

# USER'S MANUAL

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Centra user manual for build 12-F or later software

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## 1 Warranty

ALLEN DATAGRAPH Digital Finishing Systems are 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 Allen Datagraph 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. Allen Datagraph does not assume any responsibility for consequential damages occasioned by the equipment, or inconvenience or interruption in operation. In case of unsatisfactory operation, Allen Datagraph or its Dealer should be notified immediately.

## 2 Technical Support

Up to 4 hours of calls in technical support is available at no charge during the warranty period. Technical support is available during business hours based on Eastern Time Monday thru Friday. Technical support outside the limits stated will be billed at current rates.

For Technical support call: 603-216-6344

Service Policy. All service is subject to ADSI service policy. You can read the policy here: [Web Site Copy](#) / [CD Copy](#)

There are many online documents available to help you to use the Centra at our technical support page at <http://www.allendatagraph.com>. Then click on Technical Support and Online Documents, then select Centra/Cypher/DFS/DLS link..

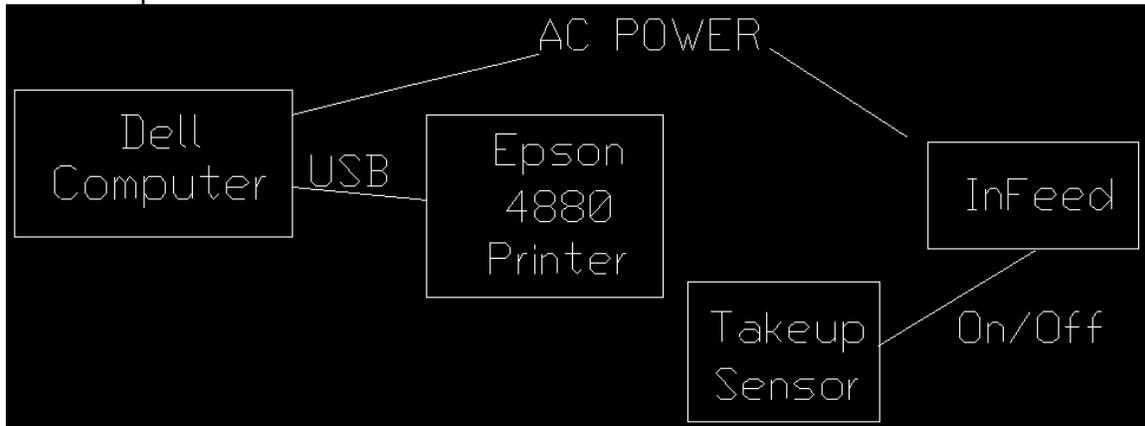
### 3 Installation

The Centra and Cypher are normally sold with on site installation. The on site installation will help you perform these steps and get you up and running.

### 4 Setting up your i-TECH Cypher Digital Label System

This section does not apply if you purchased a Centra only system.

The i-TECH Cypher Digital Label System consists of a Epson 4880 Printer, a print stand with takeup mandrel and a Centra DFS.



#### 4.1 Installation of Cypher Epson printer/InFeed/Takeup

##### 4.1.1 Setup printer base

Printer weighs 88 lb (40 kg) and should be lifted by two people.

The following are the general instructions to setup up printer.

Remove printer stand from box.

Attach ICW bracket for display monitor, keyboard, and mouse.

Mount monitor to ICW bracket using two m5 Allen bolts that are in display.

Plug in monitor to power and data cables.

A wireless keyboard and mouse are provided. Place on icw bracket.

Rest printer on stand tighten 4 clamps.

Plug usb cable, and power to printer.

The sheet tray that comes with the 4880 is not used when printing on roll media.

#### 4.1.2 Power

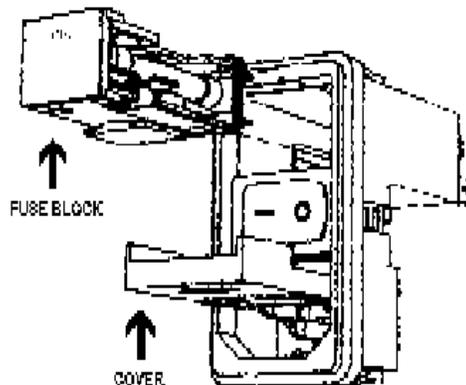
Equipment is normally factory preset for the power requirements of the your location.

**WARNING: IF YOU RUN YOUR EQUIPMENT ON 220V WITH INPUT MODULE SET FOR 110V IT WILL DAMAGE YOUR EQUIPMENT.**

- Important Note: Use of a HIGH QUALITY surge protector or uninterruptible power supply (Printer 55w, Infeed 60w, Dell computer 235w , LCD display 90w = total 440 watts) is REQUIRED by Allen Datagraph Systems. Failure to do so could affect your warranty coverage if a problem arises due to improper power connection.
- **CAUTION:** The power cord is a three-conductor cable that incorporates a safety (earth) ground connection. For the machine to operate safely and correctly, the power cord *must* be plugged into an outlet that has an earth ground contact. *Never* plug the power cord into a two-prong outlet by using a 3=2 cord adapter.
- **CAUTION:** *Never* allow roll or sheet goods to rub on the power cord because the material can cut the cord causing an electrical fire hazard!
- Computer, LCD display and printer have universal input and run from 110-240ac 49-61hz.
- The InFeed can be configured to operate from either of the following power sources:

100-132 VAC / 47-63 Hz or 180-240 VAC / 47-63 Hz

- ALLEN DATAGRAPH products are normally factory preset for the power requirements of the destination country. The machine's configuration is indicated on the power input module as either 115V or 230V. To change the configuration:
  - a. Disconnect the AC power cord from the fuse block on the power input end panel.
  - b. Open the fuse block cover with a small flat screwdriver.
  - c. Orient the fuse block so that the desired voltage appears in the fuse block cover.
  - d. Close the fuse block cover and verify that the desired voltage is showing.



POWER ENTRY MODULE

#### 4.1.1 Plug in the Equipment

Plug in power strip to surge protector or ups.

## **4.1.2 Epson CD-Rom**

The 4880 printer driver is installed at the factory. Printer ink is installed and primed at the factory. If there are any further questions on connections, please consult the supplied Epson CD-Rom or manual for the printer.

## **4.1.3 Test Print**

It is recommended to perform a test print to ensure the connection to the printer is operational.

Click on the start menu of your Windows based PC and click on "Printers and Faxes." An icon specifying the Epson 4880 should appear in this window. Right click on the icon and select "Properties or printer properties" a new menu will appear with a "Print Test Page" button. If a test page does not print, go back to your Epson CD-ROM and check your setup or consult your Epson 4880 manual.

## **4.2 Installing Wasatch SoftRIP**

### **4.2.1 Wasatch CD-Rom**

Wasatch is preinstalled on the computer that comes with the Cypher. Each complete i-Tech Centra Digital Labeling System comes with Wasatch SoftRIP, a program used to for roll-to-roll printing on a variety of different printers. If you have further questions about your SoftRIP installation, please consult your Wasatch SoftRIP user manual.

### **4.2.2 Setting up the 4880 in Wasatch**

To setup your Wasatch SoftRIP to manage your Epson 4880 printer, follow these instructions:

1. Open Wasatch SoftRIP
2. Go to the PRINT menu at the top of the screen then select SETUP and a new menu will appear.
3. Click the PRINTER MODEL dropdown menu and elect EPSON then 4880 from this menu.
4. To setup the physical connection so that SoftRIP knows what port the printer is connected to, click EDIT and then PROPERTIES. A new menu will appear. The bottom of the menu will list the physical connection. Select the Epson 4880 from this drop down if it has not already been selected.

### **4.2.3 Test Print**

To ensure the connection to the Epson 4880 printer is operating correctly, in SoftRIP go to FILE then OPEN and select one of the training label files on the AllenDirectCUT CD "AxxisTrainingLabel\_5\_inch.eps", labels in CoreLabel.zip, IllustratorLabel.zip in the techsupport\axxis directory or any other EPS, PDF, JPEG or TIFF that may be readily available. The file will load in SoftRIP, to print it click on the printer icon at the top of the screen.

## 4.2.4 Installing Color Profiles and Settings

ADSI has provided a set of ICC color profiles and pre-existing settings that work with a variety of substrates on the 4880. These are preinstalled on the computer that comes with the Cyper. Select the profile that fits closest to your current substrate, whether it is a matte or gloss paper or a BOPP Film, under the image configuration. If you would like to learn how to develop your own ICC profiles for your own materials, please contact Wasatch or visit their website for further instructions.

## 4.3 i-TECH Centra Installation

### 4.3.1 Setup DFS on stand

The DFS requires a special stand. The i-Tech Centra DFS mounts on the supplied stand. The Centra weighs 250+ Lbs (113 kg) at least 4 people are needed to move the Centra from box to the stand. Following are the general steps necessary to take the Centra out of the box.

Take box off Centra

Unbolt angle brackets holding Centra from pallet

Assembly stand

Place on Centra on stand with angle brackets

Remove bolts one at a time from angle brackets

Attach to stand using same bolts.

Attach drop brackets for chutes

Insert station bars and drop magnet bars in track.

Attach cable for sensors red wire to red wire.

Attach two triangle shaped gussets to stand using 4 machine screws provided.

Attach Infeed to this plate using 6 Phillips head and flat washer and locking washer.

Complete assembly instruction are [Web Site Copy](#) / [CD Copy](#).

### 4.3.2 Power

**WARNING: IF YOU RUN YOUR EQUIPMENT ON 220V WITH INPUT MODULE SET FOR 110V IT WILL DAMAGE YOUR EQUIPMENT.**

Note there are two power input modules, one for Infeed and one for Centra.

Important Note: Use of a HIGH QUALITY surge protector or uninterruptible power supply (700 watts) is REQUIRED by Allen Datagraph Systems. Failure to do so could affect your warranty coverage if a problem arises due to improper power connection.

**CAUTION:** The power cord is a three-conductor cable that incorporates a safety (earth) ground connection. For the machine to operate safely and correctly, the power cord *must* be plugged into an outlet that has an earth ground contact. *Never* plug the power cord into a two-prong outlet by using a 3=2 cord adapter.

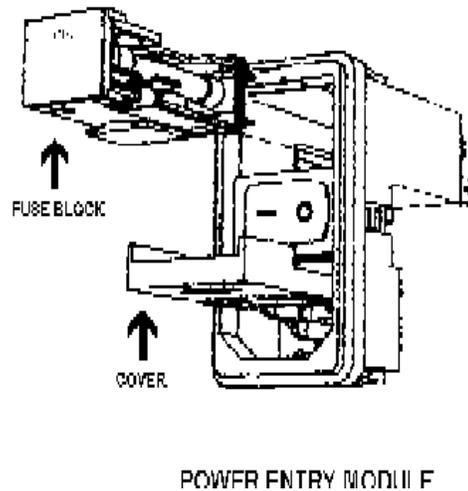
**CAUTION:** *Never* allow roll or sheet goods to rub on the power cord because the material can cut the cord causing an electrical fire hazard!

The finisher can be configured to operate from any of the following power sources:

100-132 VAC / 47-63 Hz or 180-240 VAC / 47-63 Hz

ALLEN DATAGRAPH products are normally factory preset for the power requirements of the destination country. The machine's configuration is indicated on the power input module as either 115V or 230V. To change the configuration:

- a. Disconnect the AC power cord from the fuse block on the power input end panel.
- b. Open the fuse block cover with a small flat screwdriver.
- c. Orient the fuse block so that the desired voltage appears in the fuse block cover. The DFS power entry module requires one 5 amp fuse for 110 vac or two 2.5 amp fuses for 220 vac. The infeed requires one 1 amp fuse for 110 vac or two 0.5 amp fuses for 220 vac.
- d. Close the fuse block cover and verify that the desired voltage is showing.



### 4.3.3 Connection to PC

Do not connect the Centra DFS to the computer until told to do so by the installation CD. Connection from PC to Centra is either by USB or Ethernet. If you want to read about using the Ethernet port for the cutter see the document [Website Copy](#) / [CD Copy](#).

### 4.3.4 Allen Datagraph CD-Rom

The finisher utilizes either USB (universal serial bus) interface or Ethernet connection to the computer.

The Centra comes with an installation CD that will walk you through connecting your equipment to your computer and installing software.

The Setup CD contains:

1. An installation program that walks you through connecting your Centra DFS to your computer.
2. The Remote Panel Utility program for managing finisher settings.

3. A current revision of firmware. "Firmware" is software that controls the machine functions. ***The firmware on this disk is provided for update purposes only and should not be installed on new machines.***
4. The DirectCut printer driver. This driver been tested with AllenCAD, CorelDRAW (versions 10-x5), Adobe Illustrator (versions 10-cs5), Flexisign, Inkscape, and PowerCAD. It should also work with any program that sends vectors rather than bitmaps to the driver. The DirectCut printer driver allows cutting directly from windows graphics programs without requiring additional software purchases. Note: DirectCut requires ownership of Allen Datagraph Equipment to use. Requires: Windows 7, Windows Vista, or Windows XP. Updated versions of the DirectCut printer driver is available on the tech support page at the Allen Datagraph web site at <http://www.allendatagraph.com/>.
5. During installation a test cut is performed.
6. Users Manual and sample jobs.
7. A complete copy of the technical support section of the ADSI website at the time the machine was shipped. To access this offline copy of the web site answer no to question as to whether you want software installed on this computer.

### 4.3.5 Software Updates

Software updates after the product ships will be available on the tech support section of the <http://allendatagraph.com> web site.

To update to a later version of software when recommended to do so by the tech support department, go to the web site. Click on tech support, then online documents.

Select Centra or Cutter driver from list of selections.

Find the software update and click on it to download the setup program from the web site.

## 5 Operation of the i-TECH Centra Digital Label System

### 5.1 Setting up your label job



The target should be a black rectangle on white media or a contrasting color to background. See colors in [Web Site Copy](#) or [CD Copy](#). The recommended Mark Size is 0.25 inch (6 mm). The sensor relies on reading the change in intensity of the reflection of the red LED pointer. When printing process colors on white media the best color is usually black. Certain spot colors are difficult. For example silver spot on white, while to the eye there is contrast the reflectivity of the two is sometimes nearly the same. If there is trouble with certain materials detecting the target you can print the target in a yellow or white field. The size of the yellow field should be double the scan length. (**Note:** in order to get an accurate scan no other printed marks may appear in the yellow or other high contrast colors scan area. The printer color alignment marks can appear on the inside edge of the target or the other side of the media.)

The mark should be placed at least 0.25 inches (6 mm) from the edge of the media and the spacing between frames should be at least 0.25 inch (6 mm). (Advanced usage: You can place the target closer to the edge of the material if you use inside out scanning. See [Web Site Copy](#) or [CD Copy](#))

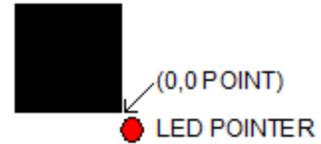


The number of rows and columns of labels between registration marks defines a set or frame of labels. A frame of labels can be one row or several rows of labels. There are several aspects to consider when deciding on how many rows of labels to print on one page. The main consideration is the trade off between speed (it takes a about second to perform the find origin (FO) command and scan the registration mark) and registration accuracy. The more often you scan the registration mark (the closer the marks) the more accurate the cut registration will be. If the job allows for overprinting the cut line, then registration may be less critical and eliminating some of the registration marks can speed the job. Generally registration marks should be placed at least every 12-20 inches (305-508 mm) on Centra. Best practice is to print registration marks for each row then adjust the cut job to skip one or more marks if desired. This procedure also insures equal spacing of the labels and gives complete flexibility for cutting. The distance between jobs, the last cut line of the previous frame and the target on the next frame must be between -4 and 4 inches (101 mm). If the distance between frames is less than the scan length, then the target must be outside of the area where the labels are printed. (**Note:** every frame of a label run must be identical or you won't be able to use the copy command). Maximum frame size is 34 inches (86.4 cm)

## 5.2 Explanation of SmartMark™

The theory of operation relies on the SmartMark™ sensor sending an analog signal to the embedded computer during a scan. The data is analyzed after the scan to automatically create a threshold, find the edge of the target and eliminate noise. The Centra scans the mark in both x and y directions and calculates the intersection of the 2 scans. The Centra computer then assigns that intersection as the 0,0 point of the Centra coordinate system and matches that to the origin point (minimum x, minimum y) of the HPGL cut file.

The Centra uses a special HPGL command, FO, to start the registration mark sensing function. It automatically re-registers the coordinate each time the FO HPGL command is received. As part of the setup a “x move between jobs” is input via the printer driver options which moves the sensor to the approximate position of the next copy’s or next frame’s registration mark. The Centra expects the target for the next frame to be within ½ the scan distance of the end of the frame.



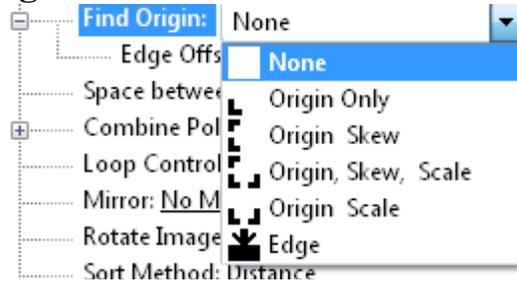
The Red LED pointer must be manually positioned with the joystick buttons at the approximate 0,0 coordinate position prior to sending the first job. The SmartMark™ system automatically repositions the sensor for subsequent copies.

The positioning process must be repeated if the joystick buttons are used. This is helpful because it allows the system to be reinitialized when needed. Some printers require a leader between jobs and this feature is a very easy way to deal with the issue.

Once the LED pointer is positioned as shown, the SmartMark™ is ready to operate and will scan the registration mark when it receives a FO command in the job stream whether on the first copy or on subsequent copies. Since the FO command is embedded in the beginning of the cut file the scan of the registration mark is performed at the beginning of each copy or frame of labels and on subsequent copies.

### 5.3 Types of SmartMark™ Scanning

There are five types of SmartMark™ scanning available. They are shown in the image to the right. The scan type is selected in the printer driver preferences.



Origin Only and Edge are the only types normally used on the Centra.

**Origin Only** is used on printed media where you want to cut out preprinted labels. Origin Only does a alignment with the visual sensor at the origin only.

**Edge** is used when you are cutting blank label stock. Edge offset is used only when cutting blank labels on unprinted material. By selecting EDGE in the driver's printing preferences menu, the SmartMark sensor will detect the edge of the media instead of a registration mark, then offset into the media by that amount and cut your blank labels.

**Origin Skew** is used if the media is not necessarily loaded straight. This scans the origin and the skew mark and rotates the cut image to match the cut location at the two scanned locations. Since the Centra keeps the media straight you do not normally need to scan the skew mark. No scaling of the cut image is performed with Origin Skew scanning.

**Origin Skew Scale** does alignment at the origin, rotation and scaling in both x and y axes are preformed. This scan type requires that the sensor size parameter be correct so that cut image is same size as printed image. Normally the y axis does not have any scaling

errors on the printer so you do not need to correct the skew point and scaling at the scale point.

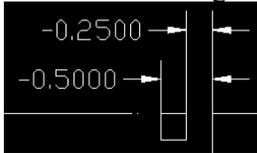
**Origin Scale** does alignment at the origin, rotation and x-axis only scaling at the scale point. It assumes that the scaling in the y-axis is correct. Normally you do not need to scan the Scale location because if you have a scaling error in your printer it is normally in the x axis and it is very consistent. If the printer you are using has a x axis scaling error you can normally correct this either in the printer or you can use calibrate to printer to get the Centra to cut the same size as the printer.

## 5.4 Designing Labels

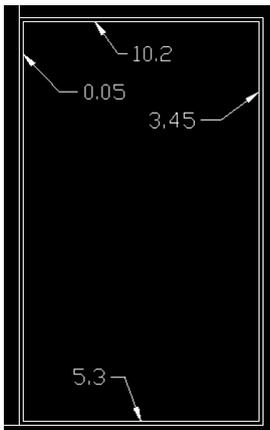
### 5.4.1 Planning Label

This tutorial will design a label for the Epson printer and Centra DFS with Illustrator and CorelDraw. It will show how to create a bleed area to minimize visual errors on the completed label. First we define our layout for a set of four 3x5 labels so we can create a set of locations in the artwork generation program workspace. We lay out the frame with the x axis (media movement going up and down on the screen and the y axis (operator/front to gear/back). The target in this orientation appears in the upper left corner of the screen. This allows for no rotation when the sending the job to the printer.

Then add the target



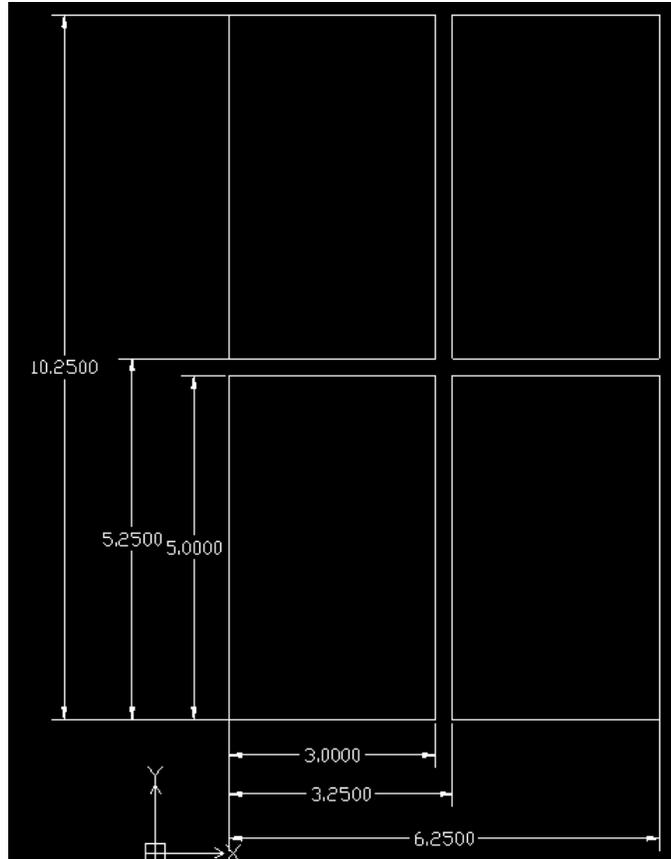
Then add 0.50 bleed on one label



So we need horizontal locations at:  
0, 5, 5.25, 5.3, 10, 10.2, and 10.25

and vertical locations at  
-0.5, -0.25, 0, 0.05, 2.95, 3, 3.25, 6.25

Add one to vertical so they are all positive numbers  
0.5, 0.75, 1, 1.05, 3.95, 4, 4.25, 7.25



Now that we have work space planned choose program to design your artwork.

## 5.4.2 Using Adobe Illustrator

Open Illustrator and create a new document.

Change units to inches

Click ok

Click on view -> rulers if rulers missing

Click on window -> layers if layer menu missing

Click on window -> color if color menu missing

Now create two layers. One called “dielines” and one called “print”. This is done from the layer window. Click on new layer button. Then rename the layers as dielines and print by double clicking on layer name, changing name and clicking on ok.

Next create the die lines. Click on the dielines layer on the layer window.

Create the die line for the target

Click on line segment tool  and then click on layout area

Enter length 0.125 and angle = 0°

Click on object -> transform -> rotate enter 90° and click on copy.

Using transform panel move top of vertical segment to x = 0.5, y = 10.25.

Move left of horizontal segment to x = 0.5, y = 10.25.

Click on rounded rectangle from tool menu  and then click on layout window. Enter the 2.9 for width, 4.9 for height and 0.166 for corner radius. Using transform panel move object so the lower left as at 1.05, 5.3.

Then click object -> transform -> move. Enter distance of 3.25 angle 0°, then click copy.

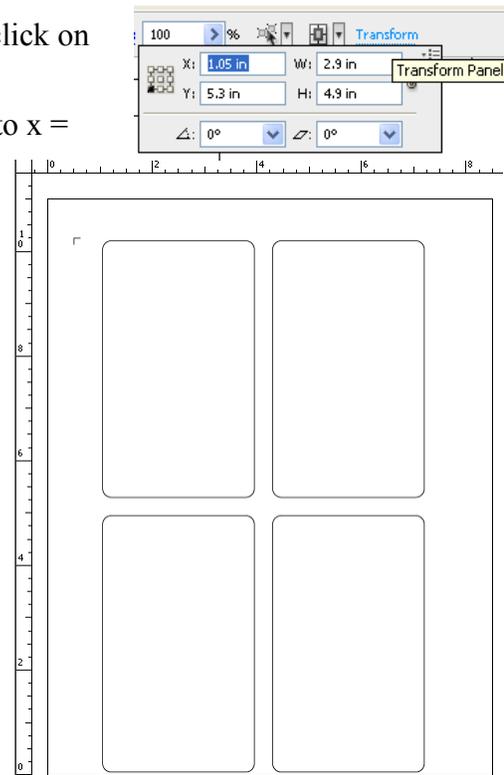
Select both rounded rectangles.

Then click object -> transform -> move. Enter distance 5.25 angle 270°, then click copy.

This completes die line layer

Next create the print. On layer menu select print layer

To create the target, click on rectangle tool , click on layout window, enter 0.25, 0.25 for size.



Using transform panel move lower left to 0.5,10

On the color menu select fill and change color to black

Change out line stroke to none. The target color should look like this when you are done.



**Note: if not have a stroke on the edge of the printed target the print and cut will not line up.**

To create the bleed background, click on rectangle tool, then click on layout window. Width 3, height 5

Move lower left corner  $x = 1$ ,  $y = 5.25$

On color window, select cmyk fill to  $k=85$   $cm=0$ , and no stroke on color menu

Now paste in foreground of label. (I used file ICON\_Axxis\_Cutter.bmp.) Size and center label on background just created.

Select background and foreground of label. Then click on object -> group

Then click object -> transform -> move. Enter distance of 3.25 angle  $0^\circ$ , then click on copy button.

Select both print labels

Copy the two labels with distance 5.25 angle  $270^\circ$

This completes the print layer.

This completed label file is at this link [Web Site Copy](#) / [CD Copy](#).

Use File -> save to save the file on your hard drive. Use file type EPS so it can be imported into Wasatch.

### 5.4.3 Using CorelDraw

First setup workspace to Allen Datagraph.

Open CorelDraw, Select -> tools -> options -> work space. Place a checkbox in front of Allen Datagraph.

Next turn on 2 dockers:

Select Window -> Dockers -> properties

and

Window -> Dockers -> Object Manager

Verify snap to guide lines is checked from the view menu.

This adds two control windows on the right side of the program

Now we can start the design. First we enter the guidelines

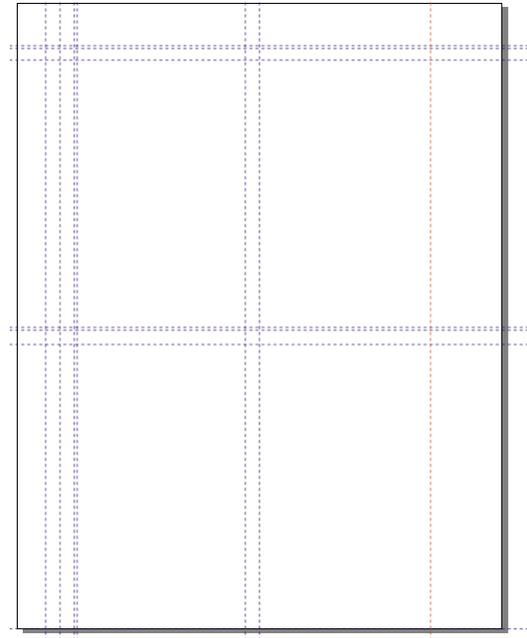


Select Tools -> Options -> Document -> Guide Lines -> Horizontal

Enter the horizontal guides determined in the layout (0, 5, 5.25, 5.3, 10, 10.2, and 10.25).

Then select vertical and enter the vertical guides (0.5, 0.75, 1, 1.05, 3.95, 4, 4.25, 7.25)

When done your workspace will look like this.

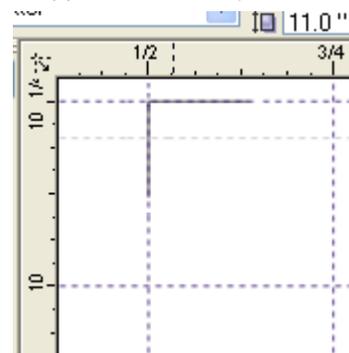


Now create two layers. One called "dieline" and one called "print". This is done from the object manager tab. Click on new layer button. Then rename the layers as dielines and print by right clicking on layer name.

First create the die lines. Click on the dielines layer on the object manager.

Use freehand tool  to draw a two sides of the target..

The use the object properties to verify the pen nib tab  has width of hairline, color black. On the paint bucket tab  verify no fill  selected. When you are done the die lines for the target should look as follows:



Next use the rectangle tool  to draw a rectangle on the inner guide lines (1.05,5.3 to 3.95,10.2). Select the rectangle and using the object properties / rectangle tab  change the corner roundness to 15. The die line will then look like this.

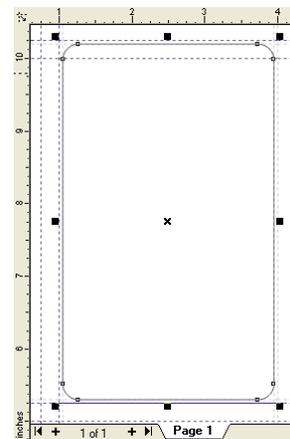
Using copy, paste, and arrange -> transformations -> position move copies of rounded rectangle to each of the following relative positions from the first rectangle.

- 3.25, 0
- 0,-5.25
- 3.25,-5.25

The dielines layer is now complete.

Now in the object manager right click on dielines layer and uncheck the visible so rest of label creation does not change the die lines.

Select the print layer so objects create reside on this layer



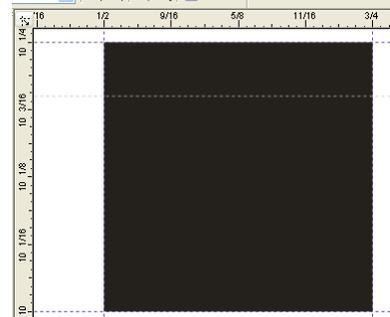
Draw a rectangle from outer guide lines (1,5.25 to 4,10.25). Then fill the rectangle with the object properties paint bucket, uniform fill, bleed color and apply. Next insert the artwork for the label and center it in the label. (I used file ICON\_Axxis\_Cutter.bmp.)



Select the label and the bleed using shift key to select 2nd item. Group them with arrange -> group. Using same procedure as above copy, paste, arrange -> transformations -> position move copies of printed label to each of the following relative positions from the first rectangle.

- 3.25, 0
- 0,-5.25
- 3.25,-5.25

Lastly draw a filled rectangle with no lines in the target position. Using object properties pen nib tab, select width = none. On the paint bucket tab select uniform black fill.



**Note: The Centra will not align print to cut correctly, if you have a pen width defined.**

The completed label file is at this link [Web Site Copy / CD Copy](#).

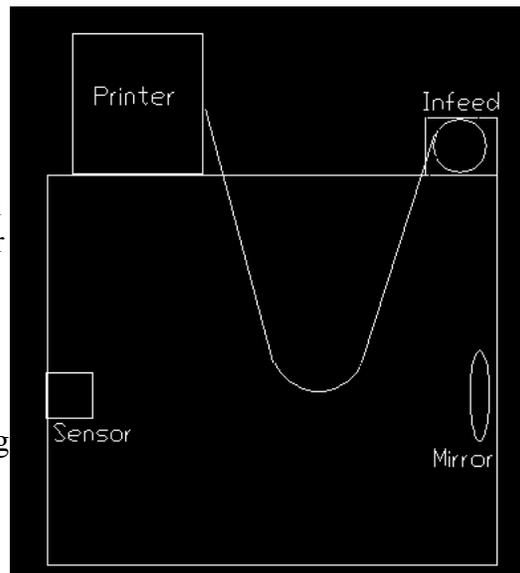
Use File -> save to save the file on your hard drive. Then use file export to export file as as EPS so it can be imported into Wasatch.

## 5.5 Webbing the Cypher Printer

Refer to the Epson's printer guide that was included with the 4880 roll printer, before threading the web - especially the "Using roll paper" section of the printer guide

The diagram above shows the media path. Turn on the printer base station and press the < Paper Source button. The printer takes a rolls of media with a width between 8.3 to 17 inches

Thread thru printer as described in the Epson printer guide. The output tray is not used. The Infeed turns on when there is media interrupting the sensor. Tape media to empty core on Infeed. Turn on Infeed. Block sensor path to insure media takeup is going correct direction.



## **5.6 Printing your label**

### **5.6.1 Loading File into Wasatch**

Refer to the Wasatch users manual for additional instructions on using Wasatch rip software.

Open Wasatch SoftRIP and go to FILE and OPEN. Browse to the file saved from Adobe Illustrator or Corel Draw and open it. The file should appear in the job tab. You should have 3 tabs at the top of the screen; job, layout and queues. A template tab will be available if you have purchased Wasatch's variable data option.

The job tab allows you to prep the job before printing an entire roll of labels. Using the cursor click on the image and draw a selection box around the area you wish to print. This box can be adjusted by clicking on the edges and dragging them where needed.

Once selected, the file must be rotated so that the labels are in the right orientation when they need to be finished. Using the rotation arrows at the top of the screen, rotate the labels 90 degrees so that the SmartMark is in the lower right hand corner of the print. Making sure that the SmartMark is in this corner will ensure that the labels will not have to be re-rolled after printing.

### **5.6.2 Set paper width**

To set the media width, go to PRINT then SETUP.

On the right side of the Image Configuration will be an EDIT button. Click and a new menu will appear. Click Properties and another menu will appear. In this menu, there are several features you can alter just as you would on any home or office deskjet printer.

Set the width of the media. All units in Wasatch are in inches, to change this option in Wasatch, please consult your Wasatch manual.

Once the media width has been set, press OK and then press OK again on the previous menu until the initial print setup window is in view. Next to the paper width select "Set Maximum Width" and then check the "Width Center" box. This will ensure that labels are printed in the center of the media.

### **5.6.3 Test print**

Simply press the printer icon button and one copy of the image will begin to print.

### **5.6.4 Load Label into Layout Tab**

If the test print is acceptable, right click on the image in the job tab and select "Add To Layout." The image will appear in the layout tab. Right click the image again and select ADD COPIES, enter the number of copies you would like to print and press OK.

Wasatch will populate the layout tab with that many copies.

On the left of the screen is a tab called UNIT OPTIONS. In this tab you can specify the gap between labels. The default is .125 inches but can be changed to your specification.

### **5.6.5 Print**

Simply press the printer icon button and the job will begin to print.

## 5.7 Webbing the Centra DFS Cutter

The Centra loading instructions are in the following linked documents. [Web Site Copy / CD Copy](#). and [Web Site Copy / CD Copy](#).

## 5.8 Media Mandrel Tension Controls

To the right of the control panel are two knobs (four with laminator option) and one switch. The knobs control the torque on the mandrel, which in turn controls the tension of the web as influenced by the mandrel that the knob controls. Each knob is labeled with the name of the mandrel it controls. Turn the knob clockwise to increase the tension or counterclockwise to decrease the tension.

There is a learning curve involved in setting the mandrel tension and the type of media and gutter width between labels affects the settings. A fair amount of trial and error is required to get the setting correct for certain difficult medias. The following will give you basic guidelines for setting up the mandrel controls

**Take-up mandrel** If not slitting set the tension as low as possible while maintaining adequate roll tension and tracking. The setting of this mandrel is the most important as it effects tracking and weeding. If slitting the tension must be set somewhat higher to insure there is enough tension on the web to allow for the slitting knife to penetrate the media.

**Weed mandrel** Set the tension as high as possible without breaking the weed material. As the percentage of weeded material gets smaller, the gutters get smaller, the less tension is required to pull the weed material off the backing while at the same time the smaller gutters can not stand as much tension without breaking.

**Lamination material mandrel** Set the tension low or off. It requires a very slight back tension on the lamination material to prevent wrinkles

**Lamination weed mandrel** Set the tension only high enough to insure the interlayer is pulled off the lamination material.

**InFeed Tension.** Normally you set the Infeed to center position and just use the motor drag to tension the media.

## 5.9 Cutting your label

After webbing the finisher, press the load button on the front panel to fill the input accumulator. This makes the finisher ready to receive data.

### 5.9.1 Force and speed

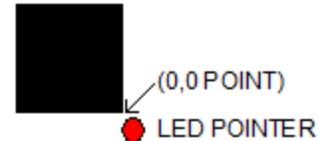
To adjust speed and force applied to knife use the up and down arrow buttons on the front panel. Start with speed = 100% and force of 30%.

## 5.9.2 Test cut

Pressing the TEST CUT button on the front panel of the finisher will perform a set of 2 circles, square, and triangle cut on the paper. Use the buttons around the select key as a joystick to move the carriage to show the cut pattern. Then use a tweezers or a matte knife to pluck out the circle and the square. Face doc should pull away from backing and not rip. Then pull out the triangle and inspect the backing. If the force is adjusted correctly you will see a light scoring of the backing material. Increase the force to apply more pressure to the knife.

## 5.9.3 Lining up SmartMark™

Use the buttons around the select key to move the carriage left, right, forward, backward until the led pointer is within 1/8 inch (3 mm) from the gear side take up corner of the target to be scanned. The gear side of the machine is away from the operator. The take up side is on the right as you look at the machine.



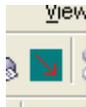
## 5.9.4 Sending file with Illustrator

Load the file you want to cut with Adobe Illustrator. If the layer window is not visible you can make it visible by clicking on Window -> Layers. Select the dielines layer on the layer menu. Click on File -> Allen DirectCut to open the DirectCut for Illustrator.

### 5.9.4.1 Sending file with CorelDraw

Load the file you want to cut with CorelDraw. If the object manager is not visible you can make it visible by clicking on Window -> Dockers -> Object Manger. Select the

dielines layer on the object manager tab. If the Allen



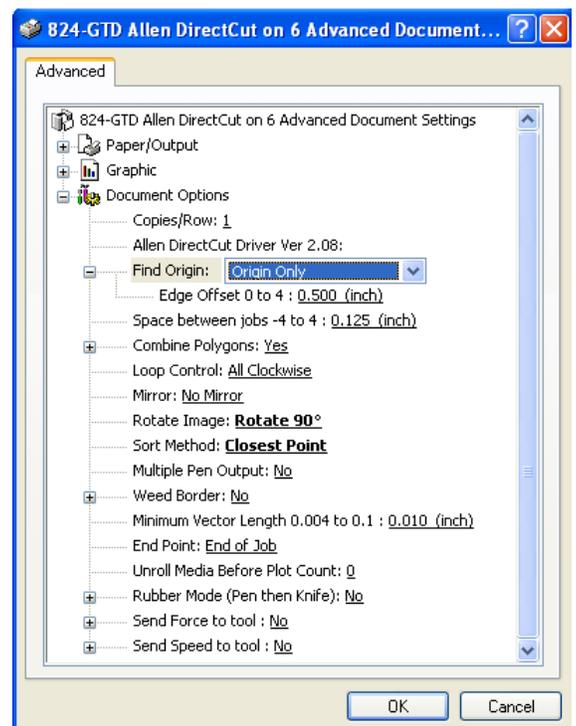
DirectCut tools does not appear near the view button, select Tools -> Options -> WorkSpace. Then check Allen Datagraph. Click on the Allen DirectCut button to open the DirectCut for CorelDraw preview window.

### 5.9.4.2 Origin only

Verify the printer you want to send the die lines to appears in the drop down box between the Cut and Properties button. Click on the properties button and select find origin type you want to use. Select origin only for normal use.

### 5.9.4.3 Sort Method

Use sort method Closest point for optimum output path.

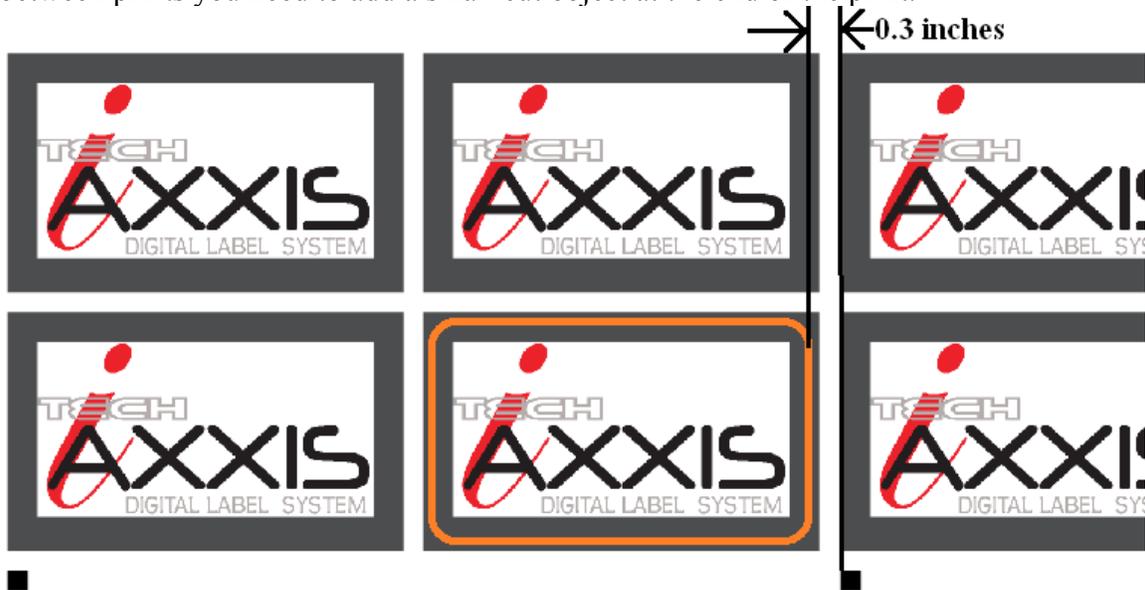


#### 5.9.4.4 Rotation

In the preview window select DFS origin. This moves the origin to the upper right. This matches the view you see when you look at the front of the Centra. Use the rotate selection in the properties until the origin of the preview is in the upper right. Select rotation from (none, 90°, 180°, or 270°).

#### 5.9.4.5 Space between jobs

The space between jobs is the distance between the last cut of the previous frame to the leading edge of the target of the next frame. In the case of the sample label designed earlier the space between jobs is 0.050 inch (size of bleed) and the space between prints. Since we designed the label panel with 0.25 inch between the two rows, it make since to set the space between labels on the print to 0.25 inch so the total space between jobs should be set to 0.3. If you want the space between jobs to be the same as the space between prints you need to add a small cut object at the end of the print.



#### 5.9.4.6 Multiple pen output

If you are using a single color and a single force set multiple pen output to No. If you want two different forces applied to knife during frame you have to set multiple pen output to Yes. You can then turn on Send Force to tool and select different forces for different pen colors.

#### 5.9.5 Cutting label

After you have set the properties click ok to close property window. Then click on the Cut button to send the job to the finisher. Once correct job is sent to finisher the computer can be used for other purposes as you can use the copy button on the front panel to send additional copies of the frame to the finisher. Select copy, use up/down arrows around select key to select number of copies or select -1 for copy count for count up mode. Then press select key.

## **5.9.6 i-TECH Centra Remote Panels and LCD panel**

The Centra has a 4 digit display and a 16 button panel. The display is used to interact with the operator showing current status. If the menu is not active the first digit is C for cut, 2<sup>nd</sup> digit is speed (0 = 0-4%, 1= 5-14%, 2= 15-24% ...), and last 2 digits are force.

### **5.9.6.1 i-TECH Centra DFS remote panel**

The remote panel is installed by the installation cd. It appears as an icon on your desktop and in the start menu at Start -> All Programs -> Allen Datagraph. Double click on the icon on the desktop to start the remote panel.



### **5.9.6.2 Action Menu**

#### **5.9.6.2.1 Save / Restore Calibration**

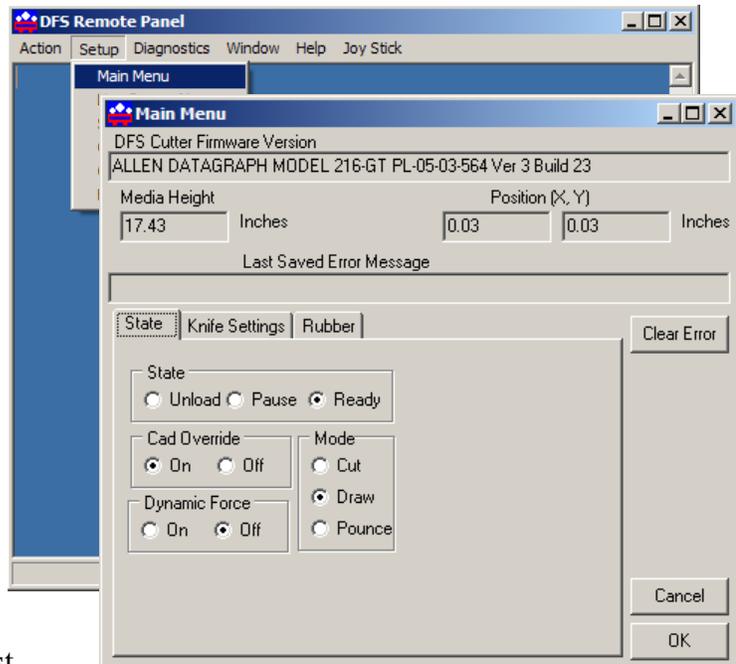
This command saves line sensor parameters that depend on the calibration and calibration of the Centra or allows loading the calibration parameters from a file. This command allows calibration of the Centra to multiple printers. It also allows backing up your settings to your hard drive in case of inadvertent operator changes to settings.

#### **5.9.6.2.2 Load / Save Settings from Cutter to File,**

These commands save the settings (see setup settings menu) and some line sensor parameters that are in the Centra to a disk file or loads settings saved by this command from a file and sends them to the Centra. This allows you to have more than 6 setups for different materials. It also allows backing up your settings to your hard drive in case of inadvertent operator changes to settings.

### 5.9.6.3 Setup -> Main Menu

The Main menu opens the main menu window. The top window shows the model number and firmware version (build 23 in the sample). The media height window shows the maximum dimension the y axis is set to cut. The Centra will send this dimension (called the clip limits) to the software so that the software program can determine if the specified cut file will fit. If a file with dimensions larger than the clip limit is sent to the Centra, the cut will be truncated. The position window shows the current location of the knife in the Centra coordinate system. The Last



Saved Error Message window displays the last error. Errors displayed here may be old. The error may have occurred earlier in the Centra's life. The **Clear Error** button clears the memory of the saved error notification. Some features are advanced and only appear if menus = advances is selected in setup → options.

#### 5.9.6.3.1 State Tab

The **State** radio buttons allow the user to set the condition of the Centra. **Unload** means the Centra is not loaded and is not ready to receive a cut file. The **Pause** radio button means the Centra is currently paused and the **Ready** button means the Centra is loaded and ready to receive the cut file and proceed with cutting. This set of buttons duplicates the Load and Pause buttons on the front panel.

The **CAD Override** radio buttons enables or disables the CAD override function. With the function **On**, the Centra will ignore some of the HPGL control commands sent from the cutting software. With the function **Off**, the software can control these HPGL functions. Some CAD systems will work correctly only when this feature is set to on.

These commands include:

AS set acceleration  
FS set force  
KA set minimum angle  
KN set knife offset  
IP input P1/P2  
RO rotate  
SC set scale  
SP select pen  
ST select tool

UV up velocity (move speed)  
VS down velocity (cut speed)

**The Mode** radio button sets the operation. Select cutting, pen plotting/drawing or pouncing. The Centra will normally only use the Cut function.

**The Dynamic Force** radio buttons (an advanced option) engages the dynamic force function, which instantaneously adjusts the force on the fly based on the actual velocity of the knife blade. All Centras must accelerate and decelerate as they cut around corners. Some medias require different force settings for different speeds. This parameter allows for building a database for these materials and when enabled will greatly improve the cutting on these materials. (See the Setup → Dynamic Force Section for more details).

### 5.9.6.3.2 Knife Settings Tab

**Draw Speed** displays and sets the velocity of the knife when it is actually drawing or cutting. The draw speed is the speed the knife travels around the periphery of the items being cut.

**Force** displays and sets the cutting force. The range of force is 1 to 100% represent 10 to 550 grams of force.

**Knife Offset** is the distance between the center of the knife blade and the knife tip. Allen Datagraph blades have a 0.012 inch (.030 cm) offset. If you have objects that do not close correctly, you might have to adjust the knife offset to correct the problem.

Description	Range	Value
Draw Speed	1 - 100 %	66
Force	1 - 100.0 %	18.0
Knife Offset	0.001 - 0.100 inch	0.012
Hole Distance	0.01 - 1 inch	0.118
Tear Size	0.008 - 0.1 inch	0.015
Min Speed Label Mode	1 - 100 %	1
Max Speed Label Mode	1 - 100 %	83
Allow Auto Speed Change		<input type="checkbox"/>

**Hole Distance** and **Tear Size** are used when the Centra is in the Pounce Mode. The hole distance setting is the distance between holes and the tear size is the distance the Centra moves with the pounce tool down to tear the media and enlarge the pounced hole.

**Min Speed Label Mode** and **Max Speed Label Mode** are used to set the limits for the automatic speed setting function of the Centra. The cutting speed will automatically increase or decrease, within the limits set here, to keep pace with the in feed device. Normally you set the Max to 100 and the min to 1.

### 5.9.6.3.3 Rubber Tab

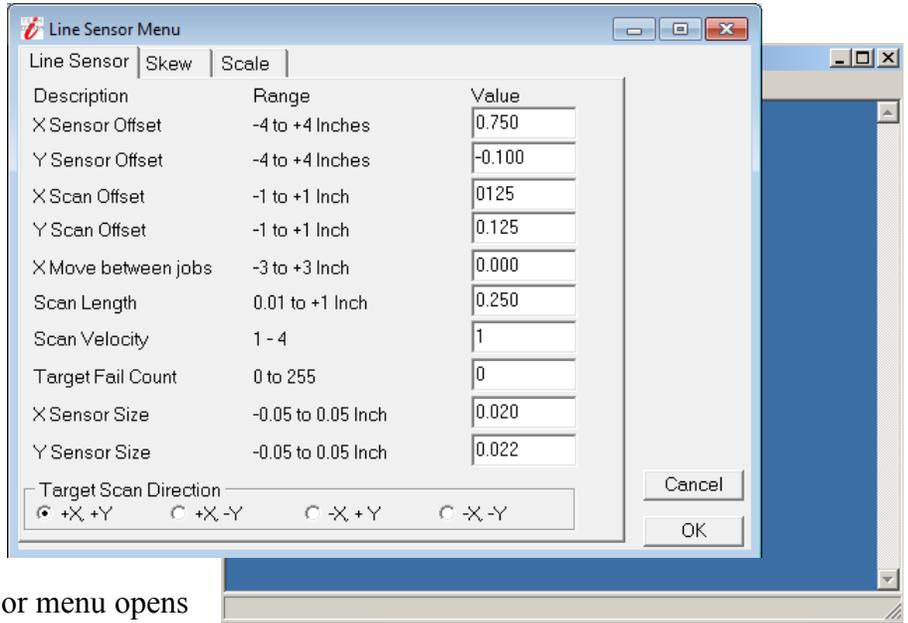
This tab is not used on the Centra unless you are doing stencil cutting at high force values.

**Rubber Minimum Angle** displays and sets the angle between consecutive vectors that when exceeded will invoke the tangential emulation mode. At angles less than the value set in this parameter the Centra will move between vectors without evoking the tangential emulation mode.

**Stencil Force** is the force separation between drag knife mode and tangential emulation cut mode.

Tangential emulation cut mode is normally used for rubber or very heavy material. The Centra will normally not cut this type of material so this value should be set to a high force %.

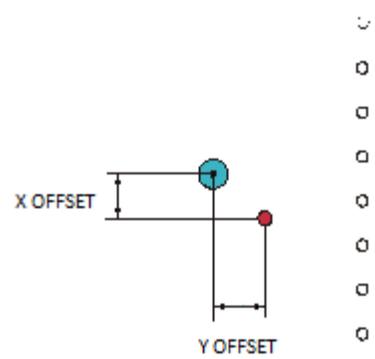
#### 5.9.6.4 Setup -> Line Sensor



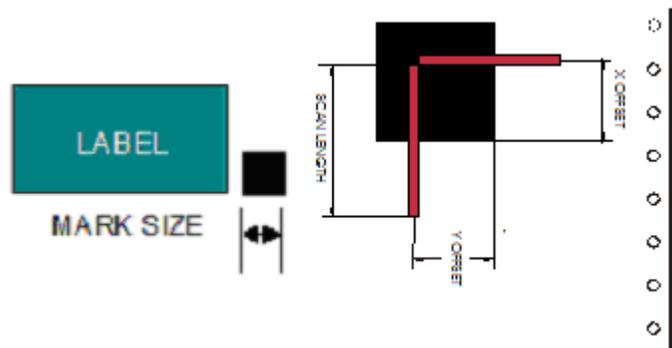
Clicking on Setup Line Sensor menu opens the SmartMark™ Menu.

##### 5.9.6.4.1 Line Sensor Tab

**Sensor Offsets** - The SmartMark™ sensor is offset from the center of the knife. The sensor offset distance is preset at the factory or during installation, but may need to be adjusted on occasion. The Centra can automatically calculate and set the SmartMark™ offset and sensor size parameters. See drawing for definition of sensor offsets. See TSB Title Calibration [Web Site Copy / CD Copy](#)



**X/Y Sensor size** is the offset from the exact center of the red dot of the SmartMark™ sensor to the sense radius and may change based on sensor sensitivity or media reflectivity. This parameter is best set using the procedure in the TSB above. The Sensor Size parameter is only useful in origin scale and three target scanning. If you are not using these methods you can set the size to 0.02 and the sensor size is included in the sensor-offset parameter.



#### Scanning Parameters

The Centra SmartMark™ system has adjustable scanning parameters to

allow for different size and style of registration marks. The primary parameters are the scan offset and length. The ideal X and Y offsets are one-half the mark size and the ideal scan length is two times the scan offset.

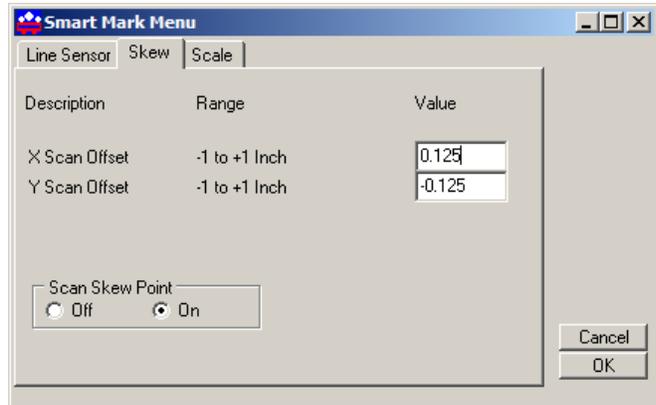
To set the parameters type in the desired numbers in the **X Scan Offset**, **Y Scan Offset** and **Scan Length**. When you have entered the desired values click on **OK**. (see also Explanation of SmartMark™ section). The scan length should = the mark size.

**x/y Scan Offsets** This is the distance to move in x and y to perform the scan. It should be 1/2 the scan length. The signs of scan offset for origin target should be +X/+Y.

**Scan Velocity** (default 2) sets the speed of the scanning. Depending on the media and registration mark contrast, this parameter may need to be adjusted. The better the contrast in reflectivity the faster the scan velocity can be set. If you are experiencing missed registration marks, you may need to reduce the scan velocity.

**X move between jobs** is the distance after the farthest excursion of the x-axis during a frame that the Centra should advance to find the target in the next frame of labels. This item is duplicated in the DirectCut printer driver as the space between jobs. These two parameters are added together so set this value to 0.

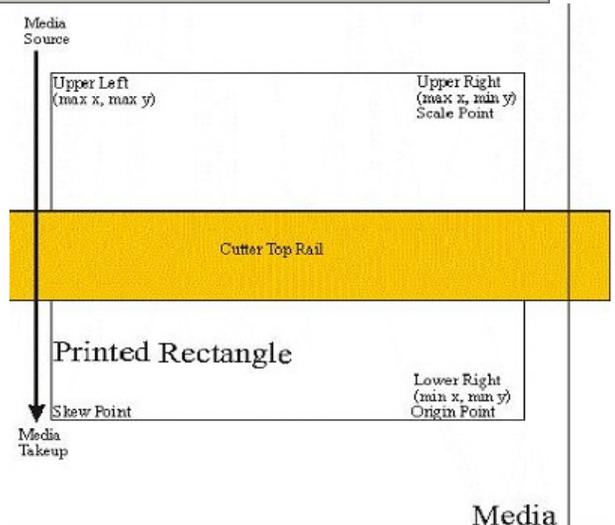
**Target Scan Direction** sets the direction of the scanning operation. For single mark origin scanning the default target scan direction is **+X, +Y**. There may be circumstances where it might be desirable to reverse the scan direction. For instance, the mark might be printed to close to the trailing edge of the preceding labels limiting the distance available for scanning. In this instance, it might be desirable to reverse the scan direction in this axis. Consideration must be given in the cut file because the inside edge of the mark will be considered as the 0,0 point for the Centra coordinate system. This is an advanced menu option and must be enabled on the setup → options page. See also [Web Site Copy](#) / [CD Copy](#).



#### 5.9.6.4.2 Skew Tab

The SmartMark™ system can use one, two or three registration marks. In standard operation the Centra only requires one registration mark to accurately cut the die lines of most labels. If, however, there is a problem with the printing it may become desirable to use multiple registration marks. (see also discussion about marks in Tutorial Using Adobe Illustrator section)

When using two registration marks the embedded computer in the Centra will automatically scan



both the Origin Point and the Skew Point. This is helpful if the printing is skewed in relationship to the media.

When using multiple registration points it is helpful to understand the FO command and its parameters.

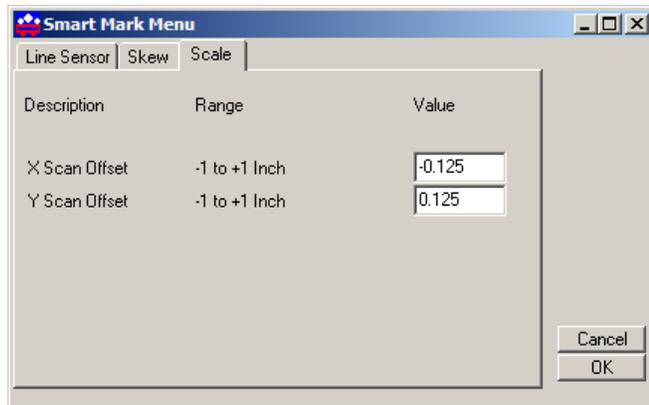
**X, Y Scan offset.** This is the distance from the skew point to perform the Y and X scans to find the skew point. With the targets defined as above, the +X, -Y is the correct signs for the scan offset for the skew mark.

**Scan Skew Point** - A fourth scanning mode is implemented that performs scaling and skewing by scanning only two marks (origin and scale). This method assumes there is no scaling error in the Y-axis. (Specify the Origin, Skew, and Scale mode in your artwork software). By selecting the scan skew mark off, the Centra will only scan the Scale and Skew mark and perform X-axis scaling and skew correction. This parameter should always be on unless your printer driver does not support origin scale processing.

**Target Scan Direction** sets the direction of the scanning operation. The skew mark is normally scanned +X,-Y. This is an advanced menu option and must be enabled on the setup → options page. See also [Web Site Copy / CD Copy](#).

#### 5.9.6.4.3 Scale Tab

**X, Y Scan Offset.** This is the distance from the scale point to perform the Y and X scans to find the scale point. With the targets defined as above, the -X, +Y are the correct signs of scan offset for the scale target.



**Target Scan Direction** sets the direction of the scanning operation. The scale mark is normally scanned -X,+Y. There may be circumstances where it might be desirable to reverse the scan direction. This is an advanced menu option and must be enabled on the setup → options page. See also [Web Site Copy / CD Copy](#).

#### 5.9.6.5 Setup -> Settings Menu

The Centra allows six factory or custom set-ups.

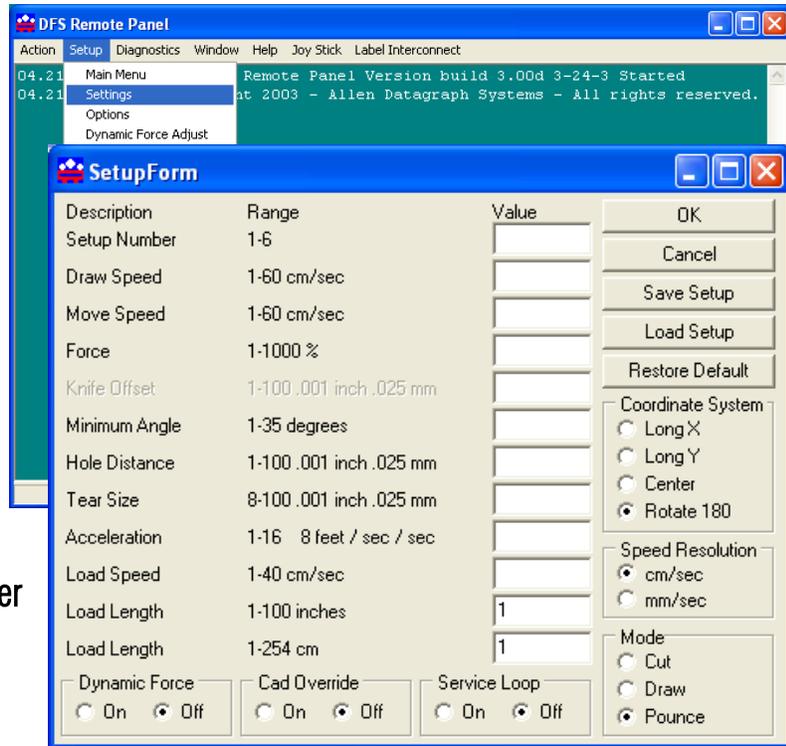
Set-Up 1, whether standard or modified, is automatically loaded at power up. A user may modify the speed, force, (or any feature) on the control panel. See key command summary. Changes to a Set-Up, *unless saved*, will be in effect only until changed from the control panel, CAS software, the unit is turned off or reloaded.

Any of the features shown in the Setup Form may be saved to one of the systems 6 memory locations.

To save a custom set-up simply fill in the desired value(s) in the appropriate window, including the Setup Number, click on the **Save Setup** button. Some features are advanced and only appear if menus = advances is selected in setup → options.

To load the edit boxes with the current system parameters, input the setup number in the **Setup Number** window and then click the **Load Setup** button.

**Setup Number** sets the memory position.

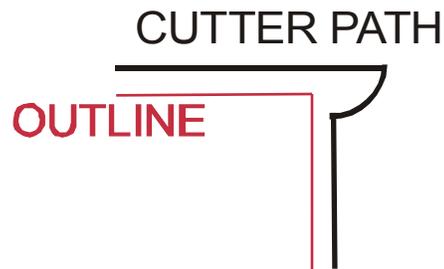


**Draw Speed** is the velocity of the knife when cutting (e.g. while the knife is down).

**Move Speed** is the velocity of the knife when in the up position (not cutting).

**Force** controls the down force or pressure on the knife.

**Knife Offset** All drag knife cutters use a knife blade with the tip offset from the center of rotation. As the Centra moves the knife trails behind it, just like a caster on an office chair. In order to accurately cut the outlines, the computer embedded in the Centra compensates for the offset of the knife. This parameter sets the offset for those calculations. The figure to the right shows the path the knife follows; the radius move at the corner allows for the knife offset. There are three blades available from our online store our online store at <http://www.allendatagraph.com>.



H20-017 30° Allen Datagraph i-TECH, DFS, Centra, Axxis cutting blade. Ideal for label stock. Angle of blade at 30 degrees to have exact control on depth of cut. This blade has a 0.012 inch (0.0305 cm) offset. It can be identified by its blue plastic cap.

H20-007 45° Allen Datagraph i-TECH, DFS, Centra, Axxis cutting blade. Ideal for general purpose cutting of vinyl and other thin materials. Angle of blade at 45 degrees to balance depth of cutting and pivot angle. This blade has a 0.012 inch (0.0305 cm) offset. It can be identified by its red plastic cap.

H20-008 60° Allen Datagraph i-TECH, DFS, Centra, Axxis cutting blade. Ideal for cutting thick materials. Angle of blade at 60 degrees to optimize cut angle. This blade has a 0.012 inch (0.0305 cm) offset. It can be identified by its green plastic cap.

**Minimum Angle** The Centra must stop and then accelerate whenever it makes a sharp turn. At shallow angles the Centra can continue at the cut velocity without decelerating then accelerating. This parameter sets the angle where below which the Centra can continue without stopping. High values increase throughput and lower value increase quality. Good quality can be obtained at reasonable speed at the default value of 12°.

**Hole Distance** displays and sets the distance between holes when the Centra is used in the pounce mode.

**Tear Size** displays and sets the hole size created when the Centra is in the pounce mode.

**Acceleration** displays and sets the servo acceleration. The unit of measurement is 1/4 g's or 8 feet per second per second. This parameter is more important in small graphics than in large labels or text. A setting of 2 to 8 is generally the best for most label cutting. This parameter does affect throughput speed on graphics with short vectors. As the graphics get larger the effect of higher acceleration diminishes. Higher acceleration can degrade cut quality. Use smaller acceleration numbers for heavy materials.

**Load Speed** displays and sets the speed of the material loading and the speed of the material pull off in the service loop mode.

**Load Length** displays and sets the length of the material that is pulled during the load cycle and service loop if the Centra service loop mode is on.

**Service Loop** This should be turned off on the Centra when the Centra is in the Label Mode.

**CAD Override On or OFF** enables or disables the CAD function. With the function **On (disabled)**, the Centra will ignore some of the HPGL control commands sent from the cutting software. With the function **Off**, the software can control these HPGL functions.

These commands include:

AS	set acceleration
FS	set force
KA	set minimum angle
KN	set knife offset
IP	input P1/P2
RO	rotate
SC	set scale
SP	select pen
ST	select tool
UV	up velocity (move speed)
VS	down velocity (cut speed)

**Mode** sets the operation mode. Select the operation mode cutting, pen plotting/drawing or pouncing.

To restore the factory default to all setups click the **Restore Default** button.

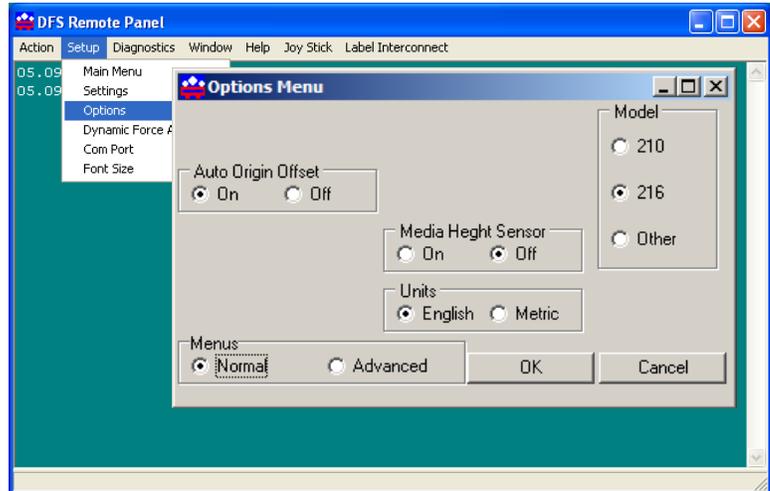
To load a setting enter setting number desired and click on **Load Setup**.

To save a setting enter setting number desired and click on **Save Setup**.

### 5.9.6.6 Setup -> Options Menu

The options menu displays and sets the following parameters:

**Auto Origin Offset** determines whether moving the joystick automatically sets the origin to (0,0). Most CAD systems and the Allen DirectCut printer driver require this option to be set On. Set to Off when cutting from a CAD system that does not use the **SmartMark™** sensor such as the Gerber Omega software.



**Language** determines which language the Centra uses. Select HPGL for most cad systems and the Allen Printer Driver. If you are using Gerber Omega select Gerber. If your cad system only outputs dmpl you can select this language.

**Menus** option offers the more advanced features of the software. It is recommended this be set to Normal until a more advance feature is understood or is required by your operation. The menu items below are displayed when the menus is set to Advanced

**Units** sets the units of measure to English or Metric units.

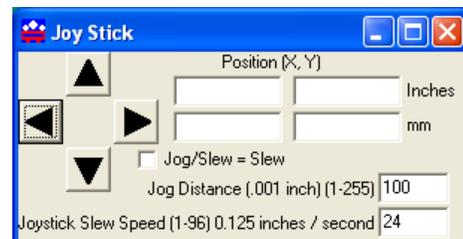
**Model** sets the model number. Password for model number change is 23. Do not change the model number unless you know what you are doing.

### 5.9.6.7 Joystick

**JOYSTICK** The joystick is used for positioning the knife and media in the die cutting station.

The four **ARROW KEYS** are used to jog the material or Centra carriage that holds the knife blade and the SmartMark™ sensor. With the Jog/Slew box unchecked so that Jog/Slew = Slew, the joystick speed will be the speed set in the Joystick Speed Window.

Left Click and hold the arrow button to move the material or carriage. With the Jog/Slew box checked so that Jog/Slew = Jog, the arrow buttons will jog the Centra that fixed distance each time the button is clicked.



The setting in the Jog Distance Window also sets the jog distance for the Front Panel Joystick buttons.

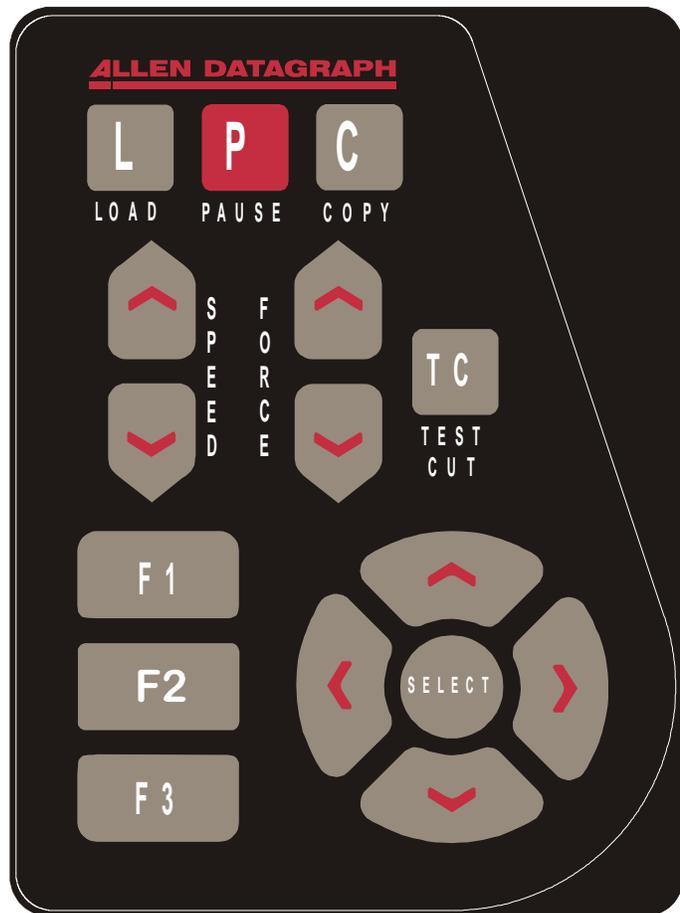
### 5.9.6.8 Front panel of i-TECH Centra DFS

The front control panel is the primary user interface for the Centra. It is used for input of speed and force as well as several other functions.

**LOAD** The load key is used to initialize the system and to load or automatically fill the supply accumulator. Once the material is fed thru the media path and the nip rollers are engaged (see section 5.7 Webbing the Centra DFS Cutter), press the load key and the supply roller will start feeding media into the supply dancer bar and will automatically stop once the supply dancer bar reaches the bottom and the input accumulator is full. The load light will then come on to indicate the system is ready to operate. Be sure that the label frame you want to cut is at least 2 inches behind the blade before pressing load.

**PAUSE** The pause key will halt the operation of the system at any point. It is used to pause the system for inspection, media jams or to pause the machine for any other reason. Press the pause key to resume the system. The system can be jogged while paused and will remember where it was and resume from where it was stopped regardless of where it was jogged. This is very helpful for inspecting the cut. You can pause the system and joystick the media or cut head away from its position to inspect the cutting or registration. After inspecting the media, simply press the pause key again and the Centra will return to the point where it was paused and resume cutting. The pause light will flash while the system is paused. You can also use the pause button to enter the unload state (press Pause followed by Load).

**COPY** The copy key is used to input the quantity of copies the Centra will digitally die cut. It is used after the first copy of the job is cut. Once the first copy is cut and you are happy with the results, press the copy key. The display will read 0001. The number represents the total number of copies including the first one run. Increase the number of copies by pressing the up arrow key of the joystick or the force up button. Hold the key down and the numbers will start moving slowing then more quickly. Press the down arrow key to lower the number. Alternatively the force keys will increment the single digits and the speed keys will increment the 10's digits. If you enter 0 the copy will stop at end of next job. If you enter -001 then it will count up forever. Remember the number

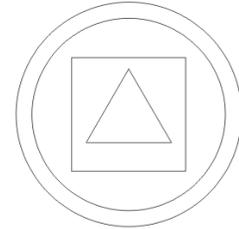


displayed includes the first copy run before the copy key was pressed. Input the copy quantity and start the cutting by pressing the **SELECT KEY**.

**SPEED** The speed keys are used for controlling the cut speed (the speed the knife travels around the periphery of the items being cut). Increase the speed by pressing the up arrow key. Decrease the speed by pressing the down arrow key. Hold the key down and the numbers will start moving slowing then more quickly.

**FORCE** The force key is used in conjunction with the test cut key to set the depth of cut. The range of force is 1 to 100% when the system is in the normal force range. For most applications the normal force range is adequate. In the normal force range mode, the force is adjustable between 10 and 550 grams of force in 100 steps.

The force is set by test cutting the media to be cut using the test cut function. Using the joystick, position the knife in an unused portion of the media and press the **TEST CUT** key. The system will cut a test cut pattern similar to the diagram to the right. With a sharp knife or tweezers you should be able to individually remove each part of the test cut pattern working from the ring to the triangle without affecting the remaining parts. A properly set force will leave a very slight scratch or mark on the liner.



The force may need to be adjusted due to blade wear during use if problems with weeding occur. Simply increase the force setting by one until satisfactory weeding occurs. If the knife blade is changed, revert back to the original setting or perform the test cut procedure again. The blade may need to be replaced if the force is increased by more than 20 percent from when the blade was new.

**F1** This key puts the pen up or down during digitizing mode.

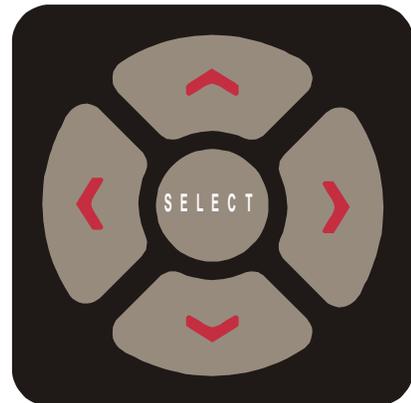
**F2** This key turns on/off the supply nip roller

**F3** This key turns on/off the take up nip roller

**RESET** the Centra by pressing the F1, F2 and F3 keys in order.

**JOYSTICK** The joystick is used for positioning the knife and media in the die cutting station and for several other functions.

The four **ARROW KEYS** are used to jog the material or Centra carriage that holds the knife blade and the SmartMark™ sensor. Press the key once to move the material or carriage slowly and press it a second time within ½ second to move at a faster speed. Tap the key to jog the Centra a fixed distance. The distance is adjustable (see Joy section below or joystick in the Remote Panel section).



**SELECT** The select key is used to invoke the menu system. Press the select key and the display will change to indicate the last used menu item. To select a menu item press the select key and then press the right or left arrow key to scroll thru the various menu items.

With the desired menu item displayed, press the up or down arrow key to select the state. When the desired state is displayed press the select key to input the menu item and state. The menu items are: ACCL, CA $\bar{d}$ , diA, FILL, indE, JOY, OPE $\bar{r}$ , and Set.

### Menu Items:

**ACCL** allows setting the acceleration in  $\frac{1}{4}$  G increments. Acceleration is the rate of increase/decrease of speed of the motors along a vector. Higher G values increase throughput however higher G values also increase the likelihood of experiencing repeatability problems. Recommended values are (2-8) for standard labels.

**CA $\bar{d}$**  override menu function enables or disables the CAD override function. This is an advance function and is only necessary when using cad systems that are not designed for the Centra. With the function **On** the Centra will ignore some HPGL control commands sent from the cutting software. With the function **Off** the CAD software can control these HPGL commands.

The commands affected by CA $\bar{d}$  override are:

AS	set acceleration
FS	set force
KA	set minimum angle
KN	set knife offset
IP	input P1/P2
RO	rotate
SC	set scale
SP	select pen
ST	select tool
UV	up velocity (move speed)
VS	down velocity (cut speed)

Press the select key to initiate the menu function. Press the left or right arrow key to display CA $\bar{d}$ , then press the up or down key to toggle between **off** and **on**. Press the select key to lock in the desired menu setting.

**diA** is used for entering into the diagnostic mode. Press the select key to initiate the menu function, then press the left or right arrow key to display diA. Press the up or down key to scroll thru the diagnostic numbers (0002 – 0099). Press the select key to start the diagnostic. (see diagnostics section) . To exit from a diagnostic mode select 0099 and press select.

**FILL** is used to add more material to the supply accumulator loop at any time during the operation of the Centra. Press the select key to initiate the menu function, then press the left or right arrow key to display FILL. Press the select key and the Centra station will pause and the supply nip roller drive will start to fill the supply dancer bar loop. Once complete the supply nip roller drive will automatically stop and the Centra will resume. This is useful if for some reason either of the dancer bar loops have insufficient material.

**indE** indexes the x-axis. One of the uses for this function is for metering material. Press the select key to initiate the menu function, then press the left or right arrow key to

display **IndE**. Press the select key. Press the up or down arrow to toggle between inches (**InCH**) or centimeters (**cEnt**). When the desired unit of measure is displayed press the select key. The display will read **0001**. The number represents the number of inches or centimeters to be metered in the x-axis. Increase the number by pressing the up arrow key of the joystick. Hold the key down and the numbers will start moving slowing then more quickly. Press the down arrow key to lower the number. Alternatively the force keys will increment the single digits and the speed keys will increment the 10's digits. Input the length and start by pressing the select key.

**JOy** allows changing the joystick parameters: of jog distance or slew speed. Press the select key to enter the menu system. Press the left or right joystick buttons until **JOY** is displayed. Press up or down on the joystick to select (**Sped** or **Jog**). Press select. Press up or down on the joystick to select a value for joystick speed (1-100%) or jog distance (0.01 inch increments). Press select to save the displayed value.

This menu item has 2 sub-menus:

- **Sped-** Allows the user to set the maximum speed that the joystick will move the material or head when pressed twice. Range 1-100.
- **Jog-** Allows the user to set the distance that the head or material will move when a joystick button is pressed and released. Range is 1-100 in 1/1000<sup>th</sup> inch increments.

i.e., 1 = 0.001", 100 = 0.100"

**OPER** is used to select the operation mode between cutting (**CUT**), pen plotting/drawing (**drA**) or pouncing (**POUn**). Press the select key to initiate the menu function, then press the left or right arrow key to display **OPER**. Press the up or down key to select the desired function. Press the select key to lock the desired menu setting.

**SEt** loads or saves a custom set-up or power up default. Press the select key to initiate the menu function. Press the left or right arrow key to display **SEt**. Press the up or down key to scroll thru (**LOAD**, **Save**), press select, press the up or down key to scroll thru the settings (1 – 6). Press the select key to load or are save the setting. Setting #1 is loaded when the machine is powered up. (see also factory and custom set-up section)

The **set** menu item has 2 sub-menus:

**Load-** loads a setup.

**To load a setting:**

- Press select
- Press left or right arrow until **SET** menu is displayed.
- Press up or down arrow to display **Load**.
- Press select
- Press up or down arrow to display the number of the setting you want to load (1-6)
- Press select.

**Save-** saves a customized setting.

### ***To save a setting:***

- Adjust force, speed, acceleration as needed.
- Press select
- Press left or right arrow until SET menu is displayed.
- Press up or down arrow to display Save.
- Press select
- Press up or down arrow to display the number of the setting you want to customize (1-6) (# 1 is the setting that is loaded on power up.)
- Press select.

### **5.9.6.9 Mandrel switches**

See section 5.8 Media Mandrel Tension Controls

## **6 Maintenance & Consumables**

### **6.1 4880 Printer (refer to Epson Manual)**

#### **6.1.1 Substrates**

The Epson 4880 uses Epson DURABrite ink, which is a water-based ink. It is recommended that all substrates are coated with an ink jet compatible coating.

### **6.2 i-TECH Centra DFS**

#### **6.2.1 Changing a blade**

The knife blade should be replaced when the force has been increased by more than 20 percent or the cut quality has degraded. The first sign of blade degradation usually occurs in the corners of the cut and may lead to poor weeding.

New blades slide into the holder to a preset height and are held in magnetically. No tools or adjustments are required. To replace the blade, first remove the blade holder from the tool holder by loosening the brass thumbscrew and pulling up on the silver knife holder. Remove black plastic cap. To remove the used blade, grasp it with a pair of tweezers and pull it out of the knife holder (discard the blade safely). Remove the new blade from the plastic case and remove the protective cap. Insert the blade into the holder and let the magnet pull it into the preset position. Install plastic cap. Reinsert the knife holder into the tool holder and tighten the brass thumbscrew.

Replacement blades are available from several sources including from Allen Datagraph Systems, Inc. They can be purchased online @ <http://www.allendatagraph.com/> or by calling 603-216-6344.

H20-017 30° Allen Datagraph i-TECH, DFS, Centra, Axxis cutting blade. Ideal for label stock. Angle of blade at 30 degrees to have exact control on depth of cut. This blade has a 0.012 inch (0.0305 cm) offset. It can be identified by its blue plastic cap.

H20-007 45° Allen Datagraph i-TECH, DFS, Centra, Axxis cutting blade. Ideal for general purpose cutting of vinyl and other thin materials. Angle of blade at 45 degrees to

balance depth of cutting and pivot angle. This blade has a 0.012 inch (0.0305 cm) offset. It can be identified by its red plastic cap.

H20-008 60° Allen Datagraph i-TECH, DFS, Centra, Axxis cutting blade. Ideal for cutting thick materials. Angle of blade at 60 degrees to optimize cut angle. This blade has a 0.012 inch (0.0305 cm) offset. It can be identified by its green plastic cap.

#### Tool Holder Block

The knife blade holder is installed in the tool holder block with a thumbscrew. The tool holder block is held to the cutting head by two hex drive screws.

#### Knife blade holder Assembly

The blade holder is designed for use with Allen Datagraph's 30°, 45° and 60° blades. Solvents and lubricants should not be used, as they will diminish cutting accuracy.

#### Knife Blades

Knives blades for the Allen Datagraph Centra Unit are made with tungsten carbide and are designed specifically for digital die cutting. The tip is offset from the center of the shaft so that the blade has a caster action when pulled. Blades are available in 30, 45 and 60-degree tip angles. The 60-degree is intended only for thick materials such as sandblast mask or thick over-laminates. For best cutting results, protect the knife tip from damage when not in use.

#### Knife Blades Depth Guide

Allen Datagraph's controlled depth knife holder has a depth guide that is adjustable to control the depth of cut the Centra makes. Normal materials do not need to use the controlled depth adjustment and the black plastic cap can be screwed in completely to expose the blade. Material with insufficient backing may require the use of the controlled depth cap. Correct adjustments allow the blade to cut the material and lightly mark the backer (carrier) material. Too much cut depth can cause cut through and premature blade wear. Not enough cut depth will make "weeding" of media difficult.

Use the cut test, force and depth adjustment to establish good cutting (see setting cut force – cut depth section)

#### 6.2.2 Changing a cut strip

Clean any debris from the groove before installing the groove filler. The filler simply snaps into and out of place with no special tools required. **It is important that the groove filler be installed fully and evenly, otherwise material cut through may occur in some sections across the cutter.** *The groove filler should be installed for knives and pen plotting, but **must** be removed for Pouncing*

Two different cut strips are available from the <http://allendatagraph.com> online store. Normal life (DF-310) and extended life (DF-410) cut strips.

#### 6.2.3 Cleaning

The regularity with which the cutter needs to be cleaned is dependent on the usage, as well as the climate and contaminants in the cutter's environment. It is recommended that the following cleaning steps be done at least as often as indicated for each procedure:

- **Biweekly.** Clean the three grit wheel surfaces with a stiff bristled e.g. tooth (not wire) brush to remove any media particles that may have built up during cutting. Brush the surface of the grit wheel while turning the grit wheel by hand so the entire surface of the grit wheel is cleaned. CAUTION: Be sure to disconnect the cutter from the power source while cleaning the unit. Keeping the grit wheel clean is important so the cutter will hold the media accurately.
- **Biweekly.** Wipe media-related dust from the set of polyurethane pinch wheels by using a soft cloth.
- **Monthly.** The outer surfaces should also be kept clean. If necessary, a mild cleaning solution on a damp cloth can be used to gently wipe the surfaces clean. It is suggested that a mild soap and water be used with a soft cloth. This solution works well on all painted surfaces. CAUTION: Do not use any abrasive cleaners, as they will cause the paint to blister.
- **Yearly.** Inspect the internal circuit board assemblies and clean accumulated dust as necessary. Be certain that the cutter power is off. Observe static discharge safety procedures that may damage sensitive electronic components. Wear a grounding strap connected to earth ground. Wear safety glasses to protect eyes. Remove rear cover and use compressed air to remove dust and debris. Replace cover to original location and make certain that the boards and any connectors are well seated.

#### 6.2.4 Pinch Wheel Maintenance

Pinch wheels are critical to the Centra unit's material handling performance. They should be inspected for wear regularly and cleaned as needed. To clean adhesive off the pinch wheels, simply use a soft cloth and denatured alcohol.

In normal use, the pinch wheels will need to be replaced in time. Also, trying to move them when they are in the down position can damage them. If material does not track well and guide alignment has been verified, the pinch wheels may need to be replaced. For best tracking results, replacement pinch wheels should be replaced as a SET.

To check condition of pinch wheels:

**Inspect condition of rubber** The rubber wheel should not have any cracks and should be securely adhered to the aluminum hub of the wheel. The transition from the flat surface of the wheel to the "sidewall" edges of the wheel should be sharp and not rounded.

**Inspect integrity of pinch wheel bearing** This is done by having the pinch wheels in the up position. Spin wheel with finger and observe whether the bearing has a dry sound or not. If it appears to be dry, the wheels should be replaced.

Pinch wheels (p/n PL-00-02-062) can be ordered from the online store at <http://allendatagraph.com>

#### 6.2.5 Mechanical Adjustments

##### Belt Tension

The Centra servomotors use timing belts to control the material (X axis) and tool (Y axis) positions. The belt tension and wear should be inspected if cut quality deteriorates. To inspect the belts, remove the back of the Centra. This can be done by removing large screws along the edge of the rear cover. (see also TSB: Mechanical Adjustments to Restore Cut Quality to Normal [Web Site Copy](#) / [CD Copy](#))

#### Y-Axis

The Y-axis short belt runs between the Y-axis servomotor and a gear assembly. To adjust the tension of this belt, it is necessary to reposition the motor bracket.

- Remove the back cover (see assembly instruction [Web Site Copy](#) / [CD Copy](#))
- Loosen the three Phillips head motor bracket screws and apply hand pressure to tighten the belt so that the belt will deflect 0.050 inches at the center when 23 ounces are applied. (1.3 mm when 660 grams are applied).
- When the belt is tight and the motor shaft is **parallel** to the bearing shaft, tighten the three Phillips head motor bracket screws. *Premature belt failure will occur if these two shafts are not parallel.*
- Verify tension.
- Close back cover.

The long belt is adjusted using a lead screw located behind the control panel.

To set the long belt's tension:

- Position the carriage to the far side.
- Remove the control panel housing as follows
- Remove the 4 allen screws that hold on the cover for the lcd display.
- Loosen the locking nut.
- Adjust the lead screw so that the belt will deflect 0.125 or feels taut. You can also pluck it like a string and it should make a low tone.
- Move the carriage slowly from two or three inches/cm front and back to equalize tension on pulleys. Check tension again.
- Set the lead screw lock nut.
- Verify belt path and tension.
- Replace the control panel housing, top rail cover and rear cover.

#### X-Axis

- Open back cover
- The belt inside the rear cover drives the grit wheel (X axis). To adjust the tension of this belt, it is necessary to reposition the motor.

- Loosen the two motor bracket screws and apply hand pressure to tighten the belt so that the belt will deflect 1/16 inch at the center when 23 ounces are applied. (2 mm when 660 grams are applied). (Replace belt if damaged or worn).
- When the belt is correctly tensioned, tighten the two motor bracket screws.
- Verify belt path and tension. Check that the large gear turns freely.
- Close back cover

### 6.3 Troubleshooting i-TECH Centra DFS

Problem	Solutions
Cutter does nothing	<ul style="list-style-type: none"> <li>• Panel lights off, no fan noise : plugged in, power on, cycle power</li> <li>• Check fuse replace with one 5A for 115 vac or two 2.5A for 220 vac.</li> <li>• E-Stop button pressed.</li> </ul>
Cut through/poor weeding	<ul style="list-style-type: none"> <li>• Is your knife blade sharp? You can check condition of blade by examining the blade tip under a 30x microscope. The blade tip must be present.</li> <li>• For very thin (less than 0.002 inch, (0.05 mm)) or liner less than 20 lb. media you might need to use the controlled depth adjustment on the end of the knife holder. Partially unscrew the black cap until just enough knife blade is exposed to cut through the media but not the backer. Test by drawing knife across media by hand. You can then use a higher force with no cut through.</li> <li>• It is important that the groove filler be installed fully and evenly, otherwise material cut through may occur in some sections across the cutter.</li> <li>• Insufficient backer weight.</li> <li>• Check mechanical adjustments <a href="#">Website Copy</a> / <a href="#">CD Copy</a></li> <li>• Increase / Decrease force. Increase decrease knife offset.</li> <li>• Check cut strip condition. Replace or reverse if damaged.</li> <li>• Decrease acceleration or speed.</li> <li>• Increase resolution in printer driver.</li> <li>• Using wrong angle of blade for material.</li> <li>• Not tracking. Fix this first.</li> </ul>
Images are incorrect size	<ul style="list-style-type: none"> <li>• If error is small (&lt; 1/2 inch (12 mm)) make sure grit wheel is clean. Dirt build up in grit will change the size of the grit wheel making it cut the wrong size. Run diagnostic 07 to calibrate the cutter to a ruler or printer as desired.</li> </ul>
Contour cuts are wrong size.	<ul style="list-style-type: none"> <li>• If you are using origin only or origin skew no scaling is done to image received. In this case you must calibrate the cutter to your printer rather than a ruler. You do this by printing a large rectangle on your printer. Then cut the same size rectangle. For x and y drawn use printed size</li> </ul>

	<p>rather than a ruler as drawn or desired size.</p> <ul style="list-style-type: none"> <li>• If you are using origin scale, or origin skew scale then the size of the cut is change by the x or y sensor size parameter in the line sensor menu.</li> <li>• See SmartMark™ setup in Appendix A</li> </ul>
<p>Labels or contour cuts are cutting in the wrong spot</p>	<ul style="list-style-type: none"> <li>• Verify you created job correctly.</li> <li>• Origin target is at minimum x and maximum y of drawing.</li> <li>• The scan area contains only target and background with no stray marks that could be seen as targets.</li> <li>• Verify printer properties are correct</li> <li>• Rotation is set correctly. Target cut should be in same corner on preview as selected origin corner.</li> <li>• Find origin property is set to Origin only.</li> <li>• Verify sensor settings have not been lost</li> <li>• In the remote panel select setup -&gt; line sensor menu.</li> <li>• Verify x sensor offset is about 0.75 inch and y sensor offset is about -0.1 inch</li> <li>• If your job is off by only a little bit (less than 1/8 inch (3mm)) and is same for every frame you can measure this error and correct your x and y sensor offset by the amount of the error you measure.</li> <li>• Verify scan length is the same as the length of the side of the target</li> <li>• Verify the scan offsets = ½ of the length of the side of the target</li> <li>• Verify the Scan Velocity is either 1 or 2.</li> <li>• Verify the space between jobs in the line sensor menu is zero.</li> </ul>
<p>Target errors tar1, tar2, tar3, tar4</p>	<ul style="list-style-type: none"> <li>• These errors indicate that the target scanner did not find the target.</li> <li>• If tar1 on first frame: <ul style="list-style-type: none"> <li>○ Verify that you positioned red led pointer to right rear corner of target</li> <li>○ Verify red led is lit.</li> <li>○ Check that distance led is from media is 3.4 to 4.6 mm.</li> <li>○ Run line sensor diagnostic (21) to verify operation</li> </ul> </li> </ul>

	<p>of sensor.</p> <ul style="list-style-type: none"> <li>• If tar1 on 2<sup>nd</sup> or subsequent frame <ul style="list-style-type: none"> <li>○ Verify space between jobs in printer driver is set correctly. If it is set correctly after cutting first frame the knife blade should be on the right rear corner of target of next frame..</li> </ul> </li> <li>• Tar2 – 4. <ul style="list-style-type: none"> <li>○ Verify job you are sending matches job you printed</li> <li>○ Verify rotation is correct in printer driver</li> <li>○ Verify job is built correctly in that scale and skew target print is in same location is die lines for scale and skew target.</li> <li>○ Verify scale and skew targets are at extents of image. Skew should be a minimum x and maximum y. Scale target should be at maximum x and minimum y.</li> </ul> </li> </ul>
<p>No action when you send data to cutter</p>	<ul style="list-style-type: none"> <li>• Allen Spooler: If plot is sent from computer and cutter doesn't cut, check for Allen spooler in the task bar (Lower right of monitor, green box with red arrow, near time). If it is not there, go to start button, programs (all programs), startup, allen spooler and click on allen spooler. If you get message saying allen spooler starting with one job left in queue, cancel it and send job again after checking to see that cutter is ready.</li> <li>• Click on red arrow in green field icon in service icon area. If you are getting unable to open port displayed</li> <li>• See if remote panel still has port open. It should auto close the port after 5 seconds.</li> <li>• Reboot computer and cutter.</li> <li>• Verify port selected is correct. You can find the correct port from the device manager.</li> <li>• Plug usb cable into same usb port as you normally do. Different usb holes are normally configured as different com ports.</li> <li>• Rerun enable printer driver to find cutter. Start &gt; All Programs &gt; Allen Datagraph &gt; Cutter Driver &gt; Enable printer driver</li> <li>• Try different usb cable or different computer.</li> <li>• From spooler cancel all jobs, turn cutter off/on and resend job.</li> <li>• No usb driver installed for equipment <a href="#">Website Copy</a> / <a href="#">CD Copy</a></li> </ul>

	<ul style="list-style-type: none"> <li>• Cutter in pause state.</li> </ul>
Job does not complete	<ul style="list-style-type: none"> <li>• Verify minimum cutter driver level of 2.08g. New software can be downloaded from <a href="#">Web Site Copy</a></li> <li>• If you have less the firmware revision 12 as usb version in your cutter turn off polyline encoded output in printer properties, device settings. <a href="#">Web Site Copy</a> / <a href="#">CD Copy</a></li> <li>• Try a different cable or computer</li> </ul>
When I turn my cutter on, the head reaches the side plate and makes a loud noise	<ul style="list-style-type: none"> <li>• Loose long Y belt if carriage is getting to the right side and making a ratcheting noise, it's could be the long y axis belt, or the y axis motor belt located under the left control panel. To determine which belt it is, turn the machine on while holding out on the long belt that attaches to the cutting head. What this does is put more tension on the belt. If the head gets to the side and they don't hear the noise, proceed to below:  Remove the control panel and locate the belt tensioner. This is a wedge-shaped device with a long Phillips head screw protruding toward the rear of the machine.  Loosen the 3/8" locking nut holding the tensioner screw in place. Turn the phillips screw a couple turns clockwise, then turn the cutter on before attaching the control panel. If the cutter initializes, there is no need to look further. If this does not solve the problem, proceed to the next step:  Remove rear cover, turn cutter on and observe the belt attached to the motor. If the motor pulley continues to turn, then the short motor belt is most likely either loose or worn out. Carefully inspect the teeth on the belt for wear with the machine off. The pulley can be rotated to allow inspection of teeth.</li> <li>• If the teeth are not worn or stripped off the belt, loosen the three mounting screws holding the motor bracket to the sideplate. Apply tension to the motor bracket BY HAND, and tighten the screws. The belt should have less than 1/8" of free play when properly tightened.</li> </ul>
Router keeps changing my ip address	<ul style="list-style-type: none"> <li>• Some routers do not keep a table of mac addresses so that the same computer will be assigned same ip address each time you power up. In this case run diagnostic 4 and assign a static ip address to the cutter. See also <a href="#">Website Copy</a> / <a href="#">CD Copy</a></li> </ul>
Material Does not track straight	<ul style="list-style-type: none"> <li>• Inspect pinch wheels</li> <li>• Clean grit wheel and pinch wheels.</li> <li>• Reduce acceleration and / or velocity.</li> </ul>

	<ul style="list-style-type: none"> <li>• Insure cutter is loaded straight. Same distance from back wall from supply to takeup.</li> <li>• Perfect leveling is not required in steps below but adjustments need to be close.</li> <li>• Machine loaded per <a href="#">Web Site Copy / CD Copy</a>.and <a href="#">Web Site Copy / CD Copy</a></li> <li>• Machine Level (place level on cut strip) level with machine / table legs.</li> <li>• Rear media guides set correctly. (Measure distance between gear panel to media guide. They should all be same distance from gear panel.)</li> <li>• Adjustable bars level. Set level on Web guide 3, exit roller and adjust until level.</li> <li>• Mandrels Level (to adjust remove back of machine and loosen 4 mandrel leveling bolts. Align with Square. Check with level. Tighten bolts.)</li> <li>• <b>Skewing</b></li> <li>• Verify both front and rear dancer bars are not bouncing on bottom or top of service loop. Bouncing will cause the media to slip between the grit wheel and the pinch roller.</li> </ul>
Lamination Not Tracking	<ul style="list-style-type: none"> <li>• Machine loaded per <a href="#">Web Site Copy / CD Copy</a>.and <a href="#">Web Site Copy / CD Copy</a></li> <li>• Machine Level (place level on cut strip) level with machine / table legs.</li> <li>• No tension is required on Laminate feed mandrel. Set tension control to off position.</li> <li>• Unwind stand inadequate. A suitable unwind stand must be used with the Centra. It should supply a small amount of back pressure and not drift from side to side.</li> <li>• Printed media must be wound on core evenly</li> <li>• Laminate same width or larger than printed stock. Laminate with should be 1/16” to 1/8” smaller than printed stock.</li> <li>• Too much pressure on laminate roller (blue rubber roller). Only a light pressure is required on laminate roller.</li> <li>• Uneven pressure on laminate roller. To set pressure loosen two nuts on each pressure control. These are the hinged cam latches that supply the pressure on the blue roller. To measure the pressure you need to create two sandwiches of</li> </ul>

	<p>three pieces of the unlaminated printed media. Place one sandwich under operator side latch and one under gear side latch. Adjust the pressure the latch applies to the blue roller until both centerpieces of the sandwiched media can be pulled with the same amount of force. Test tracking. After laminate tracking works correctly tighten lock nuts.</p>
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## Appendix A – i-TECH remote panel Advanced Options

### A.1 Enable Advanced Options

To enable advanced options select setup -> options from remote panel. Change advanced/normal menu options to advanced.

### A.2 Action Menu

#### A.2.1 Send HPGL File

Send HPGL File will send a HPGL plot file directly to the Centra. Typical origins of HPGL files include the Allen Driver, CorelDraw or some other design software. To send a HPGL plot file from the remote panel program click the Send HPGL File menu item to open the select file window. Select the files desired and click the Open button. This will send the file directly to the Centra.

#### A.2.2 Cancel, Continue, Pause

These commands will cancel, continue, or pause a job being sent by the Send HPGL command. For jobs sent by other programs you can use the Pause button on the Centra and the (F1, F2, F3) combo to cancel the currently cutting job.

#### A.2.3 Open Com Port

Opens a communication channel to the Centra and sets a long timeout for close.

#### A.2.4 Close Com Port

Closes communication port to cutter. Since only one program can talk to cutter at a time, selecting this command allows other programs to talk to Axxix. The remote panel will normally automatically close the com port after a period of inactivity.

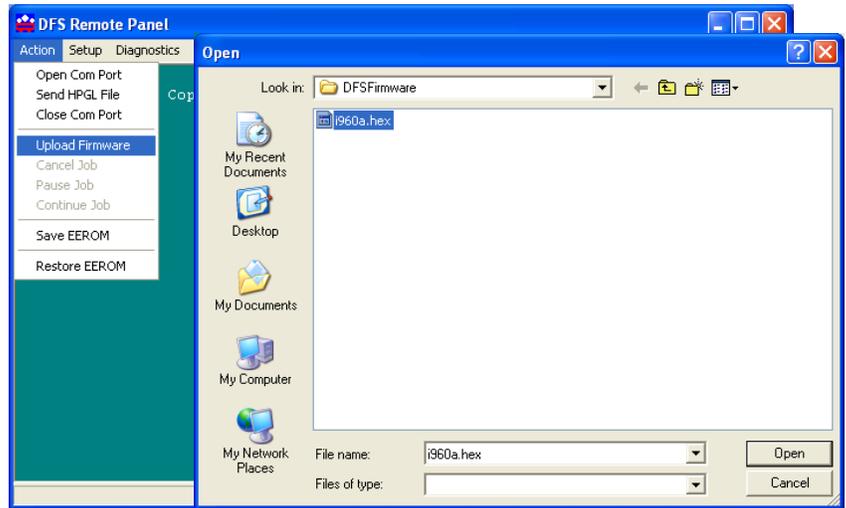
#### A.2.5 Upload Firmware

***The firmware on this disk is provided for update purposes only and should not be installed on new machines. In general you should not install a firmware update unless directed by a member of the technical support staff. Firmware updates are available on the technical support page of the Allen Datagraph web site at <http://www.allendatagraph.com>.***

This procedure details the firmware upgrade procedure. Normally firmware is only sent to customers when a software problem is reported that has been fixed in a later version of the software.

From time to time Allen Datagraph will recommend that you upgrade your firmware in your Allen Datagraph Centra. A file can be downloaded from the Allen Datagraph web site and saved to the desktop.

Before running the setup program be sure to exit the older version of the Remote Panel.



### **A.2.5.1 Firmware Installation Instructions:**

Turn off your equipment. Press the load button on your front panel and then, turn on the Allen Datagraph equipment to be upgraded. Start the Remote Panel by clicking on start, program, Allen Datagraph, Remote Panel. Click on Setup, Com Port and verify that the correct port has a check next to its name. Click on **Action, Upload Firmware**. If asked select pic32rel.hex file and click **Open**. If the upload fails, you will be given a backup procedure to follow on the computer screen.

### **A.2.6 Save to EEROM and Restore from EEROM**

This procedure allows saving the eeprom and restoring it when certain hardware is replaced.

## **A.3 Setup Menu**

These commands are used to save custom settings and factory settings to the computer when certain electronic components need to be replaced.

### **A.3.1 Main Menu**

Knife Settings Tab

The Centra can also self adjust the speed within certain limits based on the speed of the device feeding the unit. The range for speed is 1 to 100%. Enter **min and max speed for Label Mode** and check the **Allow Speed Change**. This option is only useful in direct feed from printer to centra.

**Hole Distance** and **Tear Size** are used when the Centra is in the Pounce Mode. The hole distance setting is the distance between holes and the tear size is the distance the Centra moves with the pounce tool down to tear the media and enlarge the pounced hole

The Rubber tab has several advanced parameters. They are described below.

**Rubber Scratch Force** displays and sets the down force used during tangential emulation. This is primarily used when cutting thick materials such as sandblast rubber. Tangential emulation simulates a tangential or servo controlled rotating knife by moving to a position short of the vector to be cut and putting the knife blade down with a very light force while moving toward the direction of cut to align the knife before applying the full cutting force. This improves the cut quality in thick materials. (default 0.1%)

**Rubber Backup Multiplier** (default 20) displays and sets the distance the knife will be dragged at the light force used to align it. This parameter is used with and is additive to the **Rubber Backup Offset** (default 0.02). The Rubber Backup Multiplier is based on the change of angle between vectors and the Rubber Backup Offset is a constant added to the distance calculated based on angle.

**Rubber Minimum Angle** (default 19) is the rotation angle between two vectors that enables tangential emulation. Subsequent vectors that have angle between them exceeding this parameter cause the pen to be picked up, dragged along the surface to align the knife and plunged into the media at the beginning of the next vector. Subsequent vectors that have angle between them less than this parameter will perform a drag rotation.

**Max Motion Vector Length** (default 0.001) (Named after the driver that outputs very small vectors) Allen Centras very accurately replicates the vectors in the HPGL plot file. Some design programs output vectors that are very short. It is sometimes desirable to combine some of these vectors into a longer vector to eliminate jagged edges or slow cutting. This parameter works like a curve-smoothing algorithm and is used to improve poor HPGL files.

**Anticipation Rubber** (default 0.001) and **Anticipation Vinyl** (default 0.0004) is a parameter that adjusts the backlash compensation in the Centra. The Anticipation Rubber is the parameter used when the Centra is in tangential emulation mode and the Anticipation Vinyl is the parameter used when not in tangential emulation mode. Heavier materials require more backlash compensation. These numbers are individually set at the factory and should not require adjustment except when cutting heavy materials. If you are experiencing thick and thin lines or misshaped letters, adjust the anticipation parameter to obtain satisfactory results.

### **A.3.2 Setup -> Line Sensor Skew tab**

**Y Target Location.** This is the distance between the origin target and the skew target when the 2<sup>nd</sup> parameter of the FO command is -1. This command is used on CAD systems that do not emit the FO HPGL command. You set up the initialization string to have

**BJ1;FO-1,-1;** <for origin skew and scale processing>

or

**BJ1;FO0,-1;** <for origin and skew processing>

This causes the Centra to look at the Y Target Location parameter from this menu item.

### A.3.3 Setup -> Line Sensor Scale tab

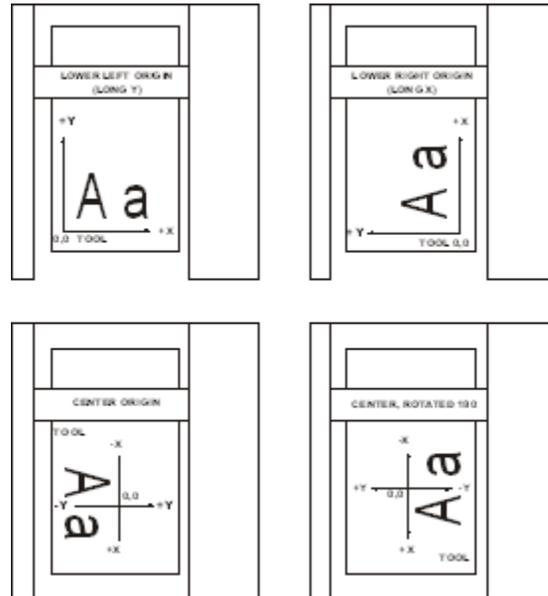
**X Target Location.** This is the distance between the origin target and the scale target when the 1<sup>st</sup> parameter of the FO command is -1. This command is used on CAD systems that do not emit the FO hppl command. You set up the initialization string to have:

**BJ1;FO-1,-1;** <for origin skew and scale processing>

This causes the Centra to look at the X target location parameter from this menu item.

### A.3.4 Setup -> Settings

**Dynamic Force** engages the dynamic force function that instantaneously adjusts the force on the fly based on the actual velocity of the knife blade. All Centras must accelerate and decelerate as they cut around corners. Some medias require different force settings for different speeds. This parameter allows for building a database for these materials and when enabled will greatly improve the cutting on these materials. (See the Setup → Dynamic Force Section for more details)



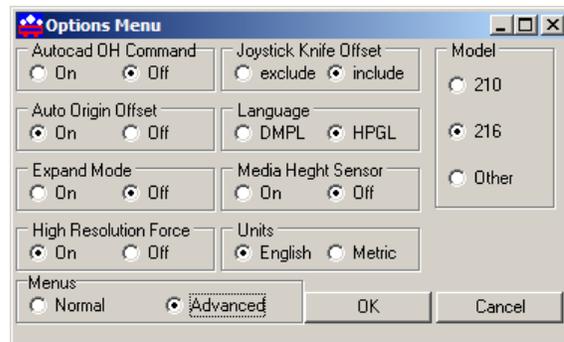
**COORDINATE SYSTEMS**

#### Coordinate System

Allen Systems have four origins to allow for flexibility when using various CAD/CAS systems. The Centra is shipped with the Long X coordinate system in all factory set-ups and is compatible with most cutter or printer drivers. The choice of coordinate systems other than Long X is beyond the scope of this document.

### A.3.5 Setup -> Options

**Menus** option offers the more advanced features of the software. It is recommended this be set to Normal until a more advanced feature is understood or is required by your operation. The menu items below are displayed when the menu is set to Advanced.



**Autocad OH Command** determines how the system will respond to the HPGL OH command.

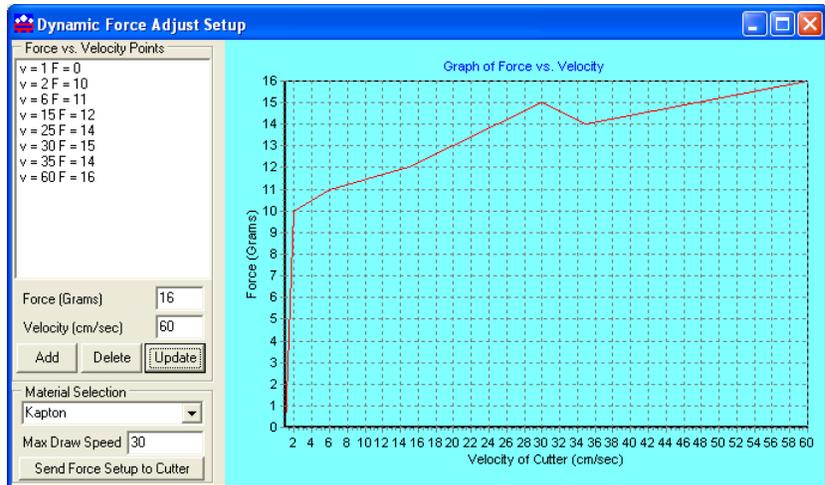
**Expand Mode** allows the Centra to cut past the normal clip limits in the Y-axis. This function allows cutting an extra 1/2 inch (12 mm) wide.

**High Resolution Force** sets the force resolution to 1 to 1000 steps instead of 1 to 100 steps. It is useful when cutting very hard to cut medias. It allow setting the force between two of the standard force settings. A force of 112 is equivalent to 11.2 % force. (also see the Setup → Dynamic Force )

**Joystick Knife Offset** this option controls whether the cutting data point includes or excludes the knife offset. The normal setting is exclude. Include is used for CadLink’s Signlab program when digitizing only. You should use exclude for all cad systems except Signlab.

### A.3.6 Setup → Dynamic Force

This feature is considered an advanced feature and does not appear on the Setup menu unless the menu is set to advanced on the option page. Dynamic Force allows different forces to be applied at different velocities. Adjust sets up the dynamic force parameters and database.



To establish a new material database type in the name of the new material in the **Material Selection** box and click **Add**. In the Force and Velocity Window, type in the desired force vs. velocity that you have established for the material. The recommended method for establishing the various force vs. velocity numbers is to run the test cut at various velocities and record the results for entry here.

Enter the Maximum cut speed for the media in the **Max Draw Speed** window. Before using Dynamic Force Adjust, it is necessary to send the force setup to the cutter memory by clicking the **Send Force to Cutter** button.

## A.4 Diagnostics

The Centra firmware contains a set of resident diagnostics. When the Centra is powered up, it automatically performs a self-test program to check all operating parameters. If a malfunction is detected, the letter “E” and a three-digit error number will be displayed in the display window. The error numbers and the corresponding malfunction descriptions are given in the Appendix B – Error Codes. When an error is displayed and no obvious damage was done to the Centra, power off the Centra and repeat the procedure that caused the error to display. If the error reoccurs, the user may push any key on the control panel to enter the diagnostic mode. Many errors automatically place the Centra in the diagnostic mode when a key is pressed.

The fail-safe system is designed to detect failures in the operation of the electromechanical system in the Centra and to prevent such failures from causing other damage. The Centra monitors motor currents and will generate an error if motor current

too high or unmeasurable. It also generates an error for impossible or dangerous conditions. The appropriate error code will appear, as mentioned above, in the display window on the control panel.

The diagnostics in the Centra exist at several levels:

1. POWER-ON
2. CONTINUOUS HARDWARE AND SOFTWARE MONITORING
3. OFF-LINE

The **POWER-ON** diagnostics are performed at power-on or reset of the microprocessor and test the microprocessor, memory, servo analog and digital hardware, and some of the testable sensors.

After initialization, **CONTINUOUS HARDWARE AND SOFTWARE MONITORING** check the sensors and fail-safe monitors for machine malfunctions. If a malfunction is detected, an error code is displayed on the control panel display, motors are shutdown and the Centra ceases operation.

**OFF-LINE** testing is used for manufacturing and field service testing and for making certain adjustments to the Centra such as calibration.

To Run Diagnostics if the Centra unit is displaying an error code on the front panel display, press any key to enter the diagnostic mode.

## **A.4.1 How to run Diagnostics**

### **A.4.1.1 From Front Panel**

Turn unit on and allow initialization to complete. If the Centra is displaying a flashing error code on the front panel display, press any key to enter the diagnostic mode.

Press the select key to initiate the menu function, Press the left or right arrow key to display diA. Press the up or down key to scroll thru the diagnostic numbers (0002 – 0099). Press the select key to start the diagnostic.

#### **TO STOP A DIAGNOSTIC**

Press the reset key sequence F1, F2, F3.

#### **TO EXIT THE DIAGNOSTIC MODE**

To return to normal operation, run diagnostic 99 or cycle the Centra power off and on

### **A.4.1.2 From Remote Panel**

To start diagnostic select diagnostic to run from diagnostic pull down menu in the Centra remote panel. Follow on screen directions. To stop a diagnostic press the CTRL-C character on the keyboard or turn off and on the Centra.

## **A.4.2 Setup Diagnostics**

### **A.4.2.1 Setup/Operation of Analog Accumulator Sensors**

#### **A.4.2.2 Analog Sensor Operation**

Uses diagnostics 40, 55, 45, 44, 41 and 42

At load or beginning of frame

Turn on takeup and supply motor for enough time to empty/fill accumulators

While idle and ready (load led on)

If input/output accumulators are  $< / >$  half full turn on supply/takeup motors to make accumulators 1/2 full.

While cutting

If input accumulator  $< 1.4$  inches of media or output accumulator  $>$  accumulator length – 2.4 inches of media then pause cutter. If stepper motors are off turn on stepper motors  $\frac{1}{2}$  inch of movement

If paused by above and input accumulator has more than required amount of inches turn on steppers for  $\frac{1}{2}$  inch movement.

At end of job center accumulators.

At beginning of copy move to load position before starting copies.

#### **A.4.2.3 Hall Effect Sensor Operation**

Uses diagnostics 55 and 45

At load fills input dancer until bottom sensor is hit.

At beginning of frame turns on both steppers to advance last frame size distance

Uses state machine to decide what steppers to turn on and when.

#### **A.4.2.4 Diagnostic 40 Set Accumulator Length**

Diagnostic 40 allows setting Analog rail length set to 2 times the distance between top and bottom of movement available. We use 34 inches on Centra.

#### **A.4.2.5 Diagnostic 55 Set Accumulator Type**

Diagnostic 55 allows setting sensor type for accumulator. Default is fill. Set to AnLg if analog sensors are installed or Fill for hall effect sensors.

#### **A.4.2.6 Diagnostic 45 Set Stepper Speed**

Diagnostic 45 allows setting speed of stepper motors. Time steppers by timing the feeding of 36 inches of media. The divide 36 by the time measured. Enter this number. On Centra this number should be about 3.5 inches per second.

#### **A.4.2.7 Diagnostic 44 Max Accumulator Position**

If you have analog sensors you must map the sensors since the transducer is not linear. Diagnostic 44 allows mapping the non-linear position of the analog position to adc values.

Before running diagnostic check operation of the adc. Do this by removing media and running diagnostic 41 for supply sensor and 42 for takeup sensor. Display will oscillate between the position and the adc value. The position value will not be correct until completing this diagnostic.

The top adc value should be in the range of 1-50 adc counts. You do this by making the plunger for the sensor just slightly push in the plunger. You change this by either rotating the block on the bar or moving the top of the diagonal toward or away from the sensor.

The bottom adc value should be between 600-750. If you have a larger value the plunger is probably bottoming out. You fix this by moving the bottom of the diagonal away from the sensor.

In order to load media on a machine on machine that has never run diagnostic 44 you have to turn off label mode with diagnostic 64 = off.

To run diagnostic load media between supply nip, through pinch wheels and output nip. Accumulator dancers should be within 1/8 inch of the very bottom on the supply side and within 1/8 inch of the very top of the takeup side. The pinch wheels should be down. Start diagnostic 44. The adc values for input and output accumulators oscillate. One number should be between 1 and 50 and the other between 600-750.

Press select. run is displayed.

The grit will advance media 1/8 inch at a time recording adc value for each 1/8 inch position. At the end of the diagnostic 44 good or bad is displayed.

If good press select and then run diag 64 to turn label mode on if you turned it off before, then diagnostic 41 and 42 to verify top, bottom and middle positions displayed. Top should display 0.00 inches bottom should display number set in diagnostic 40 above. Middle should display about 1/2 this number.

If bad is display the starting value is > 255 or the bottom value – top value is < 100 adc counts. Fix mechanical or electrical problem and try again.

Exit diagnostic by pressing any button on the front panel.

#### **A.4.2.8 Calibrate 07**

See calibration procedure at [Website Copy / CD Copy](#) available on the technical support page of the Allen Datagraph web site at <http://www.allendatagraph.com>.

#### **A.4.2.9 Calibrate to Printer**

See calibration procedure at [Web Site Copy / CD Copy](#) available on the technical support page of the Allen Datagraph web site at <http://www.allendatagraph.com>. -> tech support -> Centra -> SmartMark Sensor Page.

#### **A.4.2.10 Calibration Square Output**

This diagnostic prompts for a square size and sends an HPGL command to output the square. This is useful when calibrating the Centra to a ruler rather than a printer and is normally not required. Specifying 6 inches for the size will send the HPGL job to the Centra that will cut a 6 inch rectangle.

#### **A.4.2.11 Default Calibration 08**

This diagnostic sets the calibration constants back to the factory defaults prior to initial calibration. After running this diagnostic you will have to either restore the calibration

constants or rerun the procedure described in TSB on Calibration [Website Copy / CD Copy](#) or Smartmark™ calibration [Web Site Copy / CD Copy](#) available on the technical support page of the Allen Datagraph web site at <http://www.allendatagraph.com>. As this is a rather involved procedure Diagnostic 08 should be avoided unless you have received an E37 error, which automatically run this diagnostic.

### A.4.2.12 FO Output

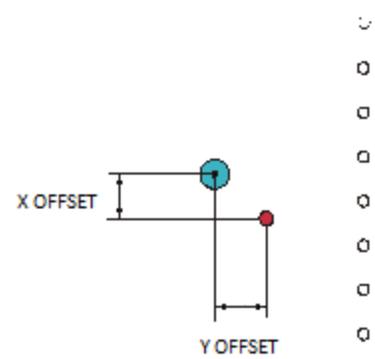
This diagnostic sends the <esc>.vfooutput: command which displays software debug information about the last SmartMark™ scan. The first line output indicates the location of the three targets and whether they were found. The last two lines indicate the amount of scaling and rotation calculated that need to be applied to the HPGL commands to cut the image.

It normally is not useful for customers to run this diagnostic. Information displayed is recorded in the serial.log file.

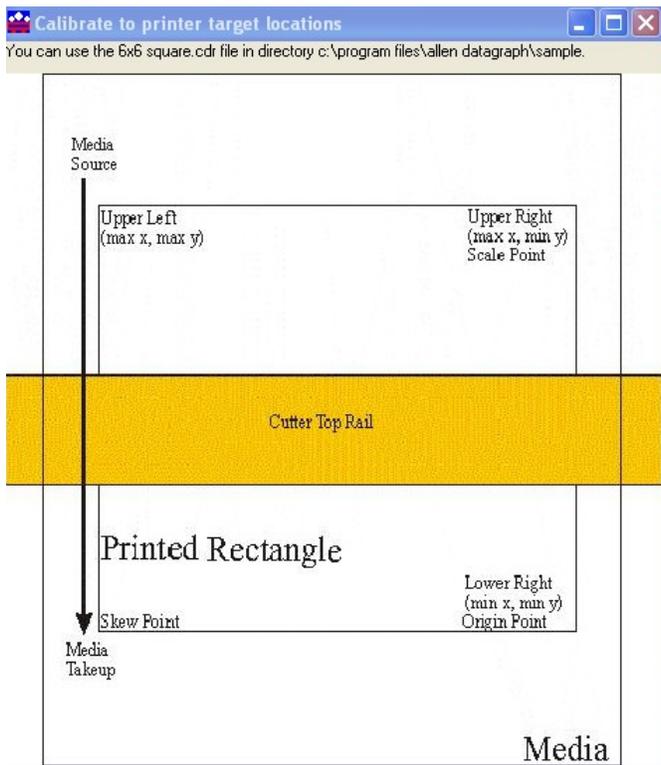
### A.4.2.13 Smart Mark Setup

#### 4.2.13.1 Sensor Offsets

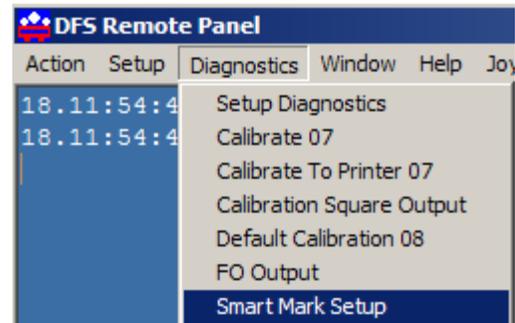
The SmartMark™ sensor is offset from the center of the knife. The red dot indicates the LED point and the blue circle represent the knife. This value is normally setup at the factory or during installation of the Centra. The offset distance is preset at the factory, but may need to be adjusted on occasion. You may follow this procedure only if you own a digitizing site (Allen p/n PL-00-11-500). Otherwise you must follow the manual procedure described in the TSB Calibration [Web Site Copy / CD Copy](#).



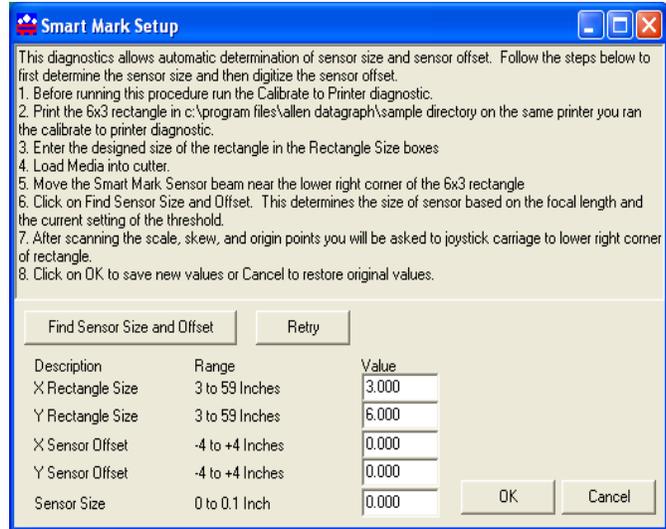
To automatically reprogram the SmartMark™ sensor offset and sensor size parameters: Open the Centra Remote Panel. Open the **Diagnostics** Menu and click on **SmartMark™ Setup**



1. Before running this procedure run the Calibrate to Printer diagnostic.



2. Print the 6x3 rectangle in c:\Program Files\Allen Datagraph\Sample directory on the same printer you ran the “calibrate to printer diagnostic”.
3. Enter the designed size of the rectangle in the Rectangle Size boxes
4. Load Media into Centra.
5. Move the SmartMark™ Sensor beam near the origin corner of the 6x3 rectangle
6. Click on Find Sensor Size and Offset. This determines the size of sensor based on the focal length and the current setting of the threshold.
7. After scanning the scale, skew, and origin points you will be asked to joystick the carriage to the lower right corner of the rectangle. Use either the optional fiber optic bombsite so that the center of the bombsite is directly above the lower right hand corner of the printed rectangle.
8. Click on OK to save new values or Cancel to restore original values.



You can review the numbers by opening the **Setup** Menu, click on **Line Sensor Menu**. See section describing the line sensor menu.

### A.4.3 Customer Diagnostics

#### A.4.3.1 Set Model Number 03

This diagnostic allows setting model number into cutter so it knows it is an Centra Cutter. Start diagnostic. Enter model 210 for 10” and 216 for 16” for Centra Finishing System then press the Select Key.

Model number can also be set from the Setup -> Options menu.

Model number should not be changed under normal circumstances. Password to change model number is 23.

#### A.4.3.2 Lan address IP assignments 04

Normally you do not need to run this diagnostic. If you are using a cross over cable the default address is 192.168.4.10 and you have set your computers ip address to 192.168.4.2. If you are using a dhcp server, most algorithms normally try to assign same ip address to mac address everytime the device requests an ip address. If you have trouble with your dhcp server giving you a different ip address everytime you turn on your machine you can set a static ip address.

select -> right arrow to dia -> up arrow to 0004 -> select

select ip or dhcp (static / dynamically assigned)

change ip address part 1 (0-255) (use for/speed up/down to change value) select  
change ip address part 2 (0-255) select  
change ip address part 3 (0-255) select  
change ip address part 4 (0-255) select

MAS is displayed. press select  
change mask address part 1 (0-255) select  
change mask address part 2 (0-255) select  
change mask address part 3 (0-255) select  
change mask address part 4 (0-255) select

GATE is displayed. press select  
change gateway address part 1 (0-255) select  
change gateway address part 2 (0-255) select  
change gateway address part 3 (0-255) select  
change gateway address part 4 (0-255) select  
then power off cutter and back on.

Example: if you want to set static ip to 192.168.3.30 with mask of 255.255.255.0 and gateway of 192.168.3.1

you would:

select -> right arrow to dia -> up arrow to 4 -> select  
select ip (static)  
change ip address part 1 192 select  
change ip address part 2 168 select  
change ip address part 3 3 select  
change ip address part 4 30 select

MAS is displayed. press select  
change mask address part 1 255 select  
change mask address part 2 255 select  
change mask address part 3 255 select  
change mask address part 4 0 select

GATE is displayed. press select  
change gateway address part 1 192 select  
change gateway address part 2 168 select  
change gateway address part 3 3 select  
change gateway address part 4 1 select

#### **A.4.3.3 Button Diagnostic 31**

Test the operation of each of the buttons on the front panel. Buttons must be pressed as prompted by this display code, in the following order: Load, Pause, Copy, Speed Up, Speed Down, Force Up, Force Down, Test Cut, F3, F2, F1, Select, Left, Right, Up, Down. If the wrong code is received the error code E036 is displayed otherwise the requested button is requested with a prompt.

#### **A.4.3.4 Confidence Test 02**

The confidence test is used to verify the operation of the cutting station of the Centra. It fully tests the capability of the cutting CPU and Servo control system.

First Load A size paper (8.5 x 11) into the cut station. Lower pinch wheels. Do not press load. Insert a Pen into the tool holder. Start diagnostic.

#### **A.4.3.5 Flag Monitor / Adjust 34**

This diagnostic is used to verify the correct flag position on the cutting head. It displays the knife height on the display. The flag is a small, flat, angled piece of metal which moves up and down between a pair of circuit board mounted sensors. The flag is held on to the knife holder by 2 Allen screws, which are loosened slightly if adjustment is necessary. There are 3 locations the knife holder can be in. They are:

**Bottom** (remove the knife from the holder and press the holder down to the bottom) The display should read between 000 and 006.

**Down** (press the knife down with a knife in the holder) The display should read 018 to 040 pressing down with a knife in the holder (no media present). Adjust flag position if necessary.

**Top** (hold the knife up) The display should read 0060 or more.

The display should change immediately as you move the knife up or down.

Slightly move the flag to obtain the above reading at each of the three locations.

Check that the flag screws are tight and recheck Bottom and Down.

#### **A.4.3.6 Flag Setup - Z Axis 58**

This diagnostic trains the Centra to match the carriage installed.

**Phase 4:** Set Tool Bottom - Remove the tool from the holder and press the Select Key.

**Phase 5:** Set Tool Down - Adjust knife depth guide to equal the blade length. Place knife tool in holder and press select key.

#### **A.4.3.7 Label Mode 64**

On power up the label mode is set to on. If you want to run without accumulators and stepper motors you can run this diagnostic and set label mode to off.

#### **A.4.3.8 LED and LCD display 29**

This diagnostic display characters on the 4 digit LCD display and flashes the LEDs.

#### **A.4.3.9 Line Sensor 21**

This diagnostic displays the amount of reflectance received back from the SmartMark™ sensor. It is normally < 20 for black and > 80 for white.

#### **A.4.3.10 Amplifier Status**

This diagnostics displays the temperature of the motor amplifiers

### **A.4.4 Manufacturing Diagnostics**

**It is not recommended that the Manufacturing Diagnostics be run unless instructed by direct contact with Allen Datagraph Technical support. Damage to the system is possible.**

#### **A.4.4.1 Collect Motor Position**

Used by engineering to tune the servo system

#### **A.4.4.2 Default Gains 48**

Reset x, y, z axis gains to default values

#### **A.4.4.3 Lift/Lower Continuous 37**

Exercises the z axis lift lower at different forces. Continuously raises and lowers the knife.

#### **A.4.4.4 Lift/Lower Demand 38**

Exercises the z axis lift lower at different forces. Raises and lowers the knife on each select key press. While knife is down at a force the cutter displays the current through the voice coil and the width of the pwm pulse to the z axis driver.

#### **A.4.4.5 Line Sensor Test**

Used by engineering to tune the line sensor hardware

#### **A.4.4.6 Motor Position Plot**

Used by engineering to tune the servo system

#### **A.4.4.7 Read Calibration Constants**

Reads and displays the scaling constants for the x and y axes. Safe to run. X and Y encoder counter per inch are around 8000.

#### **A.4.4.8 Spare Out**

Used by engineering to test hardware

#### **A.4.4.9 Tuning (Engineering)**

Used by engineering to tune the servo system

#### **A.4.4.10 Write Plot Data to Excel**

Writes the last tuning graph to file that can be imported into an Excel spreadsheet.

### **A.5 Label Interconnect**

#### **A.5.1 Read All Sensors Continuously**

Read and display the service loop sensor statuses. As they are triggered by moving the dancers in the accumulators the status changes from 0 to 1. Not used if analog sensors. Use diagnostic 41 and 42 instead.

#### **A.5.2 Reset Service Loop Sensor**

Each of the service loop (accumulator) sensors detects the presence of dancer in the accumulator travel. They are latched (set) on when triggered. To reset the sensor states back to zero use this diagnostic. Not used if analog sensors. Use diagnostic 41 and 42 instead.

#### **A.5.3 Supply motor on**

Turn on supply motor (same as F2 on front panel)

#### **A.5.4 Supply motor off**

Turn off supply motor (same as F2 on front panel)

#### **A.5.5 Take up motor on**

Turn on take up motor (same as F3 on front panel)

#### **A.5.6 Take up motor off**

Turn off take up motor (same as F3 on front panel)

## **Appendix B – Error Codes**

The mmc software error codes are in the following linked document. [Web Site Copy](#) / [CD Copy](#).

## **Appendix C – Radio and Television Interference**

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

In order to maintain compliance with FCC regulations shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio & television reception.

This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions; (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## **Appendix C – Installation and Assembly Instructions**

[Web Site Copy](#) / [CD Copy](#)

## **Appendix D – Loading Diagram**

[Web Site Copy](#) / [CD Copy](#)