

**METIS**

**DRS 2000 DCS**

**16k**  
new sensor



**axee**  
RESEARCH AND TECHNOLOGY



**Specially designed for the Industrial and Decor market,  
it integrates Metis exclusive DC SynchroLight  
(Patent protected technology)**

**METIS**

# METIS DC SynchroLight and SuperScan

Lighting is one of the key element of the METIS DRS 2000 DCS. Color, specular reflections, embossing effects and even 3D are all calculated from the information provided by the DC SynchroLight lighting system. The DC SynchroLight lighting system (patent protected technology) allows to obtain thousands of different light schematics providing a high capacity of image enhancement and quality optimization.

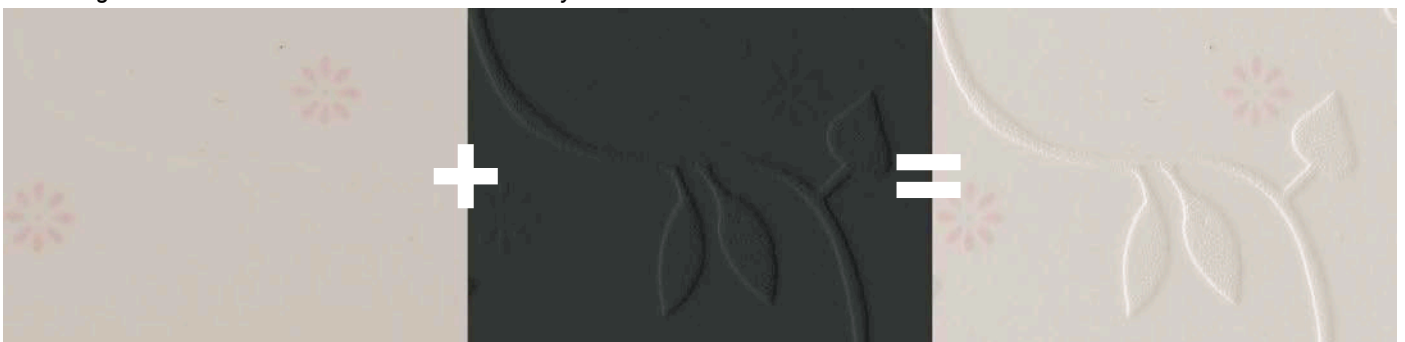
The SuperScan is a sophisticated but completely automated acquisition mode, uniquely available in METIS scanners, which consist in scanning the original several times (from 2 to 4 passes are required depending on the original type and application). During the different SuperScan passes, the DC SynchroLight is finely modulated using specific irradiation schematics. The additional information provided in the SuperScan file allows: reprocessing the light schematic (changing the light direction and intensity at any time), calculating a reflectivity MAP which allows dealing with reflections and shadows in the images, extrapolating light variations from the original surface, combining the light variations with the color information in order to obtain results that cannot be achieved with traditional means, calculating 3D information for generating a Depth MAP that can be used for 3D printing/engraving. SuperScan files can be edited in the METIS Light Inspector software (from a single SuperScan file different TIFF files can be generated).

## Thousands of possible results

*Thanks to the DC SynchroLight, from a single SuperScan it's possible to extrapolate thousands of different versions of the same original.*



*In the following detail of a ceramic, the choice of a suitable light schematic with the addition of Light Variations, allowed to obtain a color image in which the relief of the ceramic is clearly enhanced.*





## Existing 3D technologies for surface/emboss scanning

Today many different technologies are available for the 3D scanning of objects but only a few can be effectively used for the 3D scanning of embossed surfaces (i.e. wood, stones, wallpapers, etc.). This is because 3D surface/emboss scanning for industrial or decorative applications require very high resolution levels (in X, Y and Z directions) and usually also a very large format that cannot be achieved using commercial 3D scanning technologies. Actually the best results are obtained using dedicated scanners based on a Laser sensor and by scanning the original one point after the other (the full scan may require hours or even days); but apart from the scanning time there are anyway limitations with those kind of 3D scanners as they usually cannot acquire color information too (only 3D), have limited depth of field and have also problem scanning glossy originals. Attempts of building a 3D surface/emboss scanner based on the stereophotogrammetric technique (also called stereo matching) have not being succesful because of the well known limitations of this technology (limited resolution capability, inevitable stereo matching errors with lots of artifacts, inability to recognize non textured originals, etc.).

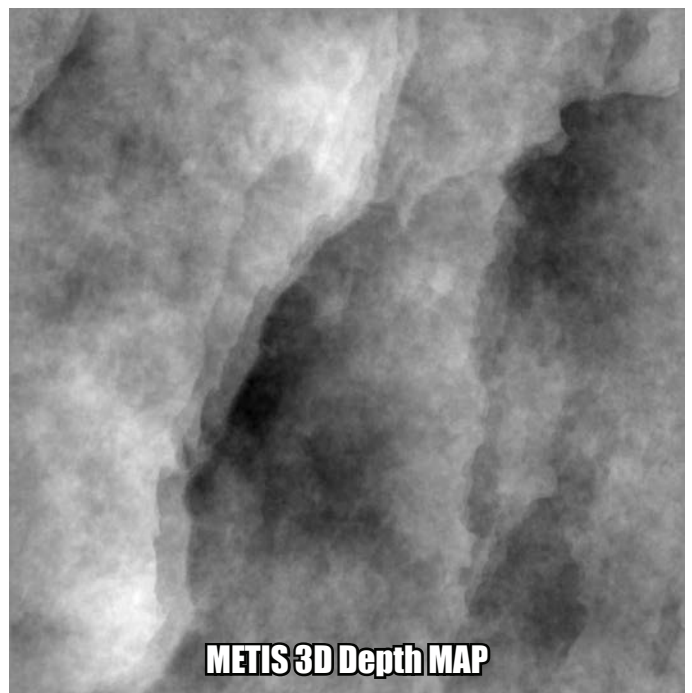
## METIS PhotoMetric stereo 3D (DRS DCS)

But METIS 3D is based on a completely different technology called Photo Metric Stereo which allows to calculate 3D data from 2D color data. The theory behind Photometric Stereo have been presented for the first time in the 1980, but no practical use was really possible at this time because the provided mathematical model was not adequate for dealing with real-life situation (things tend to be quite complicated in the real world). And in fact still today Photometric Stereo 3D have limited practical applications because of the very complicated math and because it poses strict design constrain and limitations that are very difficult to achieve (i.e. it requires a specific and extremely accurate control over the emitted light rays within the entire scanner optical path). But after a long development in METIS we have been capable of solving those issues by designing a special version of the DC SynchroLight and by writing our own algorithms to solve the PhotoMetric Stereo theoretical model (a modified model that perfectly fit our specific scanner design and therefore is also very effective). As a result, METIS is actually producing the only commercial scanners based on PhotoMetric Stereo that works ! Thanks to its unique characteristics METIS 3D provide many advantages over existing 3D laser scanners such as: color and 3D information are available almost at the same time and match at the pixel level; scanning time and 3D calculation require only a few minutes instead of hours; depth of field is much larger; can deal with glossy originals; can deal with very large originals (several meters long) while most laser scanner are limited to less than 1x1 meter. And of course there are also some limitations in the METIS 3D as: optimal 3D reconstruction is achieved on continuous surfaces and a 3D absolute measurement scale cannot be provided; therefore in applications requiring to copy non-continuous surfaces and for absolute 3D measurement, laser scanners may still be required.

*Stone detail SuperScanned with a DRS 2000 DCS.*



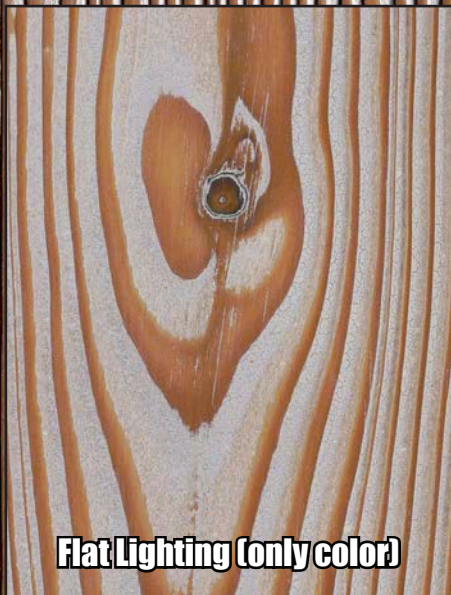
**Color Image with light from Left-Top side**



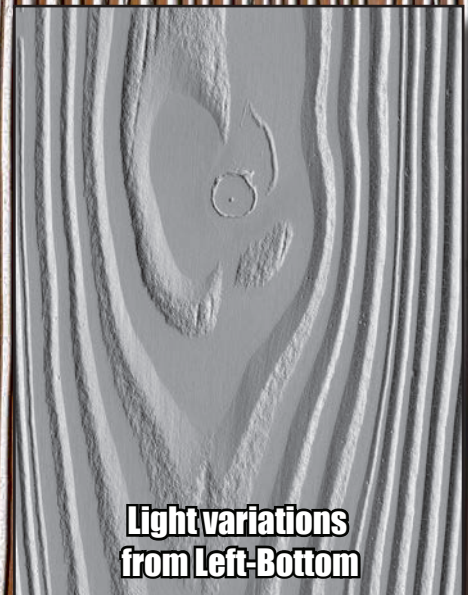
**METIS 3D Depth MAP**



# SuperScan Sample : Wood



**Flat Lighting (only color)**



**Light variations  
from Left-Bottom**

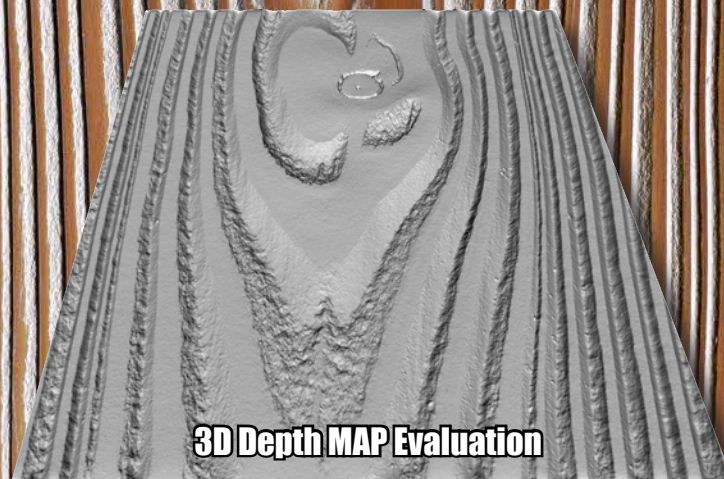
**Light from Left side**



**Light From Top Side**



**3D Depth MAP**



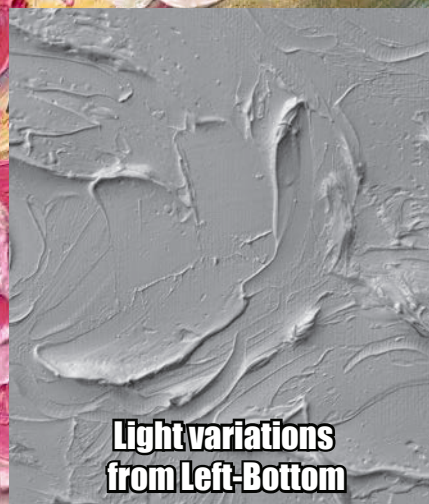
**3D Depth MAP Evaluation**



# SuperScan Sample : Oil Painting



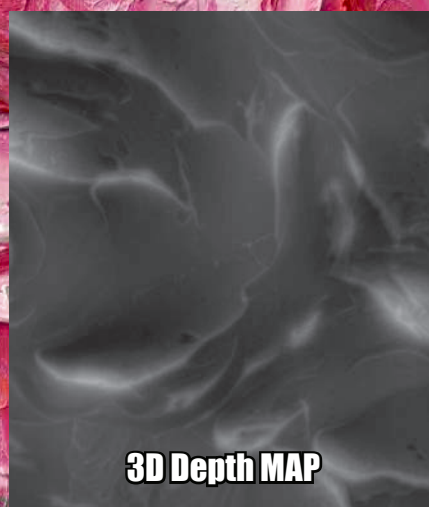
**Flat Lighting (only color)**



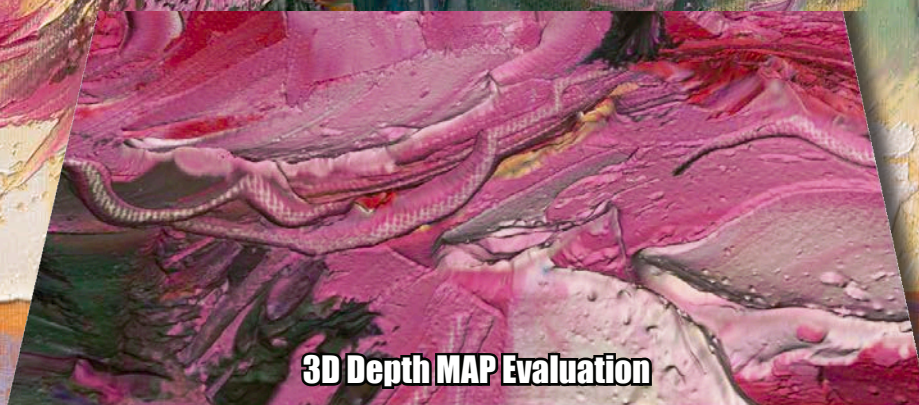
**Light variations  
from Left-Bottom**

**Light from Left-Top side**

Scanner ICC Profiles are built in factory using METIS Color Profiler software (available on request). High color fidelity with a typical  $\Delta E < 2$  can be easily achieved.



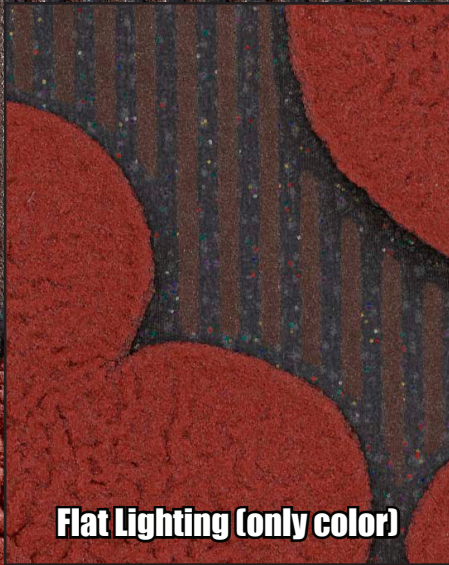
**3D Depth MAP**



**3D Depth MAP Evaluation**



# SuperScan Sample : Wallpaper



**Flat Lighting (only color)**

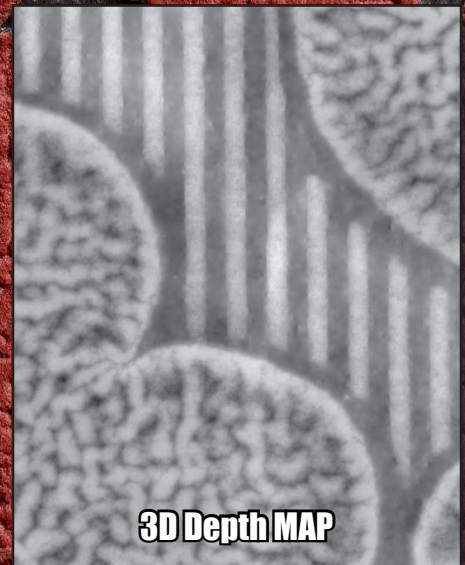


**Light variations  
from Right-Top**

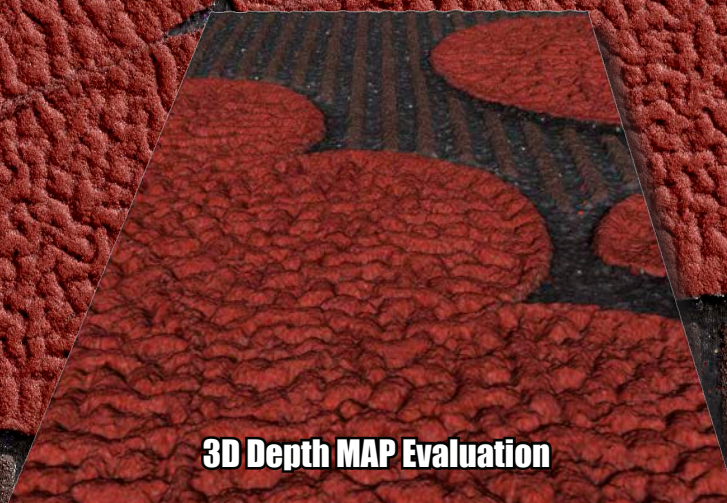
## Light from Right-Top



**Minimized Reflections**



**3D Depth MAP**



**3D Depth MAP Evaluation**



# About METIS

In METIS we continue a family tradition of industrial designers that started almost 1 century ago. This translates into high engineered and innovative products with unique characteristics and performances always at the top respect to current technology.

Start operating in the photographic domain for industrial and scientific applications

1965

1975

Start operating in the digital imaging domain for “remote sensing” applications from Landsat satellites (NASA/Telespazio)

First system for the “high geometrical accuracy” restitution of satellite imagery

1978

First commercial applications of digital imaging systems for the private sector and cultural heritage

1990



1998

First “SynchroLight” application

First DMC (3.3 GigaPixel digital camera) based on patented technology

2000

2002

First DRS 2A0 large format scanner and DRC digital camera

First DRS A1+ for books & maps

2004

2006

First DRS 5070 for antique/fragile originals integrating a sophisticated electronic book cradle integrating with pressure sensors

2010

DCS Patent (DC SynchroLight)



DRS 1300 DCS, DRS 750 DCS, DRS 2000 DCS; DMS (Multi-Spectral scanner); EDS Alpha; EDS Gamma; Light Inspector Software, Color Profiler Software, etc.

2014

First SuperScan PM3D®

New Scan Director software  
New Light Inspector software  
New Merge & Combine Tools

2015

2016



New factory (January 2016)

In METIS we are already thinking to the future and developing new technologies that will be implemented in the next generation scanner, digital camera, lighting and software

# METIS

# DRS 2000 DCS

The DRS 2000 DCS is the largest model in the METIS DRS DCS family with a scanning format of up to 200x121cm. It has been designed specially for the most demanding Industrial and Decor applications. The DRS 2000 DCS introduce new important features which have no comparison in any other system on the market such as the innovative *DC SynchroLight* lighting system (Dynamically Controlled Synchronized Light) which incorporates a new technology developed by Metis, covered by patent deposited in January 2010, which allows dynamic control of the light in the scanning area. The *DC SynchroLight* technology gives the ability to control and change dynamically, instantly and automatically the angle and intensity of the light emitted by the light sources in the scanning area, making it possible to optimize the result of the digitization, depending on the type and nature of the originals. In addition to the *DC SynchroLight*, Metis has also designed a proprietary software tool that allows post-scan light variations for real-time light changes and calculating 3D data from 2D color data, without the need to rescan the original; post-scan light changes enable to select the best light schematic in a matter of seconds and providing unique results unreachable by any other system.

Some of the other benefits introduced by the new DRS 2000 DCS system are: the digital camera integrated into the DRS 2000 DCS system has been vertically motorized in order to allow achieving an optical resolution of 1000PPI (and up to 2000x1000PPI); high scanning speed and operativity; perfect geometrical accuracy and high depth of field; new METIS Scan Director software for Fine-Art and Decor applications is now available; special 3D scanning mode (require combining 2 SuperScan images into the Light Inspector software) allowing the generation of a dense and accurate Depth MAP for 3D printing/engraving purposes.

## DRS 2000 DCS General Features

- Maximum scan format: 200x121cm. Depending on the original type (i.e. wood, stones, etc.) the scan format can be extended thanks to the Scan Merge tool that allows to automatically stitch different scans.
- Maximum thickness: 20cm
- Variable Optical Resolution: 340-1000PPI (340PPI=200x121cm 1000PPI=200x41cm); adjustable from 100 to 2000 PPI
- Very Large Depth of Field (user selectable)
- Focusing: motorized, fine adjustable by software control
- Lighting: new "*DC SynchroLight*" system, LED based, (IR/UV free) active only during the scanning process provide for thousands of different light schematics
- SuperScan mode: post-scan light changes, 3D data calculation
- High grade precision and reliable mechanic
- 250x140cm holding table

## Workstation Minimal Requirements

- Latest i7 Intel Processor
- 32 GigaBytes RAM
- Windows 10 Professional 64bit

## METIS Scan Director features

- The Scan Director is a completely new acquisition software specifically designed by METIS for the industrial and decor market and for handling 3D data and very large files
- Native 64bit software and processing
- 16bit per channel (3x16bit) image processing
- Customizable user Profiles for workflow optimization and system settings retrieving
- Fast Preview for real-time adjustments
- Automatic Lighting calibration and Gray Balance tools; Full ICC color profiling support
- Color/density tools: exposure, contrast, highlight, shadows, gamma, automatic adjustments, black and white points, histograms and point analysis, ICC color profiles, paper color correction, etc.
- Full Resolution image view immediately after the scan with History window
- "Light Inspector" tools allow for real-time light schematic variations and evaluation
- Ability to save in Metis DCS-RAW format for image post-processing

Product specification or appearance may change without prior notice.

- V.1809a-ENG



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From June 2018

# 16K new sensor

Improved color fidelity and higher resolution