GRAPHITI

PC Application
User Manual

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Version 1.0

Contents

1 Introduction

This document describes the functions and features of Graphiti PC utility.

2 Overview

The Graphiti PC utility provides an interface to connect the device with the PC and provides the following features:

1. Navigation through images
2. Zoom in and Zoom out
3. Panning through the zoomed image
4. Rotate image
5. Invert image color
6. Selection of different image-resizing filters and sub-variants
7. Support for different image file types:
    1. *.bmp
    2. *.jpg
    3. *.png
    4. *.gif
    5. *.tiff
    6. *.svg
8. Support for pdf files
9. Support for customized csv files
10. Ability to display the input image properties
11. Support for the drawing feature
12. Ability to send the commands

2.1 Connection steps

Following are the steps for connecting the device with the Graphiti PC utility.

1. Invoke the utility software available with the Graphiti PC Utility vxx.xx.xx by clicking on 'Graphiti PC Utility.exe' file.
2. Select USB HID mode using 'Space + Dot 7' or VCP(Serial) mode using 'Space + Dot 8' on the device.
3. The utility connects with the device automatically. Alternately, select the option 'manual connection' from 'Connect' menu to connect manually. Under 'Select Device' option, select the COM port manually to connect with the device. This option works only when the device is in serial mode and not in the HID mode.
4. After successfully connecting to the device, utility shows the connection status in the status bar. You can check the connection information in 'Help' menu as well.

3   GUI Layout

The PC utility layout is divided into 3 main tabs: **'Main View'**, **'Drawing Window'** and **'Command Window'** tab.

Use the shortcut, 'Control + Tab' to navigate through these tabs.
Press 'Control + G' to navigate through different groups of each window.
Press 'Tab' key to navigate through different controls.
Press 'Alt' key to access menu items and press 'Esc' to exit from menu.

4   Main (Default) View

Browse different images, customized CSV files, pdf files and perform different operations through the main window. The processed images can be directly viewed on the connected Graphiti device. The 'Main' tab contains 5 groups as listed below:

1. **Menu Bar:** The GUI has a menu bar with different options to control the device at top.
2. **Image Display:** Below the menu-bar is the image display section. It is divided into 3 sections arranged as display boxes, showing the selected source image in first box, the processed image in second and the tactile representation of the image in third box.
3. The section below the Image Display is divided into two groups:
    1. **Image file explorer:** Provide controls for browsing and navigating the image files.
    2. **File reviewing controls:** Provide controls such as zoom and rotate the selected image, navigation controls to pan through the enlarged image, image filters for the selected image and other options such as switching to other tabs and image auto scrolling.
4. **Message Box:** Below the 'File Explorer' tab is the 'Message Box' showing the details of the type of image selected (from black and white, gray scale and color).
5. **Status Bar:** Bottom of the GUI, shows the device firmware version and its connection status with the utility. Please note, all this information is available in 'Help' Menu as well.

4.1   Menu Bar

GUI has a menu bar providing different options to control the device, at top. The

Description	Onboard Keypad	Additional Information

following table describes controls available in the menu bar.

Select 'Menu' bar	Alt	This command focuses on the menu bar option 'Device Display'. You can navigate through the menu bar options using arrow keys.
Select menu bar option 'Device Display'	Alt + 'D'	This command opens the list of items under 'Device Display' option. You can navigate through the items using the Up/Down Arrow keys.
Homing all pins	Alt + 'D' + 'H'	This command moves all pins in the downward direction and sets to home position just below the touch panel surface.
Set all pins	Alt + 'D' + 'S'	This command sets all the pins at height level 4
Reset all pins	Alt + 'D' + 'R'	This command resets all the pins at height level 0
Select menu bar option 'Image View'	Alt + 'V'	This command opens the list of items under 'Image View' option. You can navigate through the items using the Up/Down Arrow keys.
Show Pixelated View	Alt + 'V' + 'P'	This command shows the pixelated view of the processed image.
Show Smooth View	Alt + 'V' + 'S'	This command shows the smooth view of the processed image.
Select menu bar option 'Connect'	Alt + 'C'	This command opens the list of items under 'Connect' option. You can navigate through the items using the Up/Down Arrow keys.
Enable auto connect to device option	Alt + 'C' + 'A'	This command enables the option of connecting to the available devices, automatically.
Enable select device option	Alt + 'C' + 'S'	This command enables the option to select the device to be connected with GUI.
Disconnect the device	Alt + 'C' + 'D'	This command disconnects the GUI from the device.
Select menu bar option 'Device Configuration'	Alt + 'R'	This command opens the list of items under 'Device Configuration' options. You can navigate through the items using the Up/Down Arrow keys.
Set Clock	Alt + 'R' + 'C'	This command configures the device clock.
Select menu bar option 'Help'	Alt + 'H'	This command opens the list of items under 'Help' options. You can navigate through the items using the Up/Down Arrow keys.
Show device information	Alt + 'H' + 'D'	This command shows the device related information such as the unit serial number, firmware version etc.
Show GUI information	Alt + 'H' + 'A'	This command shows the GUI related information.

4.2   Image File Explorer

The Image File Explorer lets you browse and select the image files from the local hard drive. The left side of the image file explorer displays the list of browsed images, while the right side of the section provides different controls to access

the list displayed on the left side and to manage the list. You can access the image file explorer directly using the PC keyboard 'Alt + F' keys.

The following table describes the controls available to browse the image and manage the list.

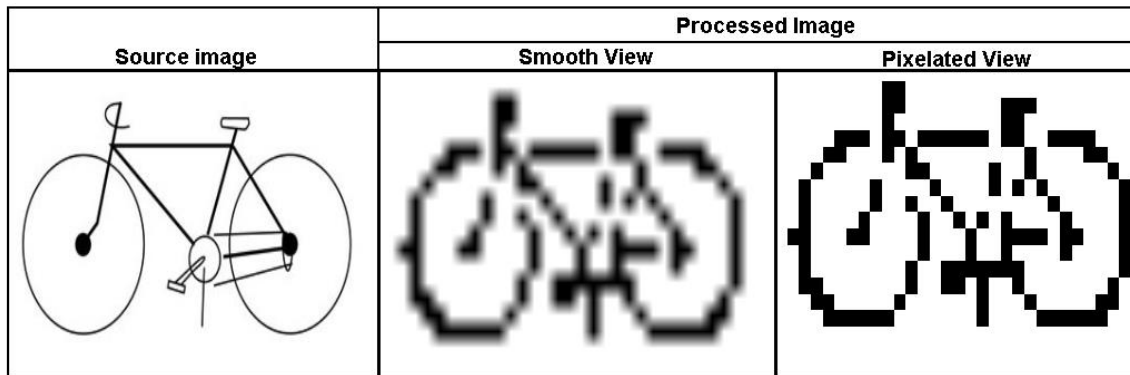| Description	GUI Button	PC Keyboard	Device Keypad	Touch Panel
Browse images stored in the PC	Browse File	Ctrl + 'B'	Not Available	Not Available
Selects image above the previously selected image	Not Available	Up Arrow	Up Key	Down Swipe
Selects image below the previously selected image	Not Available	Down Arrow	Down Key	Up Swipe
Removes the selected image from the list	Not Available	Delete key	Not Available	Not Available
Review the previous file after image is zoomed	Not Available	Up Arrow key after pressing Alt + F	Dot 3 Key	Not Available
Review the next file after image is zoomed	Not Available	Down Arrow key after pressing Alt + F	Dot 6 Key	Not Available
Clear all the images from the list	Clear List	Ctrl + Shift + Delete	Not Available	Not Available
Moves the selected image file to the desired upward position in the list	Move Up	Ctrl + 'U'	Not Available	Not Available
Moves the selected image file to the desired downward position in the list	Move Down	Ctrl + 'D'	Not Available	Not Available
Loads the image with latest timestamp from the current folder	Not Available	F5	Not Available	Not Available
Saves the selected image in the device	Save into Device	Ctrl + 'S'	Space + Dots 2 3 4 7	Not Available
Saves the selected image in the PC	Save into PC	Ctrl + 'P'	Not available	Not Available

4.3   Processing the images

To explore the loaded images, use various image-processing algorithms. Their effectiveness and tactile representation can be reviewed parallelly on the device.

4.3.1   Viewing processed Images

The processed image is shown within the processed image box. The 'Image view' option on the menu bar lets you choose between 'Smooth View' and 'Pixelated View'.

The pixelated view of the processed image gives an idea of how each pixel is positioned in the processed image. The smooth view is the default presentation of the image generated by windows OS.
The selection of smooth or pixelated view does not affect the image displayed on the tactile panel of the device.

Source image	Processed Image	
	Smooth View	Pixelated View

4.3.2   Image Resize Filters

The PC utility supports three image resizing filters such as,
1.   Bicubic (Default)
2.   Bilinear
3.   Nearest Neighbor

To change the image resizing filters, press 'A' key and then press Up/Down Arrow keys from the keyboard.

The utility changes 'Process' Image and 'Output' Image according to an image processing algorithm.

There are 6 sub-variants for each resizing filter and the different processing variants can be changed by pressing 'Ctrl + A' key and then using Up/Down Arrow key on the PC keyboard. You can also change the sub-variants, using the 'Select' key from the device keypad.

Different variants work better on different types of input images. For example, for images containing line drawing, '1 Bit Monochrome' is preferable, while for color images, '8 Bit Gray Sharpen Level 1' generates better results. Therefore, the utility allows you to explore the effects of different algorithms on the input image.

The supported image variants are:
1. 1 Bit Monochrome
2. 2 Bit Grayscale
3. 8 Bit Grayscale
4. 8 Bit Sharpen level 1
5. 8 Bit Sharpen level 2
6. 8 Bit Sharpen level 3
7. 8 Bit Sharpen level 4

The processing includes different levels of gray scaling and sharpening of the image after resizing it to the device's native pin grid size (40 x 60).

4.4   Exploring the image

The utility offers several features to explore the image. See below.

4.4.1 Zoom and Navigation Controls

1. If the zoom operation is performed on the image, the utility shows the processed image and output image according to the level of zoom.
2. After applying the zoom operation on the image, a green block appears on the processed image section, which is called the pan window.
3. The pan window in the processed image represents the image area displayed on the device. The window can be moved using Up/Down/Right/Left buttons on the unit or by using the mouse click or through keyboard arrow keys.
4. Small step zooming can be done by entering values like 1.1 or 1.25 etc. in the edit box.

Please refer section 'Reviewing Images' for more details about the key commands.

4.4.2 Image Inversion and Rotate

The 'Invert View' option under the 'Views, Edits and filters' section inverts the image colors. For example, if the input image contains a black background with some information in white color, the 'invert' option makes the background white and the information is displayed in black color.

You can zoom and rotate the inverted image as required.
If the rotate operation is performed on the image, the utility rotates and displays the rotated image in output image section.

Please refer section '<u>Reviewing Images</u>' for more details about the key commands.

4.4.3 Image Auto Scrolling

Auto scrolling feature lets you see images in a sequential manner, provided the images are browsed and loaded first. Activate auto scrolling by entering time and then pressing the 'Start' button. Once pressed, the device starts displaying images one by one.

To stop auto scrolling use 'stop' button available on the GUI or press any key in the GUI, keyboard or the device keypad. You can also start and stop auto scrolling using 'Ctrl + T' key of the PC keyboard.

4.5   Others Shortcuts

Description	GUI Button	PC Keyboard	Device Keypad	Touch Panel
Switch between different groups in forward direction	Not Available	Ctrl + G	Not Available	Not Available
Switch between different groups in reverse direction	Not Available	Ctrl + Shift + G	Not Available	Not Available
Switch between different tabs	Not Available	Ctrl + Tab	Not Available	Not Available
Switch between different tabs in reverse direction	Not Available	Ctrl + Shift + Tab	Not Available	Not Available
Switch to particular tab	Not Available	Ctrl+1/Ctrl+2/Ctrl+3	Not Available	Not Available
Set focus on file explorer window	File explorer window	Alt + 'F'	Not Available	Not Available
Zoom level: Sets focus on zoom level edit box	Zoom level edit box	Alt + 'Z'	Not available	Not Available
Select views and filter option: Sets focus on Rotate Left button	Not Available	Alt + 'W'	Not available	Not Available
Select navigation option: Sets focus on left navigation button	Not Available	Alt + 'N'	Not available	Not Available
Changes image resize filters	Image Resize Filters drop down list	'A' key or Up/Down Arrow key after pressing 'A' key	Not Available	Not Available
Changes image variants	Image Variants drop down list	Ctrl + 'A' or Up/Down Arrow key after pressing Ctrl + 'A' key	Select key	Not Available
Select next image variants	Not Available	Ctrl + 'A' or Down Arrow key after pressing Ctrl + 'A' key	Dot 5 6	Not Available
Select previous image variants	Not Available	Up Arrow key after pressing Ctrl + 'A' key	Dot 2 3	Not Available

Go to last image variants	Not Available	Not Available	Dot 4 5 6	Not Available
Go to first image variants	Not Available	Not Available	Dot 1 2 3	Not Available
Auto image scrolling: Sets focus on auto image scrolling time interval edit box	Auto Image Scrolling edit box	Alt + 'O'	Not Available	Not Available
Start or stop auto image scrolling	Stop	Ctrl + 'T'	Not Available	Not Available

4.6   *CSV File Viewer (for custom drawings)*

The utility supports and shows custom drawings created using a csv file.

You can create such drawings (files) on a computer or mobile device and can view by browsing it in the utility.

4.6.1   File format

To create the file, provide the height level values and blinking rate values for each pixel. Values for height level and blink rate is as shown in the table below.

Value	Height Level
0	No height
1	Height Level 1
2	Height Level 2
3	Height Level 3
4	Height Level 4

Value	Blinking Rate
0	No Blinking
1	100ms
2	200ms
3	300ms
…	…
50	5 seconds

The file contains two sections, 'Pixel Height' and 'Blinking rate'. Pixel height section contains the height value of each pixel and blinking rate section contains the blinking interval for each pixel.

The following example shows an image that is 5 x 5 pixels in size and shows a 3 x 3 pixels rectangle with pixels of height 4, a flashing pixel in its middle, blinking once every 5 seconds.

Pixel height

0,0,0,0,0
0,4,4,4,0
0,4,4,4,0
0,4,4,4,0
0,0,0,0,0

Blinking rate
0,0,0,0,0
0,0,0,0,0
0,0,50,0,0
0,0,0,0,0
0,0,0,0,0

4.7   Reviewing Images

Once the image is displayed on the device from a PC, you can perform various operations using the device keypad or PC keyboard or buttons available on the utility as shown below:

1. Navigation through images
2. Zoom in and Zoom out
3. Panning through zoomed image
4. Rotate image
5. Invert image color
6. Selection of different image resize filters and sub variants

The key sequences for invoking operations related to image processing are as listed in the table below.

Description	GUI Button	PC Keyboard	Device Keypad	Touch Panel
Zoom in: Incremental zoom in by 1x, up to 32x	Zoom In	Add ('+') key	Dot 5	Not Available
Zoom in with small step size 0.1	Not Available	Ctrl + Plus key	Dot 4	Not Available
Zoom in max: Displays the original image	Zoom in Max	Alt + Plus key	Select + Dot 4	Not Available
Zoom out: Incremental zoom out by 1x, up to default image view	Zoom Out	Minus ('-') key	Dot 2	Not Available
Zoom out with small step size 0.1	Not Available	Ctrl + Minus key	Dot 1	Not Available
Zoom out max: Resets the view to its default state	Zoom Out Max	Alt + Minus key	Select + Dot 1	Not Available
Rotate Image Left – 90 Degree	Rotate Left	Ctrl + 'L'	Select + Left	Not Available
Rotate Image Right – 90 Degree	Rotate Right	Ctrl + 'R'	Select + Right	Not Available
Navigates the pan window in the upward direction by 25 percent of	Up	Up Arrow	Up Arrow	Down Swipe

display size				
Navigates the pan window in the downward direction by 25 percent of display size	Down	Down Arrow	Down Arrow	UP Swipe
Navigates the pan window in the right direction by 25 percent of display size	Right	Right Arrow	Right Arrow	Left Swipe
Navigates the pan window in the left direction by 25 percent of display size	Left	Left Arrow	Left Arrow	Right Swipe
Navigates the pan window by a single pixel in the upward direction	Not Available	Ctrl + Up Arrow	Space + Up Arrow	Not Available
Navigates the pan window by a single pixel in the downward direction	Not Available	Ctrl + Down Arrow	Space + Down Arrow	Not Available
Navigates the pan window by a single pixel in the left direction	Not Available	Ctrl + Left Arrow	Space + Left Arrow	Not Available
Navigates the pan window by a single pixel in the right direction	Not Available	Ctrl + Right Arrow	Space + Right Arrow	Not Available
Changes image resize filters	Image Resize Filters drop down list	'A' key or Up/Down Arrow key after pressing 'A' key	Not Available	Not Available
Changes image variants	Image Variants drop down list	Ctrl + 'A' or Up/Down Arrow key after pressing Ctrl + 'A' key	Select key	Not Available
Select next image variants	Not Available	Ctrl + 'A' or Down Arrow key after pressing Ctrl + 'A' key	Dot 5 6	Not Available
Select previous image variants	Not Available	Up Arrow key after pressing Ctrl + 'A' key	Dot 2 3	Not Available
Go to last image variants	Not Available	Not Available	Dot 4 5 6	Not Available
Go to first image variants	Not Available	Not Available	Dot 1 2 3	Not Available
Centers the pan window to the desired location	Not Available	Not Available	Not Available	Double Tap
Inverts the image	Invert tick box	Ctrl + 'I'	Dot 8 + Dot 5	Not Available
Loads the image with latest timestamp from the current folder	Not Available	F5	Not Available	Not Available
Edit the displayed 60x40 view image	Edit Image	Ctrl + 'E'	Not Available	Not Available

4.8 Image Editing

To edit the displayed 60x40 view image, press the 'Edit Image' button available on the GUI or press 'Ctrl + E' keys from the PC keyboard.

GUI supports all the features available in the drawing window. Please refer 'Drawing window' section for more details.

5   Drawing Window

The Drawing tab provides a 40 x 60 pixels grid mapped to pins available on the device.

In this tab, there are 6 main groups as listed below:

1. **Switch View:** Allows you to switch to the two tabs:
    1. Main View
    2. Command View
2. **Height Level:** Allows you to change pixel height. In the PC utility pixel height is represented as different shades of color.
3. **Edit:** The edit option allows you to perform different operations such as
    1. Draw and erase
    2. Clear all
    3. Selection of area
    4. Crop
    5. Cut, copy and paste
    6. Undo/Redo
    7. Text label (In 8 Dot Computer Braille and English text)
4. **Shapes:** Allows you to draw a shape such as a Circle, Square, Rectangle and Line.
5. **File:** Allows you to save the current drawing as an image file. It also provides print preview and file print options to print it.
6. **40x60 Grid:** Right side of the controls, the PC utility contains 40x60 grid, where you can review the pixels, using the keyboard arrow keys.

Important Notes:

1. If the device is connected with the utility, then its display gets updated in real time, which helps you to review the drawing while performing any operation.
2. The utility supports drawing through the PC keyboard and not through the device keypad.

5.1   Review pixel (current pixel location and height)

The default state of the PC utility is in the 'Review' mode, while in drawing tab.

If the screen reader program is running, you can review pixel by moving the mouse cursor on a particular pixel or using the arrow keys on the 40x60 grid. The utility highlights the current pixel with red solid square and announce the pixel

position and height level. For example, it will announce 'R10C10H2' if the pixel R10 C10 has height level 2.

The device indicates the current position of the cursor in the form of blinking pixel, at the time of review.

5.2   Drawing and Erasing

Just like the Graphiti, the utility also supports drawing. While drawing and erasing, the utility announces the pixel position (provided that the screen reader program is running in your machine).

Drawing and reviewing can be done by keyboard as explained below:
1. Use arrow keys to review the pixel position and height.
2. To set the Pixel, press and hold 'D' key on your PC keyboard and then navigate through pixels using the arrow keys.
3. To erase the Pixel, press and hold 'E' key on your PC keyboard and then navigate through different pixels using the arrow keys.

Alternatively, press the draw button once and then move the mouse on the grid area, keeping the left key pressed to draw. Drawing can be tuned by erasing the pixel.

The device indicates the current position of the cursor in the form of blinking pixel, while drawing and erasing.

To erase the pixel, press the erase button once and erase the pixel similar to drawing.

To clear the entire drawing press 'Clear All' button.

To delete the specific area, select the area using 'Selection' button available on the GUI and press 'Delete' key from the PC keyboard.

5.3   Selecting the height

There are 5 different height levels from 0 to 4 in Graphiti. Select the pixel height by pressing four buttons named Height 1, Height 2, Height 3 and Height 4 on the utility. Alternatively, height level can be selected by Ctrl + Alt + 1 (or 2/3/4).

There is no separate button for height level 0; the erase button represents it. When you erase, the pixels update to height level 0.

The default level is Height Level 4.

Select different height levels before drawing. For example, if height 3 is selected before drawing, then the next drawing will be in height level 3 only until you change it.

5.4   Cut or Copy

Press the selection button and select the image region where you want to perform the cut or copy operation. It is necessary to select the region on the grid before pressing the cut or copy button. The utility highlights the selected region in the form of dash line. While selecting the region, the utility announces pixel number. For example, R10C10H4.

Use arrow keys to tune the selected region. While you move on the selected region, the utility announces top left corner and bottom right corner of the selected region in terms of pixel number. For example, Start R10C10H4 End R15C15H4.

Once the region is selected, press the Copy/Cut button to copy/cut the selected region. Once clicked, the utility copies the selected region into its own clipboard. After pressing the Cut button, the utility updates the region with height level 0.

Example using the keyboard:
Press Shift + S keys and then press arrow keys to select the region.

For example, if you want to copy 5 pixels at the left side of R10C10 then the procedure will be as shown below.
1. Navigate to R10C10 pixel using the arrow keys.
2. To select the region, keep pressing Shift + S keys and then press left arrow key for 5 times and then release all the keys.
3. Press Ctrl + C to copy that region.
4. Navigate to R15C10 pixel using the arrow keys if you want to paste that region at R15C10.
5. Press Ctrl + V key to paste that region.

Similarly, you can do cut operation instead of copy as explained in above steps.

Please refer 'Drawing Window – Keyboard Shortcuts' section for the keyboard shortcuts.

5.5   Paste the image

To paste the cut/copied region, press the Paste button or use the 'Ctrl + V' shortcut. For example, if you want to paste the cut/copied region at R20C20 then navigate to that pixels using mouse or using the arrow keys and press 'Ctrl + V'.

After pasting, you can move the pasted region using the arrow keys if you wish, else press enter key to finalize your changes.

5.6   Cropping the image

To crop the image, press the Selection button and select the interested region. It is necessary to select the region on the grid before pressing the crop button. The utility highlights the selected region in the form of dash line. Tune the selected region using the arrow keys.

While selecting the region, the utility announces the pixel number. For example, R10C10H4. Once the region is selected, press the 'Crop' button on the utility or 'Ctrl + Shift + X' on the keyboard to crop the selected region. The utility shows cropped region on the top left corner of the grid.

Example using the keyboard:
For example, if you want to crop 5x5 pixels at the left side of R10C10 then the procedure will be as shown below.
1. Navigate to R10C10 pixel using the arrow keys.
2. To select the region, keep pressing Shift + S keys and then press the left arrow key for 5 times and the down arrow key for 5 times.
3. Press Ctrl + Shift + X to crop that region.
4. The utility will show the cropped region on top left corner of the grid.

5.7   Shapes (Circle, Rectangle, Square and Line)

The PC utility allows you to draw 4 different shapes as mentioned below,
1. Circle
2. Rectangle
3. Square and
4. Line

You can draw shapes using the keyboard keys. For example, if you want to draw a circle, keep pressing the 'C' key and then press any arrow key. More details are available later in this document.

It is possible to draw a shape using the mouse too. Once the button is pressed for any shape, start drawing shapes on 40x60 grid by pressing the left click of the

mouse. The start location of the shape is the point where you click on the pixel very first time after pressing the shape button.

Size of the shape grows as you move the mouse across the grid. Complete the shape drawing by releasing left key of the mouse. To move the shape, use arrow keys and press the enter key to finalize the shape and its position.

Select different height level before drawing any shapes. For example, if height 3 is selected before drawing, then next drawing shapes will be in height level 3 only until you change it.

5.7.1 Circle

The start location of the circle is the center point. The utility announces the center point and radius of the circle in terms of pixel count.
Following is the procedure to draw a circle using the keyboard:
1. Go to the location where you want the center point of the circle using the arrow key. For example, R20C30.
2. Keep pressing 'C' key and then press arrow keys to draw and change the radius of the circle. For example, press left arrow key for 5 times to make circle radius 5 and then release all the keys.
3. The utility will draw circle with radius 5 pixels.
4. If you wish you can move the circle on the grid using the arrow keys.
5. Press the enter key to finalize the changes.

Procedure to draw a circle using the mouse:
1. Click on the Circle button.
2. Go to the location where you want the center point of the circle. For example, R20C30.
3. Move mouse by pressing left key in any direction up to 5 pixels and then release the left click.
4. The utility will draw circle with radius 5 pixels.
5. If you wish you can move the circle using arrow keys.
6. Click on grid to finalize the changes.

The device blinks the pixel at the center point of the circle while drawing.

5.7.2 Rectangle and Square

To draw a Rectangle or Square, the start location is the top left corner and end location the bottom right corner. The PC utility announces the start and end points in terms of pixel number.

You can draw rectangle by pressing and holding the 'R' key or Square by pressing and holding the 'S' key on the keyboard. To modify the shape, press the arrow keys.

Alternatively, you can draw a rectangle or square by clicking the Rectangle or Square button, respectively on the utility and then moving the mouse on the 40x60 grid by pressing the left key.

Once the shape is drawn, the utility highlights the shape border with red line and allows you to move that shape in any direction using the keyboard arrow keys. Press the enter key to finalize the changes.

The device blinks the pixel at the bottom right/left corner of the rectangle or square, at the time of drawing.

5.7.3 Line

The utility allows you to draw a line similar to other shapes. You can click on the line button and then can draw a line on a grid by pressing the left button of the mouse.

Alternatively, you can draw a line using the keyboard as per the steps below.
1. Go to the location where you want to draw a line using the arrow key. For example, R20C30.
2. Keep pressing 'L' key and then press arrow keys. For example, press left arrow key for 5 times and then release all the keys.
3. The utility will draw a line with length 5 pixels.
4. If you wish you can move the line on the grid using the arrow keys.
5. Press enter key to finalize the changes.

The device blinks one pixel at the last point of the line.

5.8 Text Label (English Text, Braille Text)

The PC utility supports English text (fixed size 5x3) as well as 8 Dot Computer Braille Text.

For writing the text, select the location first. After selecting the location, press 'Ctrl + Shift + T' keys, to write text in braille or press 'Ctrl + T' for the English text.

To write text label on the grid, press the English text or Braille text buttons as well. Once pressed, choose the location where you want to start typing the text using the mouse.

The PC utility shows the text box once you click on the grid.

The text box size changes dynamically to fit the text and gives you a beep when it switches to a new line and a long beep in case of navigation limit.

The Graphiti device updates the text at the same location.

Press 'Ctrl + Enter' key to add a new line in the text box manually.

Press the Enter key to finish typing or press ESC to cancel and close the text box.

The font height level is based on your last height level selection.

Please note:
1. There are three special symbols (@, $, &) which will be printed in 7x5 size in case of the English text.
2. The PC utility does not accept any shortcuts when the text box is visible. You have to close the text box first by clicking outside the text box or using the ESC key.
3. You cannot review the pixel properties when the text box is visible.

5.9   Undo/Redo

The PC utility supports undo and redo feature for the drawing correction whenever it is required. To perform undo or redo operation, use the button available on the utility or the PC keyboard shortcuts 'Ctrl + Z' for undo and 'Ctrl + Y' for redo operation.

5.10 Save Drawing

The drawing can be saved by pressing the 'Save As Image File' button. Once clicked, the utility opens a new dialog to save the drawn pattern in .bmp, .png or .jpg format. You can select the path and change the file name while saving the image. The default image file format is 'bmp' and the default file name is 'DrawingImage_1.bmp'.

5.11 Print Preview and Print

To print the drawing, press the Print button. Once pressed, the utility opens a new dialog which contains different settings such as selection of printer, orientation, paper size, number of copies, etc. Press the 'print' button to print the drawing.

Pressing the 'Print Preview' button, the utility opens a new dialog which shows preview of print page. After review you can print the drawing from the preview dialog.

Please note that the print preview settings are same as the one in the print dialog. For example, if you want to change the print orientation, it is possible from the print dialog only.

5.12 Drawing Window – Keyboard Shortcuts

Description	GUI Button	PC Keyboard
Set height level 1	Height 1	Ctrl + Alt + 1
Set height level 2	Height 2	Ctrl + Alt + 2
Set height level 3	Height 3	Ctrl + Alt + 3
Set height level 4	Height 4	Ctrl + Alt + 4
Drawing	Draw	D + Arrow keys
Erasing	Erase	E + Arrow keys
Clear entire drawing	Clear All	Ctrl + Shift + C
Selecting the region	Selection	Shift + Arrow keys
Delete specific region	Select that region and press Delete key	Select that region and press Delete key
Crop the selected region	Crop	Ctrl + Shift + X
Cut the selected region	Cut	Ctrl + X
Copy the selected region	Copy	Ctrl + C
Paste the copied/cut region	Paste	Ctrl + V
Undo drawing	Undo	Ctrl + Z
Redo drawing	Redo	Ctrl + Y
Write English text labels	English Text	Ctrl + T
Write Braille text labels	8 Dot Computer Braille Text	Ctrl + Shift + T
Draw a Circle	Circle	C + Arrow keys
Draw a Rectangle	Rectangle	R + Arrow keys
Draw a Square	Square	S + Arrow keys
Draw a Line	Line	L + Arrow keys
Save the drawing	Save as Image File	Ctrl + S
Print the drawing	Print	Ctrl + P
Review the drawing before printing	Print Preview	Ctrl + Shift + P
Switch to main view	Main View	Ctrl + 1
Switch to drawing tab	Drawing Tab	Ctrl + 2
Switch to command window	Command Window	Ctrl + 3

6   Command Window

The command window provides an interface to communicate with the device through the standard API. It is divided into 3 main groups as described below:

6.1   Command List

A default API command list is enlisted in this tab based on the connection mode with the device. Along with this list, buttons to send the command, browse the image and switch to other tabs are also provided.

For example, you can send an image from command window to the device using a 'Send Image' API. You can select 'Send Image' API from the command list and then browse any image by clicking on the 'Browse' button. After selecting the image, press 'Send' button to send an image to the device.

Please refer the document 'Graphiti API Command vx.x.pdf' for more details.

6.2   Command Editor

The command editor allows you to edit the selected command in hex format. Once the command is edited and you press the 'Send Command' button, only the edited command is sent.

6.3   Response from Device

This box shows the response received from the device. To clear this box, use the 'Clear Response' button.

You can check command and response in ASCII or Hex format using the radio button. The default format of response is in Hex.

7   Clock

You can configure the device clock from the 'Device Configuration' menu by clicking on 'Set Clock'. The utility fetches the clock information from the host PC and sends it to the device.

Alternatively, you can configure device clock from the device preference menu. Refer 'Graphiti User Manual' for more details.

8   Limitations

1. The utility cannot invert the csv file. Image processing operations such as zoom, rotate and invert is not supported for CSV file.
2. The utility can view only the first page of the browsed PDF file and can support only PDF and PDF/A standard.
3. There is an accessibility issue in print preview dialog once the Space button is pressed. Press 'Ctrl + F4' to close that dialog.
4. The image editing is supported for displayed 60x40 view only.

9   Appendices

9.1   Appendix A: Revision History

Rev.	Date	Description of Changes	Author
0.0	24th April 2018	Created	
0.1	25th April 2018	Edits	
0.2	21st May 2018	Added description of the new features	
0.3	30th May 2018	Edits	
0.4	6th June 2018	Edits	
0.5	18th June 2018	Added description of image editing (60x40 view)	
0.6	19th June 2018	Minor edits in 'Image Editing' Description	
0.7	30th June 2018	Added keypad functionality changes	
0.8	20th July 2018	Added clock information and updated "Reviewing Images" section	
0.9	30th August 2018	Minor edits	
0.10	30th October 2018	Modified 'zoom in max' key command	
0.12	26th December 2018	Edits	
1.0	25th October 2021	Removed confidentiality notes	