

**Brightsight** is your globally recognized partner in security approval of IT products.

Our services include:

**Security evaluation**

**Developer support**

**Tools**

**Training**

Our customers range from international financial institutions to telecom operators, IT product manufacturers and governments. We offer them a completely independent expert view tailored to their specific requirements.

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**Brightlight**  
Laser Manipulation  
and Analysis Tool

**Brightlight** is a state-of-the-art laser manipulation tool that has been developed, used and improved by Brightsight's globally recognised security experts since 2004. Brightlight is used to test the susceptibility of secure microcontrollers to light.

### Brightlight in Use

Laser manipulation is a technique that disturbs the normal operation of a microcontroller. A device that is vulnerable to this technique may reveal sensitive information or behave in an unreliable fashion. Brightsight is often requested by their customers to perform laser manipulation to investigate the resistance of a microcontroller product against this security threat.

Using the Brightlight tool from Brightsight, manufacturers and software developers can perform laser manipulation experiments themselves to test the level of resistance in their microcontroller products.

### Laser Manipulation

Secure microcontrollers, as used in smart cards, are designed to protect the confidentiality and the integrity of sensitive information. Electrical properties of silicon can be influenced, however, when the chip is exposed to light. This may change data that is stored or processed by the microcontroller. Laser manipulation techniques provide a powerful way to cause these changes in hardware, resulting in unreliable software execution. This process is often referred to as (single) fault injection.

The power and accuracy of the laser beam allow for manipulation of data stored in memory, data read from memory or data processed by the CPU or a cryptographic co-processor. At the software level these manipulations may change program flow execution with a risk of bypassing security functionality or dumping secret information. Manipulation of a cryptographic co-processor may enable a Differential Fault Analysis (DFA) attack causing exposure of secret key data.

### Brightlight

Brightsight's laser manipulation tool Brightlight helps to determine which locations of a chip's surface are susceptible to laser manipulation. It also gives feedback on vulnerabilities in software implementations.

The tool controls a number of peripherals that are necessary to perform laser manipulation:

- > Function generators to accurately trigger laser pulses and provide advanced cold reset functionality.
- > Oscilloscopes for real-time power consumption analysis of program execution, using advanced triggering techniques to activate the laser and cold reset mechanism.
- > An XY-table for automated surface scanning.
- > A physical interface for communication with the microcontroller.

Brightsight combined the flexibility of MATLAB® and MATLAB® scripts with off-the-shelf hardware to create a flexible workbench for laser manipulation.

An easy to use Graphical User Interface (GUI) allows navigation over the surface of a microcontroller using a reference image.

Additionally the GUI provides the option to interactively select areas on the chip for the execution of automated surface scans.

Results of a scan are transparently mapped over the reference image and show all susceptible areas on the chip surface at a glance.

The use of MATLAB® scripts creates an open environment in which a tester can flexibly design and program custom experiment control.

### Brightlight Components

Brightlight uses standard commercially available equipment in combination with dedicated Brightsight designed hardware and software:

- > MATLAB® scripts and graphical user interface to control the hardware components of a laser set-up and to communicate with the microcontroller.
- > Physical interface to connect the microcontroller with the MATLAB® software.

Brightsight specialists will install the laser manipulation tool on-site.

Each installation comes with several days' comprehensive training and hands-on exercises using the tool.

### Tailored to Your Needs

Getting meaningful results with laser manipulation techniques requires dedicated tools and expertise. The skills for laser manipulation and the best way to use the Brightlight tool can be learned in specific training programs. Brightsight offers these training programs tailored to your needs.

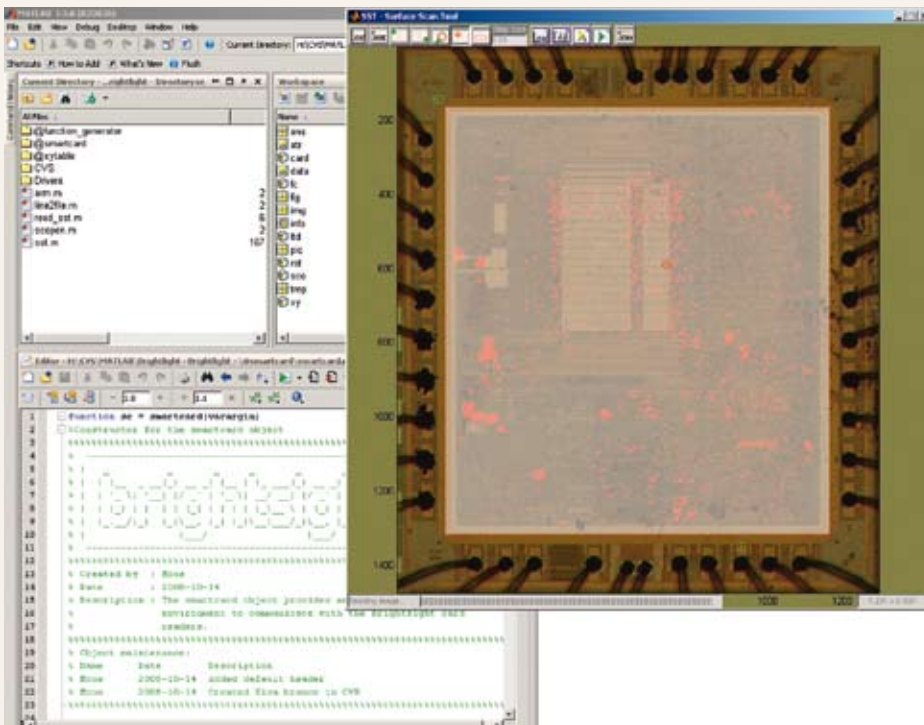


Figure 1 Brightlight analysis results

### Curious?

Have you become interested in Brightlight and want to know more? We are ready to answer all your questions. Please contact us to arrange a demonstration. It is our experience that seeing this tool in action for the first time is very exciting.

Please do not hesitate to contact us at [info@brightsight.com](mailto:info@brightsight.com) or +31 15 2692500 for more details. For more information on other tools or services please visit our website [www.brightsight.com](http://www.brightsight.com).