

## 5 Working With Studies

The Terason software provides many tools for you to work with studies. These tools allow:

- [Storing Images and Loops](#); see page 88
- [Reviewing Patient Studies](#); see page 90
- [Exporting Studies](#); see page 90
- [Exporting Images and Loops](#); see page 93
- [Deleting Studies and Images](#); see page 96
- [Printing Images](#); see page 98

### Storing Images and Loops

You can save acquired images either as individual image files, or as Cine loop files. To store images and loops, you must understand:

- [Monitoring Disk Space](#); see page 88
- [Saving Images and Loops](#); see page 89
- [Viewing saved Images and Loops](#) on page 90

You can also copy the image in the 2D Image window by tapping the F4 button. This saves the image in the Windows clipboard, and you can paste the image into another application on your computer.

### Monitoring Disk Space

Be aware of the amount of free space on your C: drive (the default drive where the application is installed). If the hard drive is full, the system cannot save files.

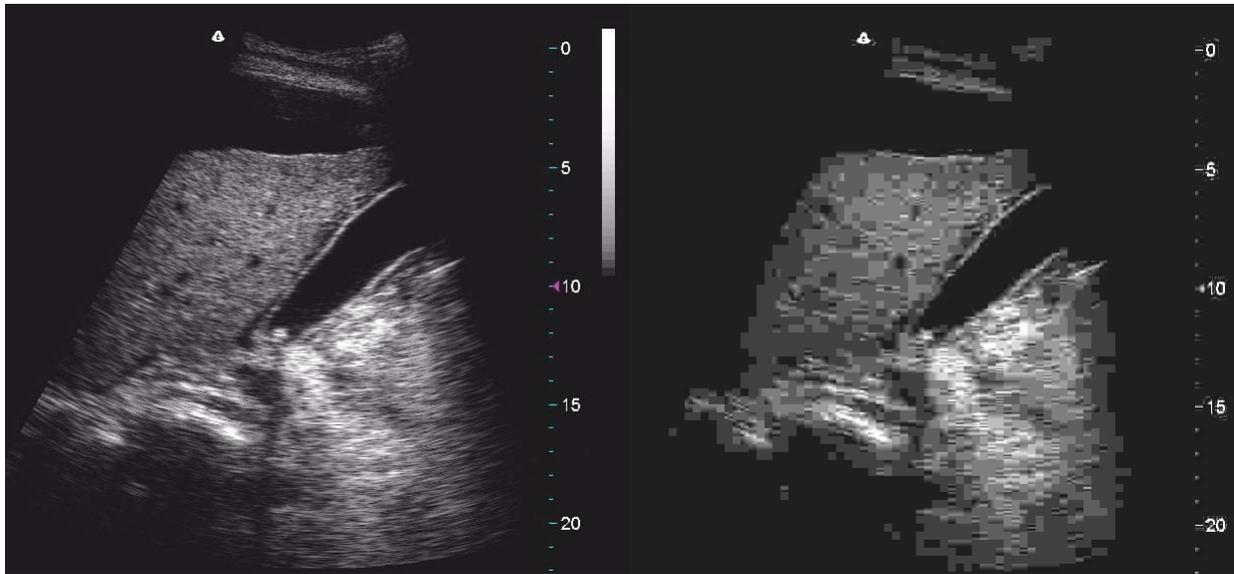
Many factors contribute to the size of an image file, such as the scan mode and measurements or annotations. A single frame (a saved image) can range from 300 KB to 700 KB. An image loop can be from 2 MB to 18 MB.

The Imaging window includes an indicator showing free disk space at the top of the screen.



**Disk Free Space Indicator**

When free disk space is less than 2 GB, the background of the indicator changes from gray to yellow. You can select a different level for this change on the Store/Acquire tab of the Setup window. If the free disk space becomes smaller than 1 GB, you should move files to a backup CD (see [Exporting Studies](#) on page 90) and delete them from the C: drive, or just delete unimportant files (see [Deleting Studies and Images](#) on page 96).



**Scan Uncompressed (Left) and JPEG compressed (Right)**

The compressed scan shows squares throughout. If you see squares like these, or an occasional block, interpret them as JPEG artifacts.

## Saving Images and Loops

Images and loops are saved to the Study directory, in the appropriate patient folder. If no patient is associated with a scan, no images or loops can be saved. All images and loops for a given patient saved on the same day are saved in the same study, unless the New Study button in the Patient window is tapped before a later image is saved. A single study cannot include images and loops saved on different days.

For Split Screen mode, you can save the Split Screen image (as a single frame showing both screens).

You can save the Split Screen image as a loop file. When you do, the Terason software saves the active screen as an image loop, and the other screen as a single frame.

**To save an image or loop**, complete these steps:

1. Tap the **Freeze button** if viewing a live image.
2. To save a frozen image, tap the **Store button**.
3. To save a loop of a live scan, tap the **Store button**.
4. To add the saved image or loop to the report for the current study, **tap and hold on the thumbnail** of the image or loop and select Add to Report.
5. To delete an image or loop, **tap and hold on the thumbnail** of the image or loop and select Delete.

If you did not load patient information for an exam, you cannot save images or loops.

You can view the saved studies as described in [Finding Studies in the Patient Window](#) on page 90.

If you open an image file and then save it again, the Terason software creates a new file; it does not overwrite the original file.

## Viewing saved Images and Loops

When you save an image or loop, a thumbnail of it appears in the area at the right of the Imaging window. When more than 12 images or loops are included in the study, some will be hidden. To view them, tap the scroll arrow at the bottom of the thumbnail area. To scroll back up, tap the scroll arrow at the top of the thumbnail area.

**To review a saved image or loop in the current study**, double-tap the thumbnail of the image or loop. It displays in the Imaging window.

## Reviewing Patient Studies

You can find saved patient studies by using the Study List... button on the Patient window.

### Finding Studies in the Patient Window

**To find previously-saved studies in the Patient window:**

1. Tap the **Patient button**.
2. In the Patient window, tap the **Study List... button**.  
The Study List window opens, displaying a list of saved studies.
3. The default is to show all the studies. To find studies done on a specific day or range of days, tap the **Study Date** menu, and select Today, Last 7 days, Last 30 days, or In date range.  
If you tap In date range, a box opens where you can select a range of dates to show studies from.
4. Find the desired **study** in the list, and tap it to select it.
5. Tap the **Review button**.  
The selected study loads in the Imaging window.

## Exporting Studies

You can export studies, images to a CD, a DVD, a USB drive, or another location on a network. When exporting a study, image, or loop, the system creates a uniquely-named subdirectory for each study, image, or loop.

**To export a study**, complete the following procedure:

1. **Save** the study. See [Saving Images and Loops](#) on page 89.

2. Tap the **Patient** button.
3. On the Patient window, tap the **Study List...** button.
4. On the Study List window, select the **study** you want to export
5. Tap the **Export** button.

The Export Selection window opens. A row of radio buttons lets you choose different parameters for selecting studies to export.

Patient ID	Patient Name	Type	Date Time	Ima...
2645675674	Arthur, Chester A	Musculoske...	2012/07/09 13:45:10	1

**Export Selection Window**

6. To **export to a CD or DVD**, configure the image format and other parameters.



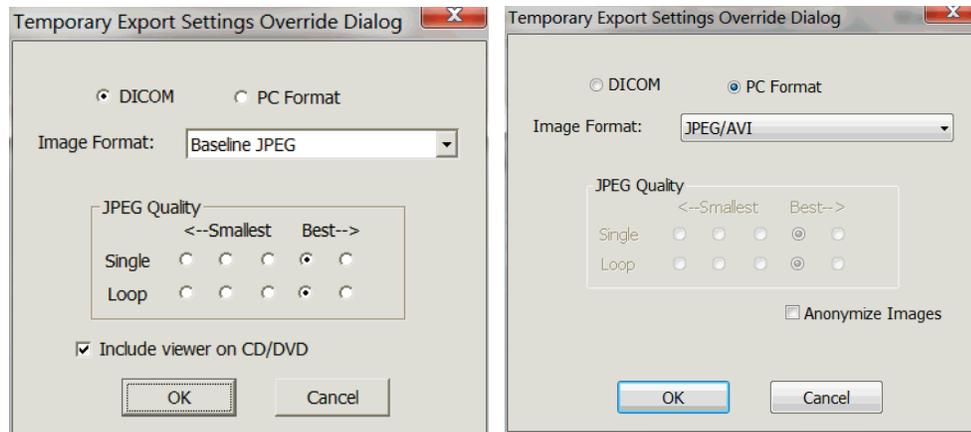
**Note:** The uSmart3200t does not include a CD or DVD drive. To burn files to those formats, you must connect an external drive to the system.

- a. Tap **CD/DVD**.

The DICOM Server button changes to a CD/DVD/USB Options button.

- b. Tap the **CD/DVD/USB Options** button.

The Temporary Export Settings Override Dialog box opens.



#### Temporary Export Settings Override Dialog Box

- c. To change the image format, choose a format from the **Image Format:** drop-down menu.



**Note:** If the PC Format radio button is selected, only the image is exported. None of the patient information is exported.

If the DICOM radio button is selected, the patient information is exported.

- d. To change the JPEG quality, select a **radio button** in the JPEG Quality area.
  - e. To copy a DICOM image viewer onto the CD, select **Include viewer on CD/DVD** so the box is checked.
  - f. To **remove patient information** from a PC Format study, tap Anonymize Images.
  - g. When the selections are correct, tap **OK**.
7. To **export to a USB drive:**
- a. Tap **USB** on the Export Selection window.
  - b. Tap the **CD/DVD/USB Options** button.
- The Temporary Export Settings Dialog box opens. It has the same controls as the CD/DVD box (see step 6, above), except that it has no option for including a viewer on the target drive.
- c. When the selections are correct, tap **OK**.
8. To export to **an electronic medical records (EMR) location on a network:**
- a. Tap the **PC Export to EMR** radio button.
  - b. If no EMR destination is set as a default, or if you want to send to a different destination, select a destination from the drop-down menu.
- For information on setting defaults for PC Export, see [PC Export Options](#) on page 134.
9. On the Export Selection window, tap the **Export** button.
- The Select Path window opens.

10. On the Select Path window, navigate to the **target drive** and select it.

11. Tap **OK**.

The Terason software exports the image or loop to the target drive.

## Export Status Indicator

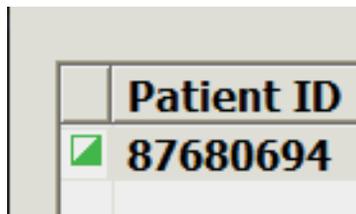
In the left column of the study list in the Export Selection window is a small box that indicates by its color whether the study has been exported. The upper left area of the box refers to exports to USB drives, CDs, and DVDs. The lower right area of the box refers to exports to a PACS system.

The meanings of the colors are given in the following table.

### Export Status Indicator color meanings

USB / CD / DVD	PACS
Blank: study not sent	Blank: study not sent
Green: study sent <sup>a</sup>	Green: study sent
	Yellow: send pending
	Red: sending failed
	Black: study has been modified since being sent (the file on PACS is not up to date)

a. During export to a USB drive or disc, the status indicator turns green. If writing to the target fails, the indicator goes back to blank.



**Export Status Indicator**

In the illustration above, the indicator shows that the study has been sent to a PACS system, and that it has not been exported to a USB drive, CD, or DVD.

## Exporting Images and Loops

You can export an image onto the computer hard drive or an external drive, as a JPEG, BMP, or AVI format. You can also attach an image in one of those formats to an email message.

See:

- [Selecting File Types for Export](#) on page 94
- [Exporting an Image in a PC Format](#) on page 94
- [Attaching an Image to an Email Message](#) on page 95

## Selecting File Types for Export

The Terason software allows you to export an image or loop to external media in any of these formats:

- AVI
- Bitmap
- JPEG

You can email image and loop files or include them as graphics in other applications.

If you save images using the JPEG format, be aware of the effects of data compression. By default, the Terason software uses a lossy JPEG compression algorithm. After compression, some of the image data is gone. When viewed, the compressed image may show artifacts caused by the JPEG compression. The artifacts may also show if you view the image on a medical viewing station that allows you to window and level the image.

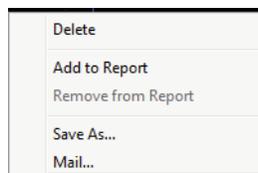
The amount of compression on an image cannot be selected or predicted. One scan may compress at a ratio of 10:1, and another may compress at a ratio of 5:1. It is possible that medically-significant structures could be lost as a result of compression, regardless of the amount of compression. In addition, compression may result in artifacts appearing on the image.

To demonstrate what JPEG artifacts look like, the following example shows an uncompressed ultrasound image, and a JPEG compressed image of the same scan. The JPEG version was compressed at a ratio of 2500:1.

## Exporting an Image in a PC Format

**To export an image in a PC format:**

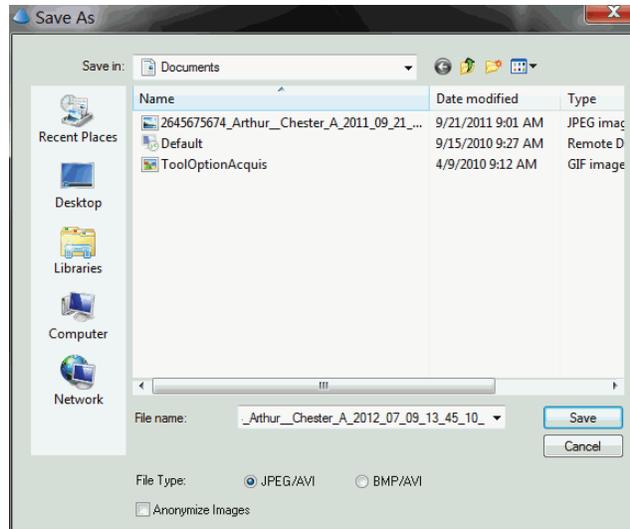
1. Tap and hold on the **image thumbnail** in the thumbnail area at the right side of the Imaging window.



**Image Context Menu**

2. Select **Save As** from the Image Context menu.

The Save As window opens.



### Save As Window

3. To remove the patient identification from the file name, tap **Anonymize Images** so that the box is checked.
4. Tap the radio button for the **format** you want to export as, either JPEG/AVI or BMP/AVI.
5. If you tapped Anonymize Images, enter a **file name** for the image file in the File Name: field.
6. Tap the arrowhead at the right-hand end of the **Save in:** field, and navigate to the directory you want to save the image file in.
7. Tap **Save**.

The system saves the image to the specified drive in the format you selected, in a new directory.

## Attaching an Image to an Email Message

When you choose the Mail... option on the image context menu, you can attach the selected image to an email message.




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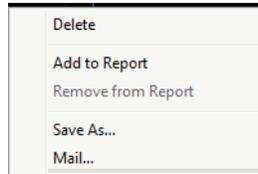
**Note:** You must have an email program installed on the Terason uSmart3200T Ultrasound System computer to use this feature.

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To attach an image to an email message:

1. Tap and hold on the **image thumbnail** in the thumbnail area at the right side of the Imaging window.

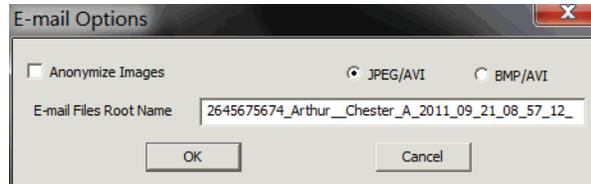
The Image Context menu appears.



### Image Context Menu

#### 2. Tap **Mail**....

The E-mail Options window opens.



### Image E-mail Options Window

#### 3. Configure the **email options**.

- a. To remove the patient identification from the file name, tap **Anonymize Images** so that the box is checked.
- b. Tap the radio button for the **format** you want to export as, either JPEG/AVI or BMP/AVI.
- c. If you tapped Anonymize Images, enter a **file name** for the image file in the E-mail Files Root Name field.
- d. Tap **OK**.

The system launches the email program and opens a new email message with the image attached.

4. Enter the **recipient and title** of the email.
5. Add any desired **text** in the message area of the email.
6. Tap **Send**.

## Deleting Studies and Images

Terason recommends that you delete unnecessary studies and images to free up disk space. Files are immediately and permanently removed from the system, and cannot be retrieved.

### Deleting Studies Manually

Deleting a study also deletes its component images and loops. Deletion is permanent, and the images and loops cannot be retrieved.

**To delete studies**, complete these steps:

1. Tap the **Patient** button.
2. Tap the **Study List...** button.

3. If the study was not done today, tap the **Study Date** menu, and select All Dates.
4. Tap to **select the study** you want to delete.  
**To select multiple studies**, drag out the keyboard hidden at the left side of the screen, tap the Ctrl key, then tap the unwanted studies in the list.
5. Tap the **Delete** button.  
A dialog asks you to confirm that you want to delete the files.
6. Tap **Yes**.  
The studies are permanently deleted, and cannot be retrieved.

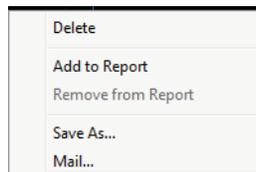
### Deleting Studies Automatically

You can configure the system to automatically delete studies that have been exported. See [Auto Delete Exported Studies](#) on page 131 to set up auto deletion.

## Deleting Images

**To delete images**, complete these steps:

1. Tap and hold on the **image thumbnail** in the thumbnail area at the right side of the Imaging window.  
A menu appears.



#### Image Context Menu

2. Tap **Delete**.
3. In the confirmation dialog box, tap **Yes**.  
The image is permanently deleted, and cannot be retrieved.

## Printing Images

You can print any image file from the Terason system. If you print an image loop, the Terason software only prints the currently displayed frame.



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**Warning:** Non-medical grade report printers cannot be used within a patient environment.

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**Warning:** During use of a non-medical grade report printer or when a non-medical grade report printer is connected to the ultrasound system, the printer must be outside of the patient environment and the ultrasound system cannot in any way be in contact with a patient.

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You can use any of the following methods to print images (described in more detail in the subsequent sections):

- [Setting Up Printing](#); see page 98
- [Printing the Displayed Image](#); see page 100
- [Printing in Split Screen Mode](#); see page 100
- [Printing Multiple Images](#); see page 101

Before printing, use Print Setup... on the Print tab of the Setup window to select a default printer and default print settings, such as page size and orientation.

## Setting Up Printing

Before printing, you must connect the ultrasound system to a printer and select default print settings.

### Connecting a Printer

**To physically connect a printer**, use a USB cable connected to the printer and to the USB port on the left side of the ultrasound system. Windows automatically recognizes the printer.

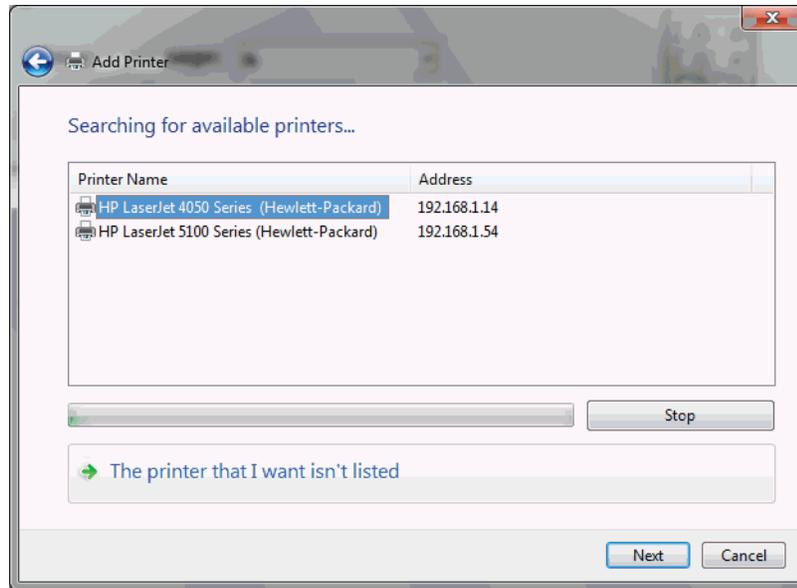
**To connect a remote printer** on a wired or wireless network, complete these steps:

1. Tap the **uSmart3200T** name at the top left of the screen.
2. Tap **Setup**.
3. On the Setup window, tap the **Print tab**.
4. Tap **Add Printer...**

The Add Printer window opens asking whether you want to connect to a local (non-USB) printer or a network printer.

5. Tap **Add a network, wireless or Bluetooth printer**.

The software begins searching for printers on all networks that the system is connected to.

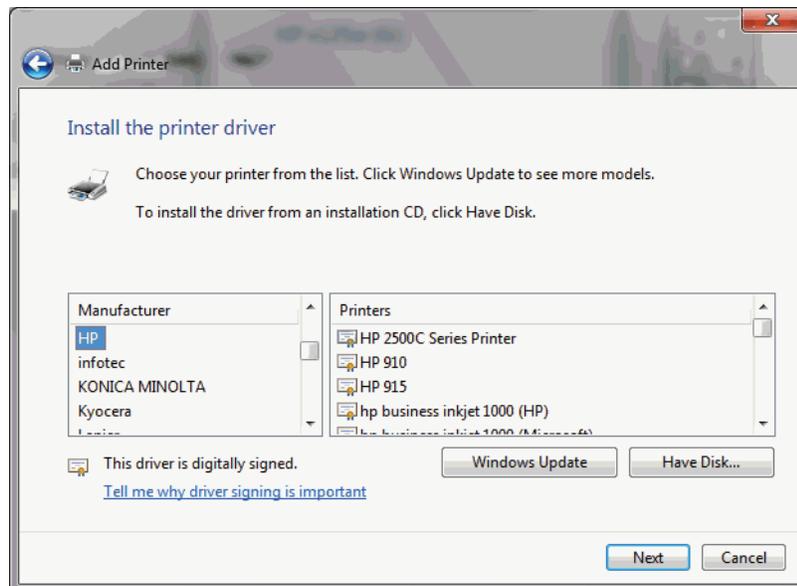


### Add Printer Window

When it is done searching, the progress bar below the list turns completely green.

6. Tap the name of the printer you want to connect to, then tap **Next**.

The Add Printer window changes, showing a list of printer manufacturers and a list of models.



### Getting the Printer Driver

7. Tap the **printer manufacturer name** in the left pane of the window.
8. Tap the **model of printer** you want to connect to in the right pane of the window.
9. Tap **Next**.

You may see a dialog box saying a driver is already installed, and asking if you want to use that driver or replace it.

**10. Tap Next.**

A confirmation message box opens.

**11. Tap Next.**

You may see a dialog box asking about sharing the printer.

**12. Tap Next.****13. Tap Print a test page** to verify that the connection to the printer is working.**14. Tap Finish.**

## Configuring Printing

You must configure the printer defaults before printing. When you tap a Print button, the image or images are sent to the printer using the defaults.

To configure the printer defaults, complete these steps:

**1.** Tap the **uSmart3200T** name at the top left of the screen.

**2.** Tap **Setup**.

**3.** On the Setup window, tap the **Print tab**.

**4.** Under **Layout**, select the number of images to print on a page.

Multiple images print only from the Thumbnail window. In all other cases, only one image prints, on one page.

**5.** Tap **Print Setup...** to configure setting such as Orientation (landscape or portrait), paper size, etc.

The window that opens when you tap Print Setup... is generated by the printer software, and is different for every printer.

## Printing the Displayed Image

When viewing an image in the Imaging window, you can print the image. You must freeze live images before you can print them.

**To print the displayed image:**

**1.** If the image is not already frozen, tap the **Freeze** button.

**2.** Tap the **Print** button.

## Printing in Split Screen Mode

When in Split Screen mode, the Terason software prints both screens.

**To print a split-screen image:**

**1.** Make sure that both screens are **frozen** and that you have added any necessary measurements or annotations.

**2.** Tap the **Print** button.

The Terason software prints the Imaging window, including both screens.

## Printing Multiple Images

You can print more than one image on a page. The images must be saved.

In Setup > Page > Layout, you can set a default number for printing when multiple images are selected. The available options are 1, 2, 4, 6, or 9 images to a page.

**To print more than one image on a page**, complete these steps:

1. Tap **Review**.
2. Tap the **Thumbnail** button.
3. Select the **images** you want to print, by tapping them.
  - To select a **continuous sequence** of images, drag out the keyboard hidden at the left side of the screen and tap the Shift button, then tap the first and last image in the sequence.
  - To select a group of images that are **not a continuous sequence**, tap the Ctrl button and tap each of the images you want to print.
4. Tap the **Print** button.

The selected images are sent to the default printer, and printed at the number per page previously selected in the Setup window.