http://gmv.cast.uark.edu A Method Store for Advanced Survey and Modeling Technologies Mon, 01 Apr 2013 03:29:18 +0000 en-US hourly 1 http://wordpress.org/?v=3.5.1 http://gmv.cast.uark.edu/scanning/hardware/konica-minolta-vivid-9i/checklist-konica-minolta-vivid-9i/konica-minota-vivid-9i-setup/ http://gmv.cast.uark.edu/scanning/hardware/konica-minolta-vivid-9i/checklist-konica-minolta-vivid-9i/konica-minota-vivid-9i-setup/#comments Wed, 20 Mar 2013 16:28:40 +0000 caitlin 5 meters]]> http://gmv.cast.uark.edu/?p=13209

This document will guide you through setting up the Konica-Minolta for use with a turntable.
Hint: You can click on any image to see a larger version.

TRIPOD & MOUNT

1. Setup the scanner tripod. The tripod doesn't have to be completely level but you want it to be stable so some degree of leveling is required.

2. Prep the scanner mount by pulling the black lever out, pushing up the gold pin, and then releasing the lever. This widens the slot where the scanner mount rests.


When done correctly, the lever will continue to stick out.

CONNECT SCANNER

3. Place the scanner on the tripod until it locks into place (you will hear a ‘click’ sound when the mount has locked). Once the scanner has been mounted, ensure that your setup is stable.

4. Remove the power cable and gray SCSI cable with the PCMCIA card adapter from the small black case. Plug the scanner power cable in and connect the SCSI cable. DO NOT TURN THE SCANNER ON.

5. Remove the card insert from the PCMCIA slot on the laptop and plug the PCMCIA card into the laptop.

SETUP TURNTABLE

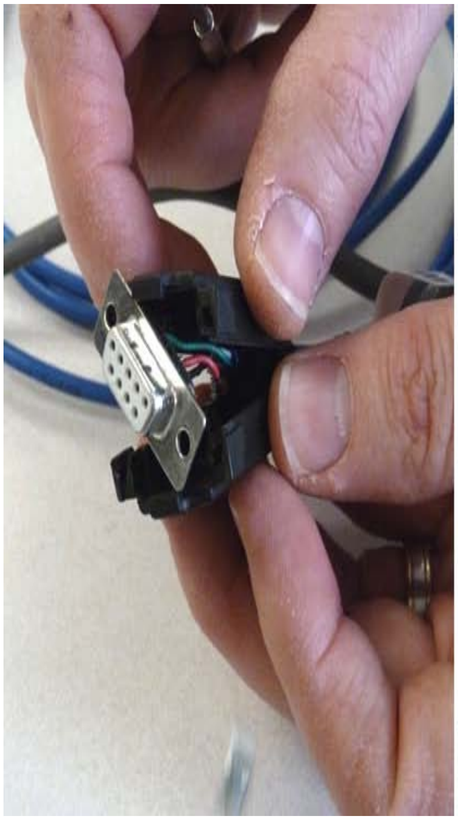
6. Remove the turntable, black power box, and all cables from the black case. Set the two, black and white calibration charts to the side for now. Place the turntable approximately 1 meter (or slightly less) from the scanner with the corded end facing towards the front i.e. towards the scanner. The suggested

scan range for the tele and mid lenses is .6 to 1 meter. When you begin scanning, the distance parameter will be displayed in the scan window. We generally suggest to keep the distance in the range of 700-800 mm to avoid data loss that can occur when an object is either too close or too far from the scanner.

7. Plug the gray cable from turntable into the black power box; also plug the power cable into the black power box. Next, take the blue serial cable and plug the green end (with 4 prongs) into the COM1 port on the black box. NOTE: Theprongs on the green end are directional and will face down.

CONNECT LAPTOP

8. Next, take the other end of the serial cable and plug it into the serial connection on the laptop. To work with a laptop, you will probably have to remove the black case around the plug end using a small screwdriver.



POWER UP SCANNER

9. Once everything has been plugged in and you have the desired lens in place (see the **Changing Lenses** section in the final slides of this post if you need to change the scanner lens). Next power on the scanner. It will take a minute to load, when it is complete, it will display the following message on screen “Please open laser barrier and press any key.”

10. Next, pull the large round cap off of the front of the scanner (bottom) and remove the lens cap (top), and then press any button on the back of the scanner to continue.

OPEN POLYWORKS

11. Next power on the laptop and log on. **Note: It is important to power the scanner first and then the laptop so the connection is established.**

12. Once everything has been turned on, open Polyworks on the laptop. Once the Polyworks Workspace Manager opens, open the IMAlign Module. Next, go to Scanners menu, and select Minolta – VIVID 9i. In the window that comes up, you should see a live camera view from the scanner (connection successful – hooray.) You are now ready to continue to the [Konica-Minota Vivid 9i – Scan Settings] post.

VIVID 9i LENSES

Changing the Lenses on the VIVID 9i

The VIVID 9i comes with a set of three interchangeable lenses: tele, middle, and wide. The scanner's camera array is fixed 640X480 pixels. Each lens offers a different field of view with the tele being the smallest. The FOV for each lens is provided below.

Lens	FOV (in mm)
Tele	93 x 69 x26
Mid	165 x 124 x 42
Wide	299 x 224 x 66

Fixed 640 x 480 array

The tele lens offers the best resolution and is ideal for scanning objects smaller than a baseball or larger objects with a higher resolution. The mid lens works well for objects that are basketball size and was the lens predominantly used for scanning pottery vessels in the Virtual Hampson Museum project. CAST researchers generally do not recommend use of the wide angle lens.

CHANGING LENSES I

A. To change the lens on the VIVID 9i, first make sure the scanner is turned off.

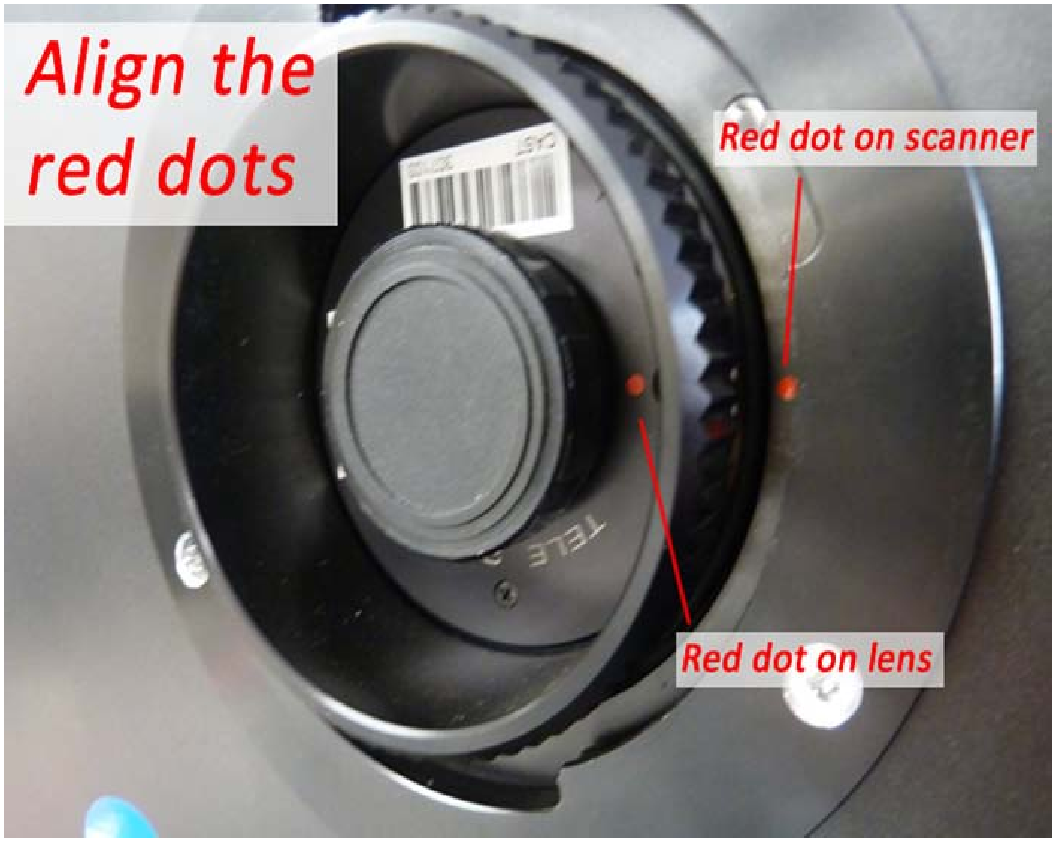
B. Next remove the lens that you wish to use from the lens box and its plastic bag.

C. Next remove the lens protector and unscrew the lens that is currently on the scanner. IMMEDIATELY place the lens cap (located on the lens box) on the back of the lens.

NOTE: Every lens should always have 2 lens caps (one of the front and back of the lens) when the lens is not in use or is being stored.

CHANGING LENSES II

D. Remove the back lens cap from the desired lens and screw the new lens into the scanner by first lining up the red dots found on both the lens and the scanner.



E. Replace the black lens protector on the scanner. Replace both lens caps on the newly removed lens, place in a plastic bag, and store in the lens box.

F. You are ready to begin scanning. Power on the scanner and continue with Step 9 on the 'Power up Scanner' Slide above.

CONTINUE TO...

Continue to Konica-Minota Vivid 9i – Scan Settings.

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This page is a guide for acquiring external control for close range photogrammetry using Trimble survey grade GPS.
Hint: You can click on any image to see a larger version.

Prepare for Survey

1. Begin metadata process
    1. Choose a method for documenting the project (e.g. notebook, laptop)
    2. Fill in known metadata items (e.g. project name, date of survey, site location, etc.)
    3. Create a sketch map of the area (by hand or available GIS/maps)
2. Choose and prepare equipment
    1. Decide what equipment will best suite the project
    2. Test equipment for proper functioning and charge/replace batteries

Equipment Setup

1. Base station
    1. Setup and level the fixed height tripod over the point of your choice
    2. Attach the yellow cable to the Zephyr antenna
    3. Place the Zephyr antenna on top using the brass fixture and tighten screw
    4. Attach the yellow cable to the 5700 receiver
    5. Attach the external battery to the 5700 receiver (if using)
    6. Attach the data cable to the TSCe Controller and turn the controller on
    7. Create a new file and begin the survey
    8. Disconnect TSCe Controller

2. Rover
    1. Put two batteries in the 5800
    2. Attach the 5800 to the bipod
    3. Attach TSCe Controller to bipod using controller mount
    4. Connect data cable to 5800 and TSCe Controller
    5. Turn on the 5800 and controller
    6. Create a new project file (to be used all day)

Collecting Points

1. Have documentation materials ready
    1. As you collect points, follow ADS standards
2. Base station
    1. Once started, the base station will continually collect positions until stopped
    2. When you're ready to stop it, connect the TSCe controller to the receiver and end the survey
3. Rover
    1. When you arrive at a point you want to record, set the bipod up and level it over the point

2. Using the controller, create a new point and name it
3. Start collecting positions for the point and let it continue for the appropriate amount of time
4. Stop collection when time is reached and move to next position

Data Processing

1. Have documentation materials ready
    1. As you process the data, follow ADS standards
2. Transfer data
    1. Use Trimble Geomatics Office (TGO) to transfer data files from the TSCe Controller and the 5700 receiver to the computer
3. Calculate baselines
    1. Use TGO to calculate baselines between base station and rover points
    2. Apply adjustment and export points

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These are basic set-up and operation instructions for operating the Optech ILRIS 3D with a laptop. See the Optech Manual that accompanies the scanner for more detailed information.

1. Set up the tripod as levelly as possible

2. Attach scanner to tripod, be sure to tighten screw securely

3. Turn on laptop and connect it to scanner using either the cable or wireless network. Depending on the desired configuration, please set up accordingly:

    Ethernet/Wired Connection

    - In Control Panel > Network Connections > Select Internet Protocol (TCP/IP)
    - Use the following IP address: 192.9.202.1 and Subnet Mask: 255.255.255.0
    - In I3dNet Software > Go to tools > Prefs > Communication > Enter 192.9.202.248
    - Polyworks dongle

    Wireless Connection

    - In Internet Protocol (TCP/IP), enter the following IP address: 192.168.0.6 and Subnet Mask: 255.255.255.0
    - In I3dNet Software > Enter IP address 192.168.0.5
    - Note that to reset the IP address you can log onto the internet > In Control Panel > Network Connections > (TCP/IP) > Specify ‘Obtain IP Address Automatically’

4. Connect batteries to I-Bar in a T-shape. This is the only way that they will provide power to scanner

5. Connect batteries to scanner using battery cable

6. Start the I3DNet Program

7. Go to the Communication Menu > Click 'Connect'

8. Click icon with red outline to place scanning area on screen and re-size red box to define the scan area

9. Click 'Acquire' button to obtain the distance to the object to be scanned

10. Set the parameters of the scan – **First** will return readings from the first object/surface that is encountered while **Last** will return readings from the last object/surface that is encountered. Use Last to scan 'through' objects such as trees, fences, etc.

11. Set point spacing of laser (resolution)

12. Press the apply button

13. Start scan and save the file in the desired location

14. Parse scan to check data quality

15. Continue to [Optech ILRIS Parser: Pre-Processing Scan Data]

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Nikon D70

Organization and documentation during image collection in the field is especially important. The table below describes the appropriate documentation for this process. Download a printable form in PDF format here or in a spreadsheet (.xlsx) format here.

For each group of images:

Entry	Description
Project name	The project name or name for the dataset.
Number of images	Total number of images.
File name for planimetric sketch or	File name and extension. Should include outline of subject and surrounding objects (if any), indicated location and orientation of each image (using a "V" symbol to indicate orientation), and other special

map	comments and/or observations.
Camera calibration file	Reference to the camera calibration file if available.
Additional notes	Any additional notes the surveyor feels applicable. Could list images containing control and/or scaling references.
For each image:	
Image file name	File name and extension.
Textural description of location and orientation	Should describe general location (e.g. north side) and camera to subject orientation (e.g. view to south).
Format conversions (if any)	List of format conversions performed on the digital images and the software used.

]]> http://gmv.cast.uark.edu/photogrammetry/hardware-photogrammetry/canon-5d-mark-ii/metadata-forms-canon-5d-mark-ii/image-acquisition-documentation-for-close-range-photogrammetry/feed/ 0 http://gmv.cast.uark.edu/scanning/hardware/breuckmann-he/setup-operations-breuckmann-he/setting-up-the-breuckmann-smartscan-he-2/ http://gmv.cast.uark.edu/scanning/hardware/breuckmann-he/setup-operations-breuckmann-he/setting-up-the-breuckmann-smartscan-he-2/#comments Mon, 09 Apr 2012 22:28:54 +0000 Angie http://gmv.cast.uark.edu/3983/setting-up-the-breuckmann-smartscan-he/

This workflow will show you how set up the Breuckmann SmartScan HE prior to beginning your scanning project. *Hint: You can click on any image to see a larger version.*

FOV

The SmartSCAN HE is a dual camera white light scanner that uses fringe projection to measure precise 3D coordinates. The unit owned by CAST is a 5 MP(megapixel) system that captures color and includes three lenses or fields of view (FOV): 125mm, 475mm, and 825mm. The field of view measure is the length along the diagonal of the scan-able area (shown in Figure 1 below).

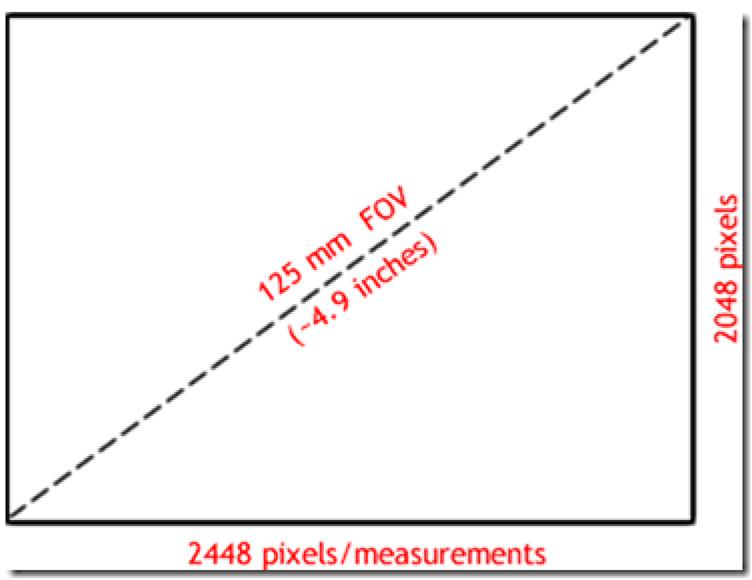

Figure 1: Approximate scan area using 125mm FOV with Breuckmann scanner

A good way to remember the different lens sizes is:

- 125mm: baseball/softball size scan area

- 475mm: basketball size

- 825mm: two basketballs or yogaball size

SIZE OF ARRAY

The size of the array – 5MP (2448×2048) is static for each of the fields of view. Scanning with the 125mm lens will provide 5,013,504 measurements across the area the size of a softball while scanning with the 475mm lens provide the same number of measurements across the area the size of a basketball. Therefore, a smaller FOV = higher data resolution. The approximate resolution for each of the lenses is provided in the table below:

Breuckmann Lens/FOV	Estimated Data Resolution (in microns)
125	60
475	280
825	500

It is important to choose an appropriate lens for your scan project. The size of the object, the desired resolution, the final product for the project, and the amount of time available to scan are all important factors to consider.

SETTING UP THE BREUCKMANN

The Breuckmann setup includes three items: the scanner case(1), the calibration chart case(2), and the tripod(3).

Figure 2: (1) Case containing scanner, optolink, and all necessary cables, (2) Case containing large calibration chart, (3) System tripod

At minimum the scanner case and tripod are necessary for every scan project. It is recommended to calibrate the scanner every time the lenses are changed on the scanner. If you are using the mid (475mm) or large (825mm) FOV's, then you will need to calibrate the system using the large calibration chart in case #2. The calibration chart for the small (125mm) FOV is in the main scanner case. Please see the workflow on Calibrating the Breuckmann for more information on system calibration.

TRIPOD SETUP

When setting up the Breuckmann, first setup the system tripod. While it is not required for the tripod to be level for scanning objects, it should be level when performing a system calibration. The tripod that is used has four levels on it (shown below). When leveling the tripod, it is best to first level the very base of the tripod (level#1) and then to level the tripod mount using the very top level (level #2). The other levels are not used.

Figure 2: Tripod levels. Only use levels 1 and 2 when leveling the tripod.

CONTENTS OF CASE

Next open the Breuckmann case, and remove the large piece of t-shaped foam. The case components are shown in the image below.

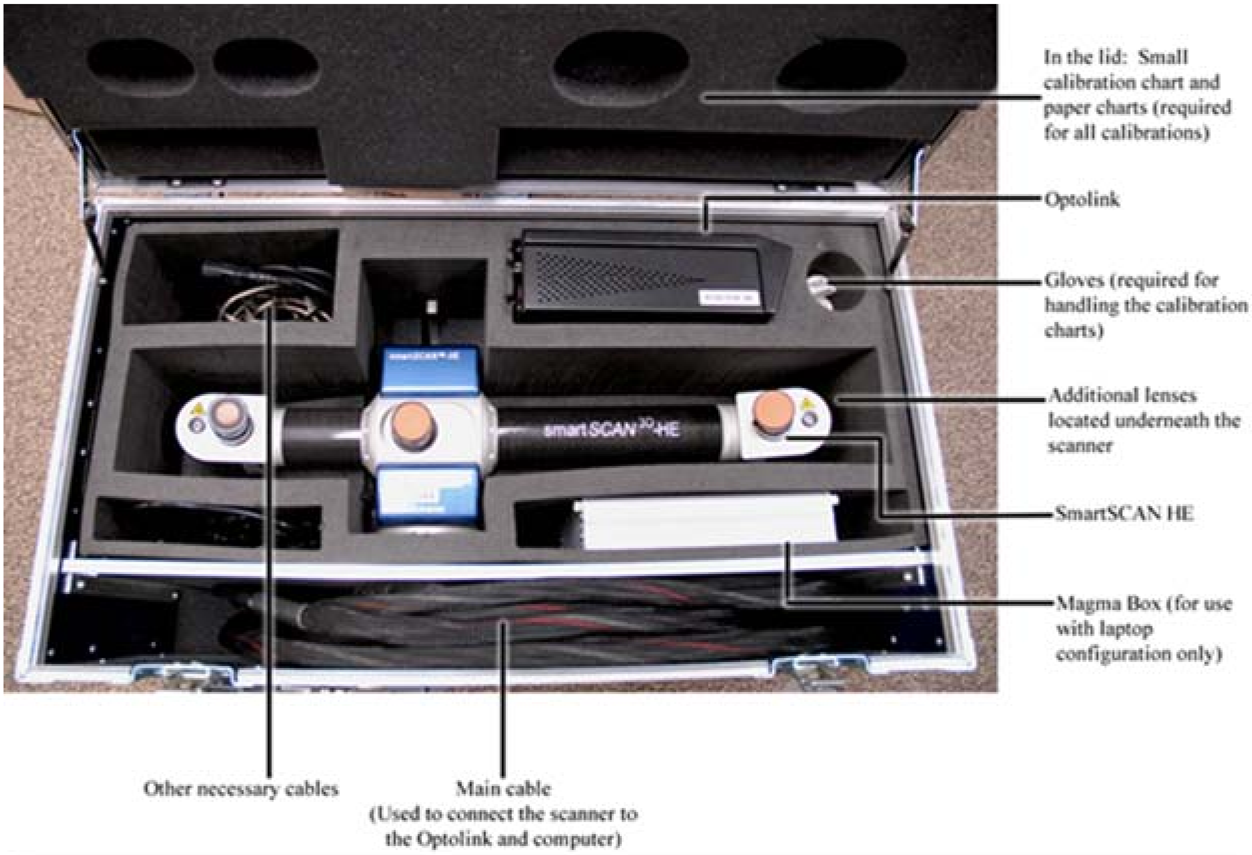

Figure 3: Scanner components in main scanner case

PLACING ON TRIPOD

Next, remove the scanner from the case and place on the tripod.

IMPORTANT: The lever on the tripod will click into place once the scanner is secured. Do NOT LET GO of the scanner until you have heard the tripod mount click. Also, always use the silver handle located on top of the scanner when moving the scanner from the box to the tripod or vice versa.

Figure 4: Placing the scanner onto the tripod

LENSES

Once the scanner is on the tripod, next choose the appropriate lenses for your project. Each set of lenses include one lens for the left camera, one lens for the right camera, and one lens for the projector. When looking at the lenses, the first set of letters indicate whether the lens is for the left camera (CL), the right camera (CR) or the project (P) and the last set of numbers indicate the FOV (12 = 125mm, 47 = 475mm, and 82 = 825mm). Notice the labels on the set of lenses below for the 825mm FOV.

Figure 5: Set of lenses for the 825mm FOV (CR = Camera Right, P=Projector, and CL = Camera Left)

One set of lenses will already be in place on the scanner. If you have to change the lenses, the additional lens sets are located under the pieces of foam directly under the scanner in the case. Before removing the lenses from the scanner, make sure the orange lens caps are in place and locate the black lens caps in the case that are used for the other side of each lens. Unscrew a lens from the scanner and **IMMEDIATELY** place the black lens cap on the other side of the lens. Repeat for all lenses and place each lens in the individual pieces of bubble wrap provided in the case. **BABY THE LENSES** as they are a crucial part of the system and can easily be scratched.

When standing behind the scanner, the projector is the center lens the left camera is to left (and farthest from the projector) and the right camera is to the right (closest to the projector). When installing new lenses it is critical to get the correct lens in the correct location. All lenses should be tightly screwed in.

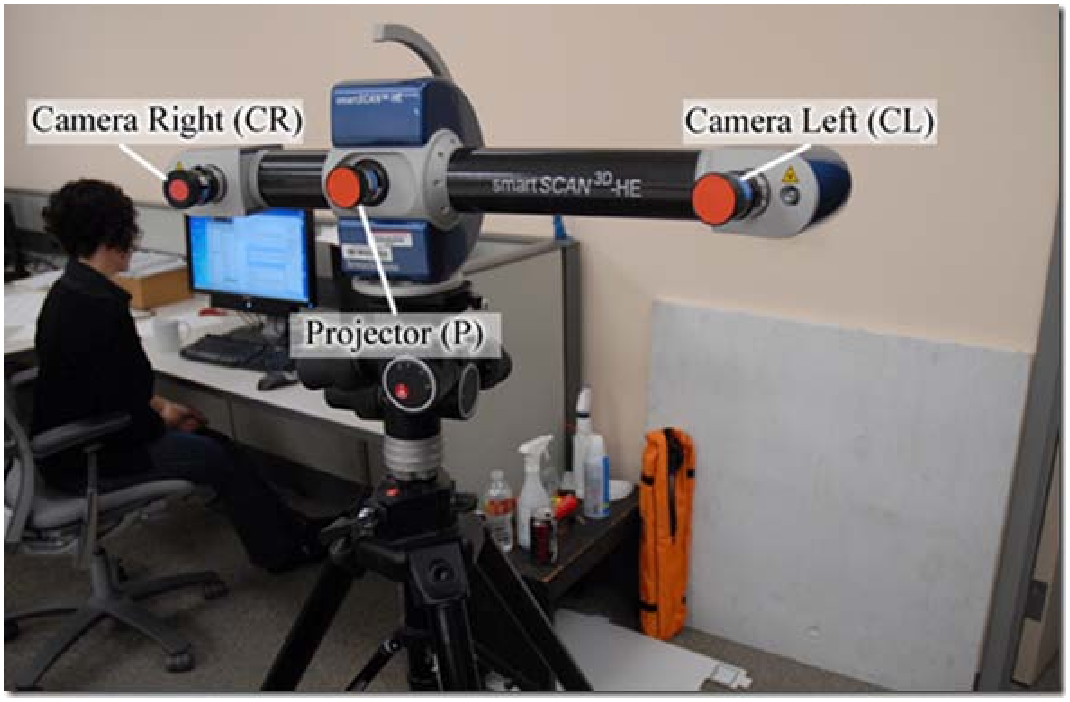

Figure 6: Camera and projector locations on the SmartSCAN

INTERFACING SCANNER WITH A DESKTOP COMPUTER (IN LAB)

Once the scanner is setup, remove the Optolink (black box) and all necessary cables. The large black cable connects the scanner to the Optolink (via the main connector) and the computer (via two firewire connections). The Optolink has its own power cable and is also connected to the computer (via USB).

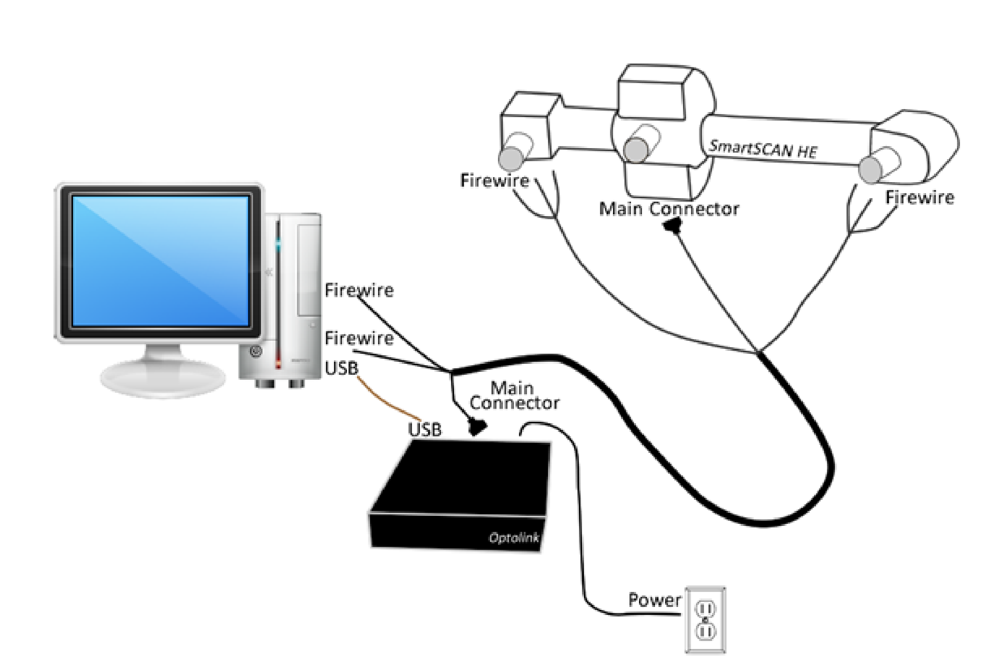

Figure 7: Diagram showing connectivity between SmartSCAN, Optolink box, and desktop computer

Connect the main connector to the scanner. Make sure the connection is square and screw in to secure (*Note*: Screws should go in easily. If not, you might be cross-threading the connection). Each camera has three cables. Be sure and line up the dots on the smallest round connection (1). Plug the remaining cables in accordingly and *be sure* to screw in the firewire connections using the screwdriver provided in the case. DO NOT FORCE *ANY* CONNECTIONS!!!

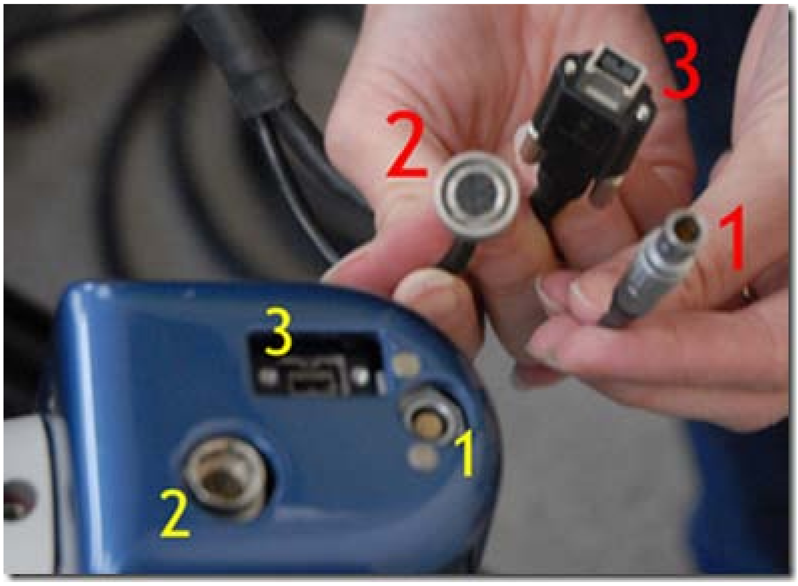

Figure 8: Three camera cables and their associated connections

When plugging cables into the scanner, it is *essential* to lift the cable slightly and attach it to the scanner handle using the attached Velcro strap. This prevents the weight of the cable from straining the connections.

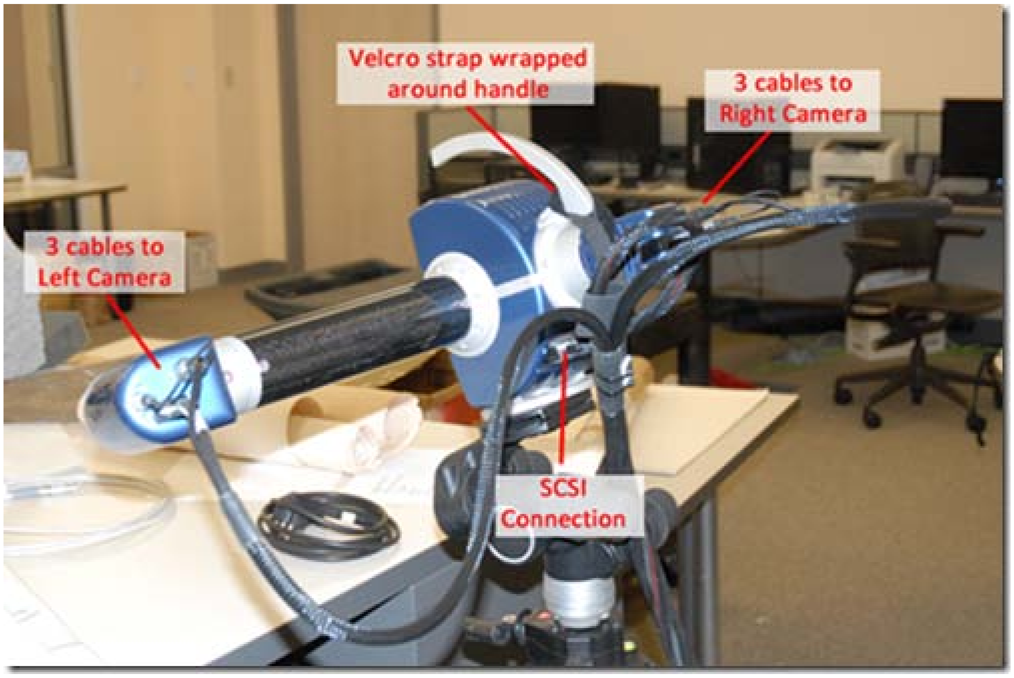

Figure 9: Completed scanner setup with Velcro strapped secured around handle for support

Next, take the opposite end of the black cable and plug the main connector into the Optolink and the two firewires into the back of the desktop. Again, use the provided screwdriver to secure the firewire connections. Finally, connect the Optolink to the desktop using the brown, reflective USB cable and plug the power cord for the Optolink into an outlet. The scanner and associated hardware are now ready to use. Power the Optolink first and then the computer. You are now ready to open the Optocat software and begin your scan project.

INTERFACING THE SCANNER WITH A LAPTOP (IN FIELD)

The Dell M4500 laptop is the currently the only CAST laptop that is configured to interface with the Breuckmann. The Magma box (silver box) is an additional piece of hardware that is required to connect the laptop with the scanner. Remove the Magma box, Optolink, and all associated cables from the scanner case. The difference between the laptop configuration and desktop configuration is that the two receiving firewire cables plug into the Magma box and the Magma box connects to the laptop using a express card adapter.

The large black cable connects the scanner to the Optolink (via main connector) and the magma box (via two firewire connections). The Optolink has its own power cable and is connected to the computer (via USB). The Magma box also has its own power cable and it connected to the computer via an express card adapter that fits into the express slot on the left side of the laptop.

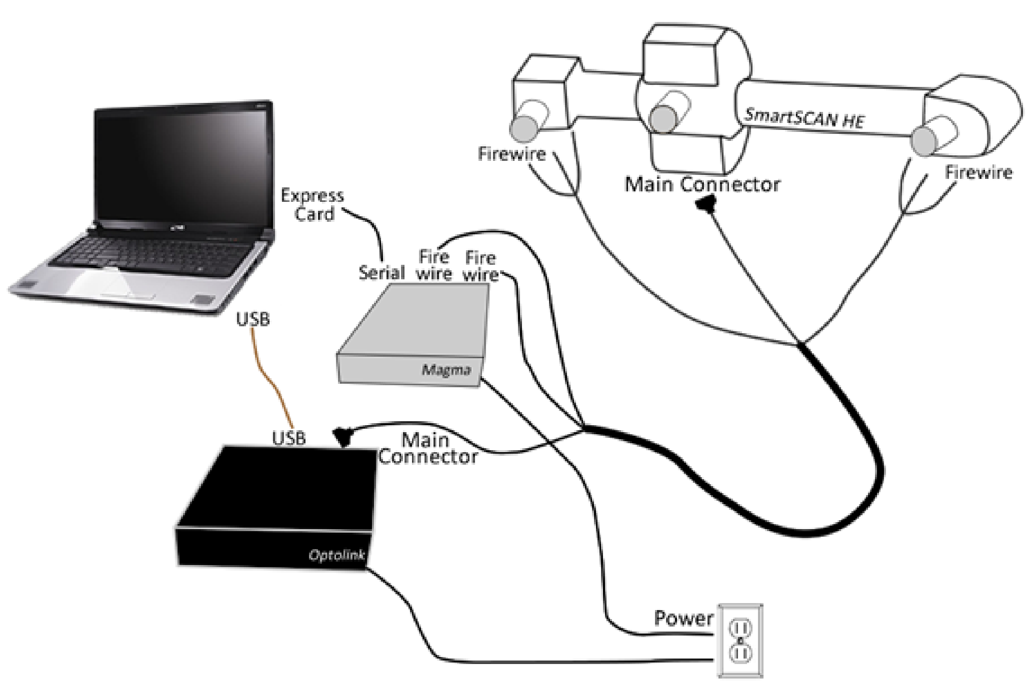

Figure 10: Diagram showing connectivity between SmartSCAN, Optolink, Magma box, and laptop

Connect the main connector to the scanner. Make sure the connection is square and screw in to secure (Note: screws should go in easily. If not, you might be cross-threading the connection.) Be sure and line up the dots on the smallest round connection (1). Plug the remaining cables in accordingly and *be sure* to screw in the firewire connections using the screwdriver provided in the case. DO NOT FORCE *ANY* CONNECTIONS!!!

When plugging cables into the scanner, it is *essential* to lift the cable slightly and attach it to the scanner handle using the attached Velcro strap. This prevents the weight of the cable from straining the connections. The finished setup for the scanner can be seen in the Figure 9 above.

Next, take the opposite end of the black cable and plug the main connector into the Optolink and the two firewires into the Magma box. Again, use the provided screwdriver to secure the firewire connections. Next, connect the Optolink to the desktop using the brown, reflective USB cable and plug in the power cord for the Optolink. Finally, connect the Magma box to the computer using the serial cable and Express Card adapter and plug in the power cord for the Magma box.

Figure 11: Express card adapter that fits the Express card slot on the laptop

The scanner and associated hardware are now ready to use. Power the Optolink and then turn on the computer. You are now ready to open the Optocat software and begin your scan project.

BREUCKMANN DISASSEMBLY

Disassembling the scanner is fairly straight forward with a few notable points. All screwed-in connections including the main connector and all firewires should be unscrewed completely and then pulled. Of the three camera cables, the smallest round connection (1) can be disconnected simply by pulling firmly on metal grips. The large round connection (2) is push-pull connector, so first slide the metal grips forward and then pull to disconnect.

Figure 12: Image showing three cables/connections for each camera

To remove the scanner from the tripod, pull the silver lever on the tripod mount back to disengage the connection and to remove the scanner. Always carry the scanner by the silver handle.

Figure 13: Pull silver lever towards the back of the scanner to remove the scanner from the tripod

Once everything is in the case, double check that all cables/connections are tucked securely in the case before closing the lid.

Figure 14: Successful pack up! (Minus the Magma box)

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INTERFACE BASICS

Z+F Laser Control Interface Basics

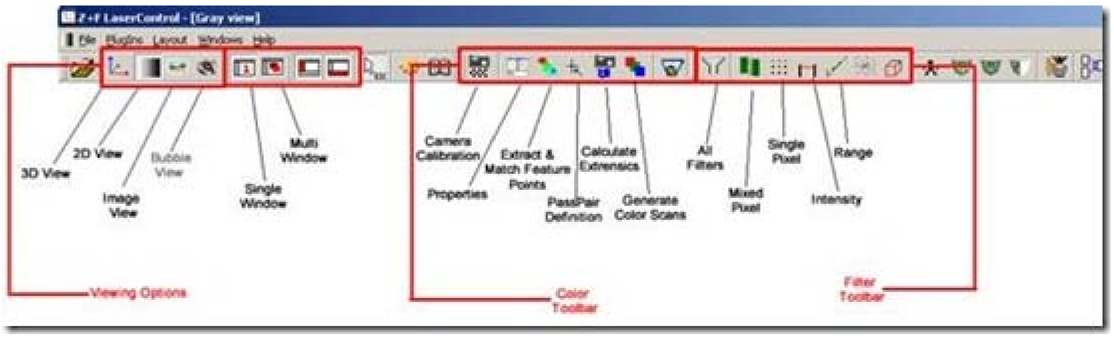

Figure 1: Laser Control Toolbars

VIEWING A SCAN IN 3D

1. To view a scan in 3D, RC in the 2D View and select Points to 3D (this gives you the most options), you can also select Full Scan to 3D (automatically subsamples) or Selection to 3D(automatically subsamples). In the Points to 3D options the Subsample factor is the key element to adjust. The default subsample is 0 which is automatic. If you want to see all of the data, set it to 1 (1/1) if you want it subsampled, set it to 4 (1 point is displayed for every 4) or 8 (1 for every 8). You can also filter by intensity and range and also do basic Mixed Pixel filters here. Remember this only filters that what you SEE in the 3D Window and doesn't actually filter the data at all.

Figure 2: Points to 3D options

OPTIONS FOR 3D VIEW

2. Look at the image for other options in the 3D View. Note: The 3D View is cumulative – data is added each time it is exported from a 2D view. To clear it, RC in the 3D window and choose Clear View.

In the Points to 3D options the Subsample factor is the key element to adjust. The default subsample is 0 which is automatic. If you want to see all of the data, set it to 1 (1/1) if you want it subsampled, set it to 4 (1 point is displayed for every 4) or 8 (1 for every 8). You can also filter by intensity and range and also do basic Mixed Pixel filters here. Remember this only filters that what you SEE in the 3D Window and doesn't actually filter the data at all.

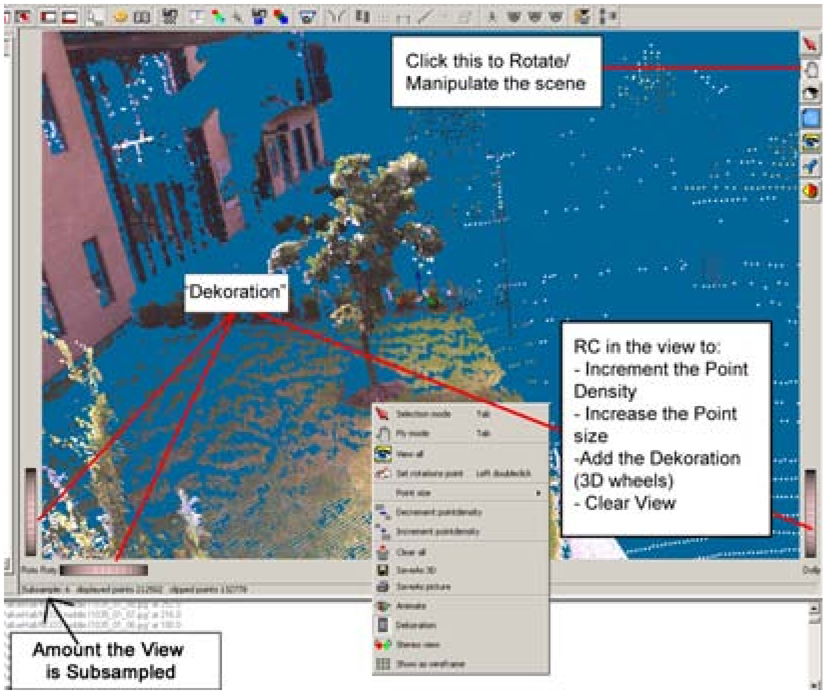

Figure 3: Points to 3D Options

CONTINUE TO…

Continue to [Z+F Laser Control: Color Mapping]()
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http://gmv.cast.uark.edu/scanning/zf-laser-control-filtering-and-exporting-your-data-2/
http://gmv.cast.uark.edu/scanning/zf-laser-control-filtering-and-exporting-your-data-2/#comments Wed, 07 Mar 2012 23:23:54 +0000 Vance 5 meters]]> http://gmv.cast.uark.edu/?p=4842

FILTERING

1. Once all of the scans have been color mapped, go through and verify the quality on all of them. As you are viewing the data in 3D, you will notice that there are extra scan points floating around in the air, as shown in the figure below. The data needs to be filtered before it is exported from Laser Control.

Figure 4: Extraneous data in the scan that will need to be filtered out

2.Open the Filter module by clicking on the Preprocessing button . Choose all of the scans and then select the Mixed Pixel, Range and Single Pixel filters – use the default settings for each filter and then verify the results.

3. To see the results of the filter, open a scan in 2D View and RC in the viewing window and select View Masks. Click on the Scans Tab in the TOC and hit the plus next to each scan – each filter is color coded to match what you see in the viewing window. You can RC on each filter and choose to View/Hide or Remove it. Each filter can also be ran individually using the filter icons in the Filter Toolbar.


EXPORTING YOUR DATA

4. Once you are satisfied with the results, you are now ready to export the data. To export the data, select File – Batch Convert to ZFS. The source should already point to the root file where all of the original ZFS files are stored and Destination is an Export subfolder within the root file location that will be created when the Start button is pressed. Be sure and check Use Mask to ensure that the filters are applied to the exported data and UNCHECK the Intensity Filter. Hit Start. All ZFS files in the root file are then converted. Here you can also export the data to ASCII (XYZ.ASC) and also PTS. For the ASCII file format, be sure to view the Options and select RGB data.

5. The data should now be ready to imported into other software such as Cyclone, Polyworks, or Rapidform.

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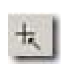
MANUALLY IDENTIFYING FEATURE POINTS PT 1

Manually Identifying Feature Points

If the automatic Extract and Identify Feature Points operation did not work or if you need to add additional feature points to a scan to get better results (and less error), then you will need to manually add a few feature points to a scan and its associated images.

1. First, click the Passpair Definition button  on the Color Toolbar. Immediately, you should see all of the points in the 2D View identified from that automatic feature point extraction. If you select an image from the TOC and open it, you will also see feature points in the image. The key to good color mapping is it have feature points in all/most of your images. When you have a scan that is a large %age sky then it can often be difficult for the automatic feature point extraction to execute. Therefore, you will want to place points in areas where you would like to see an improvement of the color mapping (areas that were not mapped well initially) and you also want a good distribution of points across all of your images where points can be easily identified.

2. By default when you open the Passpair Definition options the 2D Zoom Windows will automatically open for the scan in the 2D View and also for an image that you open. To effectively use the 2D zoom window in the 2D View (Gray View) change the Selection Mode from Rectangular to Point by clicking on the button several times until it changes from  to .

MANUALLY IDENTIFYING FEATURE POINTS PT 2

Now as you click and drag your mouse around the 2D View the view changes in the 2D View.

3. Now identify some prospective Feature points between a scan and its images. Drag the mouse in the 2D view to identify a Feature point location in the Zoom View – click on the point in the Zoom view and Name it (something that is easy to remember). Now identify the same point in the image view – Click on it (using the Zoom View) and give it the EXACT SAME NAME (copying and pasting the name often works best here). Now, check all of the images to see if the same point is identifiable in any other image, if so select the image, identify the point and give point the SAME NAME.

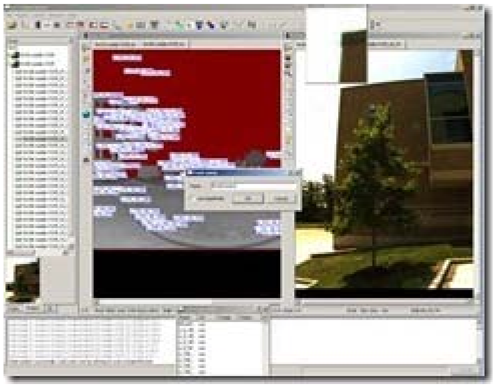


Figure 5: Process of identifying and naming manually identified points.

4. Rinse and repeat.

5. Once you have identified all of the manual feature points (3-10), click the calculate extrensics button  to calculate the external calibration file.

6. Note the error and Generate Color Scans to view the results. Verify the quality of the results and proceed as necessary.

CONTINUE TO…

If you are satisfied with the quality of your results, continue to [Z+F Laser Control: Filtering and Exporting Your Data]
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COLOR MAPPING PT 1

Z+F Laser Control Workflow for Color Mapping

1. Create a New Project.

2. Select all scans that you wish to import. If you forget a scan, do NOT Open File but instead Right Click (RC) on the project name in the table of contents (TOC) and choose Add Scan to Project.

3. Make sure the appropriate toolbars are enabled by going to File – Options. Select Plugins on the left and enable the Color and Filter toolbars.

Note: If the Color Plugin does not appear and you are using a floating license, be sure the License.dat file is copied to the local user's profile at the following location C\Users\Users Name\AppData\Roaming\ZF. Locate this .dat file in the same location within the folder of another active user

4. Double click (DC) on a scan to open it in 2D View. To view a scan in full 3D, RC in the 2D window and choose Full Scan to 3D (or selection if applicable). Next, open the 3D View by going to Window – 3d View or select the 3D View button.

5. If the images did not import automatically with the scans, RC on the Scan Name(s) in the Project Tab and choose Add Picture from scan –. Repeat for all scans; you can also add images by opening the scan (double clicking it in the Project Tab) > go to the Color Plugin Tab > Select add images. READ THE PROMPT and confirm that the correct images are being imported/applied to the correct scan. 28 images should appear below the scan in the Project Tab

COLOR MAPPING PT 2

6. Next check the camera calibration file by clicking on the Camera Calibration button or by going to Plugins – Color – Camera Calibration menu. Select the MCAM file from the USB drive that accompanies the Z+F Imager (file extension ext.xml). The MCAM file stores the intrinsic calibration file for the Z+F MCAM camera. It is good to place a local copy of the MCAM file in your project file.

7. Next check the color Properties . Make sure that “Map Fast” and “Use Mask” are unchecked. On the left, choose the scans that you wish to apply color mapping to. Note that the associated Greycards and pictures should also be selected. For export format, choose what is appropriate for your desired end product. While deriving the extrinsic calibration confirm that the appropriate scan and images are selected (click ‘Deselect all’ below both the scans and the images, then select the scan for which you are calculating the calibration. Once the scan is selected, the correct images populate)

Export Formats:
JPG and TIFF: Will create a separate image file that will be referenced by the XYZ data. Possibly useful for color correcting the panoramic image file.
ZFS: Creates an XYZRGB data set – As a default use the ZFS file format

Next choose the Camera Calibration file and apply whitebalance correction if desired. Click OK.

COLOR MAPPING PT 3

8. Now we are going to calculate the extrinsic calibration for the camera and associated images. The extrinsic calibration file calculates the subtle differences that occur from putting the camera on the scanner. In other words, whenever you mount the camera to the scanner, its position is going to vary slightly – these are the camera extrensics. Therefore once you calculate extrensics for a single scan, the same extrinsic file can be applied across multiple scans that have been acquired with camera in the same position (in other words the camera CANNOT have been removed from the scanner).

9. Now open a scan file and the run the Extract and Match Feature Points command. Click OK on the Automatic option to Calculate Extrinsics. The total resulting error should be less than 3 pixels, if it isn’t see process below to manually add more points or attempt to Extract and Match Points on another scan within the project. DO NOT overwrite the original MCAM file, rename it. NOTE: If insufficient points are extracted with the Coarse setting, try the Fine setting. Depending on the nature of the scan data, these settings may give higher or lower error, and one setting may extract sufficient points when the other setting will not.

10. Now that we have the extrinsic file, we can Generate Color Scans which actually uses the extrinsic camera calibration file to map the images onto the scan. Do this only for the scan that you used to calculate the feature points and then verify the color mapping quality. If you are satisfied with the color mapping quality, you can then run the Generate Color Scans command for the entire project. If the color mapping results are not adequate, then complete the steps in the next two tabs to manually add more feature points for the color mapping process.

CONTINUE TO...

If you are satisfied with the automated color mapping quality and have generated your Color Scans, you can continue to Z+F Laser Control: Filtering and Exporting Your Data

If the color mapping results are not adequate, then continue to Z+F Laser Control: Manually Identifying Feature Points to manually add more feature points for the color mapping process.

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http://gmv.cast.uark.edu/uncategorized/z-f-laser-scanner-scanning-your-target-2/#comments Wed, 07 Mar 2012 17:10:47 +0000 Vance http://gmv.cast.uark.edu/?p=4790

This workflow will show you how to start a scan using the Z+F Laser Scanner.
Hint: You can click on any image to see a larger version.

POSITIONING AND POWERING UP THE SCANNER

1. Position the scanner in the center of the target field

Ensure that the angle of incidence of the laser on the target is larger than 45 degrees

Recommended distance between the Z+F scanner and targets

RESOLUTION	RECOMMENDED DISTANCE WITH AN ANGLE OF 90 deg.
Middle	1 m to 15 m
High	1 m to 20 m
Super High	1 m to 25 m
Ultra High	1 m to 30 m

With smaller a smaller angle of incidence the target distance is reduced

Power the scanner on by pressing the power button for 0.3 seconds

The power-up process takes approx. 20 seconds in which time it will rotate while the mirror spins

MENUS AND CONTROLS

Menus and Controls

System Menu shown in the display. Main menu order:

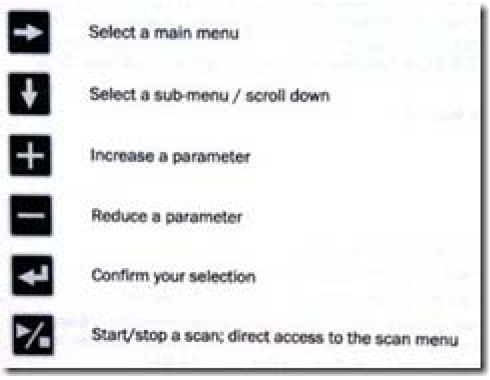
· Info

· Status

· Tilt Sensor

- Scanning
- Data Management

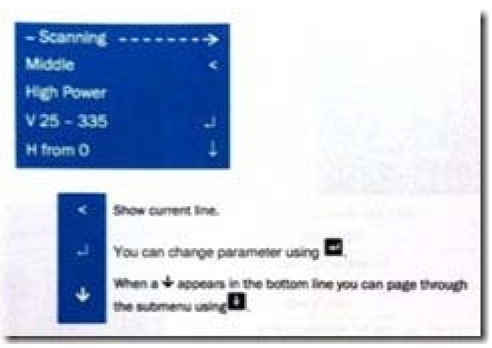
Control buttons:



SCAN MENU SYMBOLS

Scan Menu Symbols

The top line indicates the menu currently in use



See **User Manual** for full descriptions of all menus

Check the Tilt Sensor Menu

If the inclination in f the Y-direction is greater than or less than 2 degrees, an arrow will appear and the inclination should be corrected

THE SCANNING MENU

In the Scanning Menu

RESOLUTION:

Select the preferred resolution level (**Middle** or **High** is usually preferred)

Super High, High and **Middle** resolutions have a **low noise** option that reduces noise by the factor of 1.4, but scanning time is doubled

VERTICAL SCAN RANGE:

You can select predefined vertical scan ranges using the + / – buttons or further refine each predefined range by pressing the  button and increasing or decreasing the values by 5 deg. with the + / – buttons. Predefined ranges include:

· V 0-360

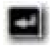
· V 25-160 and 200-335

· V25-180

· V 180-260

· V 45-135

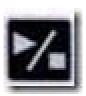
HORIZONTAL SCAN RANGE:

The horizontal scan range can be set in increments of 5 deg. for both the start and end position using the + / – buttons and pressing the  button to confirm the position

Alternatively the scanner start position can be manually set by rotating the scanner to any position greater than 0.0. Press the  button to confirm the position. Set the horizontal range end position next in the same manner

START THE SCAN

Start the Scan

Press the  button to start the scanning process. The process can also be stopped using this button and all data collected prior to interruption will be stored.

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