





# IVL TEST PLATFORM

## TEST SYSTEM FOR CURRENT-VOLTAGE-LUMINANCE CHARACTERISTICS

The **IVL TEST PLATFORM** developed by S.E.A. is a complete test system for measuring the I-V-L (current-voltage-luminance) characteristic of optical semiconductor components. The system is customized for any kind of (O)LEDs or pixel constellations. The turn-key test system consists of high-quality hardware and software with a standard stimulation and measurement equipment plus the customized test adapter system.

### Hardware

The hardware consists of a rack based system, including all necessary stimulation and measurement hardware. The test adapter allows the automated contact of semiconductor devices, plates, and samples. The system is delivered always customized as it supplies the optical sensor and electronic as well. This test adapter can be produced according to the dimensions of the test devices and can respectively be tailored.



Optional production fieldbus interfaces are available for smooth integration of the **IVL TEST PLATFORM** into production facilities.

Test adapter and measurement electronics hardware rack of the **IVL TEST PLATFORM**



Double contacts allow resistance measurements and contact check before starting the measurement. Mechanical contacting can be done manually within laboratory setup, but also via pneumatic control for automated production tests. The changeable inlet of the test adapter allows easy adaption to other sample designs.

### Software

The software controls the complete setup and measurement process.

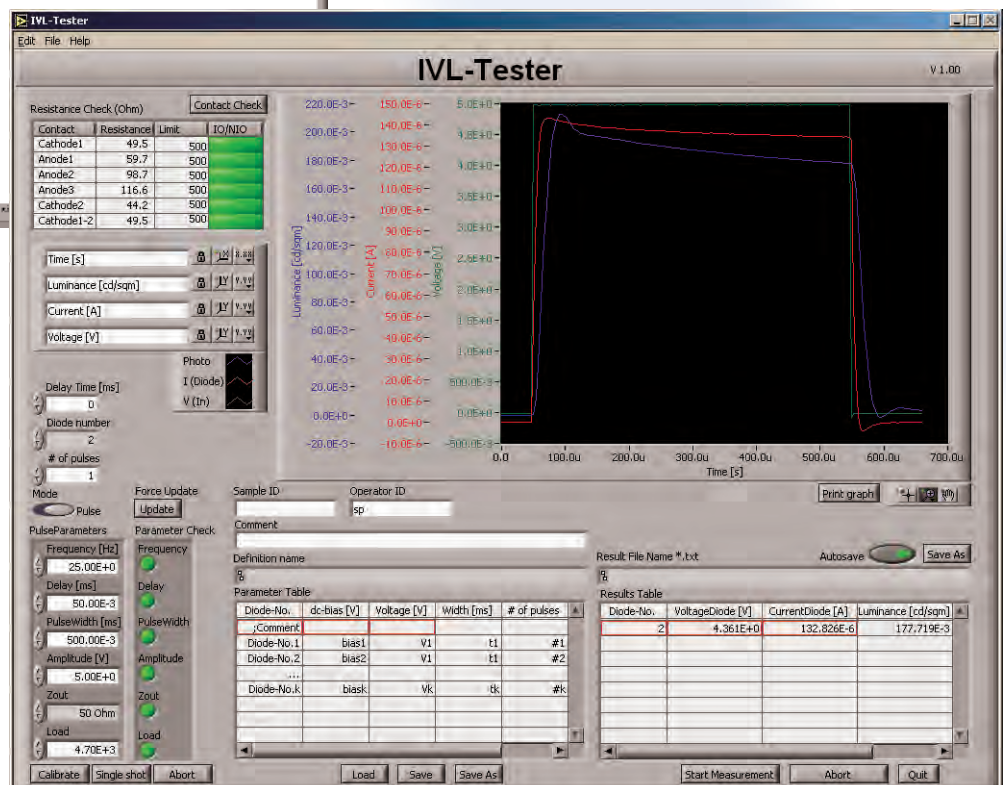
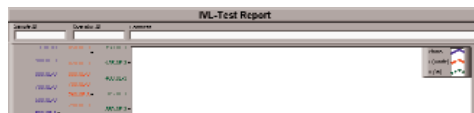
Predefined test setups and test sequences can be stored and retrieved for fast test preparation. Long term testing or sequential testing with various parameters is performed with the test sequence engine of **TESTMASTER®**, a dedicated software product for testing of semiconductors or complete electronic assemblies.

The software is based on LabVIEW™ from National Instruments and supplies an easy to use graphical user interface with many options to parametrize individual test setups.

The optical and electrical units of the tester are delivered factory pre-calibrated. Calibration models allow calibrating the optical signals on demand with an external photometer. The opportunity is given to perform a relative or an absolute calibration for each individual device.

**IVL TEST PLATFORM** user interface with contact check area, calibration, parameter definition, and module for automatic sequencing

left: IVL report sheet

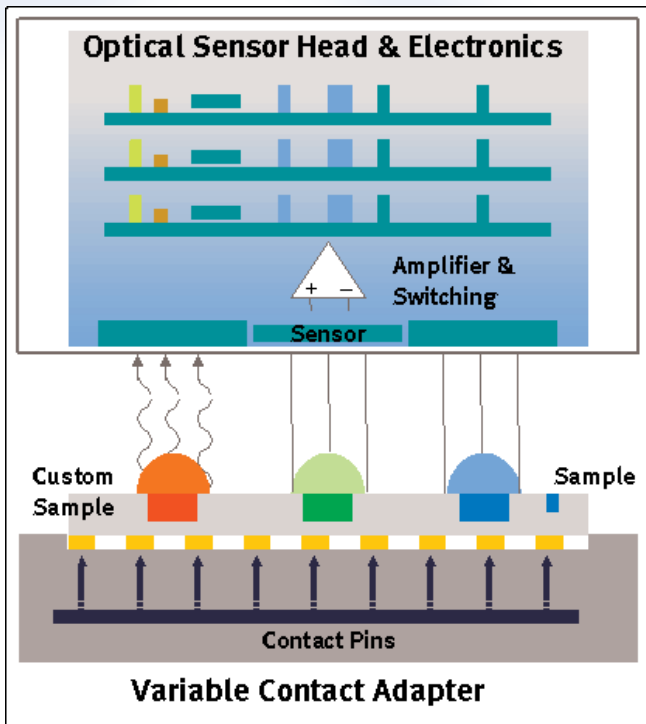
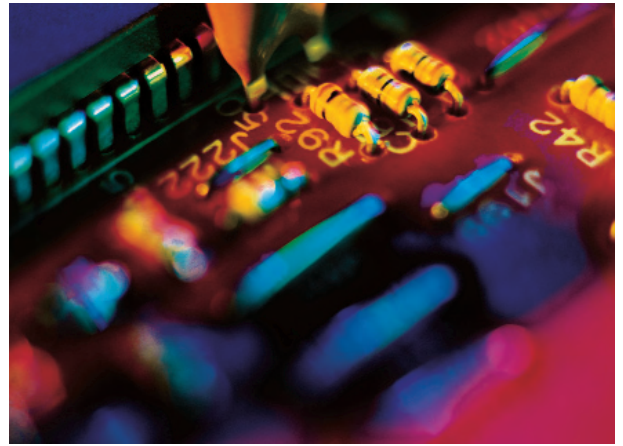


**ALL OUR KNOWLEDGE HAS ITS ORIGINS IN OUR PERCEPTIONS.**

## System

The high performance measurement hardware for the optical and electrical measurements is built by S.E.A. The measurement range of **IVL TEST PLATFORM** can be further adapted to customer specific needs.

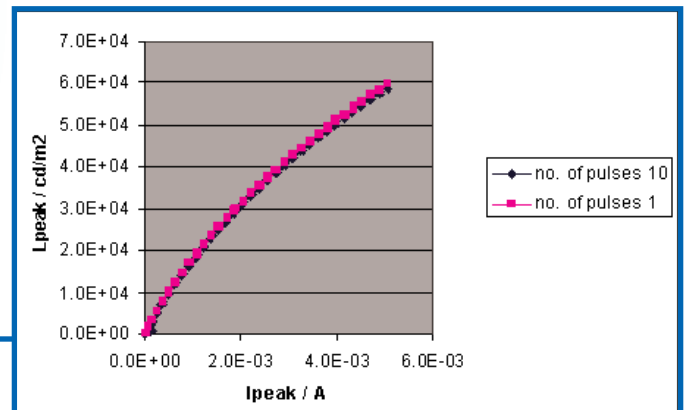
The standard system can measure luminance levels from 1 candel/m<sup>2</sup> up to 200000 cd/m<sup>2</sup> and handle all kinds of semiconductor devices with stimulation voltages of up to 100 Volt<sub>pp</sub> and 2 Ampere of current per device. The system can manually measure single stimulation points at certain DC or pulsed signals as well as transfer functions by automated sequential tests. The sequential tests allow performing aging tests.



above: Scheme of test principle: The sample is fixed in a sample holder pressed onto the contact pins by the optical sensor head. The electrical stimulation is performed from the bottom and the optical measurement from the top side.

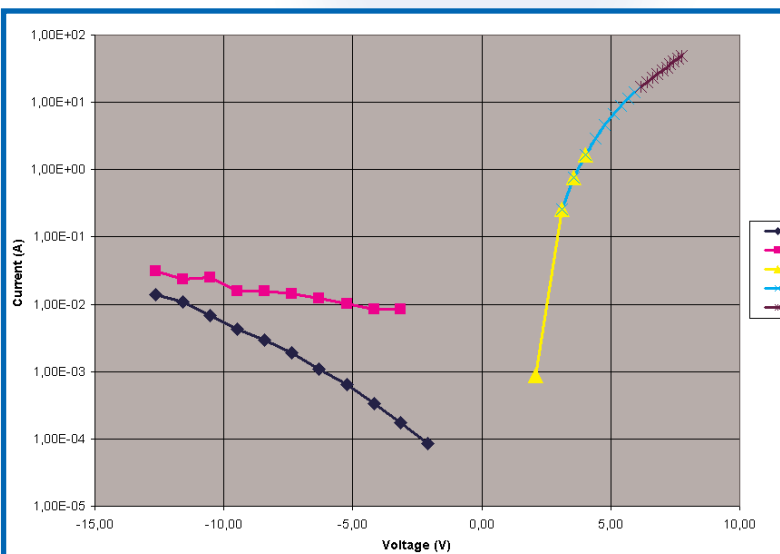
Measurement of single or multi-pixel devices can be realized by a modular switching concept.

Acquired data can be stored within ASCII files or in a database system to allow the correlation of different measurements. Each test can produce a customized report sheet, which covers the product data as well as the test results in alphanumeric and graphical form.

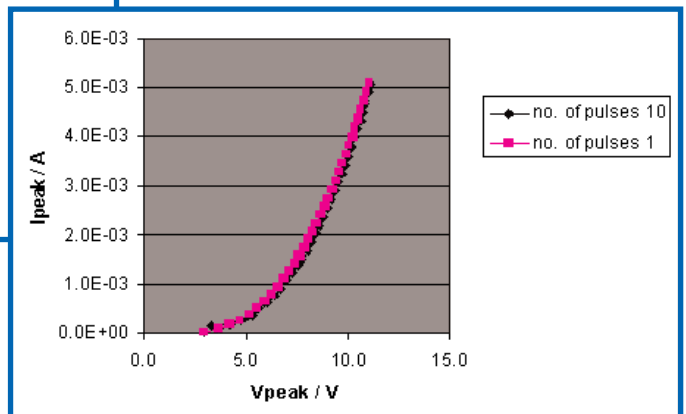


Hysteresis:  
Cyclic up-and down-ramping of the I-I and I-V (top down) curve in forward direction with two different numbers of pulses

Parameters were: 25Hz, 0.4ms width.



above: Comparison measurements in DC and pulsed mode give the same results. Reverse results differ because of the RC-behaviour of the sample design.



## Standard System Characteristics

### Mechanical System Characteristics:

- Maximum test sample dimensions: 300mm x 400 mm x 20mm
- Test contacts: standard: maximum 192  
customized: no limits

### Electrical System Characteristics:

- Stimulation: voltage 2-100 V, if resistance  $> 1 \text{ k}\Omega$  (1-50V) (50  $\Omega$ );  
device dependant current (AC/DC): 0-2 A
- Luminance: 1 cd/m<sup>2</sup> to 200000 cd/m<sup>2</sup>
- Current measurement range: 0,1  $\mu\text{A}$  - 1 A

### Highlights:

- Wide luminance dynamic range
- Various contact pins in size and number available
- Customized test adapter
- Flexible test- and measurement software

### Options:

- Contact check
- Current control: 20 mA-1 A (50  $\Omega$ )
- Calibration equipment
- DC-measurement option ( $\pm 2\text{V}$ )
- Database connecting to local or customized DB
- Pneumatic adapter for automated tests



## Performance

- industrially approved
- customized system
- turnkey solution
- high performance
- reproducible test results
- wide dynamic range for tests of nearly all semiconductors
- high performance test adapter with changeable sample holder for device specific adaption

## Consulting & Service

S.E.A. has been a successful provider of system integration solutions in measurement and automation technology for more than a decade. You can benefit from this experience by requesting our advice. Our services range from the customization of our test solutions to the development and integration of turnkey systems.

S.E.A. has expertise in optical measurements and vision inspection systems. Please ask our experts - they will be glad to submit a proposal addressing your specific testing needs.



PC based **IVL TEST PLATFORM** with test adapter, 19" rack, including pulse generator, meter, multiplexer, stimulation, and measurement electronics



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## View

The software of the **IVL TEST PLATFORM** is based on the **TESTMASTER** suite, a solution proven in numerous industrial production and R&D testing applications. The system is suitable for testing of diverse (O)LED materials used in today's display production. Complete systems for production tests of (O)LED display devices are available.

Apart from the basic **TESTMASTER** and other test platforms, our range comprises the **SPACEMASTER** system for fiber optics and the **MEASUREMASTER** for audio and video testing and analysis.