

## Reveal Scan™ Hyperspectral Imaging System for Art, Cultural Heritage and Art Restoration

Imaging paintings of various sizes can be a challenging process. 2D NIR imaging is commonly used to capture the under-drawing of a painting. However, to get the desired spatial resolution, it is necessary for the camera to be positioned close to the painting. The result is a narrow field of view requiring the user to capture many images (as many as 100) across the painting. Then comes the painstaking procedure of stitching all the images together.

Middleton Spectral Vision is pleased to introduce the Reveal Scan™ 100 — a hyperspectral imaging system for Art and Cultural Heritage. Designed for Art restoration and science departments, Reveal Scan™ combines high performance hyperspectral imaging cameras mounted on a servo controlled linear scanner for quiet and smooth motion. Dual heavy-duty tripods provide excellent stability and camera height control. The Reveal Scan 100™ comes with an integrated computer station for image acquisition.

### **Hyperspectral Imaging — a proven technique for the analysis of fine art and cultural heritage**

Hyperspectral Imaging is a powerful imaging technique that combines 2D imaging with spectroscopy, an exploratory tool to investigate how electromagnetic radiation interacts with matter. From the conservator point of view, this could be measurements of pigments, chemical composition, exposing the under-drawings of paintings and monitoring the condition of works of art over time. Capturing a hyperspectral image is different than standard RGB photography. Hyperspectral imaging is a scanning technique.



*Reveal Scan™-100 Hyperspectral Imaging System from Middleton Spectral Vision*

The camera moves via a motorized slide across the scene to render an image. It's similar to a piece of paper being placed on the glass of a copier/scanner. Once the scan button is pressed, a white illuminated line moves across the paper. When it is finished, the scanned document is displayed. A pushbroom hyperspectral camera works in a very similar fashion to create an image.

### **Spectral Cameras Optimized for Different Wavelength Regions**

Valuable wavelength information for art is contained in the 400–2500 nm wavelength range. Multiple sensors are required to cover this range. This can include the VNIR 400–1000 nm, the NIR 900–1700 nm or the SWIR region 1000–2500 nm. Middleton Spectral Vision offers spectral camera options for each of these wavelength regions.

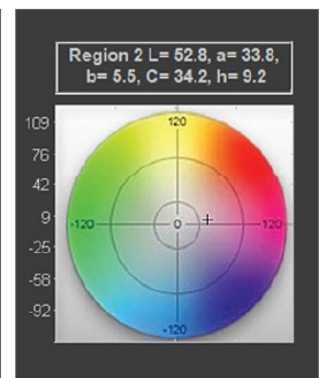
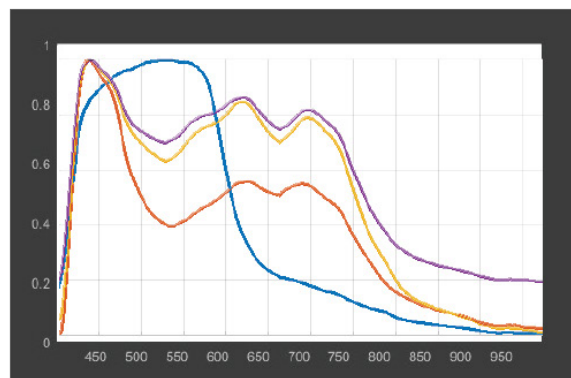
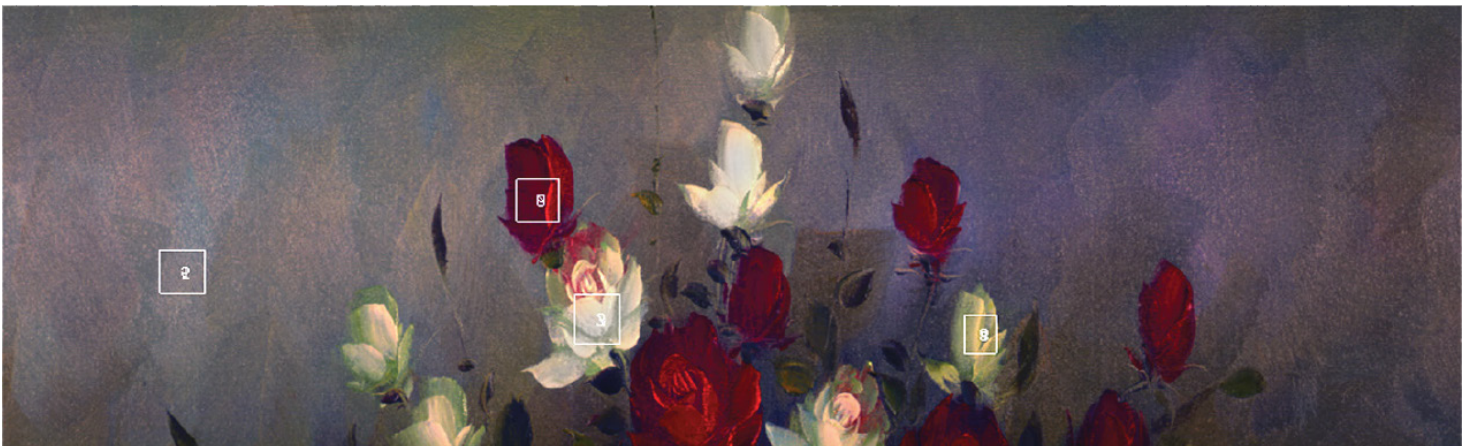
# Reveal Scan™ Hyperspectral Imaging System

for Art, Cultural Heritage and Art Restoration

## Powerful Software Tools for Image Analysis

Middleton Spectral Vision has developed KemoQuant™, a powerful, but easy-to-use software package. Hyperspectral images are much larger files than RGB images. Proper software is needed to pre-process the raw image for analysis. The hyperspectral image contains a full wavelength spectrum for each pixel in the image. Users can

select individual or groups of pixels to observe the spectrum. Multiple spectra can be overlaid in a normalized scale to look for differences in spectral features from anywhere in the image. KemoQuant™ also features advanced algorithms for identification of pure components, or to create prediction models for future analysis. Images or spectra can be easily saved to standard file formats such as TIF, PNG, or JPG.



*KemoQuant™ Software from Middleton Spectral Vision*