Operating Manual

iTech IMPAXX Digital Monument Engraver
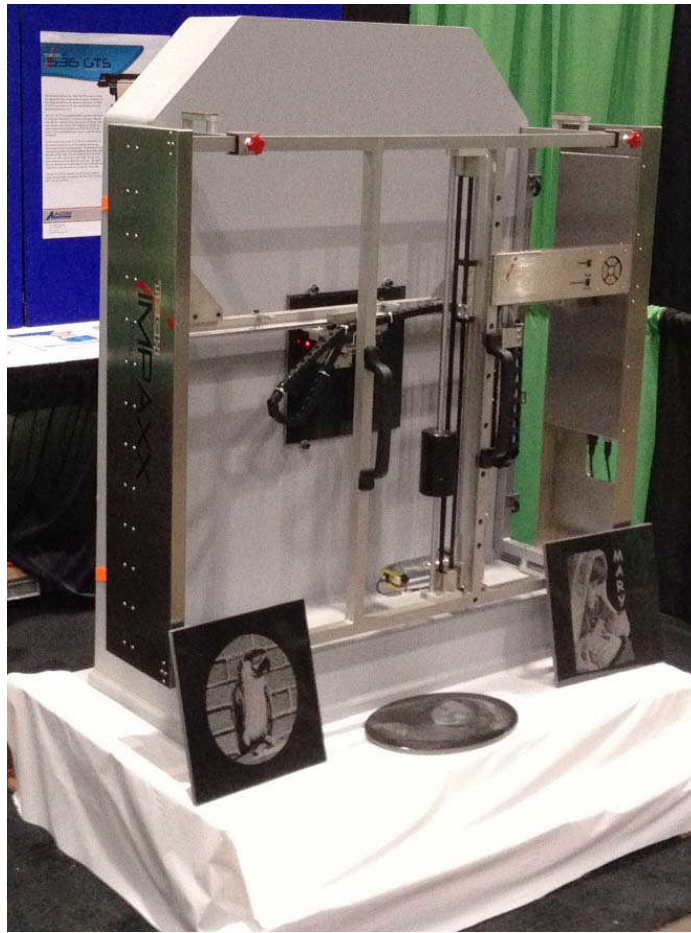
ADSI
ALLEN DATAGRAPH SYSTEMS, INC.

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Derry, NH 03038
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All products made in America

Congratulations on your new purchase!

Thank You for Selecting an Allen Datagraph Systems, Inc. iTech IMPAXX Digital Monument Engraver

At Allen Datagraph Systems, Inc. (ADSI), we are committed to serving you, our customer. Our goal is to provide you with competitive, quality products and services to meet your needs. Customer input is of great value to Allen Datagraph Systems, Inc.; therefore, we encourage any comments or suggestions.

The instructions contained in this manual are intended to ensure the safe installation, operation, and maintenance of your digital engraver. Please read this manual carefully before performing any activity on the equipment. Please note information contained in this manual does not modify or alter, in any way, the standard terms, and conditions of your Allen Datagraph Systems, Inc. purchase contract.

This manual should be readily accessible to operating and maintenance personnel at all times. Proper use of this manual, in addition to other Original Equipment Manufacturer's manuals and your in-house manuals, will assure safe, reliable and cost-effective performance of ADSI machinery.

If you are in need of service, please contact our Technical Support staff as instructed on the following pages. In order to expedite your request please include the serial number of your machine. Each Allen Datagraph Systems, Inc. machine has a label identifying its serial number.

General Information

Allen Datagraph Systems, Inc. Operating Manuals and Addenda provide a general understanding of the operation of the system, its major components, and the functional elements of those components.

The Manuals and Addenda contain Safety, Description, Installation, Operation, and Maintenance information. We strongly recommend thoroughly reading and understanding the information in this manual before operating this equipment. If additional information is required, or clarification needed, feel free to contact ADSI.

The Manuals and Addenda may not be copied or reproduced, in whole or part, without written consent of Allen Datagraph Systems, Inc.

Disclaimer of Warranties and Limitation of Liabilities

The iTech IMPAXX Digital Monument Engraver is warranted to be free of defects in both materials and workmanship. Should any part of this equipment be defective, it will be repaired or replaced, at the option of the manufacturer, at no charge for parts or factory labor for a period of one (1) year from the date of installation. All warranty services are performed at the ADSI factory.   Replacement parts not installed at the factory will be billed to the customer at regular prices and credit will be issued when the defective parts are returned. The customer is responsible for freight on warranty parts and repairs.

This warranty is void if:

The equipment has been damaged by negligence, accident or mishandling, or has not been operated in accordance with the procedures described in the operating instructions;

or:

The equipment has been altered or repaired by other than an approved service station or factory service center, or adaptations or accessories have been attached to the equipment that shall have adversely affected the performance, safety, or reliability of the equipment.

NO OTHER WARRANTY, EXPRESSED OR IMPLIED, APPLIES to the equipment. ADSI does not assume any responsibility for consequential damages occasioned by the equipment, inconvenience or interruption in operation.

In case of unsatisfactory operation, ADSI or its Dealer should be notified immediately.

Technical Support

Technical support is available during business hours based on Eastern Time Monday through Friday 8 am to 5 pm.

For Technical support click here to access our free e-mail support or visit our web site at http://www.allendatagraph.com.

Service Policy – All service is subject to ADSI service policy. You can read the policy here: Web Site Copy / CD Copy

IMPAXX Software Installation

The iTech IMPAXX Digital Monument Engraver's operating parameters are adjusted and controlled by the TMC IMPAXX Remote Panel program. This software enables adjustment of operational settings, which will optimize your image to achieve the best quality engravings. An explanation of the features and function of the remote panel is outlined later in this manual.

1) Install the IMPAXX Remote Panel from the installation CD received.

2) Connect the IMPAXX power cord and communication cable between computer and IMPAXX and turn it on. If connected to usb the found new hardware will be displayed. Automatic installation should install the correct usb driver.

3) Once the Remote Panel is installed, you will have an IMPAXX Remote Panel icon on your desktop. Click on this icon to open. Wait a few seconds - an opening screen will appear and then go away. Proceed to step 4.
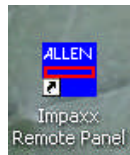
4) Click on Setup, then scroll down to Com port. If there is a com port listed in the right fly-out menu, as below, this is the com port that the machine is installed on. You can then proceed to step 6, otherwise refer to step 5.
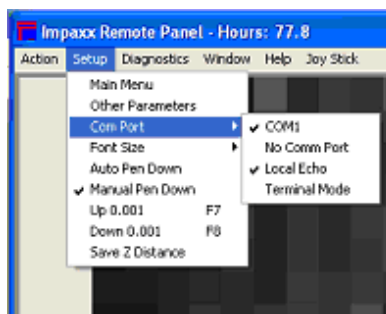
5) If no com port shows, as per the left picture below, click on Select Port. You should see the right window below, showing the IMPAXX. Click ok. If no device is showing, close the IMPAXX Remote Panel, power machine off for 10 seconds, then back on and repeat steps 3-5.
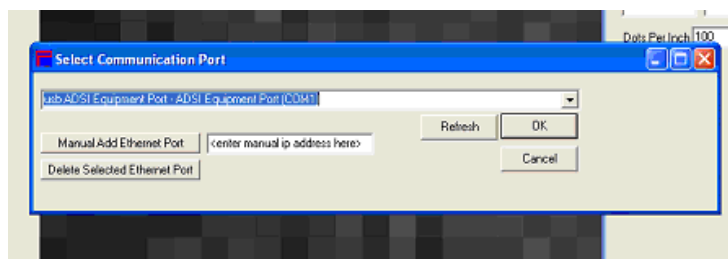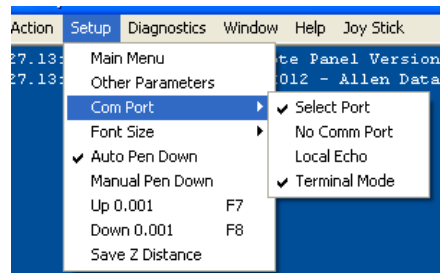

Attaching the Impaxx Engraver to Vertical Stone

The sales video at the link below shows in detail how the iTech IMPAXX Digital Monument Engraver is mounted, using ratchet straps.

https://www.youtube.com/watch?v=Q4Ko9cYhWAQ&feature=player_embedded

Horizontal / Vertical Switch

The horizontal / vertical switch needs to be in the correct position depending on orientation of machine. After changing the switch position the machine must be powered off and on to take effect. An H or a V will appear in the model number on the main menu to indicate the position of the switch. There are different motor tuning numbers depending on whether the machine is mounted vertically or horizontally. Having the switch in the incorrect position relative to machine position on power up could cause image quality to be affected.
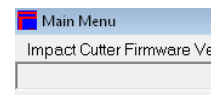
Changing the tool tip

Use wrenches to loosen the tool chuck. Insert the tip all the way into the chuck and tighten chuck.
Replacement tip part number is IE-035.

Setup of Engraving Tool Height

There are two modes for putting the tool tip down to the correct distance from the stone. In the auto mode you set the elevation you desire in the other parameter menu or the job queue and the machine will find the distance.

Manual Adjustment

In the manual mode you set the elevation by adjusting the distance using the supplied measuring tool as described below.
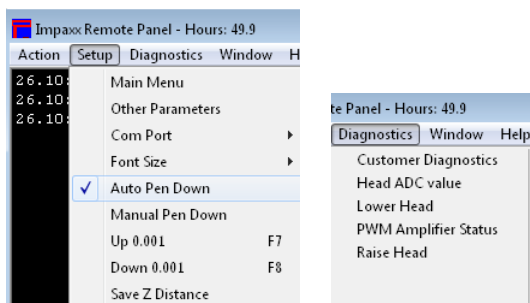
Step 1) With the IMPAXX Remote Panel software open, use the directional arrows on the Impaxx control panel to position the red LED over the work surface.

Step 2) Using the remote panel software, click on Diagnostics>Lower head. Once the head has lowered, carefully attempt to insert the .010" feeler gauge under the tool tip. What you are looking for is that the engraving tip barely drags on the feeler gauge. If the tip is dragging

slightly, the proper height has been achieved. If you cannot fit the feeler gauge under, or if there is too much gap, proceed to step 3.

Step 3) Use the F7 and F8 keys raise and lower the head, respectively. Alternately, you can go to Setup menu, then use "Up .001, or Lower .001 to raise and lower the engraving tip by the same .001" increments. Hitting either the F7 or F8 key one time will raise or lower the head by .001", as does selecting the raise and lower option under the setup menu. Once proper height has been achieved, click on Setup>Save Z distance to program the height.
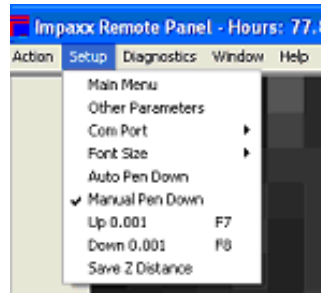
Step 4) Once the height is programmed and saved the machine will remember this height until the tool is changed again. Important - before moving the engraving head click on Diagnostics>Raise Head. The head will retract to home position and you can then move it to desired location.

NOTE: DO NOT attempt to move the tip using the directional arrows at any time without first going to Diagnostics> Raise Head. Failure to do so could result in the tip dragging on the work surface and damaging it as a result.

Image Preparation

You will need a photo editor such as Adobe Photoshop or Corel Photopaint.

You need to obtain a color or grey scale image of what you want to engrave. You can scan a black and white or color photograph using a scanner (use a high resolution for your scan so you can make image smaller rather then try to make the image bigger) or get a jpg file from a digital camera 10 mega pixel or better.

Using Photoshop or Corel Paint clean up image. e.g. Crop image to only impact the part of the image you want, and eliminate the background, remove red eye and other parts of the image that you don't want and make the background black so you don't spend anytime impacting the background.

Next decide what DPI you want to run your image. Good dpi values are 90-130. Higher dpi puts dots closer together and take longer. Lower dpi have lower quality and run faster. For this example assume you want to use 110 dpi.

Then decide what size you want the final image to be. For this example, assume you want 6 inches by 6 inches.

Next verify that the cropped image has enough pixels to run at the dpi you want.

To run an image at 110 dpi with final size of 6x6 inches you will need at least 660 pixels in your image.

Formula : convert dpi and inches to desired number of pixels:

Desired number of pixels = Engraved size in inches Multiplied by desired dpi:

You can ignore the document size and resolution displayed in Photoshop menus, as they are not relevant. Only the number of pixels is of a concern.   Increasing the size of an image is not recommended as this causes very poor quality results.

For example: If your final cropped image has 1264 x 1348 pixels, you will need to use the image size function in Photoshop or Corel Photo Paint so that you have the 660 pixels. So enter 660 pixels in place of the largest number of pixels (1348) which will automatically change the 1264 to 618. You can then use the Adobe Photoshop function Image mode -> grey scale to convert the image from color to grey scale. Save the image as png compressed bitmap with no losses or jpeg with maximum quality so you don't loose any image data.

Positioning Engraving Head

__Important note:__ When setting up a job, first verify the engraving head is in the up position to avoid collision with the work surface. If unsure, go to Diagnostics>Raise head.

First find the middle of the area to be engraved using a scale or tape measure. Place a small piece of masking tape to the stone and mark the center with a writing implement.

Align the stone so that the horizontal / vertical strokes of the machine axis so the image will not appear tilted.

Position the LED for your job to the where you marked the CENTER of your image using the joystick buttons.

i.e., If engraving a 6"x 6" image in the center of a 12" x 12" tile, you will want to position the LED to the center of the 12" x 12", so 6" in from top and side will get the result desired, with the finished image centered in the tile.

Using the directional arrows, position the red LED on the engraving head to the desired location on your work surface. The engraving head is offset from the actual engraving tool, but the software will compensate for that and your image will be positioned correctly on the final product.

Opening an Engraving Job

NOTE: The IMPAXX Remote Panel software will open and engrave a variety of image formats. The most commonly used formats are JPG, PNG, and TIF. These images can either be color or greyscale to start. For best results, the finalized image should be converted to greyscale prior to saving as your final image.

To open an engraving job in the IMPAXX Remote Panel, navigate to Action>Open Graphic Image.
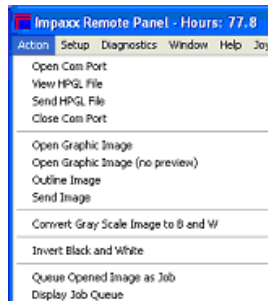
Navigate to the location of your saved image, click open, and your image will open in the remote panel window, as shown below.
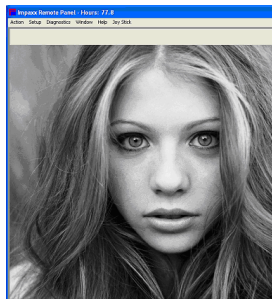
Queuing a Job

Once a graphic image has been opened, there are two ways to send it to the engraver. It can be sent directly to the engraver by navigating to Action>Send Image, or it can be sent to the job queue by navigating to Action> Queue opened image as job.

Software will ask dpi to engrave image. Enter desired dpi and click OK.

NOTE: The job queue (shown below) looks at the position of the engraving head in the x and y axes at the time that Action> Queue opened image as job is clicked.
Important to note - positioning of the head prior to queuing the job is necessary. Failure to do so will result in the image being engraved at the position the head was in prior to moving from queued position. If this happens, simply go into the job queue and click on Clear all jobs, then position the head to desired location, go back to Action> Queue opened image as job, and the job will be displayed in the job queue and have the proper coordinates. If a job appears in queue that you do not want select it and click delete. To send the job to the engraver, click on Run Jobs. The job will then engrave.
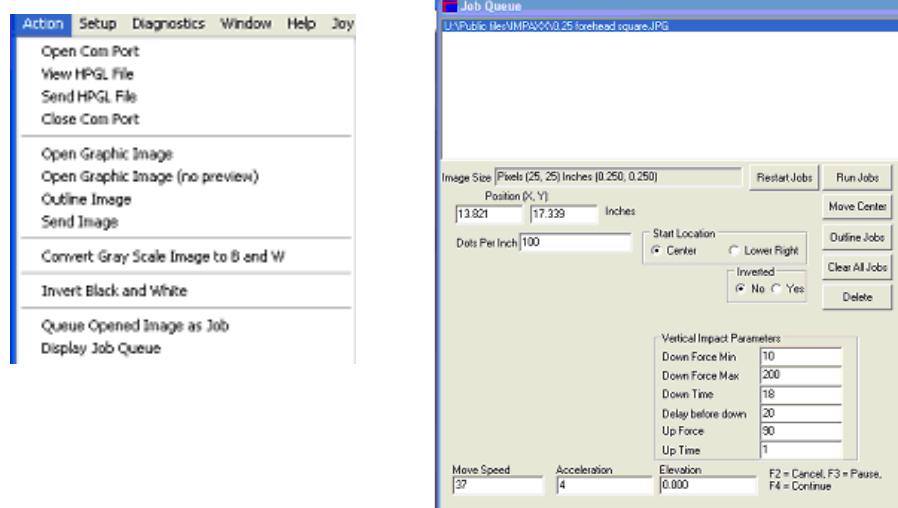
Up down controls for controlling grey scale levels
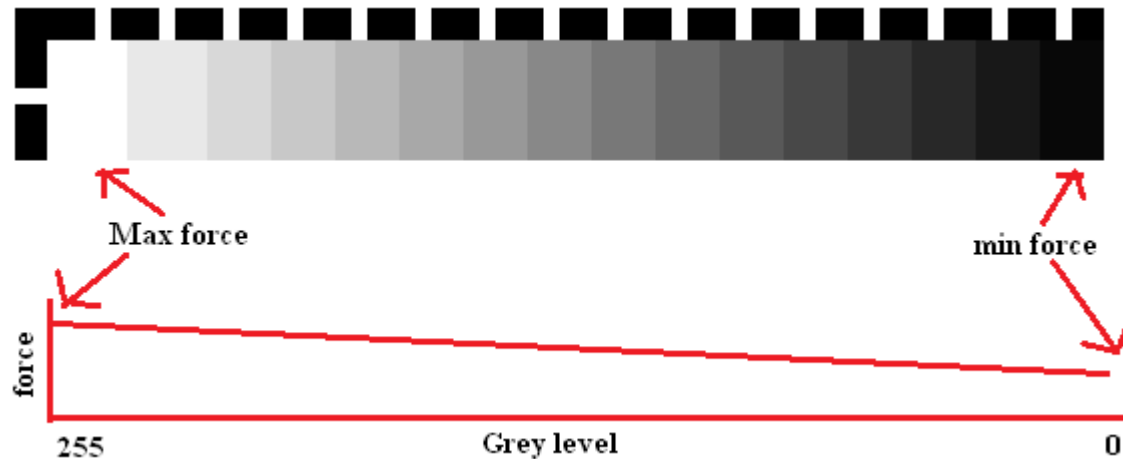
Using the supplied sample image:"1.36 greyscale.bmp"(above), located in C:\Program Files\Allen Datagraph\sample, you can engrave this image on a scrap piece of material. The object is to adjust the force required for the minimum force and maximum force so the last 2 to 4 levels of grey have almost no hits visible on the stone and the brightest white is very white. Use max force to set white and min force to set black. Lower force will produce more black, higher force will produce more white.
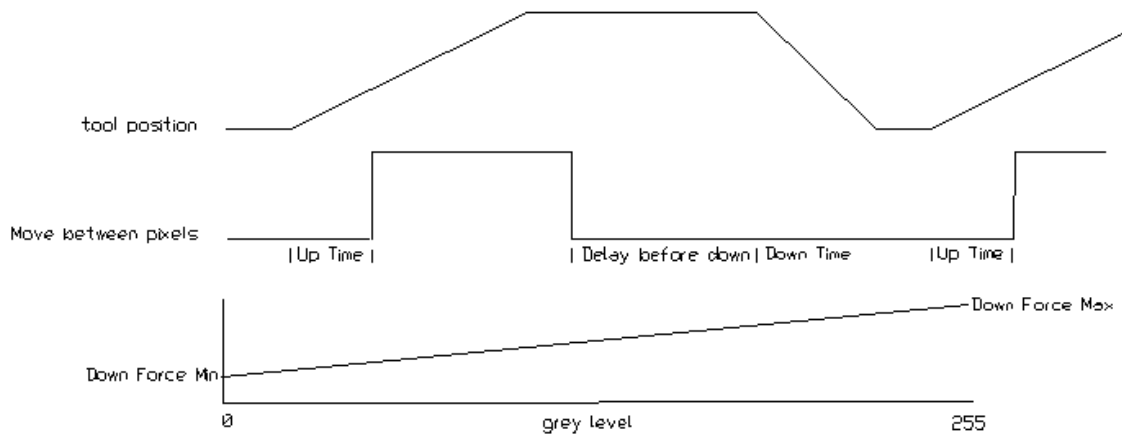
What effect does the grey scale value have on the amount of force used when punching a pixel. If the pixel grey scale value is 255 the max force is used. If the pixel grey scale value is 0 the min force is used. There is a linear relationship between the max force and the min force as represented in the graph above.

If the left hand block is not white enough you want to raise the max force. If it hits too hard you will want to reduce the max force.

If the right hand grey scale has more than 4 black squares you will want to raise the min force. If you see pixels punched in the last 2 blocks you will want to lower the min force.

By controlling the max and min force you select how hard the tool will hit the stone for each pixel. Whiter pixels hit harder and blacker pixels hit less hard.

The section below shows the settings in the other parameter menu and the job menu that control the force and the cycle time of the machine for each engraver dot.

tool position

Move between pixels

| Up Time | | Delay before down | Down Time | Up Time |

Down Force Max

Down Force Min

Down Force Min

0   grey level   255

The top graph shows the position of the tool at different phases of the up/down cycle.
Note the move between pixels starts while the end of the uptime whether or not the tool has hit the top of its stroke.

The middle graph shows the move between pixels and the wait while the tool hits the stone. High while moving, and low while still.

The bottom graph shows the amount of down force used based on the grey level of the pixel being processed.

"Up time" is number of time periods after "up force" is applied before moving between pixels. The move between pixels is started at the end of the up time even if the z axis is not all the way to the top of the stroke. This overlaps the raise time and the move time increase the number or pen down strokes per second.

Down Force Min	35
Down Force Max	180
Down Time	12
Delay before down	9
Up Force	35
Up Time	1

"Delay before down" is number of time periods after move is complete before "Down Force" is applied. This period allows the y motor to stabilize position before actually starting the down stroke.

"Down time" is the number of time periods voice coil current is applied to allow time for tool to hit stone.

The Down force will be proportional the grey level of the pixel in the image. Using "Down force min" for black pixels and "Down force max" for white pixels. With linear force in between.

Pen down stroke period is the sum of the 3 times (up time, down time, delay before down time) / 2000 + move time that is not overlapped with up time.
Eg.((1 + 8 + 9) = 18 / 2000 + 0.001= 0.01 seconds).

Strokes per second is 1 over the period. e.g. (1/0.01 = 100 strokes per second)

Offset Impact to Laser Adjustment
 Since the red alignment laser is not in the same location as the impact head, it may be necessary to fine-tune the offset from the engraving tip to the LED pointer.

Offset: Impact to Laser - Inches

| 0.55 | 0.55 |

Left Right Alignment

Left/Right Alignment (-100 to 100)

| 6 |

The IMPAXX Engraver works much like a dot matrix printer, and etches bi-directionally, meaning that it engraves when moving left to right and also when moving right to left. The resulting image consists of rows of dots. In order to align the left going row and the right going row you set the left/right alignment in the other parameter menu. If the columns are not quite aligned left to right you can adjust the left right alignment to adjust to the backlash in the y axis by adjusting. There are 4758 encoder counts per inch of travel, If the left right alignment is off by 1/2 pixel at 100 dpi the correct value will either be either +23 or -23 for the left right alignment. Engraving the sample file "checker 42x42.bmp", located at C:\Program Files\Allen Datagraph\sample, is a good way to set the alignment value. Look at the edges of each square of the checkerboard and adjust the left right alignment until you get the best alignment vertically. This is done at the factory and probably will not need to be changed.

Move between pixels

| Move Speed | Acceleration |
| 25 | 4 |

The move speed range of adjustment is 1-100% and acceleration range is 1-8 G/4 control the motor speed and acceleration while moving between pixels. Too high and machine will shake and cause misplaced pixels in the image. Too low and the image impact speed will be negatively affected.

Other parameter menu material selection:

Be sure to select the name of the material you want to use before exiting the other parameter menu.

X motor hum settings on other parameter setup page

| X Freq | 20 |
| X Amplitude | 50 |

The X Freq controls the rate of the x motor hum. We have found 20 Hz is a good number that does not make objectionable noise and does not overheat motor and is fast enough to effect the placement of pixels.

The X Amplitude controls the loudness of the hum. Higher values cause more pixel displacement. We have found you need at least an amplitude of 40 to make the rows of pixels evenly spaced and values of 65 will actually displace the pixels enough to remove the rows as there will be a slight randomness of the placement of the pixels. A value of 47 is 0.01 inches. The backlash of the system is about 40 so you get no pixel displacement until the amplitude is > than the backlash.