

QE (IPCE) IQE

LED Powered Spectral Metrology Tools



Abet Technologies Model AB6000 Quantum Efficiency measurement tool (dark enclosure not shown)

AAA: Adaptable, Advanced, Affordable

Abet Technologies updated for 2017 Quantum Efficiency tools ship in many flavors making them completely adaptable to the customer's metrology needs. The advanced LED based light source offers stable, long life performance. Choose the spectral range of interest to you and the source will be populated to match your needs. No chopper or order sorting filters are required thus making the system more affordable.

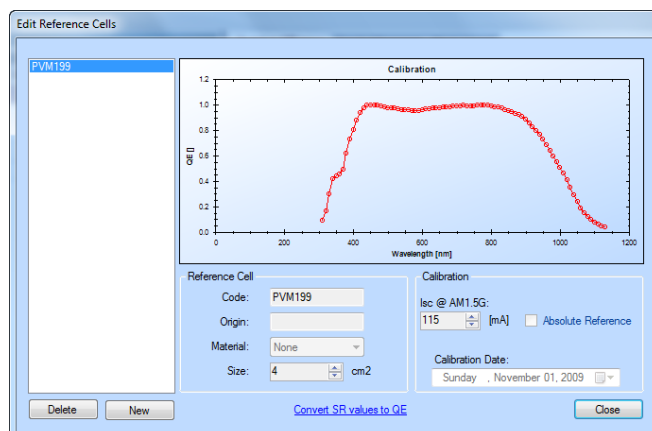
Complete

Your system ships with all the necessary hardware and software. A built in Windows 10 or higher PC allows full control of test parameter settings and instrument performance. PHOTOR software controls the instrument and offers complete data analysis capabilities.

The high-power LED based light source provides stable, long life, easy to modulate output. A fast scanning 250 mm class direct drive monochromator provides high light output. Micrometer driven slits allow reproducible bandwidth control. Micrometer driven spot size control standard. Spot size 1x5 mm standard and reproducibly adjustable to smaller sizes.

Also included are the required bias light(s), a bias voltage supply (+/- 10V), a dual channel lock-in amplifier, an I/V converter to separate AC from DC signals and amplify them, all necessary reference and monitor cells, temperature monitoring electronics, and as ordered cell mounting and contacting hardware, temperature control, XY translation stages for QE mapping, or Internal Quantum Efficiency option.

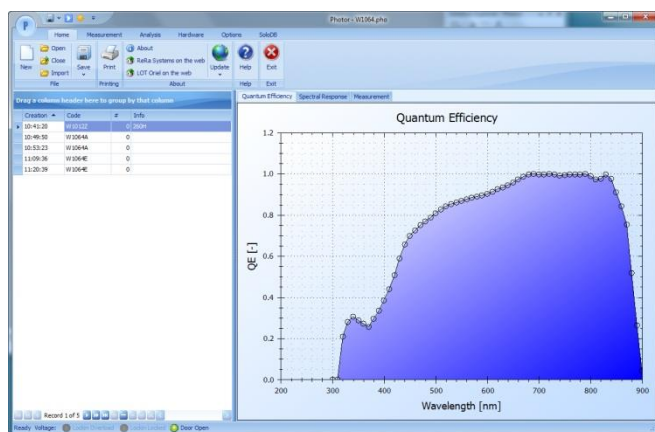
- Complete turnkey solutions for spectral characterization
- LED based light engine allows DC to high frequency monochromatic light generation. No chopper or order sorting filters required
- 250 mm focal length, direct drive monochromator offers high scan speed and generous light output
- Modular setup for maximum flexibility.
- Single and multi-junction devices
- EQE (IPCE) and IQE capabilities
- Spectral ranges 300-1800 nm
- Built-in Windows PC and dual channel lock-in amplifier
- Variable bias light (white or multi-color)
- $\pm 10\text{VDC}$ bias



PHOTOR screen with reference cell data

PHOTOR Software

The PHOTOR software package provides a complete control of all system functions in all the models of Abet Technologies' AB6000 family of EQE/IQE systems. Photor also offers standards compliant data analysis for QE, IPCE, IQE, Spectral Response, single and multi-junction, Mismatch Factor, and short circuit current for different ASTM standard spectra. PHOTOR has been developed using the latest Microsoft.NET technology resulting in a Microsoft Office look and feel, making the user learning curve very short. The algorithms used in PHOTOR meet all the current IEC standards for Spectral Response measurements. Relative measurements can be easily scaled to calibrated currents for different spectral irradiances. All such calculations are done using the ASTM G173 Reference Solar Spectral Tables.



Optimized and Flexible Design

A monitor cell is used in every scan to assure data accuracy and reproducibility.

The included DC mode electronics and completely dark enclosure allow QE metrology on organic cells and other slow response materials.

Computer controlled multi-color bias lights and voltage bias option allows multi-junction cells biasing. System design flexibility allows testing of a wide variety of cell types. A partial listing includes: poly silicon, c-Si, mc-Si, nc-Si, III-V compound cells; thin film: Perovskites, CdTe, CIS, CIGS, Si; 3rd generation: organic polymer, dye.

XY scan and multiplexer options offer automated EQE map generation or multiple devices scanning.



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Ordering Information

Please use this ordering information as a starting point and contact Abet Technologies or her distributors for complete product guidance. The large number of spectral options, and available chucks and probes far exceeds the available space on this page.

AB6000 System includes

- 350-1100 nm LED light engine and drive/modulation electronics
- 250 mm class single grating direct drive Monochromator
- Dark enclosure with convenience setup light
- Computer controlled Tungsten halogen bias light
- Si monitor cell
- Si reference cell
- Light delivery and spot generating optical assembly capable of down, horizontal and up light delivery
- Complete electronics bay with a built-in PC with Windows 10 or higher and Photor software package installed, bias supply and dual channel lock-in electronics, IV converter, monitor cell electronics, reference cell electronics, temperature metrology electronics
- PC monitor, keyboard and mouse

Order probes and chuck to match your cells separately.

Accessories and Options

- AB2160** 300-1100 nm IQE total reflectance option
- AB2161** 300 nm - IR IQE total reflectance option
- AB2162** IQE total transmittance option; requires either AB2160 or AB 2161
- AB2170** motorized XY table, 160x160 range min
- AB2142** Computer controlled multi-color bias light with selectable LEDs (standard selections 455 nm and 810 nm)
- 15090** Universal test platform
- 15090-M** Magnetic base
- 15250F-R** Micromanipulator, precision, right handed
- 15250F-L** Micromanipulator, precision, left handed
- 15251L** Micromanipulator, low resolution
For 50x50 mm or smaller devices
- AB2112** Temperature control ready vacuum stage, 160x160 mm
- 15280** Vacuum pump, QE, low noise
- 15285** Heating/Cooling Recirculator, dew point to 70°C standard

Reference Cells

- AB2152-1** Si reference cell, 300-1100 nm NIST traceable calibration
- AB2152-2** Ge reference cell, 700-1800 nm NIST traceable calibration

Many additional options and accessories available – please inquire.