

# CULTURAL HERITAGE

Solution Guide



PHASE**ONE**

what the world's best photography is made of

“We are not  
makers of history.  
We are made  
by history.”

Martin Luther King Jr.

## Contents

<b>The World of Cultural Heritage</b>	<b>4</b>	<b>Phase One iXG Camera System</b>	<b>34</b>
Cultural Heritage Collection Types and Applications	5	<b>Phase One XF Camera System</b>	<b>38</b>
Archives and Manuscripts	6	<b>IQ Digital Back Range</b>	<b>42</b>
Rare Books Archiving	7	<b>Phase One Lenses</b>	<b>44</b>
Transparent Film and Glass Plate Negatives	8	Schneider Kreuznach Blue Ring lenses	44
Fine Art Reproduction	9	<b>Phase One AutoColumn Copy Stands</b>	<b>46</b>
Special Digitization Projects	10	Phase One RPS 2300XL – Floor stand	46
Multi-Spectral Imaging	11	Phase One RPS 1600 – Table top	46
<b>Instant Capture vs. Scanning</b>	<b>12</b>	<b>Phase One 2-Motion Copy Stand</b>	<b>48</b>
<b>Phase One Film Scanning Solutions</b>	<b>16</b>	<b>Cultural Heritage Solution Partners</b>	<b>50</b>
Phase One Film Capture Stage	18	Phase One	50
<b>Phase One Flat Copy Scanning Solutions</b>	<b>20</b>	Digital Transitions, USA	50
<b>Phase One Book Scanning Solutions</b>	<b>22</b>	Cambo, The Netherlands	50
DT Atom	22	Kaiser Fototechnik, Germany	50
DT Versa	24	<b>Phase One Scanning Solutions</b>	<b>52</b>
DT BC100	26	<b>References</b>	<b>54</b>
<b>Capture One for Cultural Heritage</b>	<b>28</b>		



# The World of Cultural Heritage

The Cultural Heritage world is diverse, with many different needs and challenges. For this reason Phase One offers modular and configurable solutions, which can be tailored to specific needs.

The need for digitization is rapidly growing, with increasing focus on public access, research and preservation of information for the future. Many museums and libraries with valuable collections are expanding their digitization efforts, with exciting possibilities, made available by the rapid growth of internet-access for everyone. The history of Cultural Heritage photography is as long-

standing as photography itself. Historic collections in museums and libraries have often had a dedicated photographic studio for creating photographs of sensitive material, or for producing paper copies for researchers and scholars, protecting the original objects from wear or even damage.

Changing from analog based film processing to digitally based media has introduced a completely new range of applications, and the possibility to share the material with a much broader audience, while significantly increasing the reproduction quality. Preserving the past



Melk Abbey Library, Melk, Austria  
© Will Pryce

for the future is often a race against time, as much of the material has a limited lifespan before it is gone forever, thus solutions that enable rapid capture are not only necessary but often crucial.

## Cultural Heritage Collection Types and Applications

All Cultural Heritage collections are unique and diverse, but due to the nature of collections, they often fall into distinct categories. In order to address the diverse

nature of collections, Phase One invests in developing, implementing and delivering specialized and tailored solutions, designed to produce the best output quality, while ensuring material safety and efficient workflow.

The main collection categories are:

- Archives and Manuscripts
- Rare Books Archiving
- Transparent Material and Film Scanning
- Fine Art Reproduction

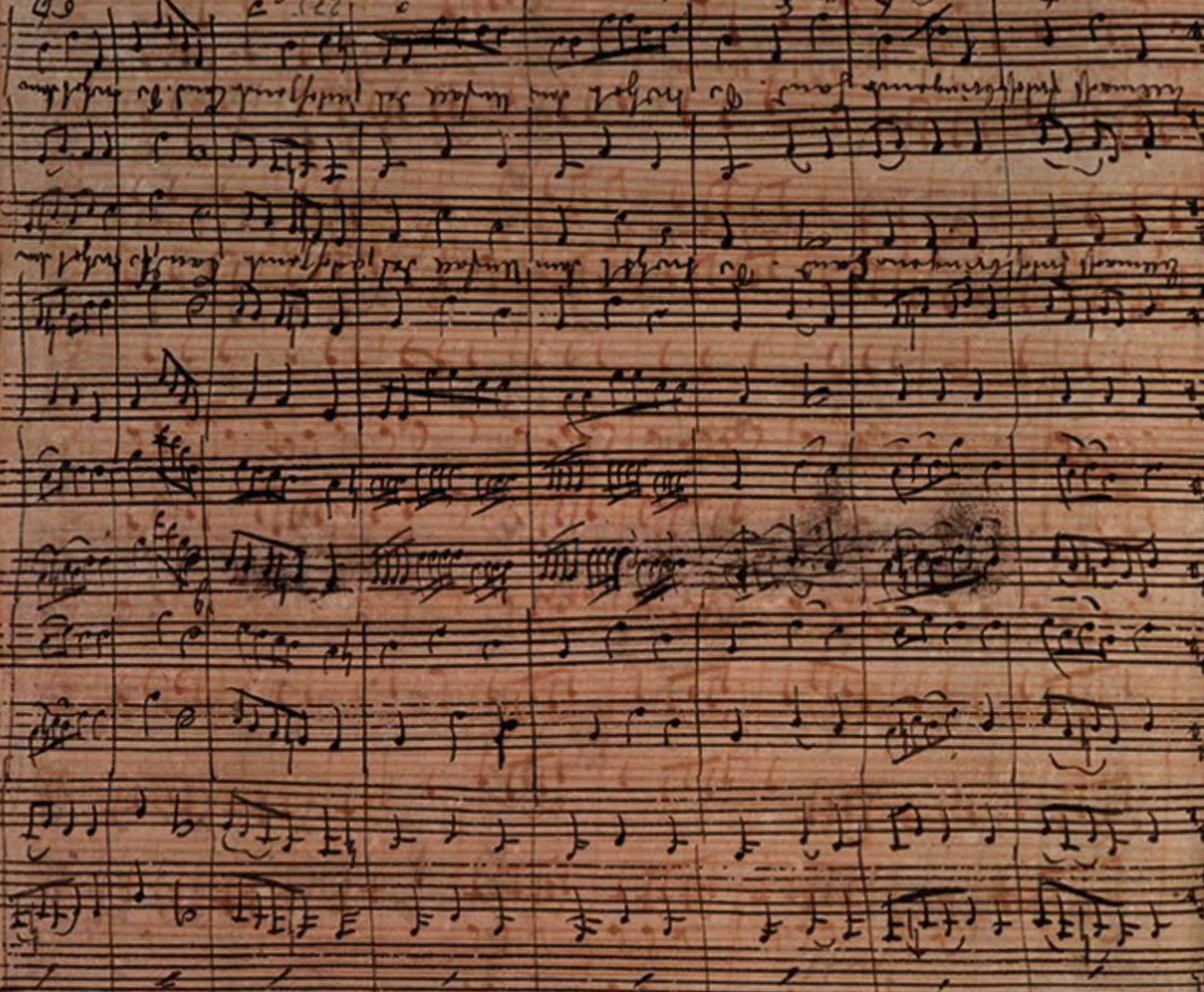


Image courtesy of the Royal Danish Library.  
Multi-spectral capture of note sheet by Danish composer Niels W. Gade.

## Archives and Manuscripts

*Documents, drawings, maps, manuscripts, photos, newspapers, musical scores, letters, post cards, and other flat objects in all sizes and shapes.*

This type of work often requires a “set and forget” workflow where the camera and software are set up so that large numbers of flat objects can be recorded quickly while maintaining high resolution and accurate consistent color and luminosity.

The high resolution of the Phase One Digital Backs allows capturing several smaller objects at the same time, thus increasing speed and efficiency.

The requirement for lighting may be divided into two categories:

1. Uniform light over the entire surface, with strict requirements to color precision. This is often achieved by photographing the material together with a color chart, as a reference for recreating the correct and exact same colors in the future.
2. Directional light may be used to enhance texture and three-dimensionality of the object. This type of work often leaves artistic freedom to the photographer, as the choices of light will enhance certain features, while diminishing others, thus giving the image an interpreted look or style.



'John Rylands Library Hebrew Manuscript 6, Haggadah f.20 recto'  
Image reproduced courtesy of the Centre for Heritage Imaging and Collection Care  
© University of Manchester

## Rare Books Archiving

A large part of the Cultural Heritage community works on digitization of rare and delicate bound materials, such as books. Digitization of books often requires special attention to the binding, that can be fragile, and will determine how the material can be treated in the process. This fact can sometimes be the limiting factor when looking for fast capture turnaround.

Uniform lighting will typically be the choice of operation here, and will often be the same throughout when working with reflective material.

Using a leveled glass plate with the camera set for fixed focus on a copy stand will accelerate the capture process, and photographing both pages at the same time with one or two cameras will also increase productivity.



## Transparent Film and Glass Plate Negatives

*Vintage glass plate negatives, medium and large format negatives, transparencies, including 35mm mounted slides, microfilm and all other transparent material.*

Uniform illumination of the materials with good color reproduction is mandatory so that all color information may be retrieved during processing, sometimes involving inverting the image from negative to positive.

The conversion process can be open to interpretation, as the base material for the original transparency varies. This is true especially for the earlier glass plates where the specific type of chemicals and processing used is unknown.

Two rolls of film may behave very differently, both in the

physical characteristics of the original base material and in their subsequent chemical development.

Traditional scanner solutions work with fixed sizes, such as 24x36mm, 6x6" or 6x9", thus limiting the versatility of the equipment substantially. Phase One camera based solutions work with all sizes of originals.

There is a tremendous speed advantage in the instant medium format capture over scanning, which may speed up the process by a factor of 300 or more.

## Fine Art Reproduction

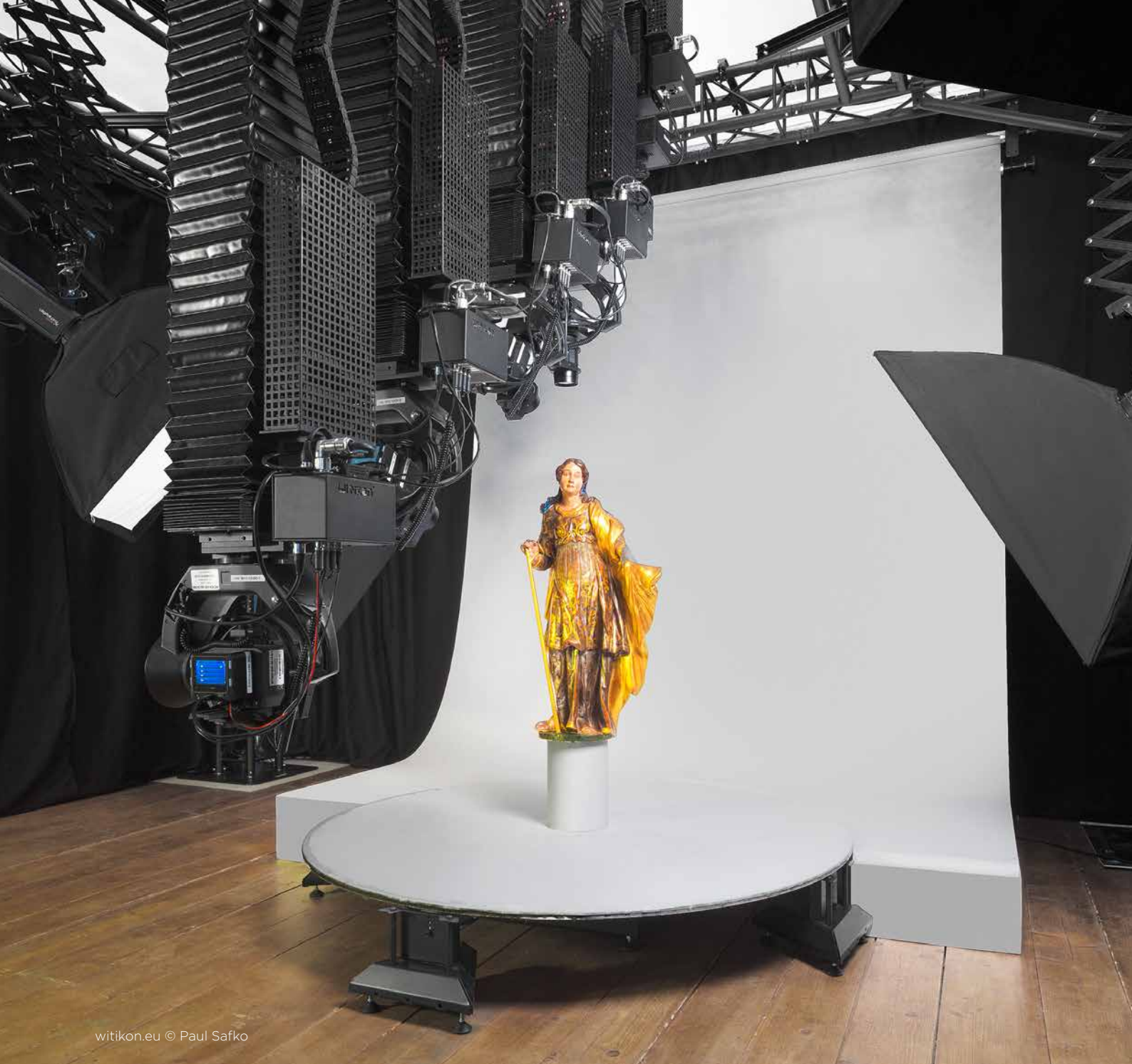
3D and large flat objects such as sculptures, pottery, decorative arts and paintings, are often captured from a tripod in the photo studio or in the gallery and exhibition halls, ideally with uniform lighting to suit the object's character and the curator's requirement.

A whole range of different lighting can be used, from flash-based to continuous light to mixed light or even natural daylight. Best results are always obtained by using medium format camera solutions; either based on an SLR-type, or view cameras with tilt & shift movements.

The fastest workflow solutions comprise of a camera system such as the Phase One XF, available with the highest resolution sensors on the market.



© www.witikon.eu



witikon.eu © Paul Safko

## Special Digitization Projects

Many cultural heritage objects that are fragile or sensitive due to various types of damage and decay are often very sensitive to human touch and thus require careful handling. Using high resolution, high precision cameras and optics allow researchers and scholars to perform non-invasive investigation and analysis with minimal or no exposure to aggressive light rays or chemicals, and bring out data that cannot be retrieved with traditional imaging techniques.

3D scanning combined with advanced photogrammetry and image analysis and calculation tools are used for measuring and evaluation of damage in historical objects. The same technology is used for creating exact replicas of precious sculptures and art work. The high resolution of Phase One cameras and the high quality and precision of the optics provide the basis for systems that are considerably faster than other scanning solutions.



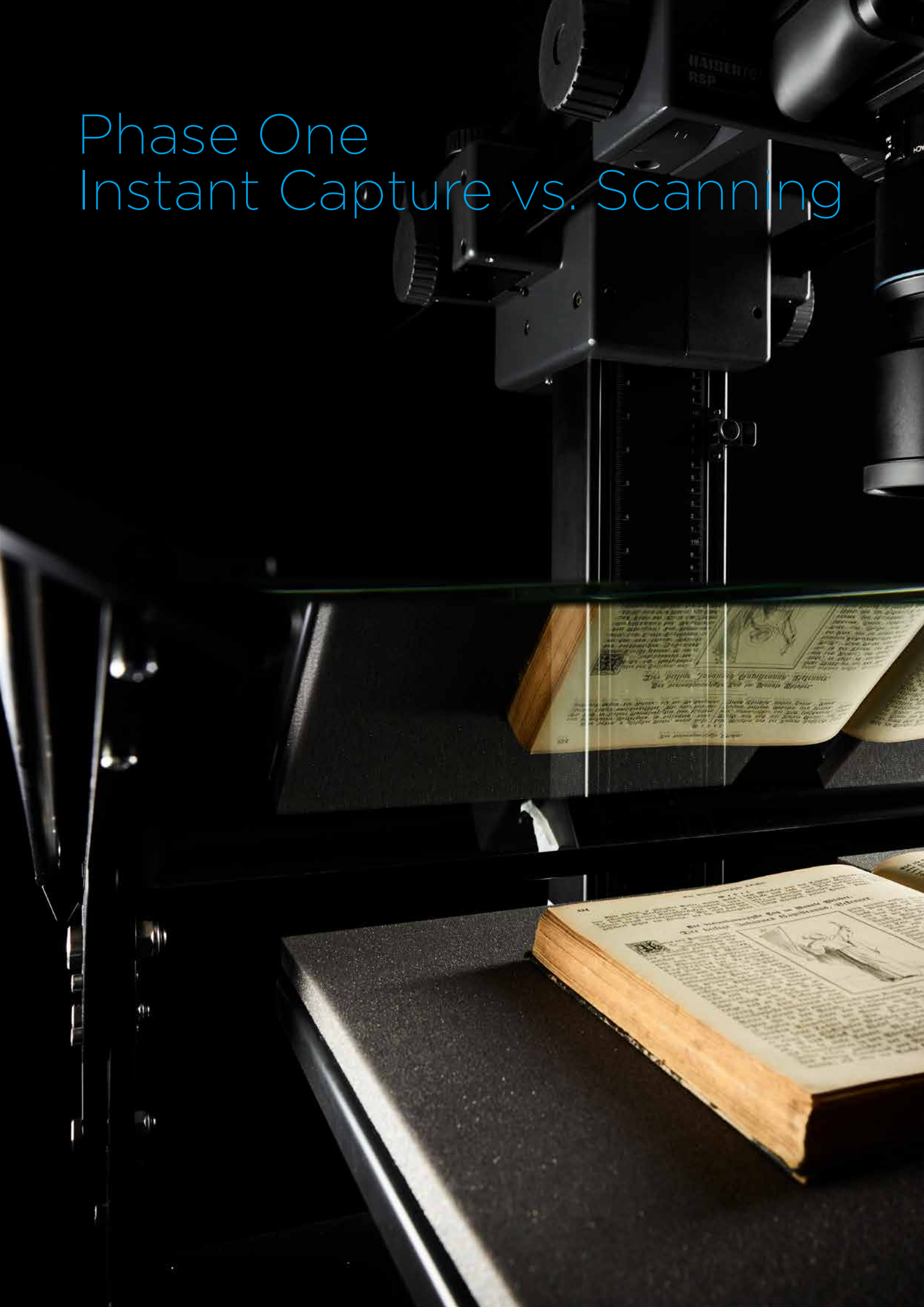
Images from The Cornaro Missal, Northern Italy, 1505, the world's most expensive illuminated manuscript. Images courtesy R.B. Toth Associates & Equipoise Imaging, LLC

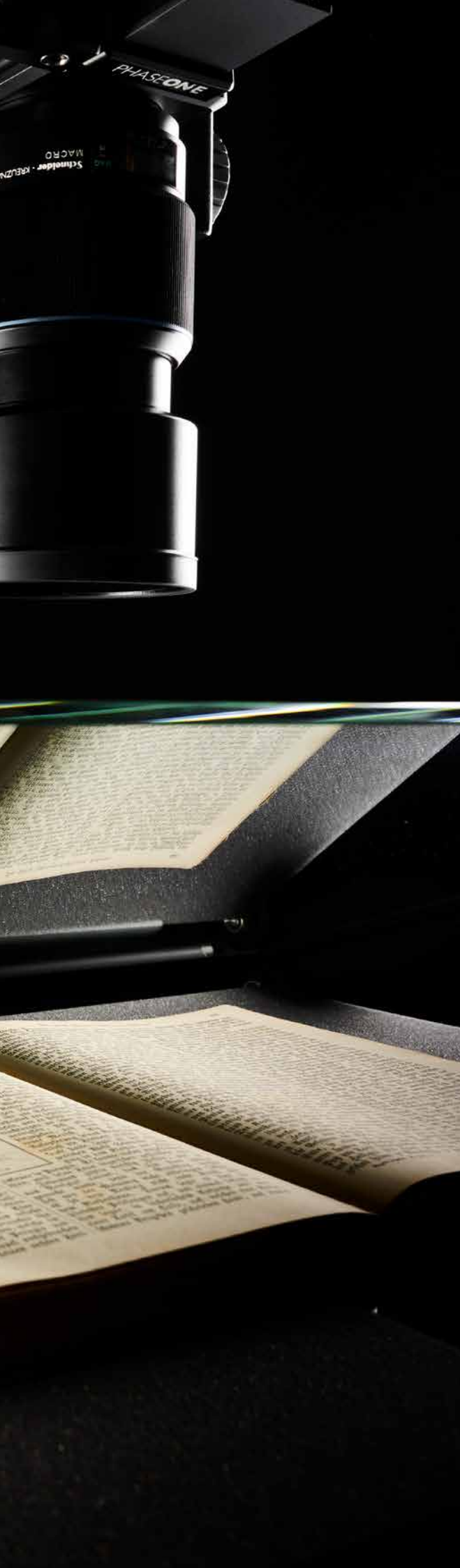
## Multi-Spectral Imaging

Multi-spectral lighting systems, in conjunction with the use of narrow-band optical filters and special image processing can be utilized to retrieve and discover information in materials that have been subject to damage or decay that is invisible under normal lighting conditions. This provides invaluable data for the research and conservation processes.

Phase One offers a number of unique camera solutions capable of capturing wide-spectrum color, as well as narrow-band achromatic images.

# Phase One Instant Capture vs. Scanning





## Speed

Traditionally, flat objects such as documents and books have been scanned using flatbed or overhead scanners equipped with a linear CCD sensor. Some of these devices can produce high resolution, high quality output. However, scanning a single page can take up to 20-30 times longer than when using a single-shot, high resolution medium format camera.

## Image Quality

When capturing cultural heritage items, it is important to produce and maintain the highest image quality possible in terms of resolution, sharpness, tonality and color. Phase One's high resolution sensors, Schneider-Kreuznach high precision optics, stable copy stands, and Capture One's advanced workflow and algorithms, enable the collections' curators, photographers and to ensure that no detail gets missed and that their collections are archived to the highest level of quality for future use and preservation.

## Automation and Ease of Operation

New high precision copy stands paired with the iXG camera system and Capture One CH deliver "AutoColumn", automated camera column positioning achieving a wanted capture resolution.

Tools for auto-cropping and for automated conversion of film scans from negative to positive also add to the move towards automation. As does "Slipstream", the new Phase One simplified capturing UI.

## Highest Resolution with ISO Compliance

The Phase One camera systems deliver scanning resolution of up to A0 @300ppi or A1 @400ppi or A2 @600ppi - all in compliance with the industry standards of Metamorfoze and FADGI, now merging into ISO 19264.

## RAW Workflow

Unlike scanners, the RAW files coming from the Phase One cameras and digital backs contain the RAW data and all the relevant information necessary for processing and re-processing. This ensures a future-proof workflow and a file that can be used time and again as needed and as software performance develops and improves.

## Flexibility

**Future-proof tethering:** With the Infinity platform of IQ4, the tethering options of Ethernet, USB-C, and WiFi provide many possibilities for flexible instalation and workflow.

**Advanced storage:** The IQ4 ensures security and speed with both XQD and SD local storage options.

**Multi-purpose use:** Unlike scanners, a camera mounted on a copy stand can be moved up/down and can use different lenses to accom-modate different object sizes, and of course can be mounted on a tripod allowing complete portability and flexibility in photographing almost anything.

## Upgradability

With the advancement in technology and improvements in sensor resolution, optics, and software algorithms, each component of the camera system can be changed or upgraded to take advantage of these advances, while keeping the same basic setup and workflow.

## Low Maintenance

Collections often include hundreds, thousands, or even millions of items that need to be digitized and reproduced consistently and accurately.

The Phase One iXG and Phase One XF Camera Systems are designed and tested to withstand the toughest working conditions. They are built with minimal number of moving parts and heavy duty leaf shutters, ensuring long life and low maintenance intervals. Modular design allows for quick and easy swapping of components when it is time for service, and the local support provided by a network of trained, value added resellers ensures continuous uptime and fast turnaround.



115. *Job's ne*



Phase One iXG Medium  
Format Camera System



Schneider Kreuznach RS  
120 mm Macro iXG lens



Phase One XF Medium  
Format Camera System



uer Wohlstand. Hiob 42, 10—14.



und Hamath sollen das Ende sein. Das sei die Grenze gegen Mitternacht.

18. Aber die Grenze gegen Morgen sollt ihr messen zwischen Hauran und Damaskus und zwischen Gilead und dem Lande Israel, am Jordan hinab bis ans Meer gegen Morgen. Das soll die Grenze gegen Morgen sein.

19. Aber die Grenze gegen Mittag ist von Thamar bis ans \* Haderwasser zu Rades und † den Bach hinab bis an das große Meer. Das soll die Grenze gegen Mittag sein.

\* 4. Mose 20, 13. † 4. Mose 34, 5.

20. Und an der Seite gegen Abend ist das große Meer von der Grenze an bis gegenüber Hamath. Das sei die Grenze gegen Abend.

21. Also sollt ihr das Land austheilen unter die Stämme Israels,

22. und wenn ihr das Loß werfet, das Land unter euch zu teilen, so sollt ihr \* die Fremdlinge, die bei euch wohnen, und Kinder unter euch zeugen, halten gleich wie die Einheimischen unter den Kindern Israel;

\* 2. Mose 22, 20.

23. und sollen auch ihren Teil am Lande haben, ein jeglicher unter dem Stamm, dabei er wohnet, spricht der Herr, Herr.

## Das 48. Kapitel.

Verteilung des Landes. Umfang der heiligen Stadt und Namen ihrer Tore.

1. Dies sind die Namen der Stämme. Von Mitternacht, an dem Wege nach Hethlon, gen Hamath und Hazer-Enon und von Damaskus gegen Hamath; das Land Dan für seinen Teil haben, von Morgen bis gen Abend.

\* R. 47, 15, 17.

Neben Dan soll Affer seinen Teil haben, von Morgen bis gen Abend.

2. Neben Affer soll Naphthali seinen Teil haben, von Morgen bis gen Abend.

3. Neben Naphthali soll Manasse seinen Teil haben, von Morgen bis gen Abend.

4. Neben Manasse soll Ephraim seinen Teil haben, von Morgen bis gen Abend.

5. Neben Ephraim soll Ruben seinen Teil haben, von Morgen bis gen Abend.

9. Und der Teil absonderlich Ruten lang

10. Und der Priester sein tausend Ruten gegen Mittag Morgen und

tum des Herrn

11. Das soll den Kindern gehalten haben mit den Kindern abgefallen sein

12. Und soll des geheiligten Allerheiligsten

13. Die Priester Grenze tausend Ruten send in die Breite soll fünf und Breite zehn

14. Und soll noch verändert ling nicht w Herrn geheil

15. Aber die in die Breite tausend Ruten mein Land soll wohnen, und soll mitten dr

16. Und da tausend und Mitternacht u gegen Morgen tausend und f

17. Die Vor hundert und f nacht und geg gegen Morgen



Schneider Kreuznach lenses from 45 mm to 150 mm



Copy Stand solutions from Cambo, Kaiser, Digital Transitions and Phase One



CULTURAL HERITAGE

# Phase One Film Scanning Solutions



## Scanning Transparent Film and Glass Plate Negatives

With a capture rate of one image per second, the Phase One Film Scanning Solutions are up to 400 times faster than flatbed, drum or virtual-drum scanners.

Regardless of the transparency or size of the original glass or film negative or transparency, it provides a consistent and reliable workflow, ensuring that the highest levels of image quality and accuracy are met.

The newly designed Phase One Film Capture Stage provides an adjustable, geared support mechanism and

is compatible with a range of carriers for glass plate negatives as well as most popular film strip and sheet formats. It can be easily adjusted to position the object directly under the camera. Made of high-grade aluminum, it ensures longevity and reliability for many years.

The film carriers, also made from aluminum, are designed to maintain film flatness with a minimal amount of stress and easy mounting/dismounting.



The glass plate carriers support most common and odd plate formats and are equipped with an optically optimized glass base. These too are made of high-grade aluminum and are built to last. They provide an economical solution for almost all types and sizes of plates.

With sensitive glass and film transiencies and negatives, material handling and its safety are key and the Phase One Film Capture Stage offers the ideal solution for a wide range of applications.

The Phase One iXG Camera System comes with a Schneider Kreuznach 120mm Macro RS lens equipped with the Reliance Shutter, rated at 1 million actuations and allowing for reliable and consistent capture of the finest detail with minimum amount of vibration.

The Phase One XF Camera System comes with a Schneider Kreuznach LS 120mm f/4.0 Macro lens designed to produce a flat image and thus ensuring maximum sharpness across the frame.

Check out the full Phase One portfolio of scanning solutions for Cultural Heritage at the end of this guide.





## Phase One Film Capture Stage

The newly designed Film Capture Stage provides an adjustable, geared support mechanism and is compatible with a range of carriers for glass plate negatives as well as most popular film strip and sheet formats. It can be easily adjusted to position the object directly under the camera.

### Specifications

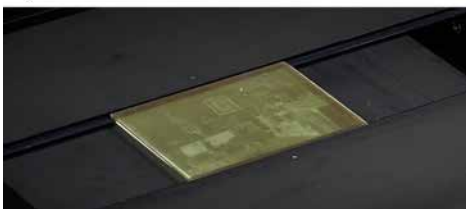
#### Dimensions (WxHxD)

730 x 216 x 700 mm

(28.7 x 8.5 x 27.5 in.)

#### Weight

approx. 13.5 kg (29.7 lbs)



## Phase One Film Carriers and Glass Plate Holders

The Phase One Film and Glass Plate Carriers are designed to work with the Film Capture Stage, ensuring smooth handling and efficient workflow.

Made of milled high-grade aluminum and using optically optimized glass base, they maintain parallelism and flatness.

The Film Carriers work with specially designed clamps that carefully stretch and flatten the film strips.

### Supported film formats:

- 35 mm strips
- 120 mm strips
- 9 x 12 cm
- 13 x 18 cm
- 18 x 24 cm
- 4 x 5 in.
- 8 x 10 in.
- Mounted 35 mm slides

The Glass Plate Holders work with specially designed “top stop” which ensures accurate and quick positioning of glass plates of the same size.

### Supported glass plate formats:

- 9 x 12 cm
- 13 x 18 cm
- 18 x 24 cm
- 24 x 30 cm



# Phase One Flat Copy Scanning Solutions

## Scanning with AutoColumn or with 2-Motion capabilities

The Phase One iXG and the XF camera systems give the highest levels of resolution and flexibility allowing capture of large objects such as drawings and maps, as well as smaller objects such as books, and manuscripts. Sensors with up to 150MP deliver scanning resolutions of up to AO @300ppi, fit for the most demanding digitization projects.

AutoColumn is available with iXG and the RPS 2300XL copy stand.

The RSP 2-Motion repro stand allows both the camera and the object to be moved and thus capture a wide range of object sizes and resolutions.

With the Schneider Kreuznach lenses, both sharpness and detail are maintained across the field of view.

## Components

### The General Purpose Kit includes

- Phase One iXG or Phase One XF camera system
- Phase One AutoColumn RPS 2300XL copy stand or Phase One RSP 2-Motion motorized copy stand
- Capture One CH

### Features and benefits

- Solid, reliable and durable build
- Easy, fool proof operation

- Maximum adjustability
- 2-speed, self-limiting worm gear for accurate positioning
- Max. camera load of up to 15 kg
- Flexible and modular design
- Up to 400 times faster than traditional scanners
- Consistent, reliable Autofocus with excellent manual Live View adjustment

Check out the full Phase One portfolio of scanning solutions for Cultural Heritage at the end of this guide.



Phase One iXG Medium Format  
Camera System



Phase One XF Medium Format  
Camera System



Schneider Kreuznach RS 72 mm  
iXG lens



Schneider Kreuznach LS  
80 mm f/2.8 lens



Capture One  
Cultural Heritage



Phase One RPS 2300XL  
AutoColumn copy stand

or

Phase One RSP 2-Motion  
motorized copy stand

# Phase One Book Scanning Solutions



## Digital Transitions DT Atom Flexible Scanner with Book Digitisation Cradle

The DT Atom is a tabletop digitization platform, featuring AutoColumn, that can be extended and upgraded to accommodate nearly any digitization project. The user can unlock the Standard Hardtop and swap to a variety of accessories to better accommodate different material types. The camera can be removed and used on a tripod or handheld. In this way, it can be used for architectural, portrait, installation art, and other photography.

### DT Book Cradle

Compatible with the DT Atom, and DT Versa and all legacy Digital Transitions work stations, the DT Book Cradle provides conservation-friendly, preservation-grade, fast and efficient digitization of A3 bound material (up to 17" x 12"). Its unique design incorporates a tilt-inward mount for the camera to provide ergonomic digitization without increasing the footprint of the system.

The optional glass uses a lift-assist mechanism to improve the ergonomics of the user over long periods of use. The glass can be fully removed in less than a minute when even the minimal operator-controlled contact with the glass is not suitable for a given material.

To ensure the safety of the binding, the mechanism of the book platform freely slides forward and backward to guarantee the gutter is always properly aligned to the captured frame. This also ensures the glass, if used, cannot produce undue pressure on the binding.

### DT Atom with DT Book Cradle, Features & Benefits:

AutoColumn functionality when used with iXG and Capture One CH.

- Easy to operate and works as mobile solution
- User-swappable tops for wide range of materials
- Operated by foot and/or hand releases
- Includes DT Photon LED lighting (CRI/CQS of 98)
- Allows book opening of 80°, 100°, or 180°
- Allows capture with or without glass
- Glass lift-assist for long-term use ergonomics
- Open platform design allows upgrading resolution, thereby preventing obsolescence.





## Digital Transitions DT Versa All-purpose Digitization Cradle

Originally designed and built for the National Archives Records Administration, the DT Versa Reprographic Capture Cradle is the latest integration of book capture and reprographic technology.

Developed with AutoColumn for the iXG camera system to achieve preservation grade reproductions at the fastest rate of capture - while providing reliability, ease of use, and safety of the original materials - the DT Versa is the optimum digitization solution for the rapid capture of rare, bound and loose document collections.

The DT Versa features a built-in pneumatic 180° dual platen book cradle that adjusts to the thickness of bound collections. The system is designed to bring printed materials to optimal focus and accommodates books up to 63.5 x 89.0 cm with up to 10.2 cm bindings.

The book cradle platens are self-adjusting platforms that utilize dual pneumatic pistons for raising and lowering. The platforms gently push the books against the glass plate for image capture and can also leave documents partially open when the binding is too fragile and cannot be completely flattened.

The DT Versa is operated by foot pedals and can be fine-tuned to protect the widest range of materials. For increased safety, the glass top is hinge-mounted to the back of the table and includes lift-assist gas pistons and is secured with hand locks.

The DT Versa features a modular design that incorporates today's finest digital camera systems and can be upgraded as technologies or needs change.

To increase versatility, a 76.2 x 101.6 cm copyboard is also included that can be placed over the glass so that oversized books, foldouts, maps, rare materials, paintings, film and glass negatives (utilizing the Phase One Film Capture Stage), and more can be digitized. The DT Versa Capture Cradle is truly a proficient system that will protect your investment and enable you to expand the scope of your digitization program.



## Digital Transitions DT BC100 Dual Camera Book Cradle Solution

**Built on the success of the DT Reprographic System, this system redefines the way library materials are digitized. The BC100 is the only true 48 bit system on the market that will meet the high demands of cultural institutions by providing the highest image quality, speed, and reliability needed to capture a wide variety of bound and loose materials - all while protecting the original documents.**

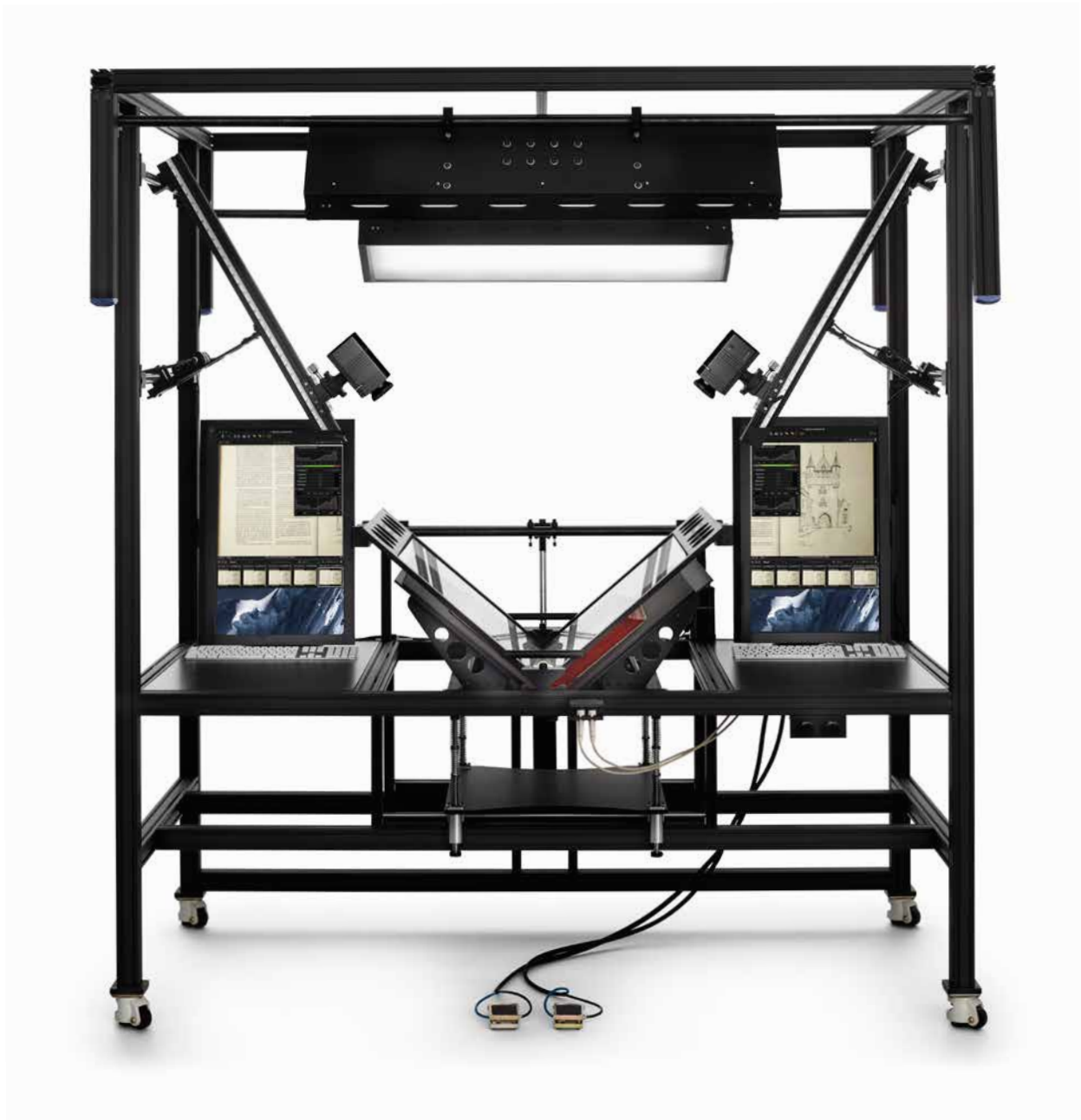
Designed for the mass digitization of books, the 100° bonded v-shaped anti-reflective glass platen and adjustable book cradle secures and holds the largest variety of bound materials with page sizes up to 17"x24" or A2 size per side.

These combined components keep the focus plane the same while being gentle on the binding of the book. The glass platen of the DT BC100 is designed with a pneumatic lift system to increase productivity while protecting the books, and is incapable of free falling.

To ensure the safety of the binding, the mechanism of the book platform slides back and forth and then sets to make certain that the glass platen is always in the middle of the book's gutter.

The platform rests on a controllable support system that may be adjusted by the operator for different book types. This system has been designed to address the shortcomings of traditional robotic systems, including lack of quality control, the tendency to skip or damage fragile pages and the need for manual assistance. The BC100 has also been constructed with the comfort of the operator in mind. The operator sits in the station and controls the system with a variety of foot and/or hand releases, thereby preventing repetitive stress injury. All operations are within arm's length and the lights are at a pleasant level. There are extra shelves allowing the operator to have computer displays and other equipment nearby.

The modular design of the DT BC100 allows the camera and capture device to be upgraded when necessary, ensuring that it will not become obsolete. It is fabricated with airplane grade extruded aluminum to .005" tolerances, so it will not break down after years of continuous use. The versatile features and reliability of the DT BC100 make it the ideal solution for all of your mass digitization projects.

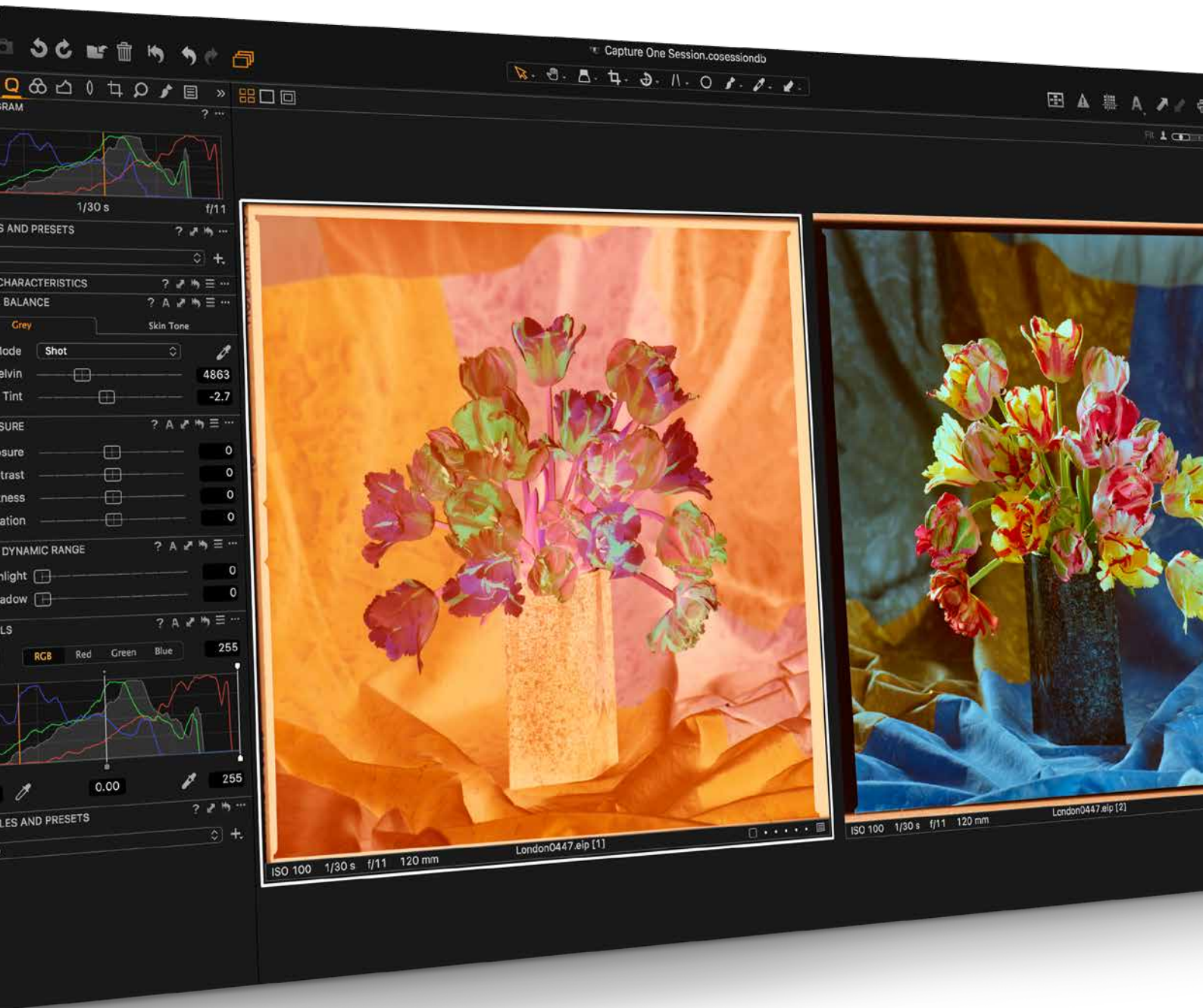


#### Features & Benefits:

- Dual Camera Book Capture System with an incredible rate of capture.
- Capable of shooting bound and loose materials, including works on paper, serials including newspapers, loose manuscripts, photos, drawings, etc.
- 100° anti-reflective glass platen enables the digitization of up to 6" bindings and page sizes up to 17" x 24" or A2 size per side.
- Delivers preservation grade TIFFs, JPEGs, and PDF's in RGB, grayscale, and CMYK modes. Open Source Raw and DNG also supported.
- The only true 48 bit system on the market.
- Operated by foot and/or hand releases.
- Four retractable vibration dampening casters.
- Open platform design allows camera and capture devices to be upgraded, thereby preventing obsolescence.
- Variable resolution options available.
- Compatible with our DT Reprographic Systems for increased versatility.
- Easy to operate.
- Durable design for years of continuous use.

# Capture One for Cultural Heritage

Capture One CH is a professional Rapid Capture Solution dedicated to the Cultural Heritage community. Built on the renowned Capture One software, the Cultural Heritage edition offers a highly specialized feature-set that delivers a significantly faster reprographic workflow during both capture and post-production. The new Slipstream mode - a simplified user interface front-end - provides for capturing to be handled by less-skilled operators, and it speeds up the workflow, especially when working on large collections and large volume of documents that needs digitization.



## CH A Quantum Leap in Productivity

Use Capture One CH to optimize your images. Not only do you get the highest image quality from the advanced image render engine, you also have access to powerful adjustment tools to fine-tune your images for final presentation, digital asset management, for archival and retrieval, and much more.

## CH Negative Film Reproduction Tool and Styles

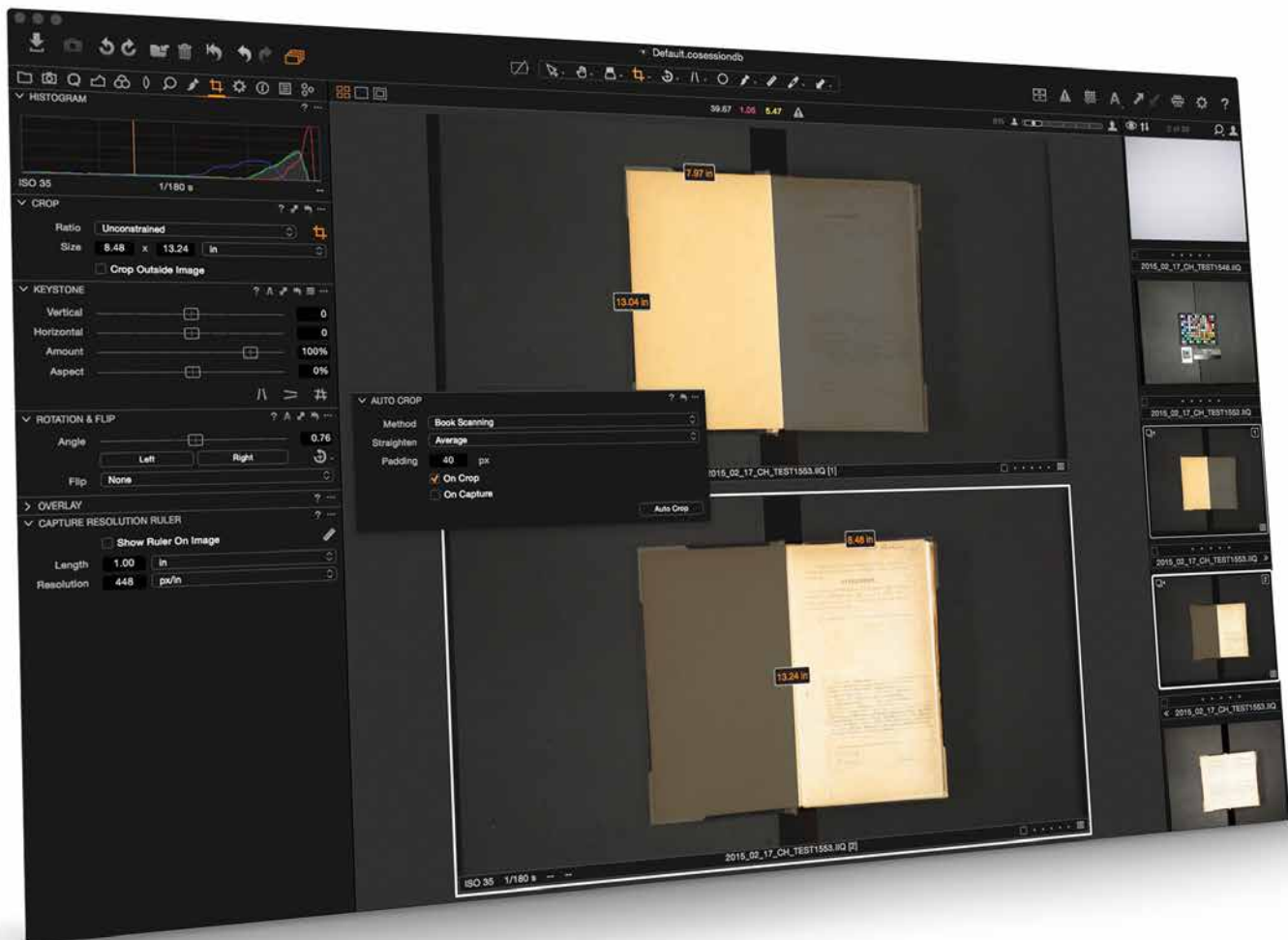
An improved workflow that automates the conversion of negative transparent material in both black & white and colors. Use the exposure tools in an intuitive way to adjust exposure, contrast and colors, and get perfect results, ready for print or post processing. A selection of Cultural Heritage styles allows to quickly chose a set of conversion parameters for different film types.

## CH Advanced Auto Cropping

Advanced auto cropping of film rolls and strips that includes straightening and post-crop auto levels optimization.



CULTURAL HERITAGE



## CH Auto Crop & Auto Rotate

Boost productivity by automating cropping in post-processing. Select cropping options for flat art reproduction or books, including corner or edge alignment with positive or negative padding for all cropping methods.

On-Capture multi-crop increases productivity when digitizing books that do not require the full resolution of the camera where 2 pages can be captured and separated on the fly.

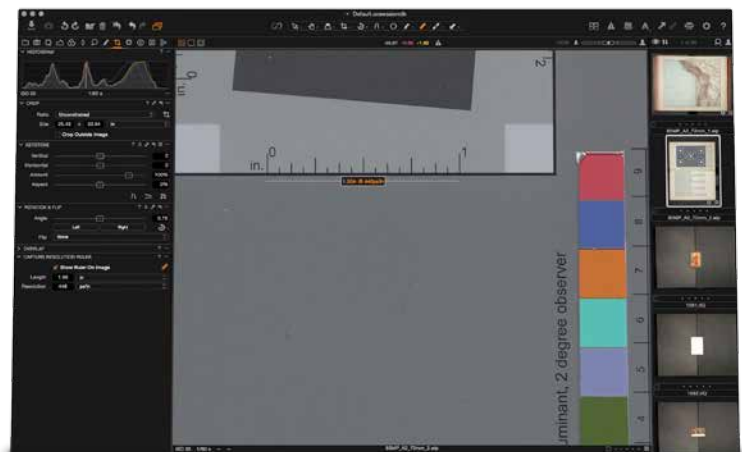
## CH Camera Focus with AutoColumn and PPI-Assist

In combination with the iXG camera the Camera Focus tool delivers accurate measuring of distance to object and based on that it calculates the capture resolution, magnification and Field-of-view. The data is calculated for current camera position and delivers precise data for automated or guided re-positioning the camera to capture at target ppi, magnification or Field-of-view.

Check out the AutoColumn solutions available at the end of this guide.

## CH Capture Resolution Ruler

The Resolution Ruler delivers verification of the capture resolution at any given camera position. It allows for marking up a known length in the target subject matter, in inches or centimeters, and calculating the exact capture resolution.



## CH Slipstream Capturing for non-trained Operators

Slipstream delivers a simplified, easy to use capturing interface allowing non-skilled operators to handle the capturing process. Slipstream is working on-top of the Capture One CH platform. This facilitates interfacing and access to the admin tools for camera setup, for post processing, and for image storage matching the needs of both simple and advanced networking environments.



## CH CH Workspaces

A Capture One CH workspace is a logical setup with a Collection of tools customized to optimize a given CH workflow. Workspaces may be made for tailoring the user-interface for preparation, for production and for file storage. It can include the required capture and processing tools for specific Reflective or Transmissive materials. Workspaces can be used by both admin and Operator personnel.

## CH ICC Profiles for Cultural Heritage

Obtain high color accuracy with the specialized ICC profiles optimized to be robust under the slight changes happening to lighting over time. The profiles work for both flat art and three dimensional objects. Available for common studio light types such as flash, LED and tungsten as well as for specific types of film.

## CH Creative Enhancements

Advanced Color Editor can help to achieve monochrome images or to enhance selected colors. In order to achieve the perfect image, Capture One CH offers an Enhanced Color Editor and also a black & white Tool. Capture One CH offers a vastly improved noise reduction, especially for higher ISO images.







# Phase One iXG Camera System

Cultural institutions have the staggering task of achieving perfection in the preservation of their collections. Phase One delivers to the need for intelligent capture solutions built to process high volume digitization programs with speed and accuracy. Our specialized research and development team have developed a configurable solution that provides an ergonomic and

efficient workflow, resilient hardware, and Phase One's patent imaging capabilities. The efforts have yielded the iXG Camera System: a system designed with quality, durability and ease of use in mind, a wide range of applications, and it comes with a complete software integration into a new version of Capture One CH.



The iXG Camera System **accurately measures distance to object matter** and records PPI, Field-of-view and magnification, making it easy to positioning iXG on any copy stand for a given scanning purpose. We refer to this functionality as **PPI-Assist**. In combination with the Phase One **AutoColumn** copy stands and Capture One CH, the iXG Camera System is integral to deliver automated camera positioning for a wanted ppi.

With the Phase One Film Capture Stage, all kinds of film and glass plates can be readily digitized. The configuration of the iXG solutions go hand-in-hand with the development of Capture One Cultural Heritage software. Our iXG Camera Solutions are designed with quality, material safety and an efficient workflow in mind.

# iXG Camera System highlights



## Color accuracy & superior detail

The iXG Camera System uses CMOS sensors in both the iXG 100MP and iXG 50MP models to ensure the highest resolution and lowest noise. These sensors produce the most accurate colors and minute details, enabling accurate reproduction for all Cultural Heritage applications. The degree of detail, quality and accuracy of color is crucial for the accurate reproduction of precious books and artworks. The iXG 100MP Achromatic model uses Sony 100MP Achromatic sensor, combining the highest possible resolution and class-leading wide spectrum sensitivity that are so desirable for specialized applications such as multi-spectral and NIR (Near Infra-Red) imaging, typically employed in research and conservation of manuscripts, paintings, maps and drawings.

## Schneider Kreuznach optics

The iXG Camera utilizes integrated flat field optics with the 72mm and 120mm Schneider Kreuznach lenses, addressing the needs of flat copy work, being particularly useful for libraries, archives, and universities. In combination with the digital lens profiles of Capture One CH, the lenses offer the highest quality in terms of resolution, flatness, sharpness, lack of distortion and color uniformity required for the most demanding reproduction applications. 21mm and 42mm Extension tubes are available for close up capturing of film and small objects at higher resolution and are designed and built with the same accuracy and quality as the camera body and lenses.

## AutoColumn and PPI-Assist

The full integration of hardware with the customized Capture One CH software yields an efficient, professional workflow and precision results. This includes AutoColumn and PPI-Assist functionality for easy setup of scanning jobs. Tools for auto-cropping and aligning of both documents and books is a huge time saver, as is the automated workflow for the scanning of negative film.

## Industrial durability – one million actuations guarantee

The iXG Camera System is designed to work hard and to last. It offers industrial build quality, made with aerial-grade aluminum and the most durable mechanical and electronic components available today. The Reliance Shutter's longevity allows us to offer a guarantee of one million actuations. And with the iXG 100MP in electronic shutter mode, an unlimited number of shutter actuations can be achieved.

## Scientific Tools and SDK for integration

The iXG Camera System and the Capture One SDK are designed to provide an open platform for new imaging applications. For example, with the addition of accessory lighting and filtering, the wide spectrum, infrared, and multi-spectral capabilities of the iXG meet the highest standards required. These iXG capabilities and its incredible focusing accuracy opens the door to computational and sequential imaging, required for both multi-spectral and 3D applications.

# iXG Camera System

## Technical Specifications

### System specification



<b>Imaging sensor options</b>	iXG 50MP, iXG 100MP and iXG 100MP Achromatic (See specification for Digital Backs)
<b>Lens mount</b>	Phase One iXG
<b>Shutter type</b>	Leaf shutter, integrated in lens (reliance shutter/RS shutter)
<b>Shutter speed</b>	1/250s – 30s
<b>Focus positions</b>	Close range to near infinity, 21 mm max. extension
<b>Focus control</b>	Motorized & encoded, controlled from Capture One CH software
<b>Mechanical mounts</b>	Threaded holes at top & bottom with a dedicated L-Bracket
<b>Triggering options</b>	Hand release, host capture from software
<b>Flash output</b>	Via Secured LEMO connector
<b>Live view / HDMI</b>	1920x1080 25p/30p, 1280 x 720 50p/60p
<b>Data storage</b>	USB 3.0 tethered to Capture One CH, PRO and DB
<b>Dimensions (mm)</b>	Focused to infinity: 150 x 120 x 100 Focused to close range: 180 x 120 x 100
<b>Weight (g)</b>	2300 (Including 72 mm lens and mounting bracket)
<b>Operational temp range (c)</b>	10-35 (office environment)
<b>Humidity (%)</b>	15-80 (office environment)

### Lens specification



The iXG optics are designed and manufactured by Schneider-Kreuznach for the highest quality and flat field performance. The lenses are mounted with iXG-RS leaf shutters guaranteeing 1.000.000 actuations. The iXG in-camera motorized extension and the 21mm and 42mm extension tubes, provide the magnification ranges shown below.

	Schneider Kreuznach 72mm RS-iXG	Schneider Kreuznach 120mm RS-iXG
<b>Magnification range</b>	Infinity to 1:0.9 with extension tubes	1:6,9 to 1:1,2 with extension tubes
<b>Lens thread diameter (mm)</b>	40.5	46.0
<b>Lens shade (collapsible, screw-on)</b>	Included	Included
<b>Field of view</b>	62° at all apertures	48° at lower magnification & up to f11, 40° at 1:1



# Phase One XF Camera System

Built on many years of experience in the high end photographic market, the Phase One XF Camera System brings unrivaled quality, accuracy, and reliability, and sets a new standard for a flexible platform equipped with everything that is needed for reproduction at the highest possible level.

- Robust, solid, aluminum-alloy construction.
- Advanced, expandable operating system.
- Intuitive and easily customizable user interface.
- Choice of fully integrated Waist Level and Prism viewfinders.
- Support for all Schneider Kreuznach LS 645 format lenses, from 28 mm to 240 mm.



- Support for all Phase One and Mamiya Focal Plane lenses and many legacy Mamiya 645 lenses.
- Advanced HAP auto focus system with remote control from Capture One.
- Compatible with all Phase One IQ Digital Backs with a choice of 50-150 Megapixel.

# XF Camera System Highlights



## Honeybee Autofocus Platform

HAP-1 is designed with a custom processor, coupled with a high-resolution CMOS AF sensor. Combining a unique floating-point architecture and a fully programmable interface, HAP-1 allows for continuous tailoring and tuning of the AF system, providing user-accessible software updates for years to come. The new Hyperfocal Point Focusing, creates unique presets for each lens which make HAP-1 automatically return to that specific point on demand.

## Sequence Photography

**Focus stacking** - Select the desired focus plane and the camera will create a series of images with multiple focusing steps and these can be then stacked in 3rd party software solutions to give a greater depth of field.

**Intervalometer** - The camera can be programmed to take a series of images at fixed intervals.

**Exposure bracketing** - When there is a need to record an extremely wide dynamic range, the camera can be programmed to create a series of images with fixed ISO and aperture but with variable exposure times.

## New Modular Viewfinders

The waist-level finder is convenient for many styles of photography, be it in studio or on location. With the ability to attain a more effective working position, the waist-level finder is a great addition to the creative toolbox.

The XF Camera System can measure the light on the newly designed HAP-1 autofocus platform. Using this ability, light metering is now available with our waist-level finder.

With a solid glass prism, the 90° viewfinder is the brightest of its kind and has virtually no loss of light. Together with nearly 100% frame coverage, the prism viewfinder displays a perfect view of the scene and comes standard on all XF Camera Systems.

## OneTouch User Interface

The OneTouch UI on the XF Camera System is a seamless combination of intuitive dials, keys and touch screen interactions. Each operation is used only where it makes sense and where you want it. OneTouch UI is designed with the goal of making controls so simple that photographers will feel at home within moments of getting started. The 1.6" grip screen is designed for clear visibility in any lighting condition using a transfective capacitive.

# XF Camera System

## Technical Specifications

### Imaging Sensor



#### Imaging Sensor

<b>Digital Back options</b>	IQ3 50-100MP & IQ4 100-150MP with XF mounts (See specification for Digital Backs)
<b>Backwards compatibility</b>	IQ1 & IQ2 with P mounts

### Size & Weight



#### Dimensions (W x H x D)

#### Weight

<b>XF Camera System*</b> <b>w/ 90° prism viewfinder</b>	152 x 135 x 160 mm	1390 g
<b>XF Camera System*</b> <b>w/ waist level finder</b>	152 x 173 x 160 mm	1020 g
<b>XF Camera Body</b> <b>w/o battery</b>	152 x 108 x 85 mm	790 g
<b>IQ Digital Back</b>	98,5 x 88,5 x 62,3 mm	695 g
<b>90° prism viewfinder</b>	68 x 52 x 152 mm	500 g
<b>Waist level finder</b>	67 x 17 x 57 mm (closed) 67 x 65 x 57 mm (open)	130 g

\* without lens

### Battery

<b>Battery</b>	BP-911/914/915 3400 mAh
<b>Powershare</b>	IQ3 only
<b>Power input</b>	With accessory
<b>Internal battery charging</b>	XF and IQ3
<b>Support for USB 3 charging hub (1.5 A)</b>	IQ3 only

### Flash

<b>Flash trigger</b>	Integrated Profoto wireless
<b>Wireless trigger range</b>	20m (outside)
<b>Back flash sync</b>	Yes
<b>Flash sync speed</b>	1/125s
<b>focal plane shutters (max)</b>	
<b>Flash sync speed</b>	1/1600s
<b>leaf shutters (max)</b>	

# IQ Digital Back Range

## Technical Specifications

### IQ4



### Specifications

	IQ4 150MP	IQ4 150MP Achromatic	IQ4 100MP Trichromatic
Resolution	151 Megapixel	151 Megapixel	101 Megapixel
Long exposure	60 minutes	60 minutes	60 minutes
16 bit Opticolor+	Yes	Yes	Yes
Sensitivity (ISO)	50 - 25600	200 - 102400	35 - 12800
Sensor type	CMOS	CMOS	CMOS
Sensor size	53.4 x 40	53.4 x 40	53.4 x 40
Active pixels	14204 x 10652	14204 x 10652	11608 x 8708
Pixel size (micron)	3.76 x 3.76	3.76 x 3.76	4.6 x 4.6
Output image dim. 300dpi	120.26 x 90.19 cm	120.26 x 90.19 cm	98.3 x 73.2 cm
Output image dim. 600dpi	60.13 x 45.09 cm	60.13 x 45.09 cm	49.1 x 36.9 cm
Mount options*	XF	XF	XF
3.2" touch display	Yes	Yes	Yes
High bandwidth interface	Yes	Yes	Yes
XF Powershare	Yes	Yes	Yes
Wi-Fi 802.11	Yes	Yes	Yes

### Captures per second

	14-bit	16-bit	14-bit	16-bit	14-bit	16-bit
Focal plane (full res.)	1.4	0.7	1.4	0.7	1.4	0.7
Leaf shutter (full res.)	1.2	0.7	1.2	0.7	1.2	0.7

### Images

IQ4 150MP © Paul Reiffer   IQ4 150MP Achromatic © Paul Reiffer   IQ4 100MP Trichromatic © Yulia Gorbachenko   IQ3 100MP Achromatic © Joel Tjintjelaar   IQ3 100MP © David LaChapelle   IQ3 50MP © Anja Poulsen

# IQ3



IQ3 100MP

IQ3 100MP  
Achromatic

IQ3 50MP

101 Megapixel	101 Megapixel	51 Megapixel
60 minutes	60 minutes	60 minutes
Yes	Yes	n/a
50 - 12800	200 - 51200	100 - 6400
CMOS	CMOS	CMOS
53.4 x 40.1	53.4 x 40.1	44.0 x 33.0
11608 x 8708	11608 x 8708	8280 x 6208
4.6 x 4.6	4.6 x 4.6	5.3 x 5.3
98.3 x 73.2 cm	98.3 x 73.2 cm	70.1 x 52.6 cm
49.1 x 36.9 cm	49.1 x 36.9 cm	35.0 x 26.3 cm
XF, H	XF	XF
Yes	Yes	Yes
Yes	Yes	Yes
Yes	Yes	Yes
Yes	Yes	Yes

14-bit	16-bit	14-bit	16-bit	14-bit	16-bit
1.4	0.7	1.1	0.6	1.8	1.8
1.2	0.7	0.9	0.5	1.4	1.4

## Mount options\*

XF: XF, DF+ and DF

H: Hasselblad H1 and H2

V: Hasselblad V-series

# Phase One Lenses

Schneider Kreuznach Blue Ring Lenses



45mm LS f/3.5

Providing a focal length that is perfect for almost any application, the Blue Ring 45mm f/3.5 offers edge-to-edge sharpness and nearly distortion free results.

- Tack sharp wide-angle lens
- Minimum optical distortion
- Flash synchronization up to 1/1600<sup>th</sup>



55mm LS f/2.8

Minimal distortion semi-wide-angle design provides a normal look, great for editorial portraits and lifestyle photography.

- Fast aperture, shallow depth of field
- Compact size with LS capabilities



80mm LS f/2.8

A preferred choice for location fashion photographers using fill flash and an essential lens for every photographers kit.

- Fast aperture allowing shallow depth of field
- Edge-to-edge sharpness
- Extreme optical performance

For the full range of available lenses please see [www.phaseone.com](http://www.phaseone.com)



110mm LS f/2.8

A longer focal length with just enough optical compression for full-length fashion, beauty and portraiture.

- Fast lens allowing shallow depth of field
- Extreme anti-flare optical design



120mm LS f/4.0 Macro

Macro lens ideal for close-up product shots, and equally ideal for close up beauty, action, nature and wildlife photography.

- Edge-to-edge tack sharp images
- Beautiful out-of-focus bokeh
- Auto Focus and Manual focus



150mm LS f/2.8

Our fastest telephoto lens, providing razor thin depth of field at f/2.8. Perfect for studio and location portraiture.

- Fastest telephoto lens
- Auto and manual focus
- Razor thin depth of field

# Phase One AutoColumn Copy Stands





## Phase One RPS 2300XL - Floorstand AutoColumn copy stand with LED option

The new standard of AutoColumn copy stands, the Phase One RPS 2300XL, is designed with motorized AutoColumn technology to accommodate for efficient work with the iXG camera system and Capture One CH.

The Phase One RPS 2300XL features high precision camera positioning, and a geared movable camera arm. A camera leveling head secures precise and quick positioning.

An LED baseboard insert is available for transparency scanning.

Wall mount options are available for the 2300XL column as well as upgrades for existing RPS 2300 products in the field.

### Specifications

<b>Base plate</b>	100 x 75 cm (39,4 x 29,5 in.) Desk top or Floor position
<b>Column height</b>	2,30 m (90 in.)
<b>LED insert plate</b>	42 x 32 cm, 6500K, dimmable
<b>Maximum load</b>	10 kg (22 lbs)
<b>Camera mounting plate</b>	Arca Swiss type quick release



## Phase One RPS 1600 - Tabletop AutoColumn copy stand with LED option

The new standard of AutoColumn copy stands, the Phase One RPS 1600, is designed with motorized AutoColumn technology to accommodate for efficient work with the iXG camera system and Capture One CH.

The Phase One RPS 1600 features high precision camera positioning, and a geared movable camera arm. A camera leveling head secures precise and quick positioning.

An LED baseboard insert is available for transparency scanning.

### Specifications

<b>Base plate</b>	100 x 70 cm (39.4 x 27,5 in.)
<b>Column height</b>	1.60 m (6.2 ft.)
<b>LED insert plate</b>	42 x 32 cm, 6500K, dimmable
<b>Maximum load</b>	10 kg (22 lbs)
<b>Camera mounting plate</b>	Arca Swiss type quick release



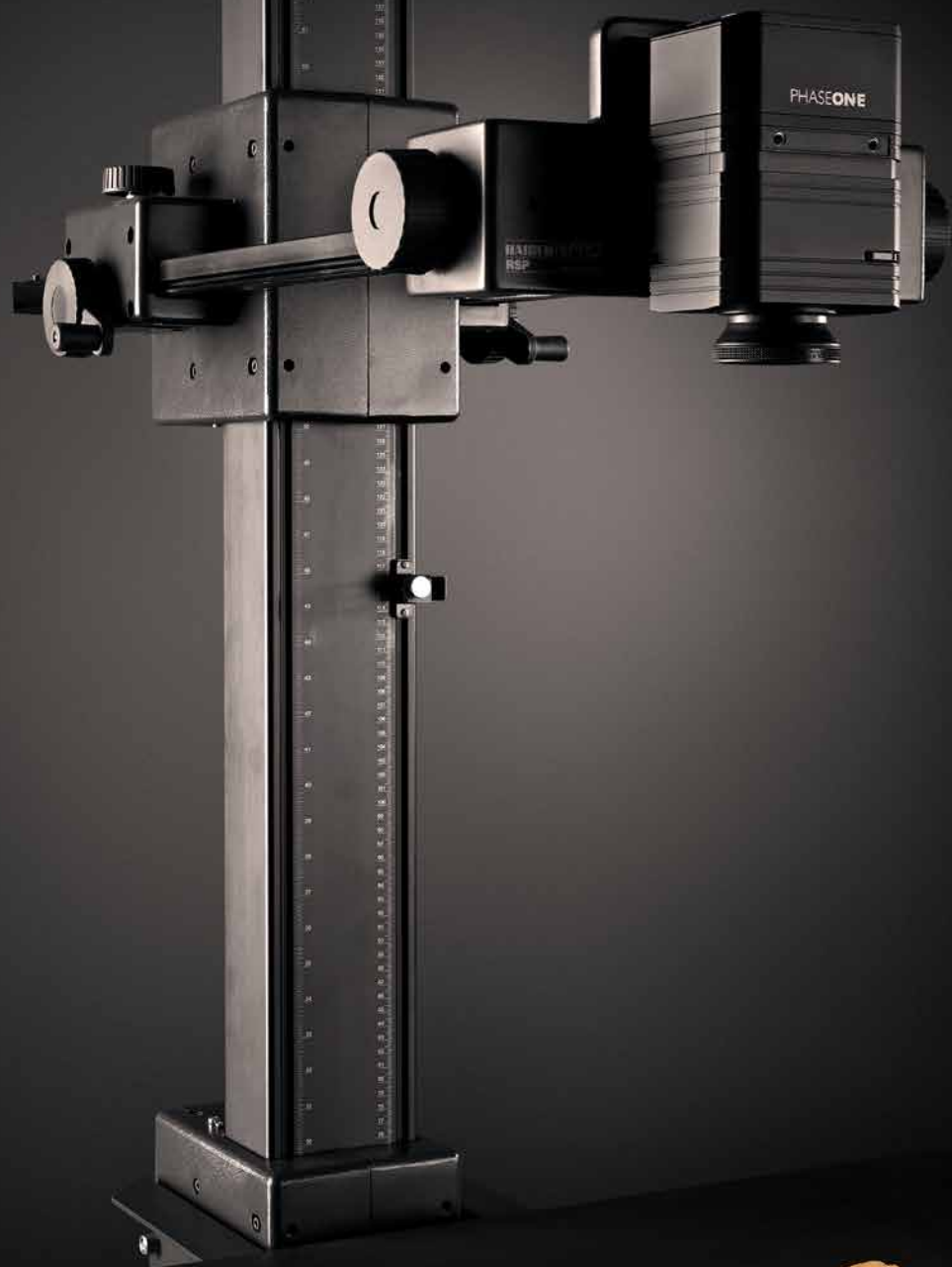
## Phase One 2-Motion Maximum flexibility for larger objects

The RSP 2-Motion adds an adjustable, motorized 100 x 80 cm baseboard allowing for greater flexibility and use of different lenses when scanning larger objects. The baseboard can be fitted with a steel sheet plate up to DINA0 format for magnetic attachment of large drawings, maps etc.

### Specifications

<b>Total height</b>	227 cm (89.4 in.)
<b>Maximum working span</b>	160 cm (63 in.)
<b>Column cross section</b>	120 x 80 mm (4.7 x 3.1 in.)
<b>Maximum load</b>	on camera carrier: 10 kg (22 lbs) on base board: 15 kg (33 lbs)
<b>Base board</b>	100 x 80 cm (39.4 x 31.5 in.)
<b>Camera platform</b>	13 x 13 cm (5.1 x 5.1 in.)
<b>Connecting thread (interchangeable)</b>	1/4" / 3/8"
<b>Required floor space (WxD)</b>	100 x 126 cm (39.4 x 49.6 in.)

# Phase One 2-Motion Copy Stand



# Cultural Heritage Solution Partners

## Phase One

Phase One is the world leader in open-platform medium format digital camera systems and solutions designed to deliver the highest image quality for professional photography.

Our products are built by hand using the best materials, highest precision and most advanced quality assurance processes.

Our company was born digital and we have always strived to deliver the highest image quality possible through innovative solutions. Well known Cultural Heritage

institutions worldwide rely on our combined systems to consistently deliver the highest level of quality, performance and safety for demanding collections of objects.

Phase One was founded in 1993 and is based in Copenhagen with offices in New York, London, Tokyo, Cologne, Hong Kong and Shanghai.

Phase One is proud to work together with the world's leading value added resellers. In doing so we ensure the highest level of service and support to our customers.

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## Digital Transitions, USA

The Digital Transitions' Division of Cultural Heritage provides cameras and copy-stand solutions to support the digitization programs of libraries, museums, archives, collectors, service bureaus and other institutions.

Digital Transitions' approach is comprehensive. They work closely with every client to design a complete solution with an efficient standards-based workflow.

This includes careful choice of hardware, integrating our systems into existing infra-structures, and providing ongoing support and training to staff in order to keep the digitization program running efficiently.

For more information, please visit:

<http://www.dtdch.com/>

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## Cambo, The Netherlands

Cambo BV, founded in 1946, is based in the town of Kampen in The Netherlands, and today works from a modern 2,000 sq.m. facility with the latest computer controlled design and machine tools, ensuring production to the highest standards.

Cambo produces a range of camera support stands and other studio accessories, including dedicated Reproduction cameras and Reproduction stands.

For more information, please visit:

<http://www.cambo.com/en/>

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## Kaiser Fototechnik, Germany

For more than 40 years, the copy stands from Kaiser Fototechnik have been chosen by photographers, libraries, and archives for professional repro-graphic work. Together with Phase One's camera solutions and software, we have created a line of Instant Capture

solutions for efficient and high quality digitization projects.

For more information, please visit:

<http://www.kaiser-fototechnik.de/en/>





# Phase One Scanning Solutions

## CH Product Portfolio

### Film scanning solutions (+/- Autocolumn solution)

- Film scanning solution with Autocolumn, iXG 50MP
- Film scanning solution with Autocolumn, without camera
- Film scanning solution, Kaiser rePro iXG 50MP
- Film scanning solution, Kaiser rePro, without camera

### Flat copy scanning solutions (with AutoColumn or 2-motion solution)

- General purpose scanning solution with Autocolumn, iXG 100MP
- Optional LED insert for baseboard
- Wall mounted General purpose scanning solution with Autocolumn, iXG 100MP
- Upgrade scanning solution with Autocolumn for existing Cambo RPS, iXG 100MP
- Upgrade kit with Autocolumn for existing Cambo RPS, iXG 50MP
- General purpose scanning solution with 2-motion, iXG 100MP

### Book scanning solutions (single- or dual camera solution)

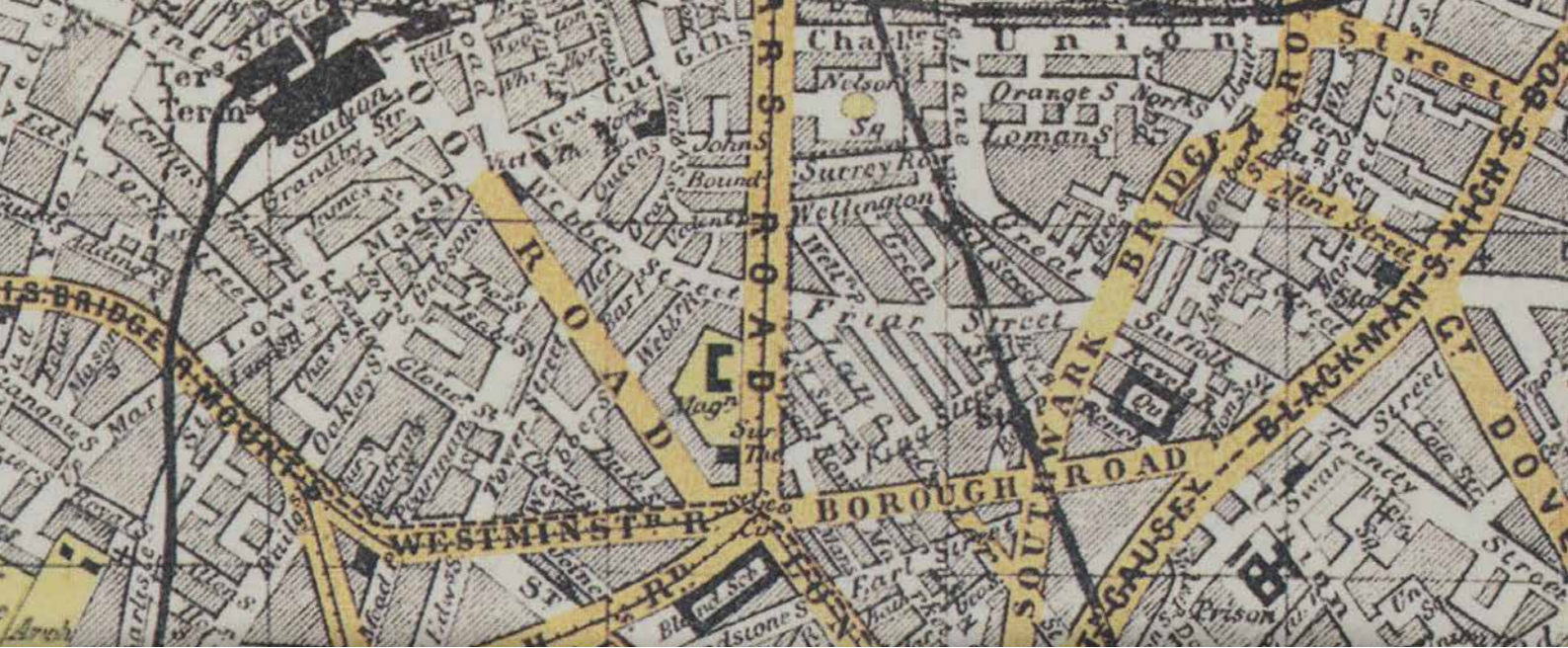
- Book scanning solution, DT Atom flexible book cradle, with Autocolumn, iXG 100MP
- Book scanning solution, DT Versa 180 degrees cradle, with Autocolumn, iXG 100MP
- Book scanning solution, BC100 dual camera, 100 degrees cradle, iXG 100MP

## Suitable Resolution (Size@PPI)

## Baseboard size

## Auto-column

Down to 6 x 4.5 cm @3500ppi	100 x 70 cm	Yes
	100 x 70 cm	
Down to 6 x 4.5 cm @3500ppi	80 x 60 cm	No
	80 x 60 cm	No
Up to A1+ @400ppi	100 x 75 cm	Yes
	42 x 32 cm	
Up to A0 @300ppi	N/A	Yes
Up to A1+ @400ppi	100 x 75 cm	Yes
Up to A2 @350ppi	100 x 75 cm	Yes
Up to A1+ @400ppi	100 x 80 cm	No
Bound: A3 @1000ppi Open 180° A2 @600ppi	59 x 65 cm	Yes
Bound: A2 @400ppi Open 180° A1 @400ppi	102 x 76 cm	Yes
Up to A2 @500ppi	A2	No



2motion: Table and camera	Table-top	Floor-standing	Wall-mount	Column height	Light table for film scanning
					LED insert
	Yes		N/A	1.6 m	LED insert
			N/A	1.6 m	LED insert
	No		N/A	1.5 m	Kaiser Light Box
	No		N/A	1.5 m	Kaiser Light Box
	No	Yes	N/A	2.3 m	LED insert
	Yes		N/A		LED insert
	No		Yes	2.3 m	
	N/A	Yes		2.3 m	
	N/A	Yes			
Yes		Yes	N/A	1.6 m	Kaiser Light Box
	Yes		N/A	1.4 m	DT Photon LED
	N/A	Yes	N/A	1.6 m	Kaiser Light Box
	N/A	Yes	N/A		



# References

## Partial list

### USA

American Museum of Natural History  
New York, NY

Smithsonian Institution  
Washington DC, PA

Library of Congress  
Washington DC, PA

Harvard University  
Cambridge, MA

Museum of Modern Art  
New York, NY

New York Public Library  
New York, NY

Walt Disney Studios Burbank  
Glendale, CA

Stanford University  
Stanford, CAA

The U.S. National Archives  
Washington, DC

### UK

The British Museum  
London

The British Library  
London

The Bodleian Library  
Oxford

The John Rylands Library  
Manchester

Cambridge University Library  
Cambridge

### The Netherlands

The National Maritime Museum  
Amsterdam

Picturae  
Heiloo

### France

The National Library of France  
Paris



The luminous portrait studio of the Alinari Brothers' photographic establishment, in Florence, Italy. On the left is the photographer Gaetano Puccini. 1899, Fratelli Alinari

© Alinari Archives-Alinari Archive, Florence, Italy

#### Switzerland

The National Library of Switzerland  
Bern

#### Denmark

The Royal Danish Library  
Copenhagen

#### Norway

The National Archive of Norway  
Oslo

Munch Museum  
Oslo

Inter-municipal Archive of Møre  
og Romsdal,  
Ålesund

#### Qatar

Qatar Foundation  
Doha

#### Austria

Vienna University of Technology  
Vienna

#### Germany

Berlin State Museums  
Berlin

The Prussian Cultural Heritage  
Foundation  
Berlin

The Schleswig-Holstein State Library  
Kiel

Bavarian State Library  
Munich

The House of West Germany  
Bonn

The State Conservation Office  
Mainz

Linden Museum  
Stuttgart

Folkwang Museum  
Essen

The Rhien Picture Library  
Cologne

Additional references and customer testimonials can be found on <https://www.phaseone.com/cultural-heritage/resources/videos-in-action>

For more information, please visit  
[www.phaseone.com/cultural-heritage](http://www.phaseone.com/cultural-heritage)



**PHASEONE**  
what the world's best photography is made of