

QE (IPCE)

IQE

LED Powered Spectral Metrology Tools



Abet Technologies Model AB6000 Quantum Efficiency measurement tool, 350-1100 nm range

AAA: Adaptable, Advanced, Affordable

Abet Technologies new for 2015 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.

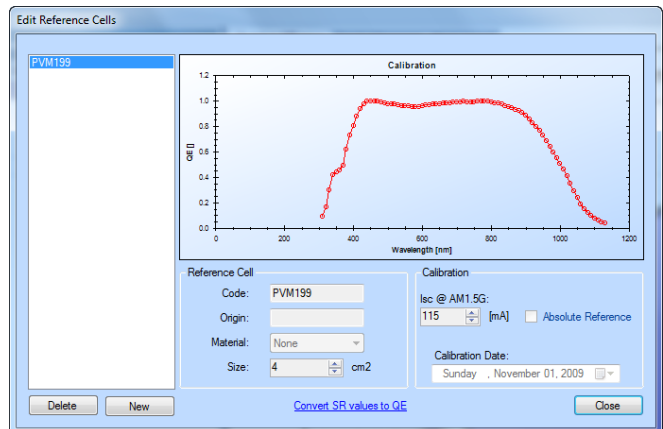
Complete

Your system ships with all the necessary hardware and software. A built in Windows 8 or higher PC allows full control of test parameter settings and instrument performance through a touch screen panel and standard keyboard and mouse. PHOTOR software controls the instrument and offers complete data analysis capabilities.

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. Fiber light delivery allows complete flexibility in test setups and also scrambles polarization to minimize polarization bias induced errors.

Also included are the required bias light(s), a bias voltage supply (+/- 10V), a 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.

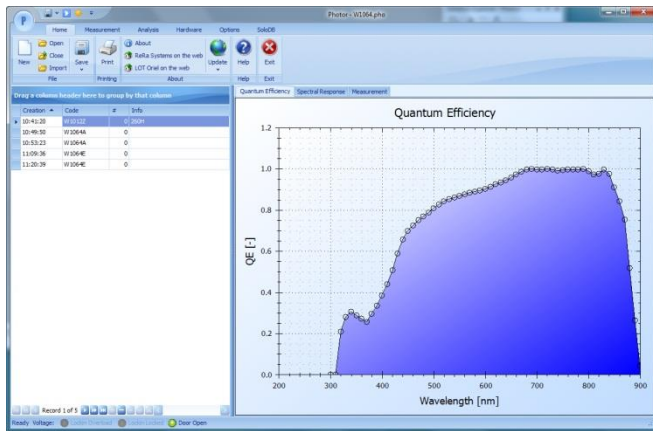
- Complete turnkey solutions for spectral characterization
- LED based light engine allows DC to high frequency monochromatic light generation. No chopper or order sorting filters required
- 250 mm focal length, direct drive monochromator offers high scan speed and generous light output
- Modular setup for maximum flexibility. Fiber coupled output homogenizes light polarization
- Single and multi-junction devices
- EQE (IPCE) and IQE capabilities
- Spectral range 300-1800 nm
- Built-in Windows PC and DSP powered lock-in amplifier
- Variable bias light (white or multi-color)
- $\pm 10\text{VDC}$ bias
- IV curve generation up to 100 mA



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 2013 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.

Use the included reference cell for specular reflectivity measurement to obtain an IQE estimate.

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.

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 fiberoptic and spot generating optical assembly capable of down and up light delivery
Complete electronics bay with a built-in PC with Windows 8 or higher and Photor software package installed, Ethernet connectivity (order wireless option if desired), touch screen controls, bias supply and lock-in electronics, IV converter, monitor cell electronics, reference cell electronics, temperature metrology electronics, optional vacuum pump controls
PC monitor, keyboard and mouse

Order probes and chuck to match your cells separately.

Accessories and Options

AB2160 IQE option with BaSO₄ coated integrating sphere
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
15090-F Levelling feet
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, 12 VDC, low noise
15281 Temperature Stabilizing Recirculator, 25°C
15285 Heating/Cooling Recirculator, dew point to 120°C

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.

Abet Technologies regularly continues to upgrade our products and therefore all specifications are subject to change without notice. Please contact factory for the current specifications.