**Herbarium Imaging Guide**

Contents

[Getting the workstation up and running 2](#_Toc169097661)

[Assessing the stage: 4](#_Toc169097662)

[Setting up the workstation 5](#_Toc169097663)

[Setting up the camera 6](#_Toc169097664)

[Exporting and ingesting TIFFS 6](#_Toc169097665)

[Setting up the software 8](#_Toc169097666)

[Focus 10](#_Toc169097667)

[Capturing the Target 12](#_Toc169097668)

[Capture session 13](#_Toc169097669)

[Workflow 13](#_Toc169097670)

[What to do… 14](#_Toc169097671)

[Finishing the imaging session 16](#_Toc169097672)

[Initial Camera Set Up 18](#_Toc169097673)

# Getting the workstation up and running

*Very important:*

*\* Please note that minimal interaction and adjustment of the workstation is optimal, and parameters are given for reference in ensuring all is in order. Please do not change settings or unplug cords unless experiencing issues with the set-up.*

A machine with a white cover

Description automatically generated

Start up by turning on:

1. The computer by pressing the power button
2. The primary EIZO-monitor by pressing the power button on the bottom right corner
3. The two light panels via switches near the DC plugs on the bottom of each panel

A close up of a device

Description automatically generatedA close up of a device

Description automatically generated

The lights should be set to 75% brightness and can be adjusted with the knob near the bottom of the light panel.

Ensure following cables are connected:

* Orange USB-C cable, from camera to computer.
* Black AC adapter cable, from camera to power supply.

A close up of a camera

Description automatically generated

## Assessing the stage

A measuring tape on a grey surface

Description automatically generated

1. A close-up of a photo editor

   Description automatically generatedEnsure the stage is clean and relatively dust-free
2. If necessary, clean with a cloth or use the hand vacuum
3. Ensure the institutional scale bar and 1X Object-Level Target are clean
4. If the color patches appear exceptionally dirty, a check can be made to ensure that they accurately reflect the L\*a\*b\* values written on the target by taking an image, hovering the cursor over a patch, and reading the L\*a\*b\* values at the top of the Capture One workspace
5. If necessary, replace the target and scale. There are extras at the Herbarium.
6. Allow the computer to install updates and the lights to warm up by leaving them on while you set up the workstation

## Setting up the workstation

1. Raise or lower the height of the entire workstation to your comfort by gently pressing the button on the front left corner of the tabletop
2. Log into the computer using established credentials

Computer login NHMD:

Username: **SUA-SNM-DaSSCo01**

Password: **zaq12Wsxcf=03**

1. Create a folder for the images of the session in the ‘DaSSCo\_Digitization’ folder on the desktop
   1. The imaging folders follow this naming convention: **YYYYMMDD\_InstitutionAcronym\_Pipeline\_Initials** for example, **20221125\_NHMD\_Herb01\_CG**

**20240314\_AU\_Herb02\_HV**

* 1. If multiple people are using the workstation during a day, create a folder for each digitizer. This is important to ensure that the metadata attributed to the folder/images are correct.

1. Check ‘DaSSCo\_Digitization' folder for any backlog. Un-ingested folders will contain only RAF files, while ingested folders will be “empty”, containing only a Capture One folder. Please delete ingested folders.

If there are folders containing a multitude of file types, they have been unsuccessfully ingested. Please add “\_error” to the folder name.

## A camera with a lens Description automatically generatedSetting up the camera

1. After the camera’s initial setup, nothing needs to be further adjusted. For initial setup instructions see the back of this document.

If anything seems amiss with the camera check these, otherwise only ensure that the settings are as follow:

* 1. Mode Dial 🡪 M
  2. Aperture ring 🡪 C

1. Ensure the camera is situated at the highest point on the column, approximately 95 cm at the bottom of the camera carriage.
2. Remove lens cap and place it logo side up.
3. Turn the camera on via switch on the top.

## Exporting and ingesting TIFFS

The first step of an imaging session is to export the previous session’s raw images into TIFF files and process them through the **Ingestion Client.** This is a background process and should run while you are imaging.

Ideally, there should only be one folder in the backlog but if there are multiple, export and process them throughout the day’s session, coordinating with other digitizers if need be.

A screenshot of a computer

Description automatically generated

1. Open the Capture One program on the desktop by double clicking the icon

Graphical user interface, text

Description automatically generated

1. Start an export:
   1. Go to **‘Library’** and choose the previous session’s folder

Graphical user interface, application

Description automatically generated

* 1. Select all images by clicking the first image in the right-hand viewer panel, holding the shift key and then selecting the last image
  2. Click ‘**Export**’ at the top left of the window

1. A screenshot of a computer

   Description automatically generatedA new window entitled ‘**Export Images**’ will open, check the following settings are correct:
   1. Under ‘**˅Export Recipes**’, ensure that only ‘**Herb01**’ is selected with a check mark and highlighted in orange.
   2. ‘**˅Location**’ settings:
      1. Folder: ‘**Same as original file**’
      2. Existing file: ‘**Overwrite’**
   3. ‘**˅Naming**’
      1. Format: ‘**Image Name’**
   4. Then click the ‘**Export X Images**’ button (lower left corner)
2. Allow time for the images to export. An estimate of the export time will be shown in the export window. This usually takes between 15 min to 1 hour depending on the number of pictures.

While Capture One is exporting, go ahead and set it up for the day’s session (see next page).

When the export is complete, run the folder through the **Ingestion Client** (see the Ingestion Client Guide). This can be done whenever is convenient in your workflow.

## Setting up the software

1. In Capture One click ‘**TETHER**’ to view camera settings.

A screenshot of a computer

Description automatically generated

1. A screen shot of a camera

   Description automatically generatedClick ‘**˅Camera**’ and ensure correct information and settings.
2. FUJIFILM GFX100S camera  
   GF80mmF1.7 R WR lens
3. M Manual
4. ISO 100
5. Shutter speed 1/30
6. Aperture f11
7. AWB Auto White Balance
8. Raw
9. Click ‘**˅Next Capture Naming**’
   1. In the **‘Format’** field, ensure that **‘Name’** and **‘Camera Counter’** are present. If they are not, click the three dots to the right of the field and select those two options in that order
   2. A screenshot of a computer

      Description automatically generatedIn the **‘Name’ field**, ensure that **InstitutionAcronym\_Pipeline\_** for example, **NHMD\_Herb01\_** is present

A screenshot of a computer

Description automatically generated

1. Click ‘**˅Next Capture Location**’ to set the file path for your images.
   1. Click the ’**˅**’ to the right of ‘**Folder**’
   2. Select ‘**Choose Folder…**’
   3. Go to D:\DaSSCo\_Digitization
   4. Choose the folder you set up at the beginning of the session
   5. The folder field should read **YYYYMMDD\_InstitutionAcronym\_Pipeline\_Initials,** corresponding to your situation, for example, **20240321\_NHMD\_Herb01\_MJG**
2. Click ‘**˅Next Capture Adjustments**’
   1. A screenshot of a computer

      Description automatically generated**ICC Profile**: First select **‘Fuji’** then select **‘Fujifilm GFX 100S Generic’**
   2. **Orientation**: select **'270°’**.
3. Place the first folder of herbarium sheets from the first pigeonhole (#1) to the left of the enclosure

Select the top specimen and place it on the stage, taking care to line up the top right corner with the angle

* 1. The camera is set to Continuous Focus, so you should hear the camera focusing on the specimen

The camera is set to never sleep, but if it has turned off, you can wake it up by pressing the shutter, or turning it off and then on again.

A screenshot of a camera

Description automatically generated

1. select ‘**Live View**’ by clicking the **camera icon** in **‘Camera’**-settings.

*OBS! If Capture One’s live view starts up without picture, check the cables between computer, camera and monitors*

## Focus

* + - * 1. A screenshot of a computer

           Description automatically generatedA window entitled **‘Live View’** will open where you can assess the focus.

Assess the focus by selecting an area of interest on the herbarium sheet to zoom in to.

* + - * 1. A screenshot of a computer

           Description automatically generatedClick on **the magnifying glass** in the top center panel, or press the **‘Z’** key to use the **‘Zoom-In’** tool

1. You can adjust this by pulling the slider at the top right of the window above **‘Viewer Zoom’**
   * + - 1. Click on **the hand** in the top center panel, or press the **‘H’** key to use the **‘Pan’** tool to move around the herbarium sheet
2. You can adjust this by moving the box under ‘**˅Live View Navigator’** in the right panel
   * + - 1. Click **‘˅Camera Focus’**
         2. While zoomed into your area of interest, click <<< << < > >> >>> arrows to fine-tune focus. Make use of the **‘˅Live View Focus Meter’**, if necessary.
         3. Assess other regions on the herbarium sheet, including the barcode label for focus using the **‘Zoom-In’** and **‘Pan’** tools and adjust focus, if necessary

While in Live View, the ´Continuous Focus´ setting is overwritten.

If you need to readjust the focus during the session:

* + 1. Pause and then start the live view under ‘**˅Live View Controls**’ in the ‘**Live view**’- window.

The camera will auto-focus while Live View is paused.

* + 1. Manually adjust the focus under ‘**˅Camera Focus**’ in the ‘**Live view**’-window.

## Capturing the Target

Graphical user interface

Description automatically generated

* 1. Turn on the Imaging Reference Monitor by pressing the button on the front. This will switch the EIZO Monitor to portrait view as well. Swivel the monitor accordingly.

1. Move the **‘Live View’** window to the Imaging Reference Monitor in the enclosure by dragging the window across from the EIZO Monitor to the Imaging Reference Monitor and making it full size
2. Looking at the Imaging Reference Monitor in the enclosure, ensure the herbarium sheet and the institutional scale bar and 1X Object-Level Target on the angle are in the field of view
3. Return the herbarium sheet to the top of the stack at the left of the stage
4. Place the **FADGI 19264** target on the stage
5. Take an image by pressing the foot pedal or space bar. Place the target back in its case.

The workstation is now set up and imaging of the specimens can begin.

# Capture session

Safety note

Mercury chloride has been used to preserve many of the herbarium sheets. Please note that gloves are available to protect your hands from mercury chloride and to protect the specimens from fingerprints. If you forego gloves, please make sure to wash your hands when leaving the workstation.

*Before starting the session note your start time. There’s no need to note breaks but you can either note the number of specimens handled when you leave for lunch, so you can make two Digitizer Statistics inputs* ***or*** *subtract lunch time from your final statistics and make one input.*

## Workflow

**During the barcoding workflow the folders and sheets have been put in reverse order. When imaging, work from the top folder and top sheet down to the bottom to place the folders and sheets in their original order.**

1. Select the top folder, open it and place the stack of herbarium sheets to one side of the imaging stage and the empty folder to the other.
2. Select the top specimen and place it on the stage, taking care to line up the top right corner with the angle.
3. Take the picture using the foot pedal.
4. Place the imaged specimen in the folder.
5. Place every sheet plant-side-up on top of the previous sheet. NEVER place the sheets with the specimen facing down.
6. Continue until you have imaged all herbarium sheets from the folder and place the folder on a cardboard support. Stack imaged folders carefully on top of each other.

**While photographing keep in mind to…**

* Regularly check the imaging reference monitor for focus and placement of the herbarium sheet.
* Re-establish the focus approximately every 250 images or when necessary for example when going from ‘’flatter” to “thicker” (such as branches or thick root systems) and vice versa (as described in **‘Focus’**).
* Make sure the barcode is unobstructed, free from any dust or plant debris

1. When a box is fully photographed, check that the stack of folders is in correct alphabetical order by the species name on the folder.
2. First place all the folders inside the original, numbered plastic bag, and then place this inside a zip lock bag.
3. Don’t zip lock the bag all the way at this point. This will help air to escape when it’s placed in its box.
4. Place the bag in the ‘Imaged’ cart.
5. Continue until you have imaged all folders from the ‘To Be Imaged’ cart.

**Taking a break!**

It’s important to take short breaks while doing repetitive work. Use these breaks to walk, stretch and/or hydrate. When leaving for a break:

* Leave light panels, camera and computer on
* ALWAYS wash your hands before eating, drinking, or using the restroom

## What to do…

* If you encounter **damaged or loose specimens**
  1. exercise caution and handle very carefully
  2. image as usual
* If you encounter a **specimen with loose fragments**
  1. place the fragments into the container on the sheet
  2. if the sheet does not have a container, take care to maintain association of the fragments with the specimen
* If you encounter **active (living) pests**
  1. flag the sheet with a strip of paper and place back in folder.
  2. close folder and place all folders from the box back in the bag. Zip it completely closed.
  3. alert Collections Managers immediately
* If you encounter **a multi object specimen containing multiple barcoded specimens and labels on the same sheets**
  1. image as usual
* If you encounter **a multi object specimen containing barcoded specimens across several sheets, but only one of the sheets contains a label** 
  1. image the sheet(s) containing the label(s) with a disposable barcode (D-BC) placed at the lower end of the scale bar and the label barcode (L-BC) below that
  2. remove the L-BC and image each following specimen sheet with the same D-BC
  3. throw away the D-BC specific to this case. Next time you encounter an instance of an MOS, use a different D-BC
* If you encounter a **multi specimen object**
  1. image as usual
* If you encounter a **sheet with multiple foldouts in layers containing multiple labeled and barcoded specimens**
  1. open the sheet and line it up with the angle (some of the specimens may be upside down)
  2. image as usual
* If you encounter an **irregular sized sheet**
  1. arrange the sheet to line up with the angle
  2. image as usual
* If you encounter a **sheet that only contains specimens within containers**
  1. do not open the containers
  2. image as usual
* If you encounter a **specimen with no label or information on the front (specimen with a label or information on the back of the sheet), but with a barcode**
  1. image as usual
* If you encounter a **specimen that has two different types of barcodes**
  1. image as usual
* If you **encounter a specimen without a barcode**
  1. determine if a barcode would be appropriate and attribute a barcode, if required
  2. if a barcode has been attributed, image as usual
  3. flag the specimen in the Issues Log, as not entered into app
* If you encounter a **type specimen in a red folder at Herbarium C**
  1. skip, do not image
* If you encounter a **type specimen in a general folder**
  1. skip, do not image
  2. flag the type and set aside folder containing the type for Collections Managers

If you encounter other issues, check the Herbarium Imaging Issues Protocol, with other digitizers or the collection managers.

If you ever have to set aside a sheet for Collections Managers, flag the sheet and set aside the entire folder.

# Finishing the imaging session

A screenshot of a computer

Description automatically generated

1. Establish white balance for all images
   1. Click the ‘**TETHER**’ tab in the left-hand panel.
   2. Click the **’˅’** to the right of **‘White Balance’**
   3. Select the **‘Pick White Balance’** tool next to mode (the tool will turn orange when active)
   4. Click patch 13 on the Object Level Target
   5. Select the **‘Pick White Balance’** tool next to mode (the tool will turn white when inactive)
   6. A screenshot of a computer

      Description automatically generatedClick the three lines at the top right-hand corner of the **‘White Balance’** window
   7. Select **‘Save Custom Preset´**
   8. A window entitled **‘Save Preset’** will open. Name the preset using the following naming convention: **YYYMMDDAM** or **PM\_Intials**

For example, 20240517PM\_CG

* 1. click **‘Save’**
  2. Select all images in the session by clicking the first image in the right-hand viewer panel, holding the shift key and then selecting the last image
  3. Click the three lines at the top right-hand corner of the **‘White Balance’** window
  4. Select the preset you just saved

At the beginning of each month the presets should be deleted to ensure easy navigation of the folder. Open the ‘White Balance’ shortcut folder on the desktop or go to:

C:\Users\SUA-SNM-DaSSCo01\AppData\Local\CaptureOne\Presets60\White Balance

and delete all presets.

1. Ensure lens corrections are applied to all images![Graphical user interface, application

   Description automatically generated]()
   1. Check that all images are still selected
   2. Click open ‘**˅Lens Correction**’

* Set ‘**Profile**’: Fujifilm Fujinon GF80mm F1.7 R WR
* ‘**Chromatic Aberration**’ is checked.
* ‘**Hide Distorted Areas**’ is checked.

1. All necessary adjustments have now been applied to the session’s images and you can now shut down the workstation by:

* Closing Capture One
* Enter your data into **‘Digitisation Statistics’**
* Turn off the computer (unless the Ingestion Client is running)
* Turn off the lamps
* Turn the camera off
* Place the lens cap back on the lens
* Wipe or vacuum the imaging stage.
* Cover up the enclosure

# Initial Camera Set Up

For initial set-up, or if anything seems amiss with the camera, ensure the correct settings are selected in the camera menu as well as on the camera body and lens

* + - * 1. In the **AF/MF** camera menu, under **‘AF/MF SETTING’**, select **‘PRE-AF’** and ensure that **‘ON’** is selected

A picture containing text, screenshot, font

Description automatically generated

A picture containing text, screenshot, font, line

Description automatically generated

* In the same **‘AF/MF SETTING’** menu, select **‘INSTANT AF SETTING’**, and ensure that

**‘AF-C’** is selected

A picture containing text, screenshot, font, line

Description automatically generated

* + - * 1. In the **SET-UP** camera menu, under **‘POWER MANAGEMENT’**, select **‘AUTO POWER OFF’**, and ensure that **‘OFF’** is selected

A screenshot of a power management system

Description automatically generated with low confidence

* + - * 1. On the physical camera body ensure that:
* **Mode Dial** on the body of the camera turned to **M**

Graphical user interface, application

Description automatically generated

* **Focus Mode Selector** on the body of the camera turned to **C**

Graphical user interface, text, application

Description automatically generated

* The **Aperture Ring** on the lens is turned to **C**

Diagram

Description automatically generated

* + - * 1. Turn off the LCD monitor screen by pressing the ‘View Mode’ button on the front of the camera:

A screen shot of a video camera

Description automatically generated

Choose ‘EVF Only’ mode.