CLYDE HSI SC-XYZ SERIES

Complete, High-performance, Turn-key, Hyperspectral Art Scanning Systems

From UV to SWIR

ClydeHSI SC-XYZ Series Hyperspectral Scanning Systems are **complete, transportable, high precision, all-in-one** hyperspectral scanning systems, designed for scanning objects up to 6m x 6m, with a spectral range from UV to SWIR (300-2500nm). The system can be supplied with a custom flight case, and includes spectral camera(s), SC-XY Series scanning system, illumination system, high performance computer and all data acquisition, display, and analysis software.

All SC-XY Series scanners have auto-focus, auto-exposure, auto-frame rate and scan motion correction, as well as a laser target finding system for accurate region-of-interest selection across full measurement area.

User interchangeable fore-optics with automatic lens magnification correction for all spectral camera and lens configurations.

Dual-camera operation with simultaneous data acquisition at speeds of 40mm/s at 0.1mm spatial resolutions across the spectral range.

Key Features:

Laser Crosshair for Accurate ROI Selection

Dynamic Stand-off Distance Adjustment for non-flat Artwork

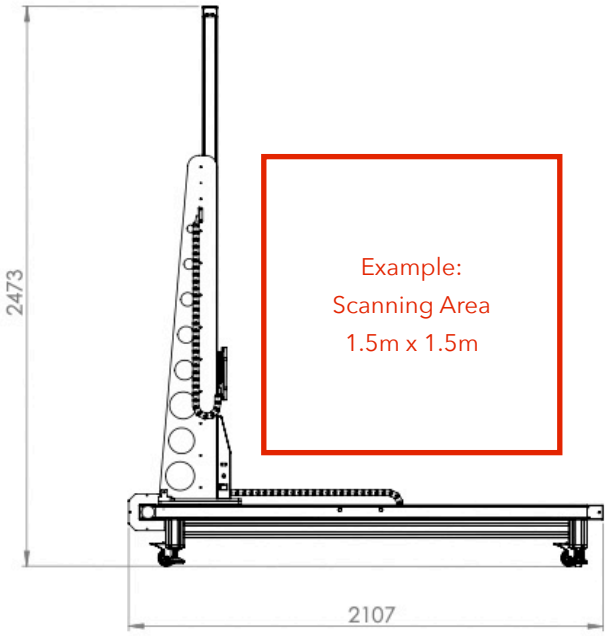
Auto-focus of Spectral Cameras

Auto-exposure Setting

Auto-square-pixel Facility

Simultaneous Dual Camera Acquisition

Micro-XRF and Raman Options



Example:
Scanning Area
1.5m x 1.5m

Scanning Stage Technical Specifications

Parameter	Value	Units	Comment
Scan Movement	X, Y, Zm		Multi-modal operation with spectral correction and multi-strip mosaic imaging for large area high resolution scans
Scanning Areas Available	1000 x 1000, 1500 x 1500, 2200 x 2200, 2500 x 2500, 4000 x 4000, 6000 x 6000	mm^2	Other scan areas are available - please consult ClydeHSI
Maximum Scan Pixel Area	240,000 x 240,000	pix^2	6m x 6m scanner gives up to 57.6GPix images
Scan Step Resolution	25	µm	
Optical Resolution on Target	25	µm	In macro mode
Zm (Macro Stage)	±75	mm	Option
Zm Control System	Real-time distance measurement		Option
Spectral Camera Payload	≤50	kg	2 or more HSI cameras and/or other measurement devices can be mounted and operated simultaneously

ClydeHSI Hyperspectral Cameras

ClydeHSI manufacture push-broom (line-scan) hyperspectral imaging cameras of high spatial and spectral purity that are used in a wide range of scientific research and industrial inspection applications. These hyperspectral cameras measure a line image one line at a time and register spatial position across the line while simultaneously recording the optical spectrum at each spatial position.

ClydeHSI SC-XYZ Series scanners are capable of single and dual camera operation with simultaneous data acquisition, and are fully compatible with all ClydeHSI hyperspectral cameras, light sources, and data acquisition and analysis software. This ensures broad adaptability to applications and the capability to capture hyperspectral data from a broad spectral range.

Hyperspectral Camera Options for SC-XYZ

Parameter	Value					Units
Model	VNIR-S	VNIR-HR	NIR-HR	NIR-HR+	SWIR	
Spectral Range	400-1000		950-1700		1000-2500	nm
Optical Spectral Resolution	8	<3	<5		≤12	nm FWHM
Pixels (Spatial Line)	1936		320	640	384	pix
Pixels (Spectral)	1216		256	512	288	pix
Spectral Sampling/pixel	0.3		3	1.5	5.6	nm
Smile and Keystone	Sub-pixel across output field					-
Camera output	Up to 14					bit
Camera Interface	USB-3, GigE				Camera LINK	-
Frame Rate (full frame)	Up to 155		Up to 344	Up to 300	Up to 450	lfps
Shutter	N/A	Integrated				-
Lens Mount	C-mount					
Lens Options	17, 23, 35, 50		15, 22.5, 30, 56, 1:1 Macro			mm

Example System Configuration

- SC-XY Series Scan Module
- VNIR-HR 400 to 1000nm, hyperspectral camera
- NIR-HR+ 950 to 1700nm hyperspectral camera
- Broad-band (400-2500nm) illumination system
- Fore Objective Lens Kit
- Setup, focus, and calibration (reflectance) tiles
- Laser target finding system for accurate ROI setting
- Workstation computer
- Acquisition, visualisation, and analysis software
- Installation and testing by ClydeHSI engineer
- Application support and data processing help

Optional Accessories

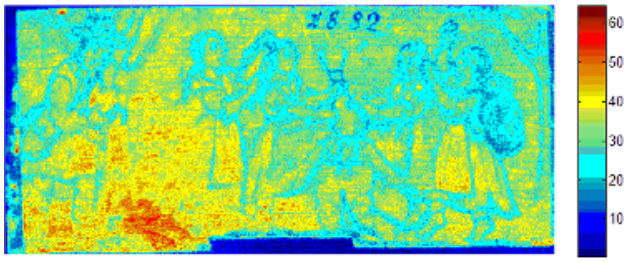
- Photogrammetry (16 Mpix to 400 Mpix camera options)
- NIR Reflectography Camera (100 Mpix and 400 Mpix options available)
- Raman-532 Hyperspectral Camera and laser line illuminators
- SWIR-384 Hyperspectral Camera (1000-2500nm)
- Broadband super-continuum laser illumination system with line dispersing optics
- LED illuminators
- Motorised painting mounting frames
- Micro-XRF
- Motorised Zm stage positioning system to accommodate for different sample depths
- Microscope for spatial resolution to 1µm
- Database server and software

Material Characterisation of a painted beehive panel by advanced spectroscopic and chromatographic techniques in combination with hyperspectral imaging.

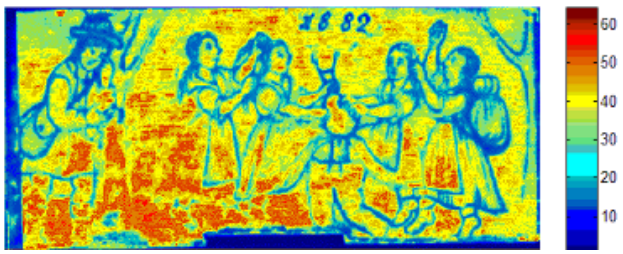
Retko, K, et al, Heritage Science 2020 8:120

False Colour RGB Image

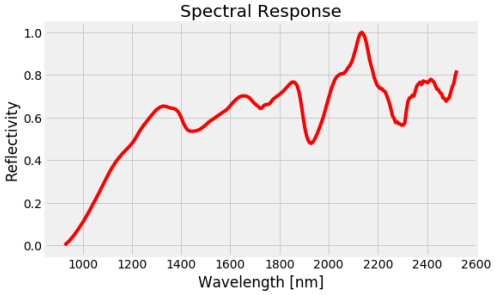
SWIR Greyscale Image



Prussian blue distribution at 2371nm



Dammar distribution at 1650-1750nm

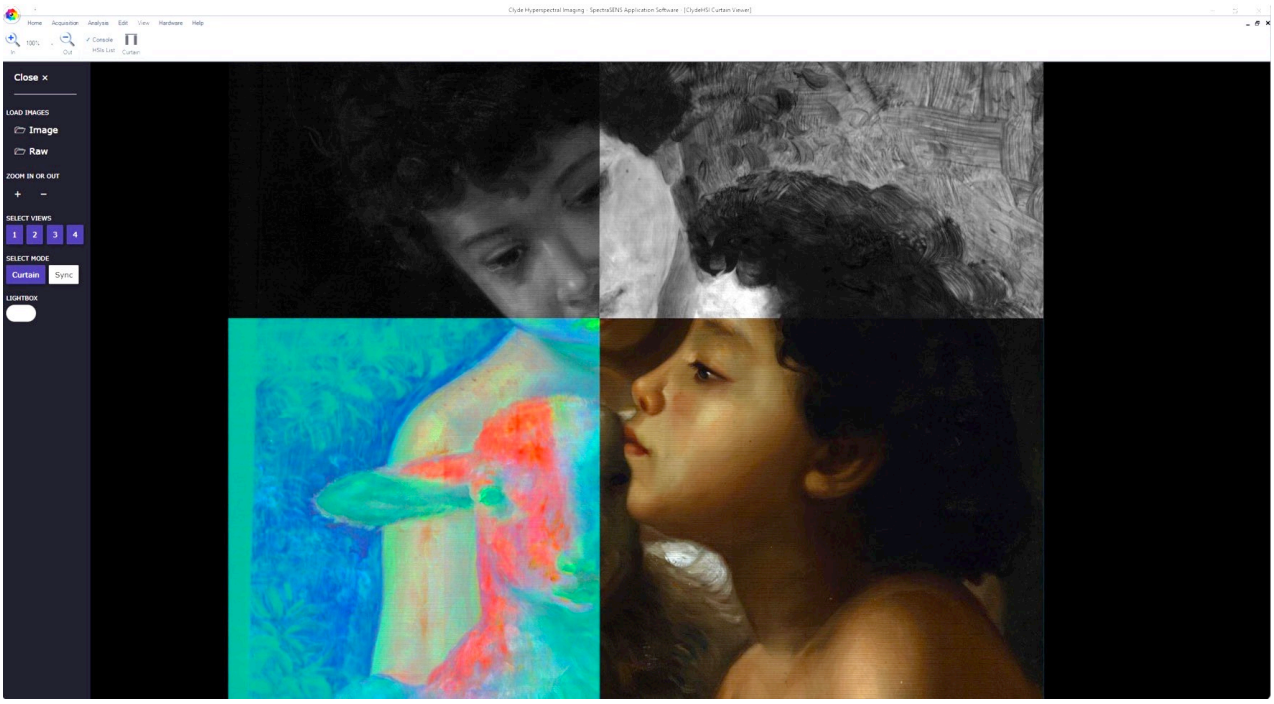


About Us

We make and measure rainbows.

ClydeHSI are specialists in optical spectroscopy and provide a wide range of both hyperspectral and conventional spectroscopy instruments and full systems. All our products are supported by leading software for data acquisition, analysis and display.

We take care of the technology, so you can focus on what matters to you: the spectroscopy, the imaging and the science.



Our mission is to provide each and every one of our clients with a complete, end-to-end hyperspectral imaging solution, designed and rigorously tested to ensure **robust, reliable, accurate and repeatable** hyperspectral imaging measurements across a range of academic and industrial applications. Our ultimate goal for all of our systems is to **make hyperspectral imaging easy** for any and all end users.

We believe in **high quality engineering and design**, allowing us to develop market leading products and services. Within our Photonics Research Facility, we have the capability to rapidly develop new products and systems, and welcome the opportunity to partner with our customers on new developments - both within the scientific research community and for equipment for industrial applications.

Headquarters:

1 Aurora Avenue,
Clydebank,
Glasgow, G81 1BF,
United Kingdom

info@clydehsi.co.uk

+44 (0)1419529475

www.clydehsi.com