog to Digital converters, and dual channel, dual phase digital lock-in amplifiers. Its ActiveX controls provide all the usual ease of use and flexibility associated with ActiveX

Accessories

Accessories are easily accommodated with a flexible design front plate and a number of adapters to industry standard interfaces. Some of the accessories include the **A-C-O** male adapter to Newport-Oriel 1.5 inch series flange system and the Cornerstone family of monochromators, the **A-C-A** adapter for PI-Acton SpectraPro SP300, SP500 and SP750 series monochromators or the **A-C-T** adapter to ThorLabs 1.035-40 threaded mounts for 1 inch optics. Please inquire if your needs require other adapters.

Abet Technologies, Inc. 168 Old Gate Lane Milford CT. 06460 Tel: 203-540-9990 Fax: 203-874-6257
www.abet-technologies.com sales@abet-technologies.com

ABET TECHNOLOGIES
Function Focused Innovation™

General Specifications

Specifications here presented are limited by the space constraints of this short brochure – please contact us for any additional information you may need.

Compatible with Windows XP or later USB 2.0 or higher (cable not included)

ActiveX interface. Each ActiveX instance running communicates with one DLD at a time. Multiple ActiveX instances can run simultaneously allowing multichannel measurements

16 bit, 375 kHz Analog to Digital Converter

A selection of Photodiode and Pyroelectric detectors. Special detector requests accommodated for detector packages up to TO-5 size.
Room Temperature and TE Cooled models with a cooler controller unit built in.

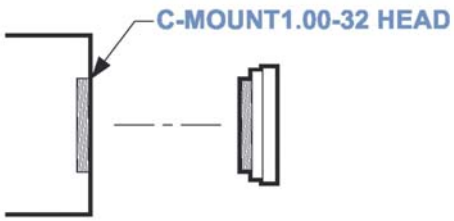
Si/InGaAs sandwich models equipped with dual A/D channels

Software selectable transimpedance gains of 10^5, 10^6, 10^7 and 10^8 V/A for photodiodes

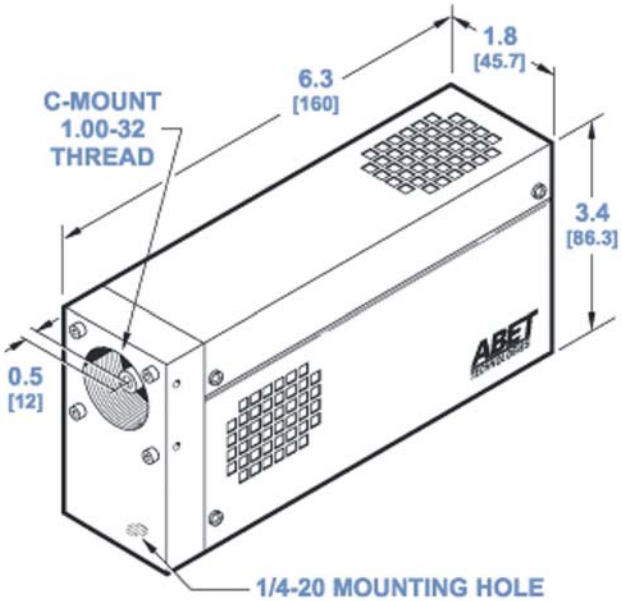
TTL Sync input (SMA connector)

90 / 260 V, 50-60 Hz Universal Input power supply

Adapters



The face plate of DLD detectors has a C-mount thread to accommodate a number of adapters like the A-C-T or A-C-O. 6 mm rods from 30 mm spaced cage systems can be attached directly to the DLD and accommodate a great variety of components from many manufacturers.



Dimensions of a DLD digital detector

Ordering Information:

DLD-100-Si-0.5 UV enhanced Si detector 0.5 mm diameter	$2,165
DLD-100-Si-3 UV enhanced Si detector 3 mm diameter	$2,176
DLD-100-InGaAs-2 InGaAs detector 2 mm diameter	$2,468
DLD-100-InGaAs-3 InGaAs detector 3 mm diameter	$2,538
DLD-100-P-2 Dual phase lock-in Pyroelectric detector, 2 mm diameter	$4,427
DLD-100-Si-2.4-InGaAs-1-TE Sandwich Detector, TE cooled, dual channel, dual phase lock-in, Si 2.4mm, InGaAs 1 mm	$6,200

Add –M suffix to the model number if you need your detector shipped with an M6 thread adapter for metric setups (no additional charge). This adapter screws into the ¼-20 mounting hole and adds approximately 7 mm to unit's height.

ACCESSORIES

A-C-T Adapter C-mount to Thor Labs 1.035-40	$32
A-C-O Adapter C-mount to Oriel 1.5 inch flange	$87
A-C-A Adapter C-mount to Acton SpectraPro	$87
C-USB-6 Cable, USB, 6 ft (1.8 m) long	$12

CE

Abet Technologies, Inc. 168 Old Gate Lane Milford CT. 06460 Tel: 203-540-9990 Fax: 203-874-6257
www.abet-technologies.com sales@abet-technologies.com