Paragon Documentation

Version 1.5

Version	Date	Change	Author
1.0	09Jun2014	Initial Publication	GT Engineering
1.1	20Aug2014	Resolved TOC links. Cleaned up images along right border.	J. Monroe
1.2	10Sep2014	Added KI Calibration Description	J. Wolff
1.3	16Sep2014	Added Information on Limit Switches, Updated section on operator workflow	L. Hook
1.4	24Oct2014	Added Restore operation. New in V2.0.2	J. Monroe
1.5	02Dec2014	Corrected System Monitor name to Status Monitor	J. Monroe

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Architecture

- Process Manager, Controller, GUI, Control Panel basic operations
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CutWorks

AccuMark version 8.5.2 or greater can output Job files directly and requires no conversion through CutWorks.

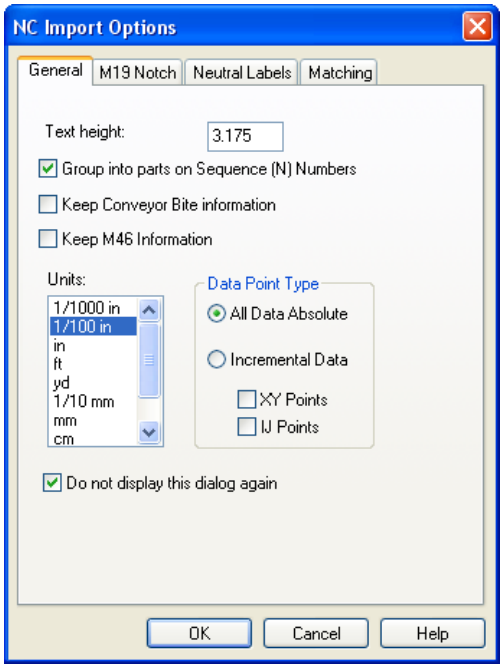
CutWorks version 7.0.2.21 HF#4 or greater is recommended use with Paragon.

Paragon software automatically opens Cutworks which runs in the background. CutWorks is used to convert cutdata to the Job file format for the Paragon.

Data Import

If the following Data Format Tool Codes are present in the NC data, units do not have to be configured in NC Import Options. [NOTE: These NC codes were not supported prior to Cutworks version 7.0.3]

G70	3.3 English format
G71	5.1 Metric format
G91	4.2 English format



Tool Assignments

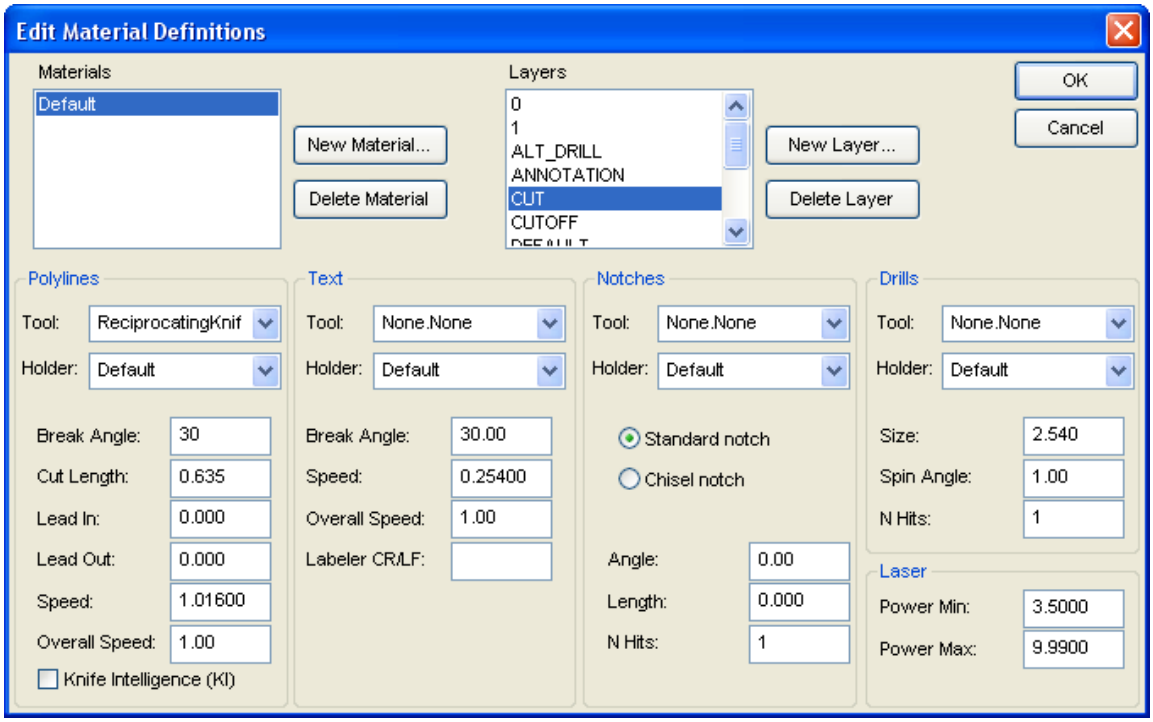
Edit Material Definitions is used to Assign Tools to specific Layers. All the Holders should remain at Default for every Layer.

Polylines - ReciprocatingKnife.ReciprocatingKnife1, DragKinfe.DragKnife1

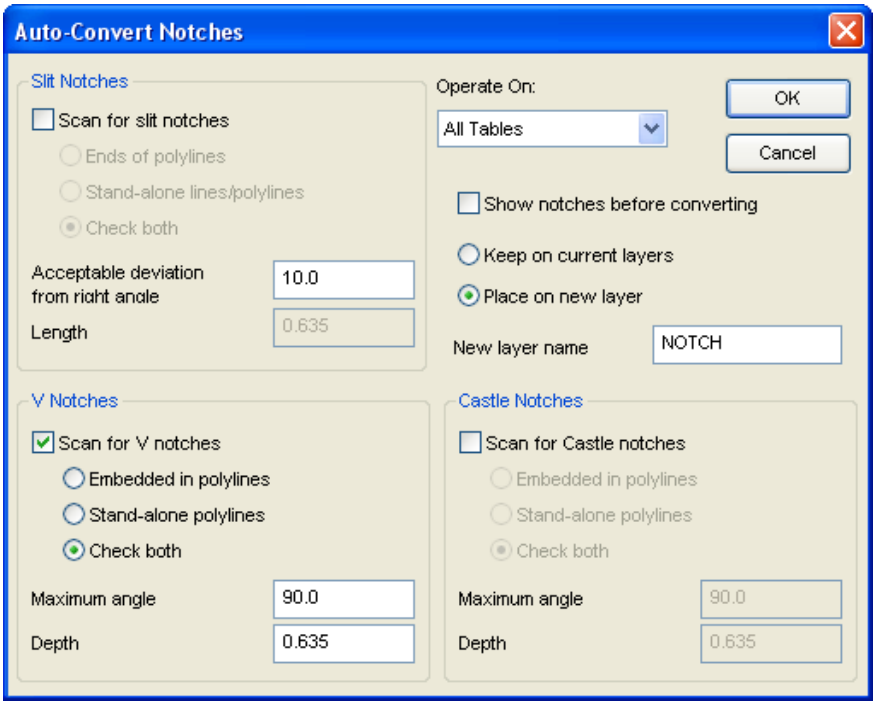
Text - Pen.Pen1, None.None

Notches - Z1 Tool assignment only, Select None.None for Paragon

Drill - Drill.Drill1, Drill.Drill2 or a specific size

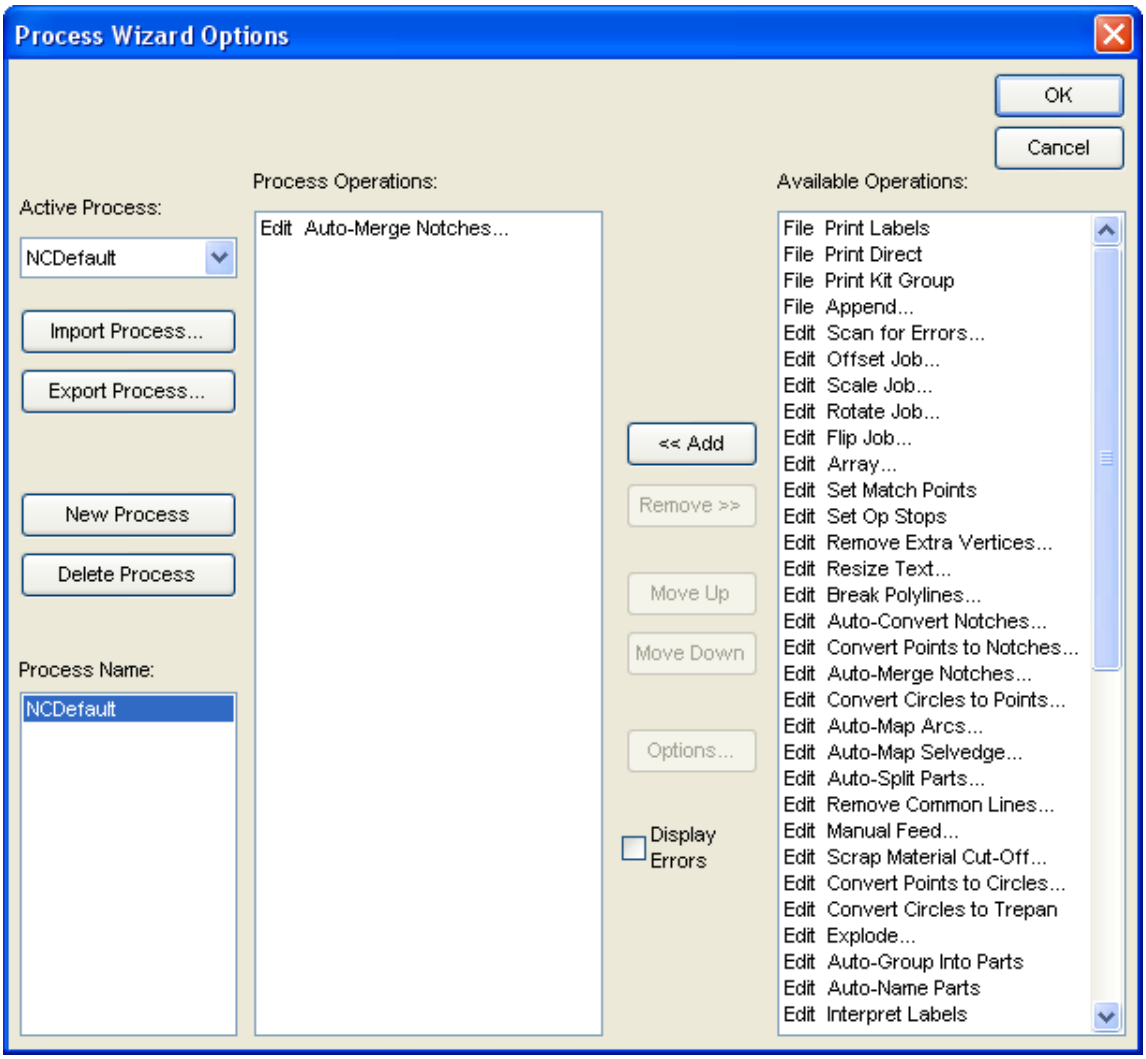


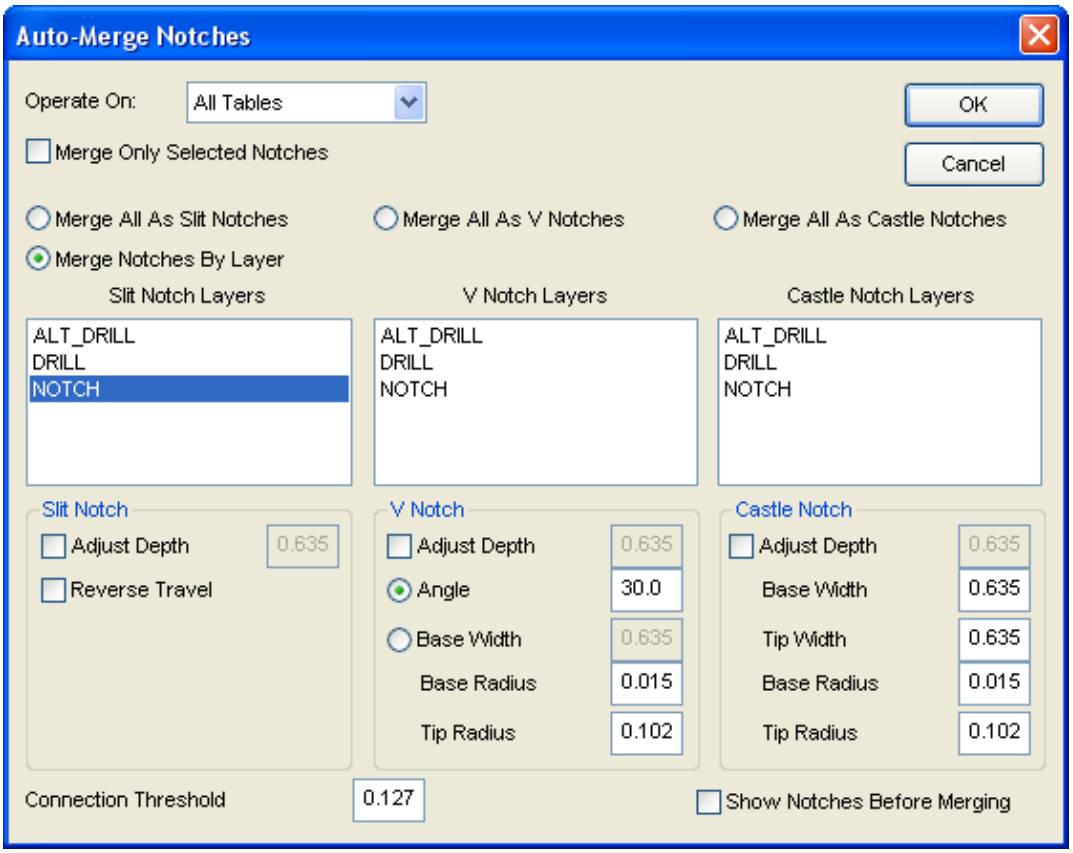
V Notch Detection



Process Wizard Options

If NC data includes Slit Notches, Edit Auto-Merge Notches must be in the active Process Wizard to convert the notches from a Notch entity to the Reciprocating or Drag knife as part of the piece perimeter.



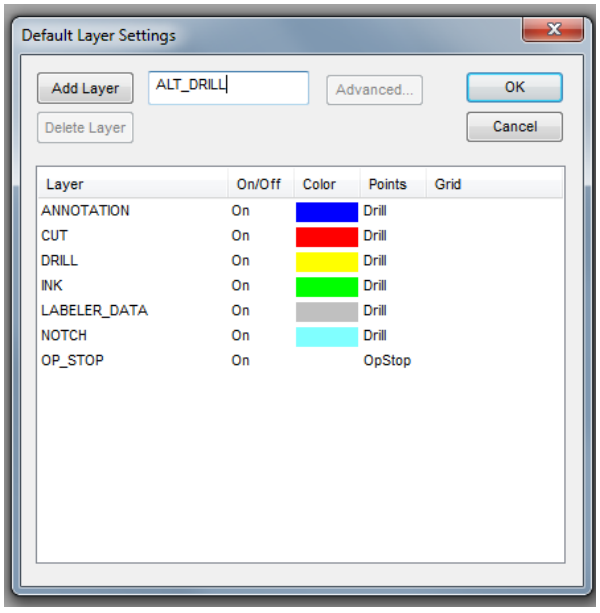


Once CutWorks is configured for the customer data, the conversion is automatic when Open Job is performed.

Dual Drill configuration

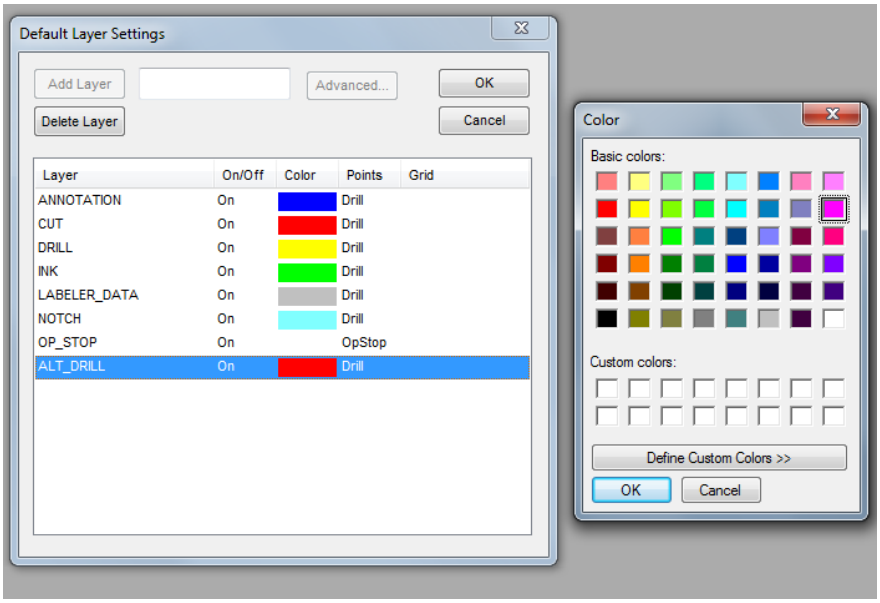
Define Drill 2 Layer

In the Edit->Default Layer Settings menu dialog, check if the ALT_DRILL layer is present. If not, type ALT_DRILL in the edit box and then press the Add Layer button.



If desired, change the alternate drill color by right clicking on the color box and selecting

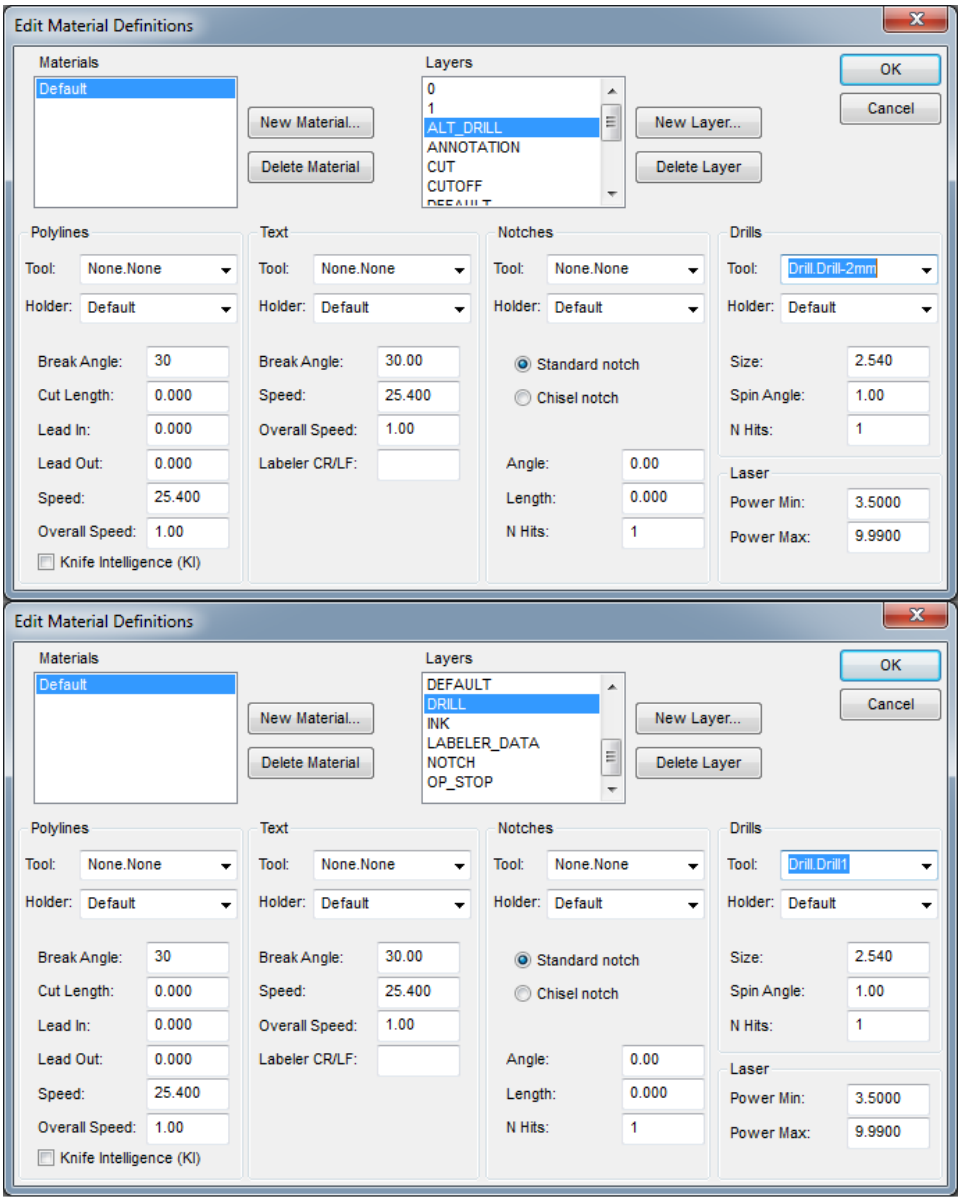
the desired color.



Drill 2 Materials Definition

Select the Machine->Edit Material Definitions menu. Select the ALT_DRILL layer and in the "Drills" box on the right, select an appropriate tool for the second drill.

> NOTE: In Cutworks version 7.0.3, select "Drill.Drill2". In Cutworks version 7.0.2, Drill.Drill2 is not present, so select any one of the other drill tools, for example, "Drill.Drill-2mm".



GERBERcutter Drill 2 Setup

In the GERBERcutterUI, select the Utility Drawer->Change Tool function. Setup the Head1.Holder3 to contain the drill name specified in the Cutworks Materials Definition (either Drill.Drill2 or Drill.Drill-2mm.)

Optionally, setup a different color for the drill 2 symbol through the “Utility Drawer->Change User Settings”.

Basic Operation

Getting Started Guide

The “Getting Started Guide” is an essential reference for anyone that is using the Paragon cutter the first time. It provides a complete overview of the cutter hardware/software, and outlines how to cut a simple job from start to finish.

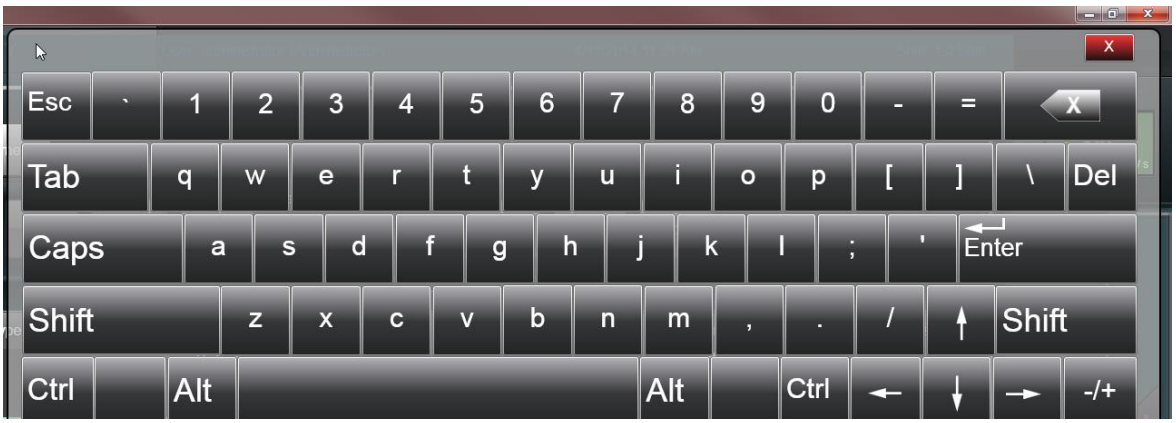
Logging In

To begin using the cutter, you must be an authorized user with a username and password.

1. Select a username from the dropdown menu
2. Touch the password field and type your password
3. Press “Enter”.

Using the Touch-screen Keyboard

Keyboard input for the GERBERcutter software is done by using the on-screen keyboard. The keyboard automatically appears once you touch an input field on the screen:



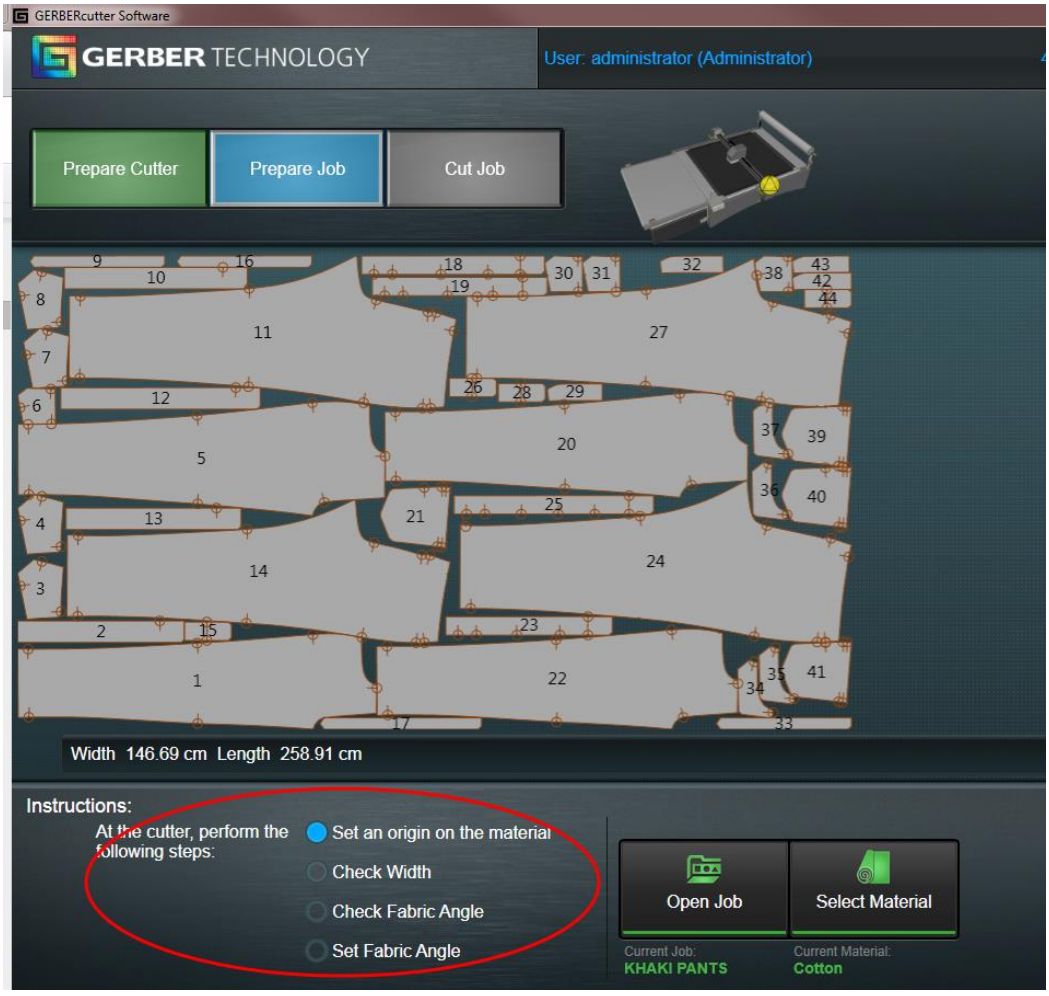
Once you have entered a value in a text field, use the “Enter” key to enter the value and dismiss the keyboard.

If you have made an entry in a text field but do not wish to keep it, click the red “X” in the top right hand corner to dismiss the keyboard and return the entry to it’s original value.

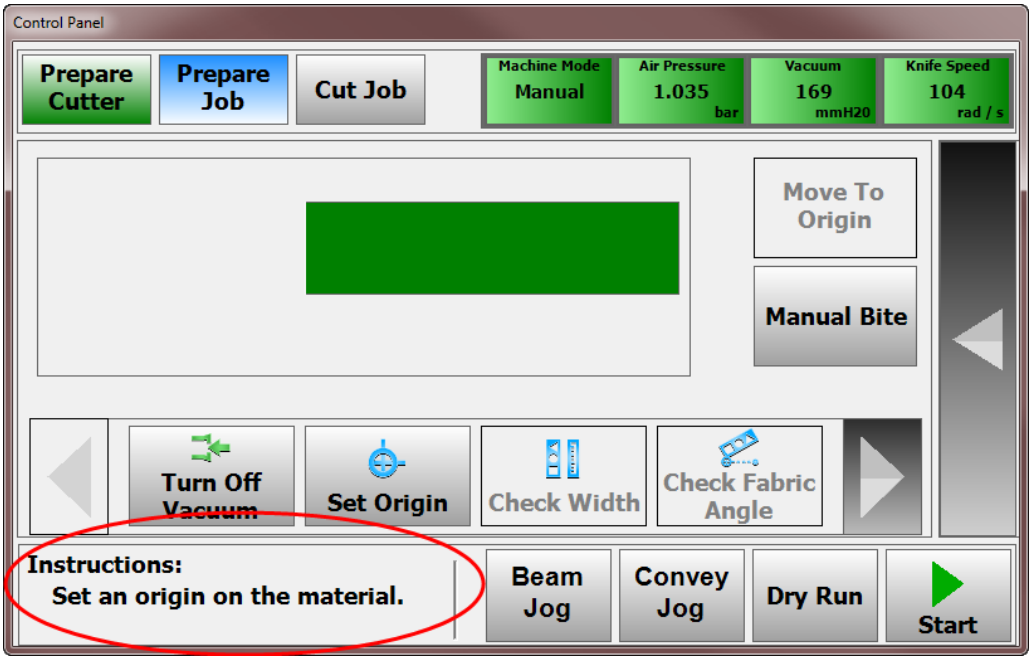
The arrow keys can be used to move the cursor within an input text field. To completely clear a text field and enter a new value, use the “Del” key.

Operator/ Workflow Instructions

Once logged in, a series of steps are necessary to cut a job. Each step is displayed on both the GERBERcutter software touch screen and beam control panel in the instruction area (lower lefthand corner) of each screen:



Operator Instructions shown on the GERBERcutter Software



Operator Instructions shown on the Control Panel

Basic Operation and Operator Workflow

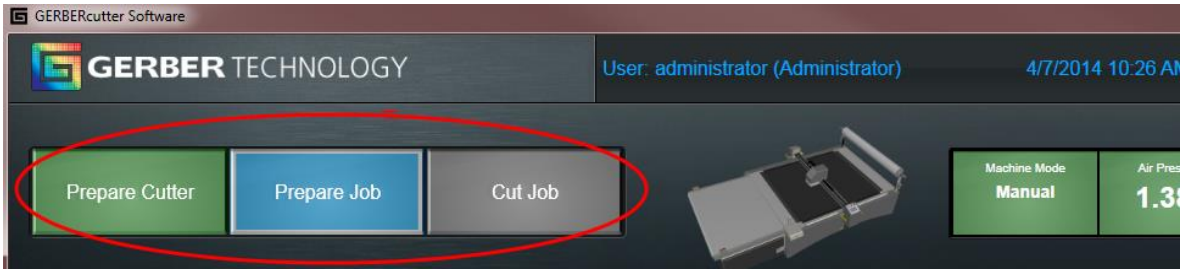
Overview

The GERBERcutter Software has been designed to lead the operator through the cutting process in a step-by-step fashion. The steps required to complete a cutting job from start to finish are referred to as the "Operator Workflow".

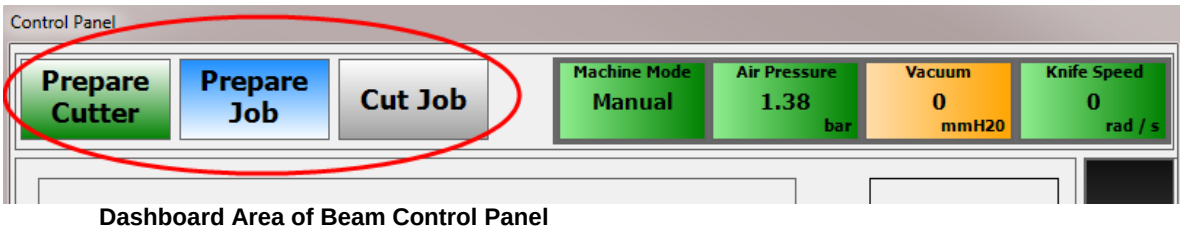
The operator workflow steps are grouped into 3 distinct phases: **"Prepare Cutter"**, "**Prepare Job**", and "**Cut Job**". Each phase is displayed on a separate screen on the both the GERBERcutter software and the Beam Control Panel.

Dashboard area of the GERBERcutter Software and Control Panel

The operator can easily tell exactly where they are in the cutting process by a quick glance at the top left portion ("Dashboard') of either display:



Dashboard Area of GERBERcutter Software



Dashboard Area of Beam Control Panel

Referring to the Dashboard screen above, it's easy to see that:

- all steps have been completed for "Prepare Cutter" (Green)
- the active current steps are within "Prepare Job" (Blue)
- the system is not ready to begin the "Cut Job" processing yet (Grey)

Each phase in the cutting process is color coded with a background color with the following meanings:

Background Color	Meaning	Status
Blue	There are 1 or more steps to complete	Active
Green	All required steps are complete	Complete
Grey	No steps required at the present time	Inactive

It's possible to navigate between the "Prepare Cutter", "Prepare Job" and "Cut Job" screens on the main cutter window by pressing them in the top left corner of the screen. However, it's best to return to the active (blue) screen if available. The active screen lists the instructions for performing the next step in the process.

Operational Information

The dashboard area on the GERBERcutter software and control panel also displays operational information that reflects the current cutter status.

The cutter has two modes of operation:

Manual - indicates the operator can manually control hardware functions, such as moving the Cutter Head, Beam, and Conveyor.

Automatic - when the cutter is processing and cutting a Job file

The current machine mode is displayed in the top right corner of the software:



The dashboard area is also color coded using the following colors:

Color	Meaning
Green	Normal operation
Yellow	Possible problem or warning
Red	An error or condition requires attention

Steps to Operate the Cutter

The “Prepare Cutter”, “Prepare Job”, and “Cut Job” screens each display a series of workflow steps involved to successfully cut a job.

Prepare Cutter

The “**Prepare Cutter**” steps prepare the machine for cutting:

- Clear Emergency Stops (if required)
- Calibrate (if calibrations have not been completed previously)
- Enable Servos
- Home

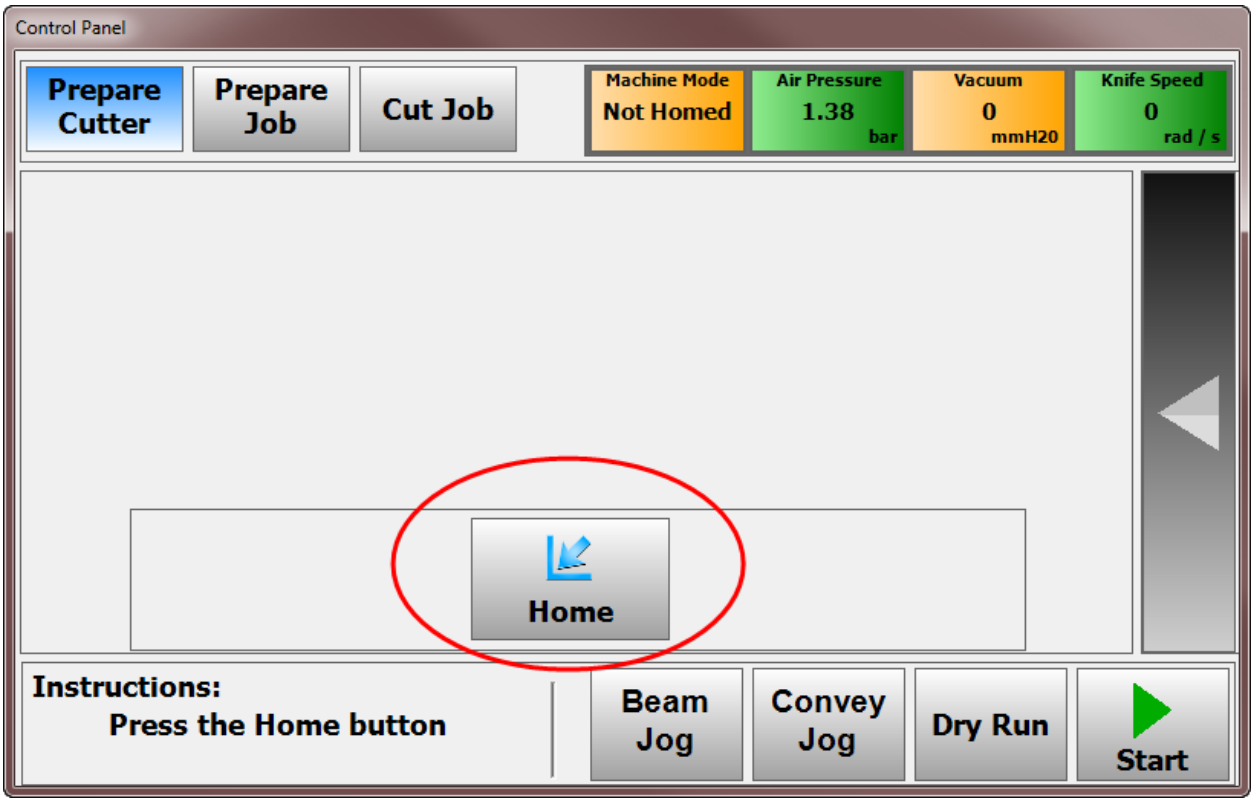
Clearing the Emergency Stops is only necessary if the cutter had previously been stopped using one of the E-Stop controls.

Calibrations are normally performed when the cutter is installed, but if any of the calibrations have not been completed, they will need to be performed before attempting to cut.



The “Enable Servos” button activates the servo components that allow movement of the beam and cutting tools. Press the Green “Servo Enable” button to activate the servos.

The “Home” step is performed by pressing the “Home” button on the Beam Control Panel:



Prepare Job

The “**Prepare Job**” screen displays the steps required for each new cut job:

- Open a Job File
- Select a Material (if required)
- Set the Ply Count (if required)
- Turn On the Vacuum

- Set Origin (or Anchor Point if any parts are skipped)
- Turn On the Knife
- Check Width (if required)
- Check Fabric Angle (if required)
- Set Fabric Angle (if required)

Supported File Formats

The GERBERCutter Software is designed to work with Job (*.job) files. However, the cutter software can read and process a variety of file formats. Here is a list of some of the more commonly used formats:

Type of File	File Extension	Comments
Job	*.job	Native file format, generated from Accumark version 8.5.2 or higher
NC	*.nc, *.cut or no extension	
DXF	*.dxf	AutoCAD (DXF & DXF15)
CEI	*.cei	
GBR	*.gbr	
CUTTICKET	*.cutticket, *.ctx	XML file, references any of the above file types
ASTM		ASTM Sewn Products Automation Standard File Format

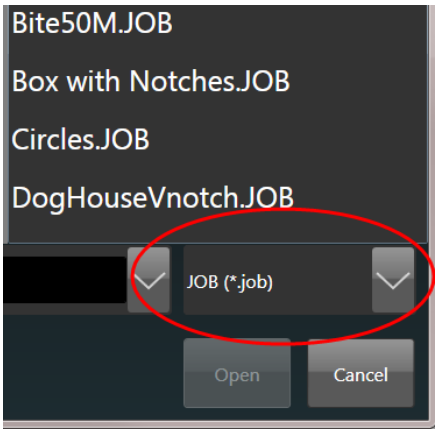
Cut Tickets

A Cut Ticket is a specialized input file which defines several properties used by the cutter software when the Cut Ticket is read. This file contains the name of the job file to read along with several other properties (plies spread, etc.). If the name of the material and the plies spread information is specified within the Cut Ticket and associated Job file, the operator does not have to enter this information manually, saving time when preparing a job.

Opening a Job File

To open a new job file, press the "**Open Job**" button on the main GERBERcutter window, select a file to load, and press "**Submit**".

If there are many different files in a directory you are working with, they can be filtered to only display a specific file format. For example, if you only use "Job" files, select the *.job file filter which will only display files of that type. This makes it easier to locate a file:

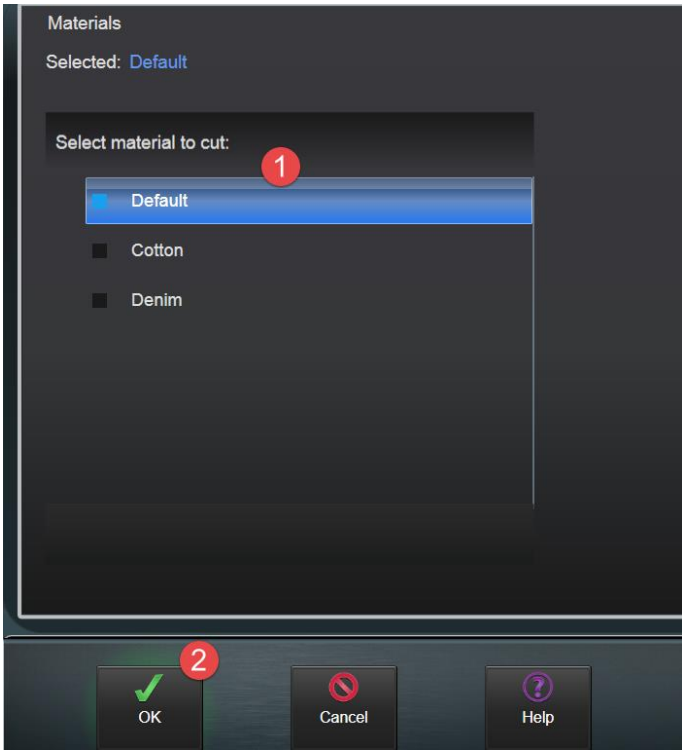


Material Files and Material Selection

When preparing a job, the operator must specify the type of material to be cut. This is done by selecting a material name immediately after opening a file for cutting, but can also be done by specifying a material name within a job file. The material name is linked to several key properties which may affect cutting including ply height, weight (light vs heavy), fiber (natural, blend, synthetic) and fabric type (knit, woven, non-woven).

To select a material, press the "**Select Material"** button:

(1) select a material from the list of materials that appears
(2) press "**OK**" once a selection has been made.



If a material is specified within a job file, it should already be defined in the software. The system is initially configured with a single “Default” material. Additional materials can be created, as long as the current operator has been granted the privileges to do so. See the section titled “Material File Creation” for more information.

In version 2.0.2 and above, selecting a material can be bypassed if desired. Refer to “Customizing the Workflow” for more information.

Processing Settings Related to Materials (*Applies to Version 2.0.1 and prior releases*)

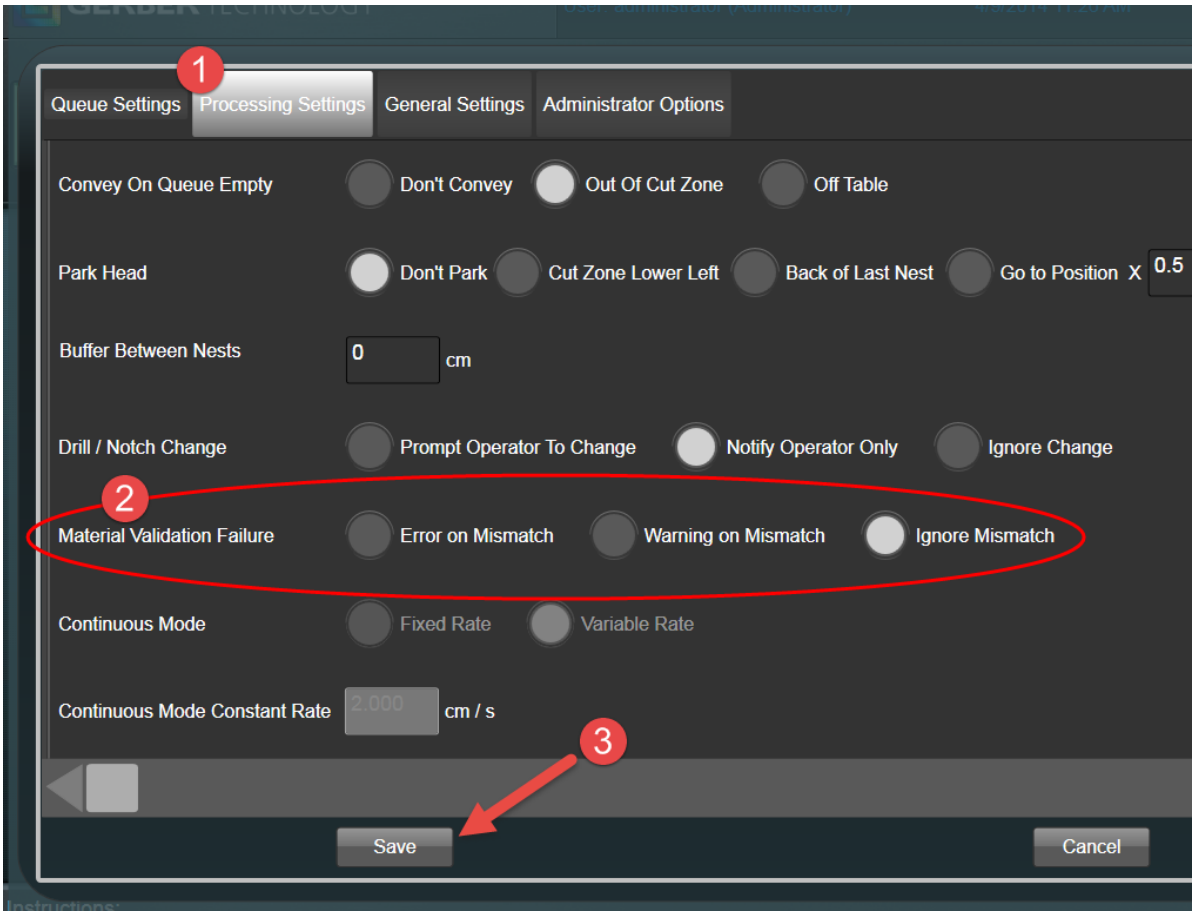
Sometimes when a material is specified in the *.job file, the material listed in the file may not match one of the materials currently configured on the system. When this occurs, the issue is handled based on a software configuration settings called “Material Validation Failure” which has 3 possible values:

- **Error on Mismatch**: Displays an error when the job is submitted and does not allow it to be cut. The job is removed from the queue.
- **Warning on Mismatch**: Displays a warning that the material does not exist, but allows the operator select an alternate material (or create a new one) and proceed with cutting.

- **Ignore Mismatch**: Does not display a warning or error that the material does not exist, but allows the operator to select an alternate material (or create a new one) and proceed with cutting.

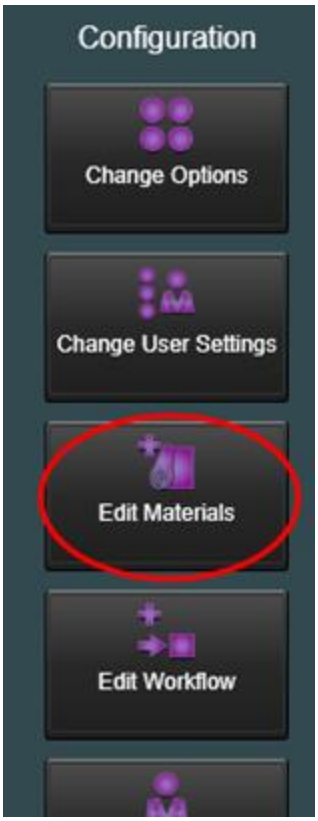
To change this behavior, open the Utility Drawer, and press the “Change Options” button. Select the “Processing Settings” tab, then select one of the options listed under “**Material Validation Failure**”.

Be sure to press **“Save**” or “**Cancel”** when you are finished making changes!



Viewing and Managing Materials

To see which materials are currently available, or to create new materials, open the “Utility Drawer”, and press the **“Edit Materials**” button:



Refer to the section on “Material File Creation” for more information about creating materials.

Ply Count Selection

After selecting a material, the operator may also be prompted to set the ply count (if the software is configured to enable this step). If CutTickets are being used, the ply count can be specified in the *.cutticket file instead.

Turn on the Vacuum

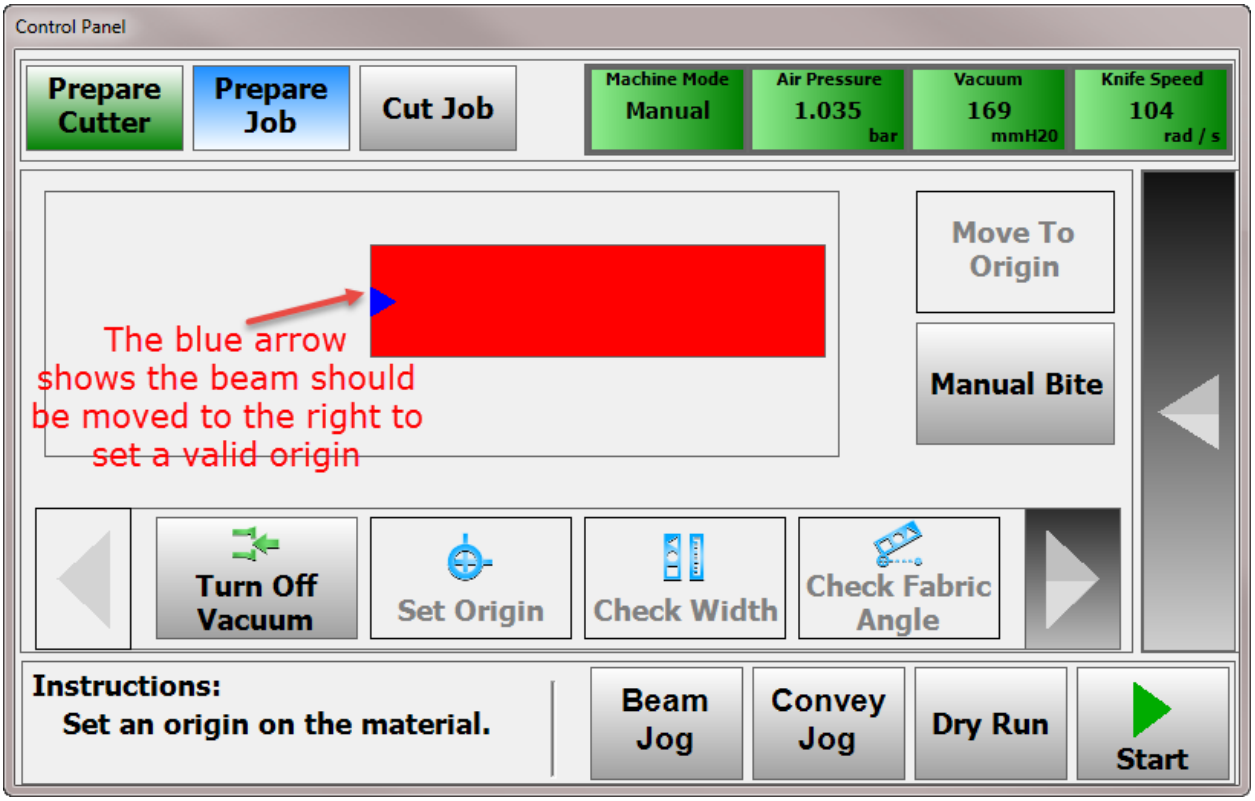
Turn on the table vacuum by pressing the button on the beam control panel:

Note: Vacuum may be turned off at anytime by pressing the button once again.

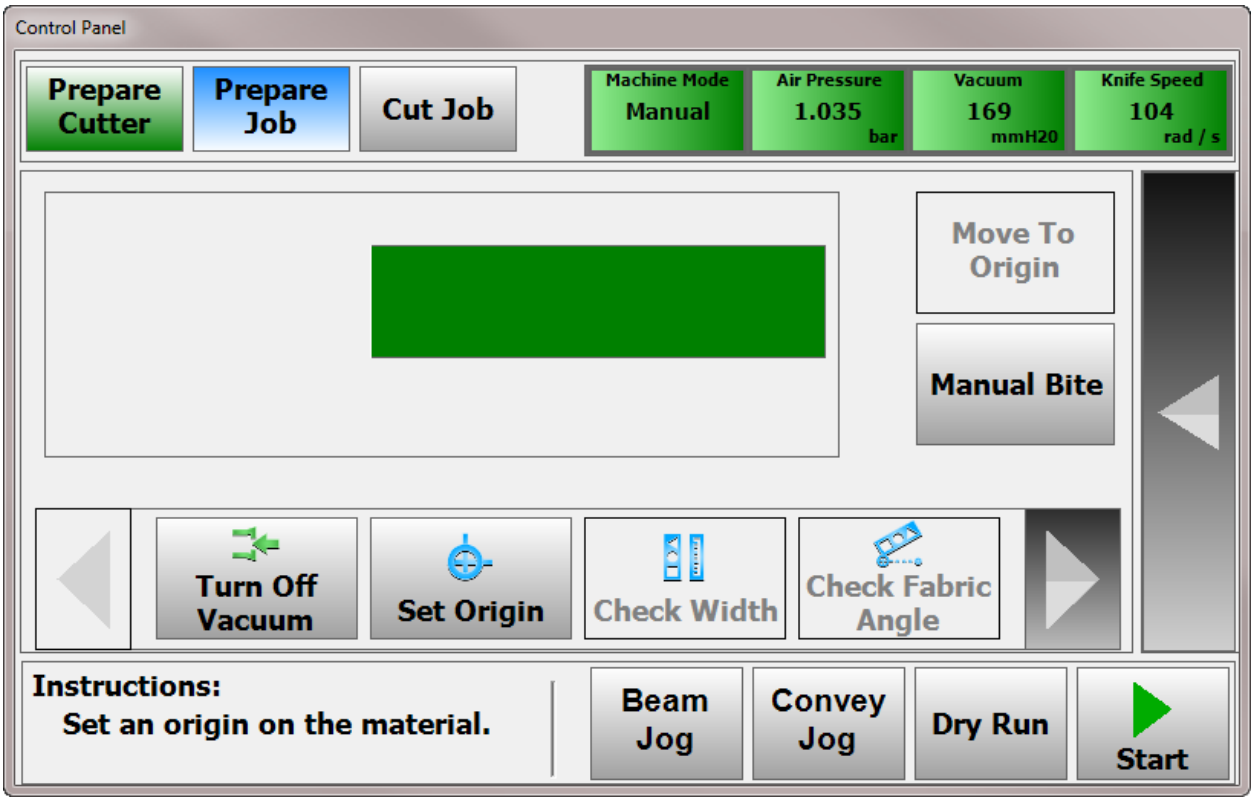
Set Origin

To set an origin, refer to the “origin tool” area on the beam control panel. A background color of red indicates an invalid origin location while a green background indicates a valid origin. Hold

the “**Beam Jog**” button and move the Joystick to position the laser to a valid location, using the background color displayed on the control panel as a guide.



Red indicates an Invalid Origin Setting



Green indicates a Valid Origin Setting

Once a valid origin location has been found, press the “Set Origin” button on the control panel.

Checking the Fabric Width

The “Check Width” button is used to verify that the current job will fit on the fabric (width) by moving the laser to the furthest “Y” position found in the job. If the job does not fit on the material, the data can be automatically scaled to fit the fabric.

To scale the data to fit the fabric, re-position the laser to fit on the fabric and press “**Scale Width”** button.

A similar procedure can be used to scale the data to fit the fabric in the “X” direction using the **“Scale Length”** button [Note that this will only work if the entire job fits on the cutting table, i.e. there are no bites in the job.]

Adjusting the Fabric Angle

The “Check Fabric Angle” and “Set Fabric Angle” functions are used together for making fabric angle adjustments.

When the material is moved onto the cutting table, it may not be perfectly aligned. Fortunately, the software can make adjustments for fabric alignment issues. “Check Fabric Angle” can be used to verify the material is placed properly on the table, while “Set Fabric Angle” compensates for possible misalignment. To make these adjustments:

1. Press “Check Fabric Angle”
   The laser is moved to the lower right corner of the table, with the “X” coordinate defined as the furthest “X” position the job will occupy in that bite, and the “Y” position defined by the “Y” position of the origin (or as compensated for by a previous fabric alignment adjustment.) If the material is not aligned on the table, the laser may point to an area off the material.
2. Use the joystick to adjust the laser to the proper position on the fabric if necessary
3. Press “Set Fabric Angle”.

Note: “Set Fabric Angle” cannot be performed unless “Check Fabric Angle” has been done first.

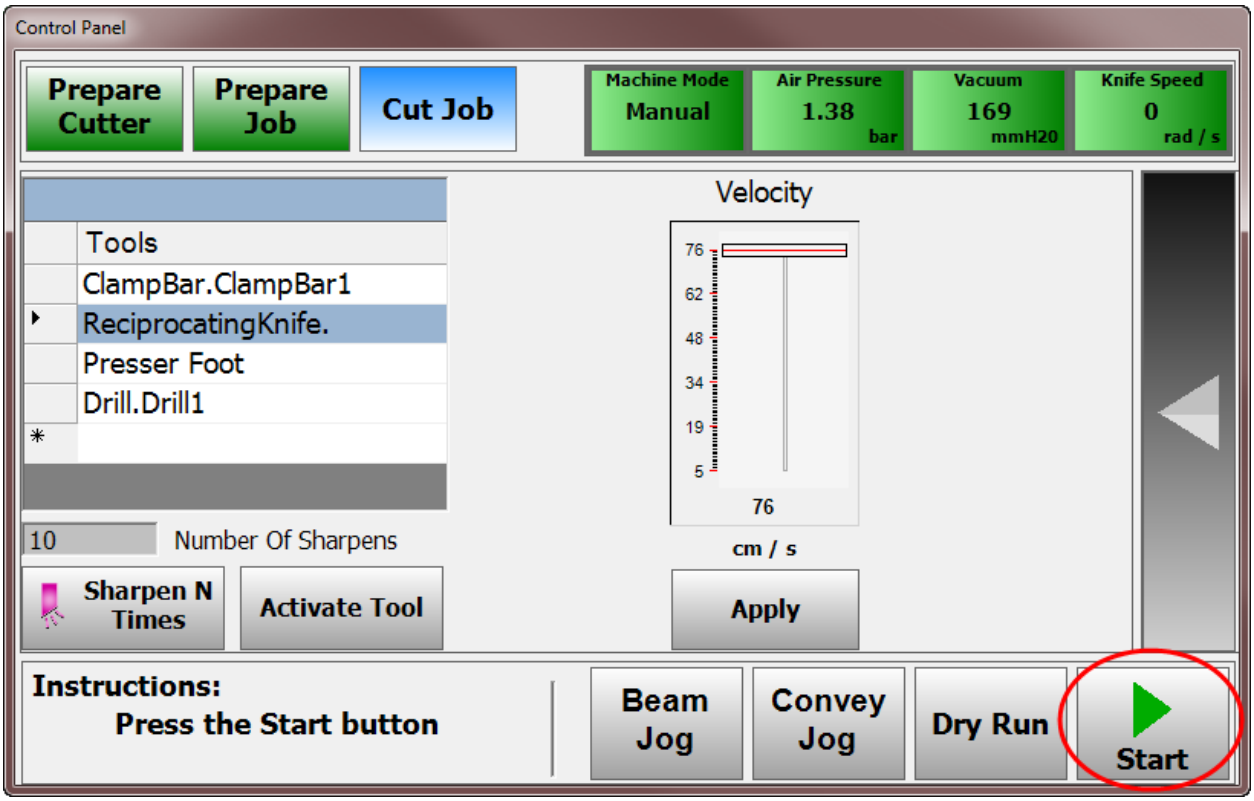
Cut Job

The “**Cut Job**” screen is displayed when the cutter is ready to begin cutting or actively processing a job:

- Start Cutter (or resume)
- Stop Cutter

Starting, Stopping and Cancelling Jobs

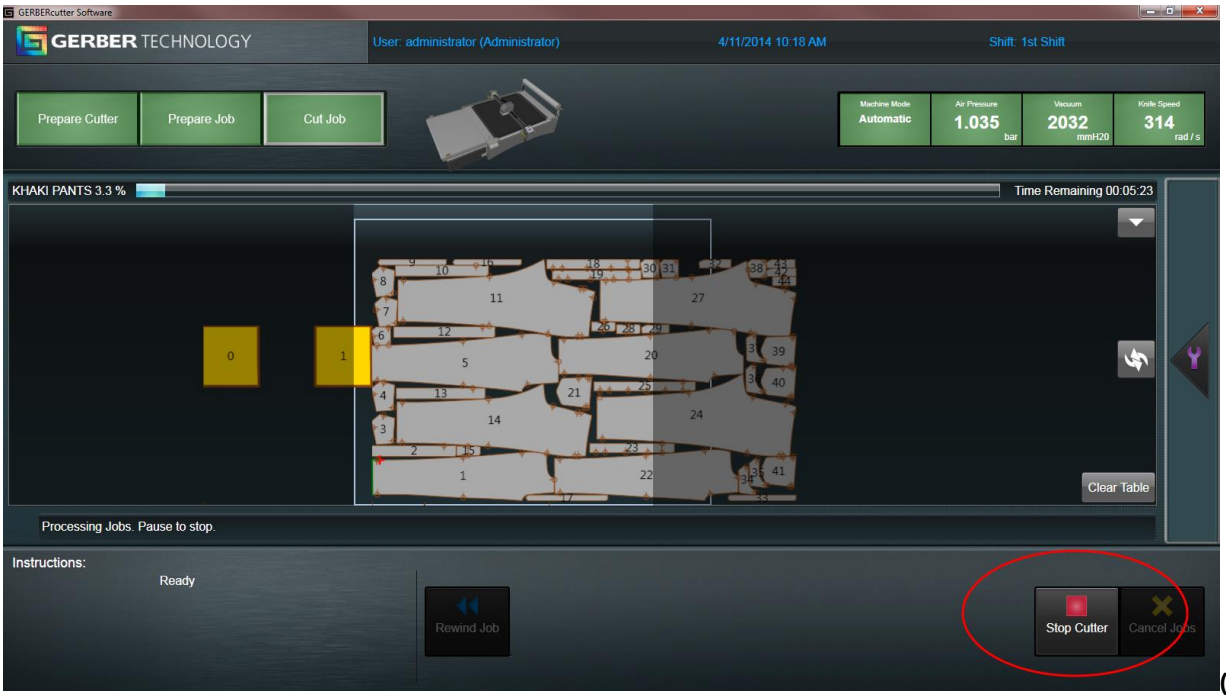
To start a job, press the “Start” button on the control panel:



To stop a job in progress, press either (1) the large red “Stop” button on the control panel or the (2) “Stop” button on the GERBERcutter Software:



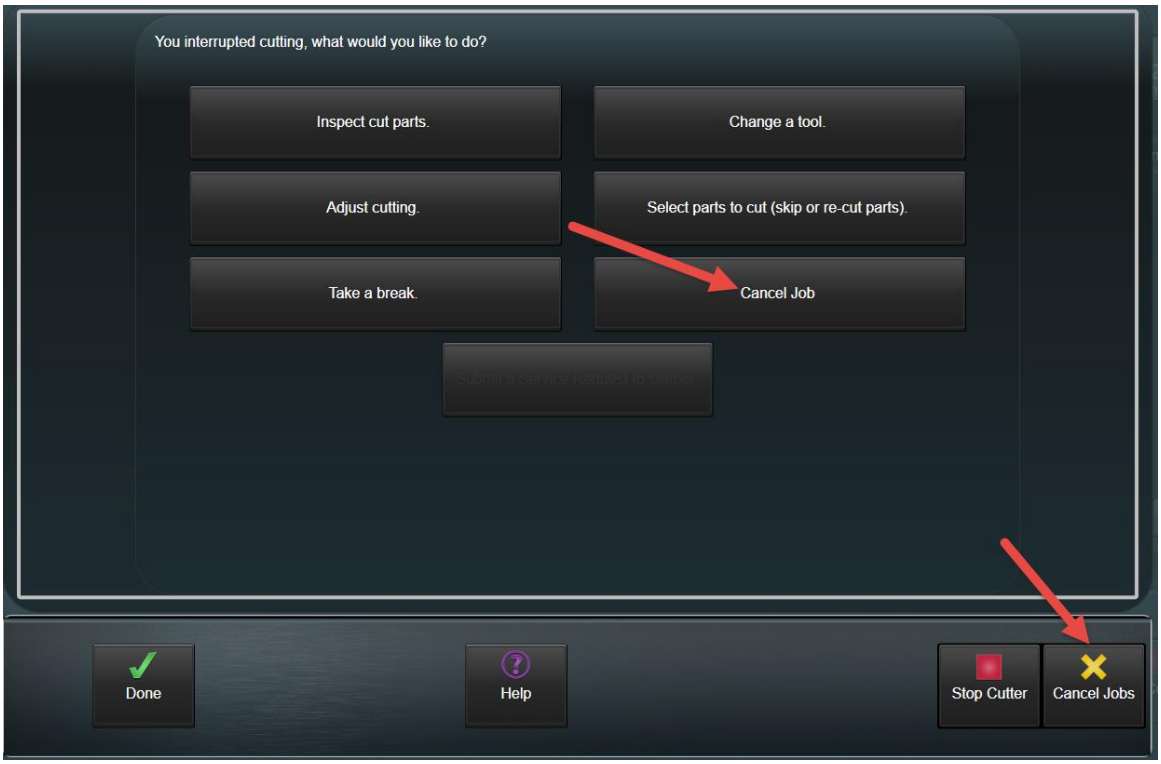
(1) Press “Stop” on the Control Panel to stop a job



(2)

Press “Stop Cutter” on the main GERBERcutter UI to stop a job

Once a job has been stopped, the operator can make adjustments and resume cutting, or cancel the job entirely by pressing the “Cancel Job” button on the Wizard screen that appears, or the “Cancel Jobs” button on the main interface:



Note: In version 2.0.1 and prior releases, if the operator wishes to resume cutting the same job at some point, ***"Cancel" should not be pressed****! Instead, exit the software and use the "Automatic" recovery procedure described in a separate section of this document.*

Beam Jog

To move the cutter head and beam:

1. Press and HOLD the "Beam Jog" button
2. Move the joystick in the desired direction

Convey Jog

To move the Conveyor:

1. Press and HOLD the "Convey Jog" button
2. Move the joystick to the left or right to move the conveyor

Start vs. Dry Run

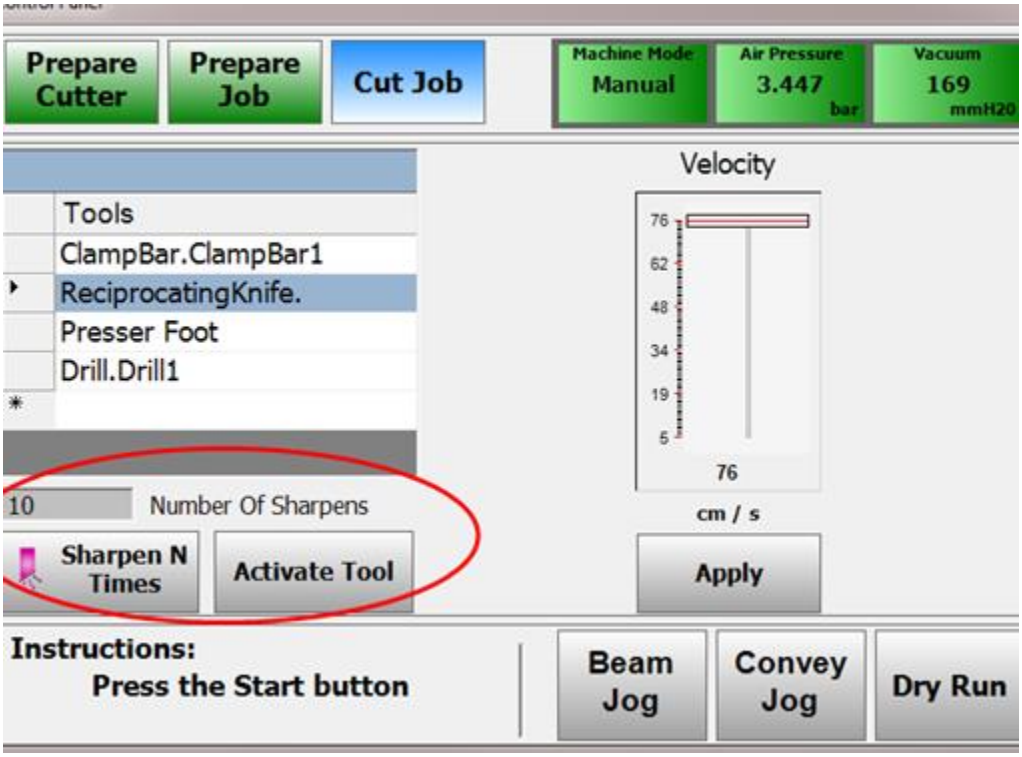
When a job has is ready to run, the operator may decide to perform a “Dry Run” instead. Pressing the “Dry Run” button instead of “Start” will trace the cut path on the material with the laser instead of using the knife to actually cut the material.

Sharpening the Knife

It’s important to keep the knife sharp to ensure high cut quality. The knife is sharpened automatically based on parameter settings for the *number of pieces cut* and the *amount of cutting performed.*

However, the knife can be sharpened anytime on demand from the Control Panel on the “Cut Job” screen. To do so:

1. Enter the number of sharpens to complete (default is 10)
2. Press the “Sharpen N Times” button on the control panel:



Tool Activation

1. Select a tool to activate
2. Press “**Activate Tool**” to activate the tool, or “Lift tool” to de-activate it

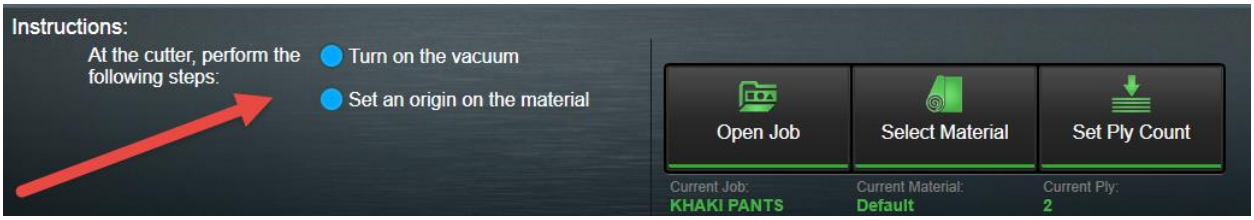
Tool Settings

1. Select a tool from the list on the left
2. Use the vertical slider to adjust the tool pressure and/or velocity
3. Press “Apply” to save the new values

Once a job has completed, the operator is returned to the “Prepare Job” screen. This allows the operator to start preparing the next job for cutting right away.

Workflow Instructions and Status Area on GERBERCutter Software and Control Panel

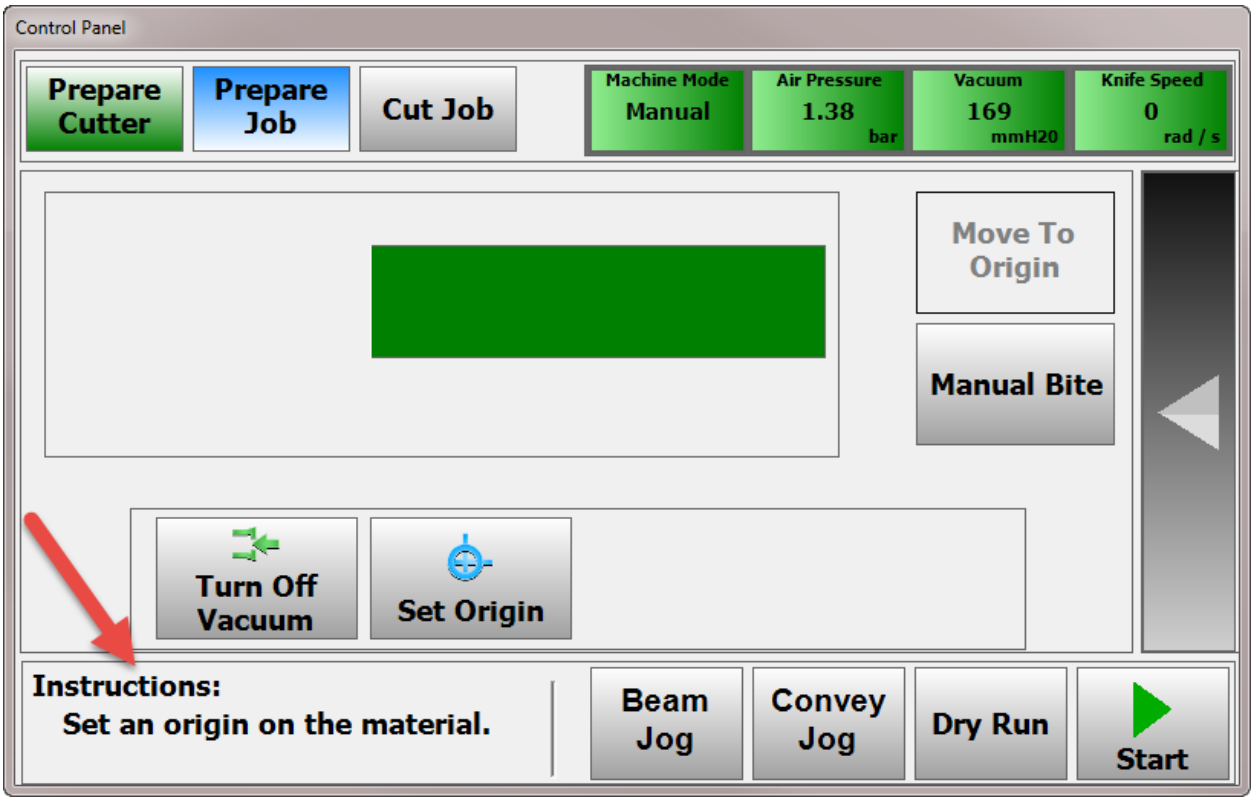
There is a “Workflow Instructions & Status” area at the bottom left hand corner of the GERBERcutter software and control panel. This area provides instructions to the operator in the form of the steps that need to be performed next. Each instruction is color coded using the same color scheme used for the “Prepare Cutter”, “Prepare Job” and “Cut Job” screens. A blue circle indicates the step is active and needs to be performed, while a “green” circle signifies a step is complete, and “grey” is inactive.



Workflow Instructions & Status Area

Workflow Instructions and Status Area on Beam Control Panel

Certain steps can only be performed on the Beam Control Panel (BCP) instead of the main cutter window. In this case, refer to the control panel “Workflow Status” area for instructions:



Workflow Instructions and status are on the Beam Control Panel

The above screen shows the “Turn On Vacuum” step is complete which displays in green. However, the “Set Origin” step still needs to be performed and displays in blue.

Customizing the Workflow

The operator workflow steps can be customized for each cutter. Customizing the operator workflow can only be performed by a user with administrator privileges.

Operator workflow steps are categorized as follows:

- **“Required” steps** - must always be performed
- **“Required Conditional” steps** - are performed if certain operating conditions are met (e.g. vacuum on/off)
- **“Optional” steps** – are only performed if they have been included in the workflow via a default setting or specifically by an administrator user.

Only optional workflow steps can be added or removed from the operator workflow. All other steps are required.

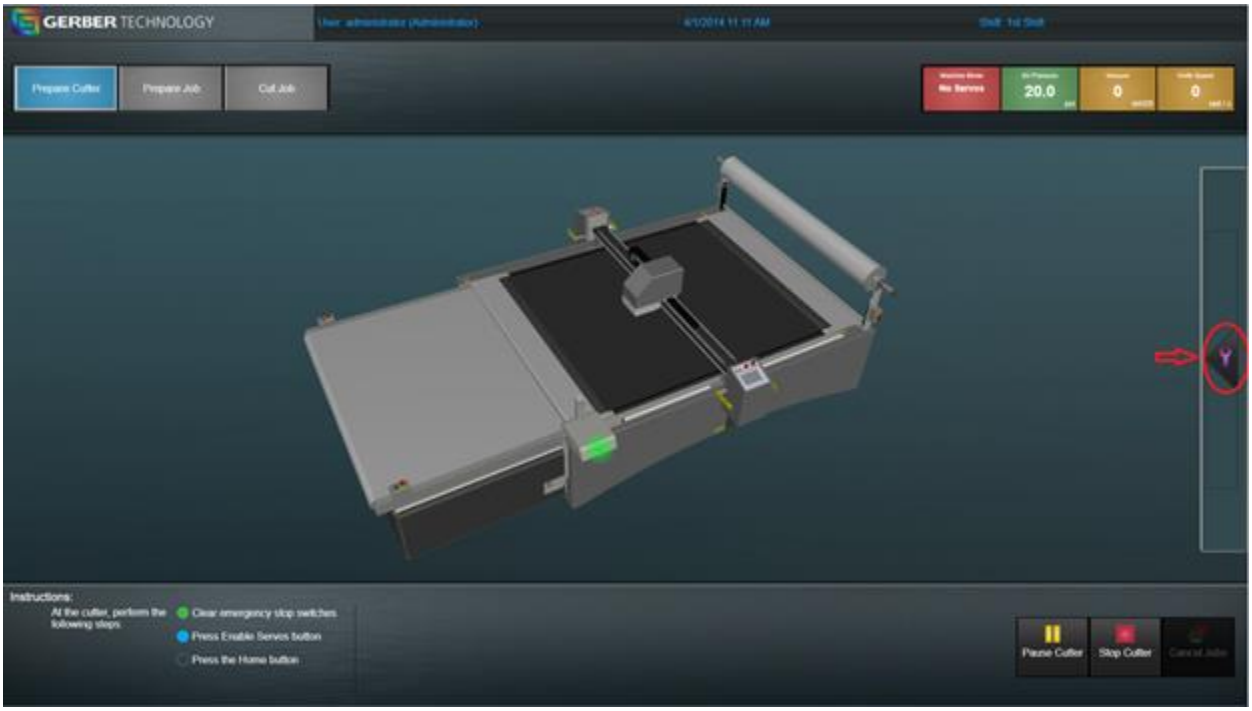
Required	Required Conditional	Optional

ClearEmergencyStops	TurnOnVacuum	NullKnifeIntelligence
Enable Servos	TurnOnKnife	CheckWidth
Home		CheckFabricAngle
Calibrate		SetFabricAngle
OpenJob		
SelectMaterial *		
SetPlyCount		
TurnOnVacuum		
SetOrigin		
Start		
Resume		

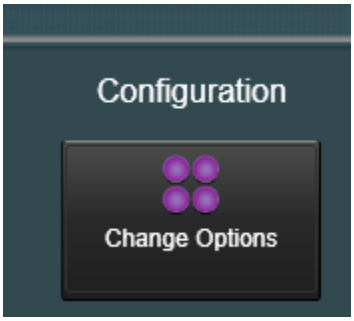
** Note: the "Select Material" step can be configured as "Optional" in version 2.0.2 and later.*

To modify the operator workflow:

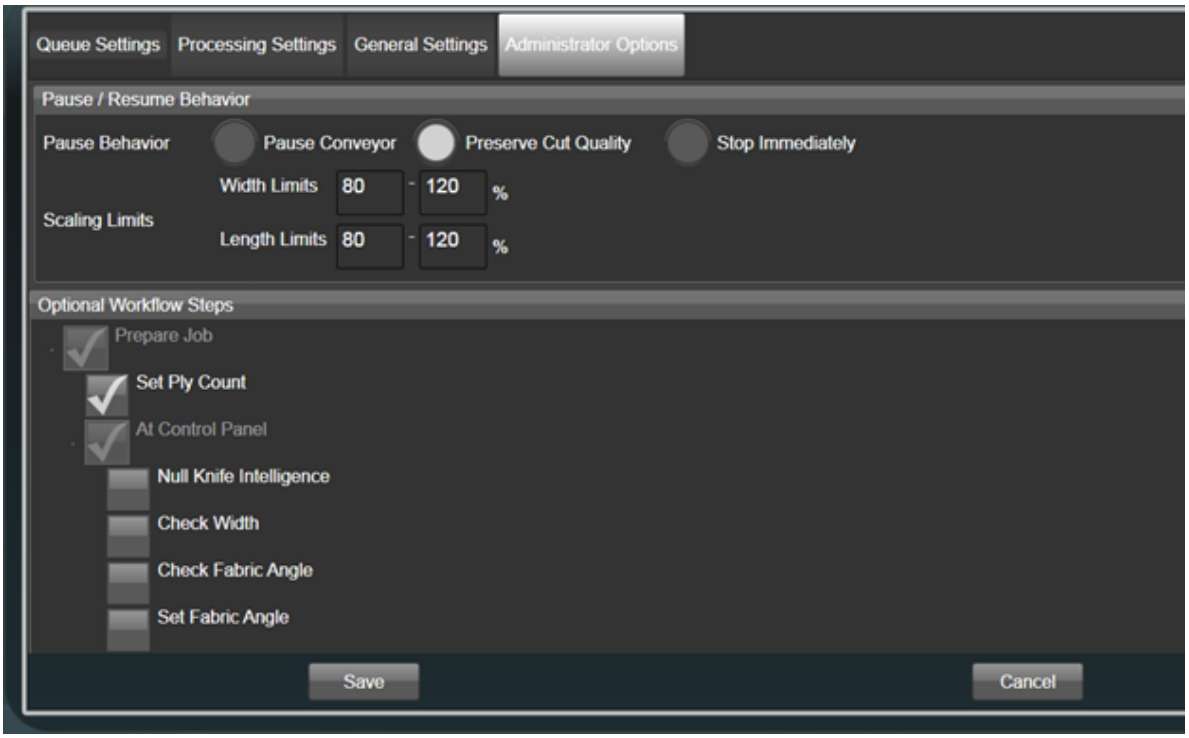
1. Open the "**Utility Drawer**":



2. Click/Touch the “**Change Options**” button:



3. Click/Touch the “Administrator Options” tab:



Administrator Options of the GERBERcutter Software

In the screen shown above, the only optional step that is enabled is “Set Ply Count”. With these settings, a user will be prompted to set a ply count during the “Prepare Job” activity, but will not be prompted to perform any additional steps at the control panel (Null Knife Intelligence, Check Width, Check Fabric Angle, Set Fabric Angle).

4. At the bottom of the dialog box that appears, the section “Optional Workflow Steps” displays the optional steps which can be toggled on or off. A “check” next to the step indicates it is currently included in the workflow. Changing these settings is as easy as clicking a checkbox to toggle between an “enabled” or “disabled” state.

Note: Pressing the “Save” button is not required when modifying the operator workflow steps since these changes take effect immediately. However, when changing most other options, pressing the “Save” button is required.

Other Operations

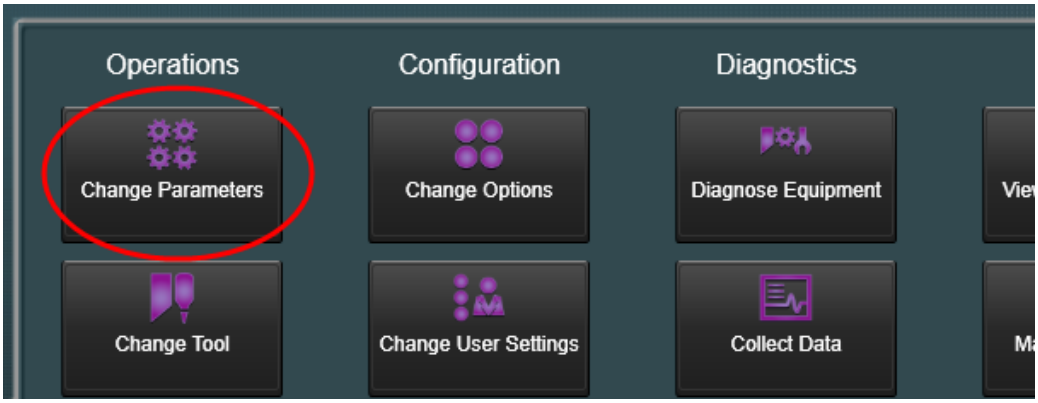
Changing Cut Speed

To change the maximum cutting speed, use either one of the two methods listed below:

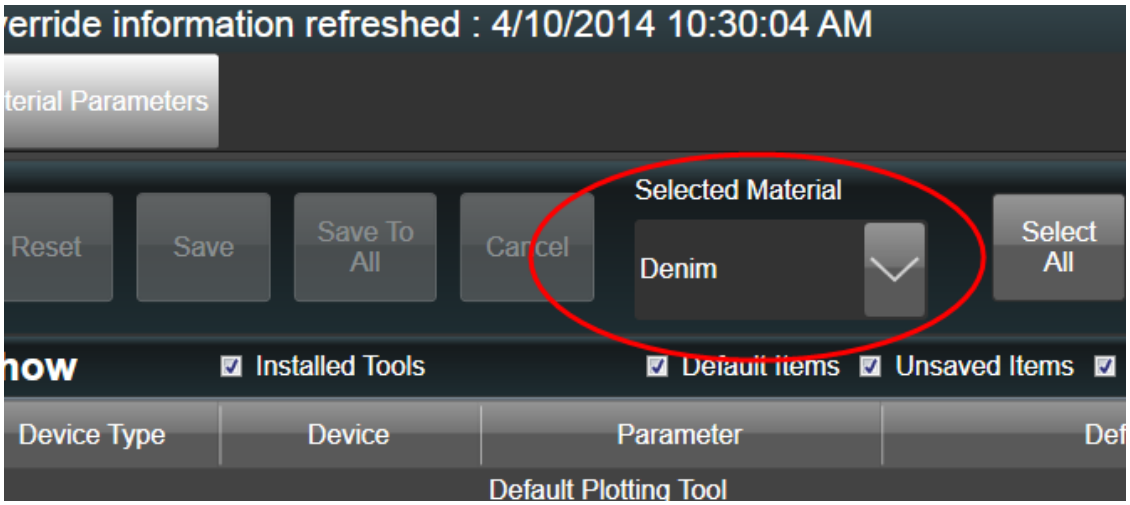
Method 1: change the “Maximum Velocity” parameter value:

1. Open the “**Utility Drawer**”

2. Press the “**Change Parameters**” button:



3. Verify the correct material is selected:



4. Enter a new value for “Maximum Velocity” for the current material
5. Press the “Done” button to close the “Utility Drawer”

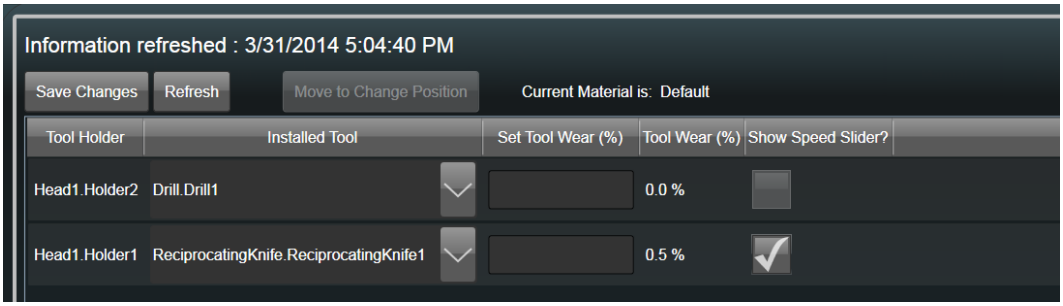
Method 2: adjust the “**Speed Slider**” (if enabled) on the “Cut Job” screen.

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Note: the speed slider is not shown by default, and must be enabled on a tool-by-tool basis

1. To enable the speed slider, open the "**Utility Drawer"** on the right hand side of the GERBERcutter Software.
2. Press the "**Change Tool**" button.
3. Notice there is a checkbox located next to each tool labeled "Show Speed Slider":

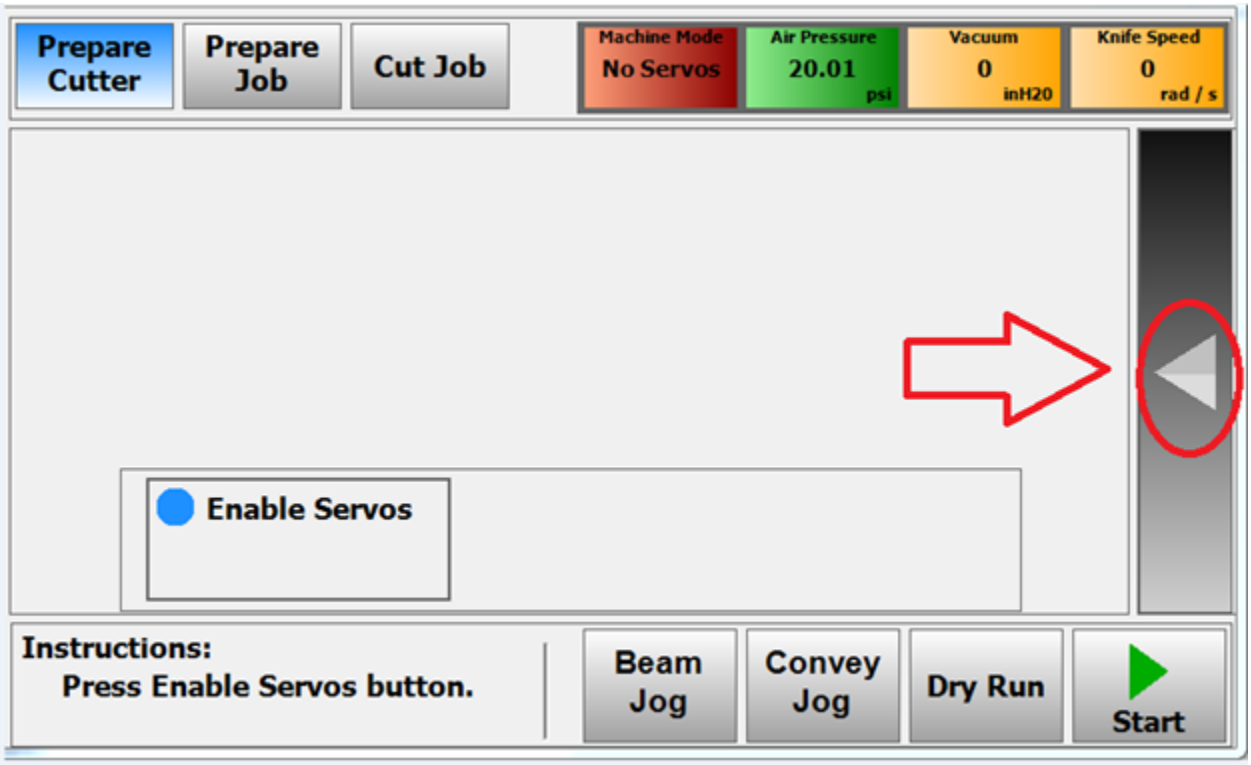


4. To display the slider, make sure the checkbox is "checked" for the current tool
5. Press the "**Save Changes"** button in the upper left corner of the dialog box.
6. Press the "**Done**" button to dismiss the tool change dialog.
7. The slider will display on the "Cut Job" screen of the GERBERcutter software

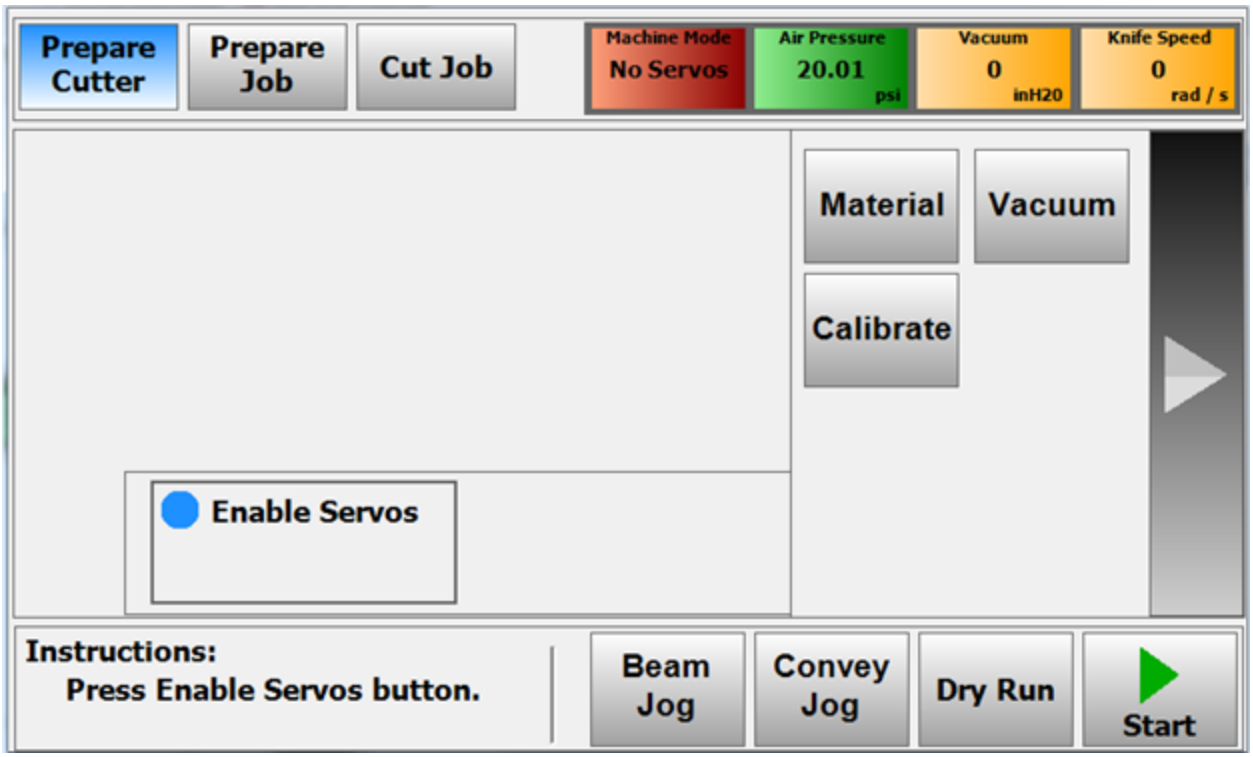
Note: In either case, the new velocity setting will not take effect until the cutter finishes the current process item and begins the next.

Additional Control Panel Operations (Tool Drawer)

Many operations on the beam control panel are performed in a certain order, but some of the operations can be performed outside of the normal “workflow”. To access the additional functions, open the “Tool Drawer”:



When the “Tool Drawer” is open, it provides access to the Material, Vacuum and Calibrate pages:



Material Page Operations

The material page access to the “Check Width”, “Check Fabric Angle” and “Set Fabric Angle” operation, even if these steps are not currently enabled in the “operator workflow”. Refer to the “Prepare Job” section of this document for more information about these steps.

Moving to or Setting an Origin

*> To move the laser to the last set origin, press “**Move To Origin**”*
*> To set a new origin, press “**Set Origin**”*

Perform a Manual Bite

*> To manually advance the conveyor bed, press **and hold** the “Manual Bite” button and then use the joystick to move the conveyor.*

Perform a Manual Trim Cut

> To trim the material off after cutting a job:

1. *Move the laser to the position to start cutting*
2. *Press **and hold** the “Manual Trim Cut” button*
3. *Use the Joy Stick to control where the material is cut. The knife will plunge and begin cutting in the direction specified.*
4. *Release the “Manual Trim Cut” button. The knife will lift.*

Vacuum Page

The vacuum level adjustments can be made in two ways:

Setting the vacuum to a specific level

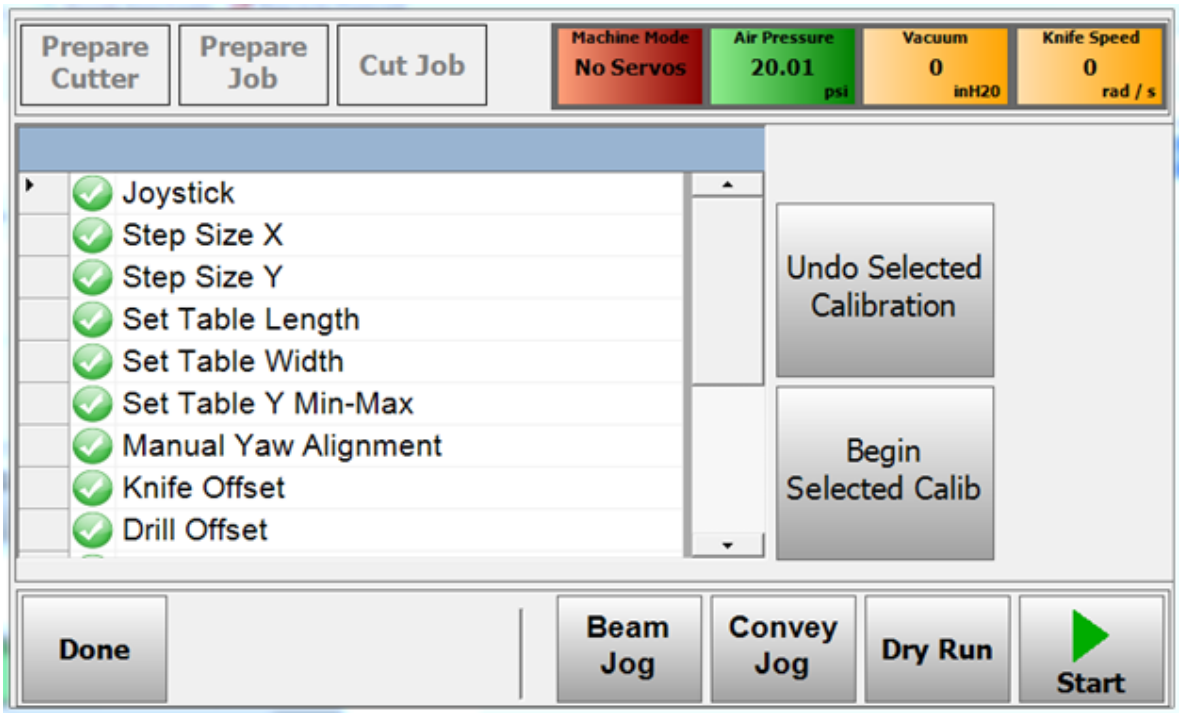
1. *Use the vertical slider to select a specific level*
2. *Press the "**Apply**" button*

Setting the vacuum level using a "preset" level

1. *Select a pre-set levels from the list (Biting, Continuous, Cut, Idle, or Off)*
2. *Press the "**Go To Level**" button*

Calibrate Page

To display or run a calibration, press the **"Calibrate"** button. A list of possible calibration routines is displayed along with the status of each:

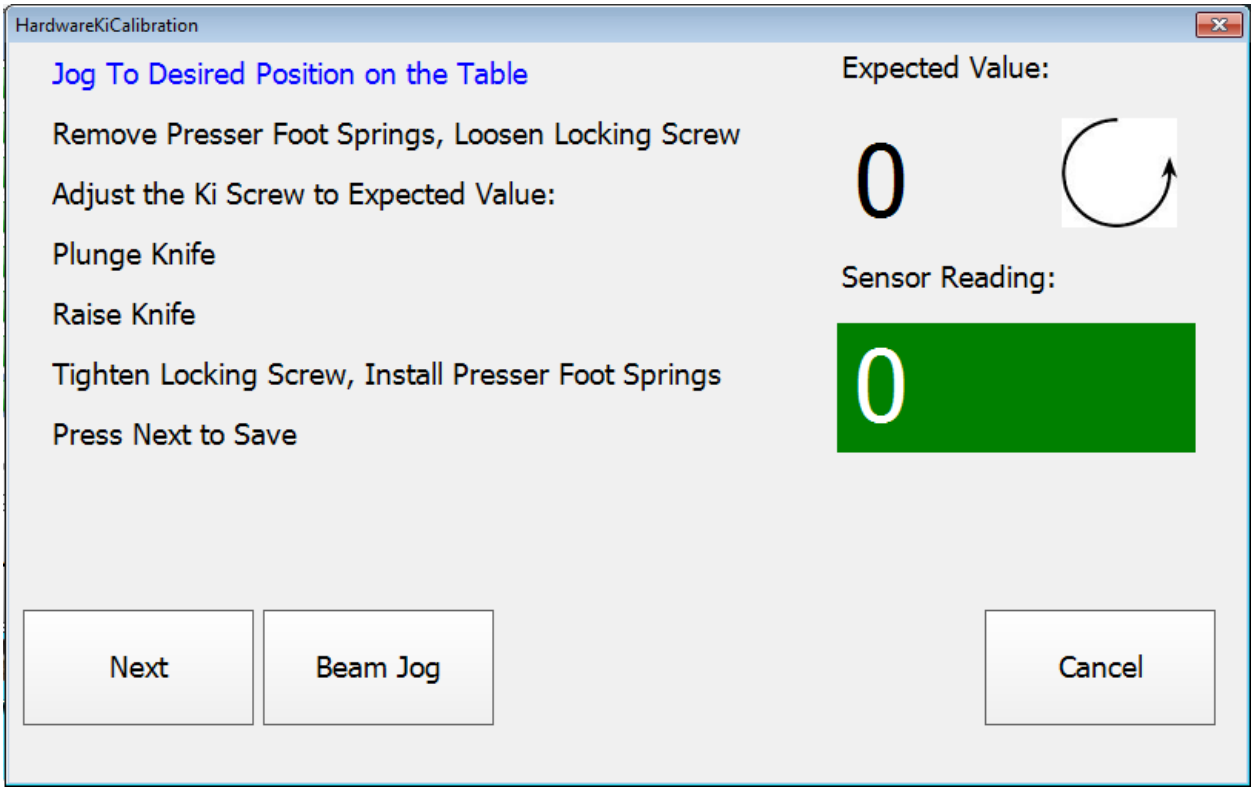


Calibrations are always performed in order, from top to bottom of the list. If you "**Undo**" a calibration at the top of the list, you must "redo" the calibration along with any calibrations that follow it in the list.

A green “checkmark” icon indicates a calibration has been performed and red “x” icon means the calibration failed or needs to be done.

For more information on calibrations, refer to the “Calibrations” section of this document.

Ki Calibration



1. Initially move the head to a position so that you are able to access the Ki sensor on the presser foot bowl.
2. Remove the presser foot bowl springs, and then undo the locking screw for the LVDT sensor screw.
3. Turn the LVDT sensor screw in the direction indicated so that the sensor reading value is as close to 2.5 volts.
4. Follow steps to plunge the knife and see if the sensor reading changes a significant amount. If the sensor reading changes to yellow color, something is not aligned correctly.
5. Finish steps and tighten down the locking screw and replace the presser foot bowl springs.

Limit Switches Page (in version 2.0.2 and above)

The operator can adjust the limit switch settings associated with each tool on this page.

1. Select a Tool
2. Toggle the Up/Down switch status on/off by pressing the “Switch” button

3. Adjust the wait times if necessary if switches are “On”
4. Press “Apply” to save your changes

Logging Off

When an operator has finished cutting, log off in one of the following ways:

1. From the drop down menu available by clicking the “GERBER” logo on the top left corner of the GERBERcutter Software, then select “**Log Off**”
2. From the “Utility Drawer” by clicking the “**Log Off**” button

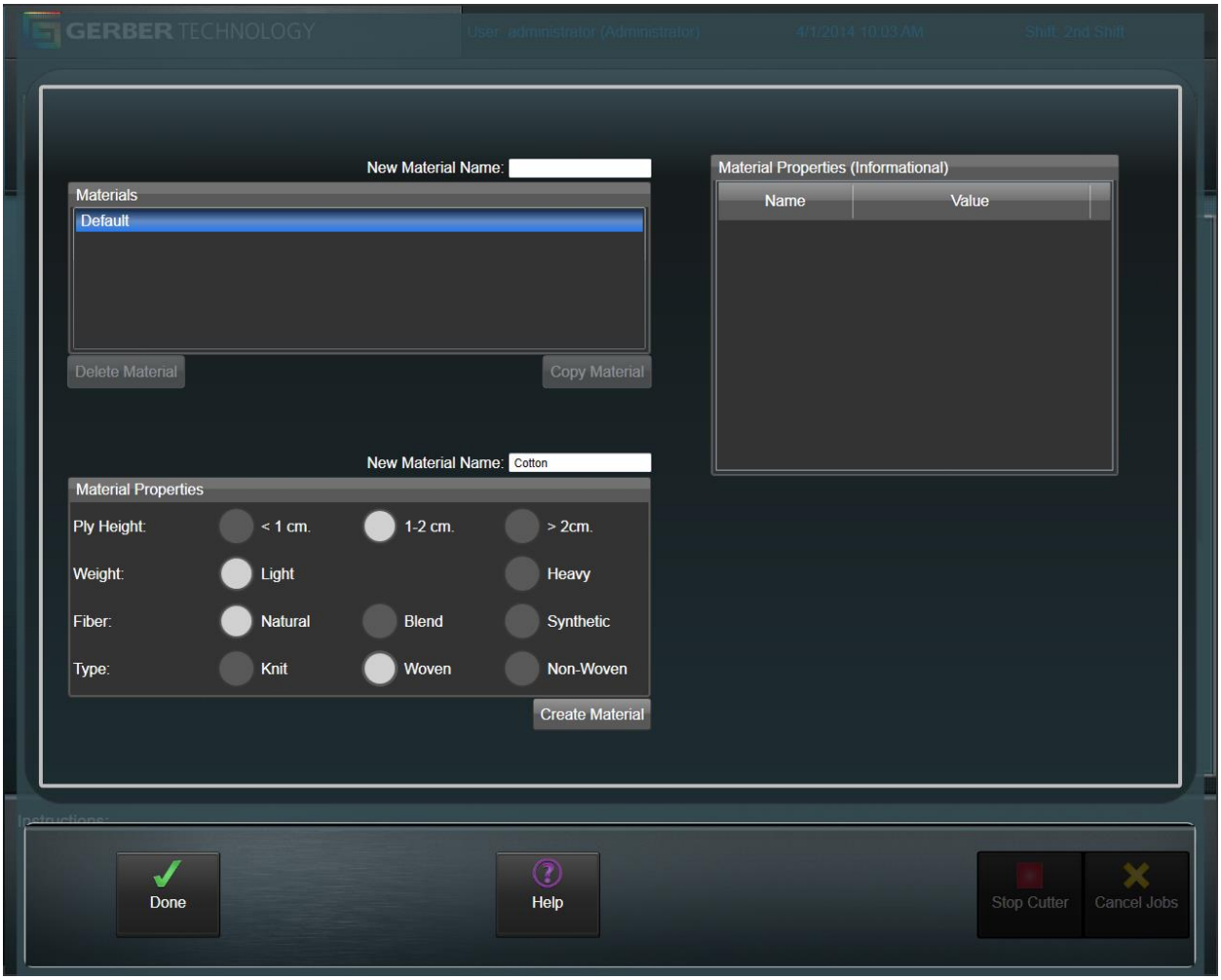
Material File Creation

There are two methods that can be used to create Material Files on the Paragon system. An existing Material can be copied and then individual parameters can be adjusted for a specific fabric. This approach requires some experience with the Paragon system and expertise in the individual Material parameters. To assist new operators the Paragon has an automatic Material Creation feature.

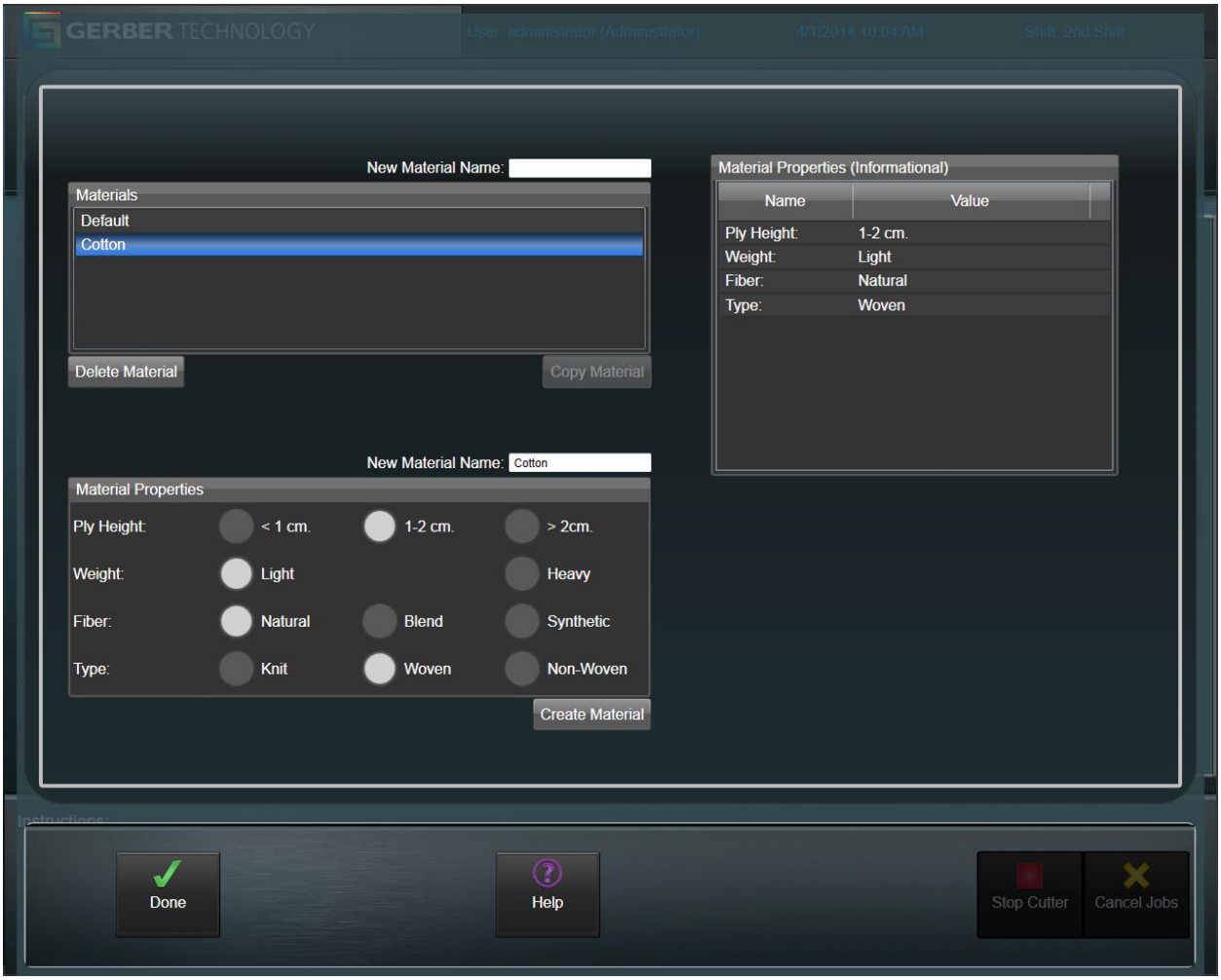
By entering material properties the Paragon system can automatically create a Material file with the appropriate parameters settings for the cutting application. Cut Speed, Knife speed, Sharpening and Vacuum parameters are configured automatically based on the input of Material Properties by the operator and the expertise of Gerber Applications Specialists.

1. Open the Utility Drawer and Select Edit Materials
2. Type in the desired name in the New Material Name window as shown below.
3. Select the Ply Height.
4. Select the Fabric Weight. Fabrics greater than 250 gsm [7.5 oz/yd^2] can be considered as “Heavy” fabrics.
5. Select the Fiber type.
6. Select the Type of fabric.
7. Press the Create Material button.

The new Material file is intended to provide a starting point for cutting a new fabric. Parameters in the new Material file can be edited as required based on observations from actual cutting.



Note: In version 2.0.2, the ability to create a new material by setting the "Material Properties" is currently unavailable.


GERBER TECHNOLOGY
User: administrator (Administrator)
4/1/2014 10:04 AM
Shift: 2nd Shift
New Material Name:
Materials
Default
Cotton
Delete Material
Copy Material
Material Properties (Informational)
Name
Value
Ply Height:
1-2 cm.
Weight:
Light
Fiber:
Natural
Type:
Woven
New Material Name:
Cotton
Material Properties
Ply Height:
< 1 cm.
1-2 cm.
> 2cm.
Weight:
Light
Heavy
Fiber:
Natural
Blend
Synthetic
Type:
Knit
Woven
Non-Woven
Create Material
Done
Help
Stop Cutter
Cancel Jobs

GUI Overview



Key to Figure

1. Dashboard
2. Display Window
3. Workflow Status
4. Workflow Instructions
5. Control Buttons
6. Utility Drawer

(1) Dashboard

Information regarding current cutter status displays across the top of the screen.

(2) Display Window

Depending on the primary button clicked, this window displays a 3D diagram of the cutter or a processing view of the job file. The 3D cutter uses animation to indicate current system status, such as a flashing green light when Servos are not enabled.

(3) Workflow Status Area

Information about the current task being performed shows below the display window.

(4) Workflow Instructions

Located at the bottom left hand corner of the screen, workflow instructions will direct the operator through the required steps for cutter operation.

(5) Control Buttons

Yellow **Pause/Resume Cutter** button and red **Stop Cutter** button provide computer access to pause, stop or start machine operation.

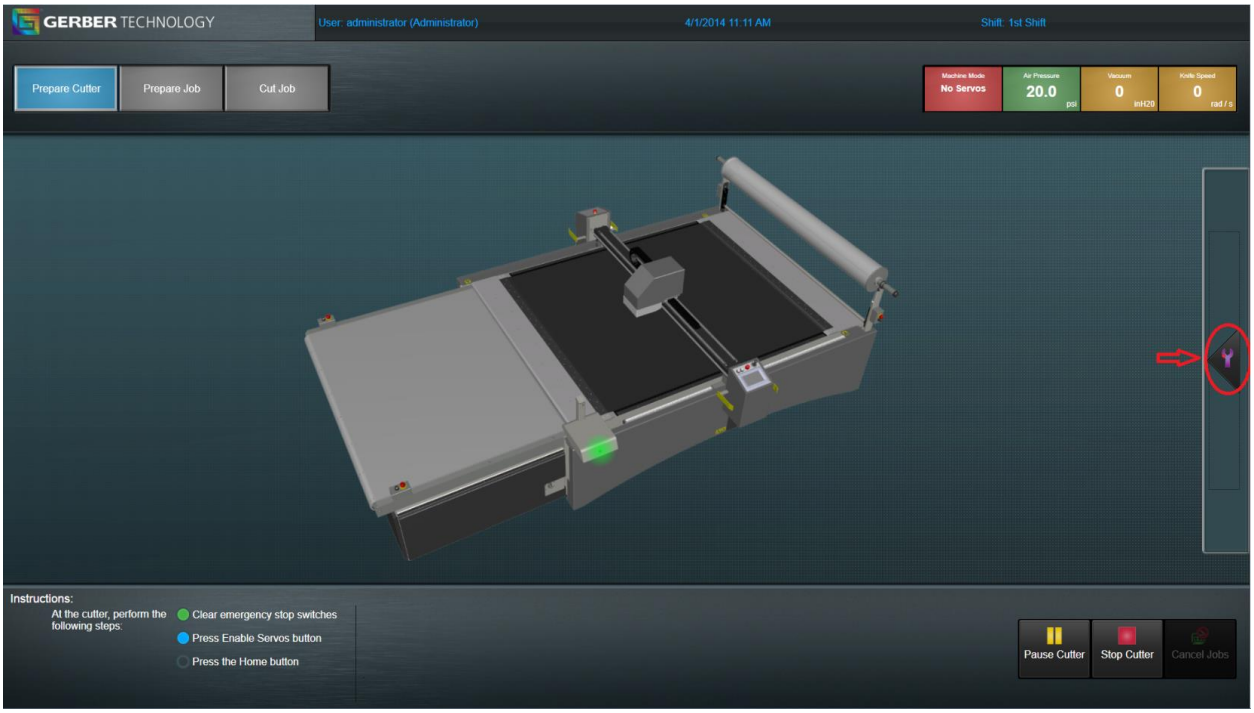
(6) Utility Drawer

The utility drawer holds role dependent tools that allow the user to monitor or amend predetermined cutter functions.

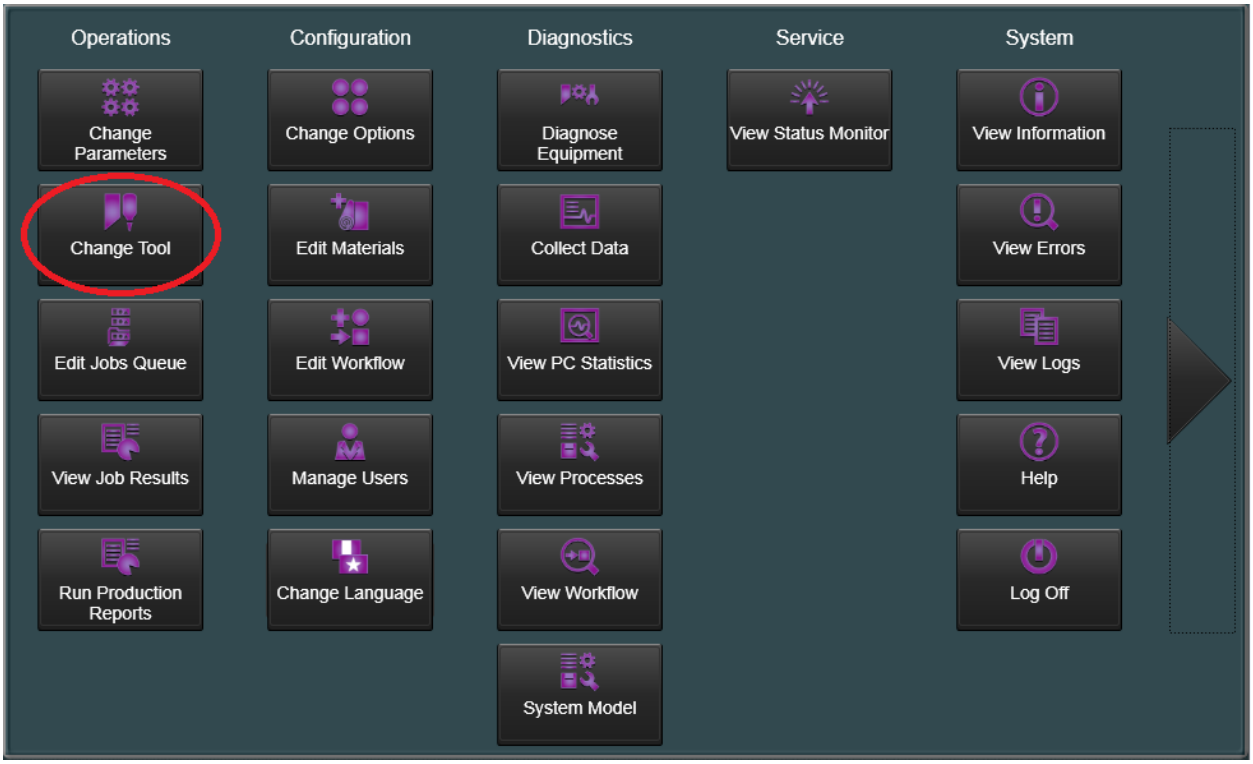
Tool Change

The Tool Change feature is used whenever an installed tool is replaced on the Paragon cutter. When a new knife blade or drill bit, (if cutter is equipped with a drill), requires changing, the operator will use this function to move the head to the calibrated position to perform the change. Note: Tool wear is based upon the limit set in Material Parameters. Once the limit is reached, the Status Monitor will alert the user that a Tool Change is required.

From the Main Gerbercutter UI screen, the operator will open the Utility Drawer by pressing the Left hand facing arrow located on the right side of the screen.

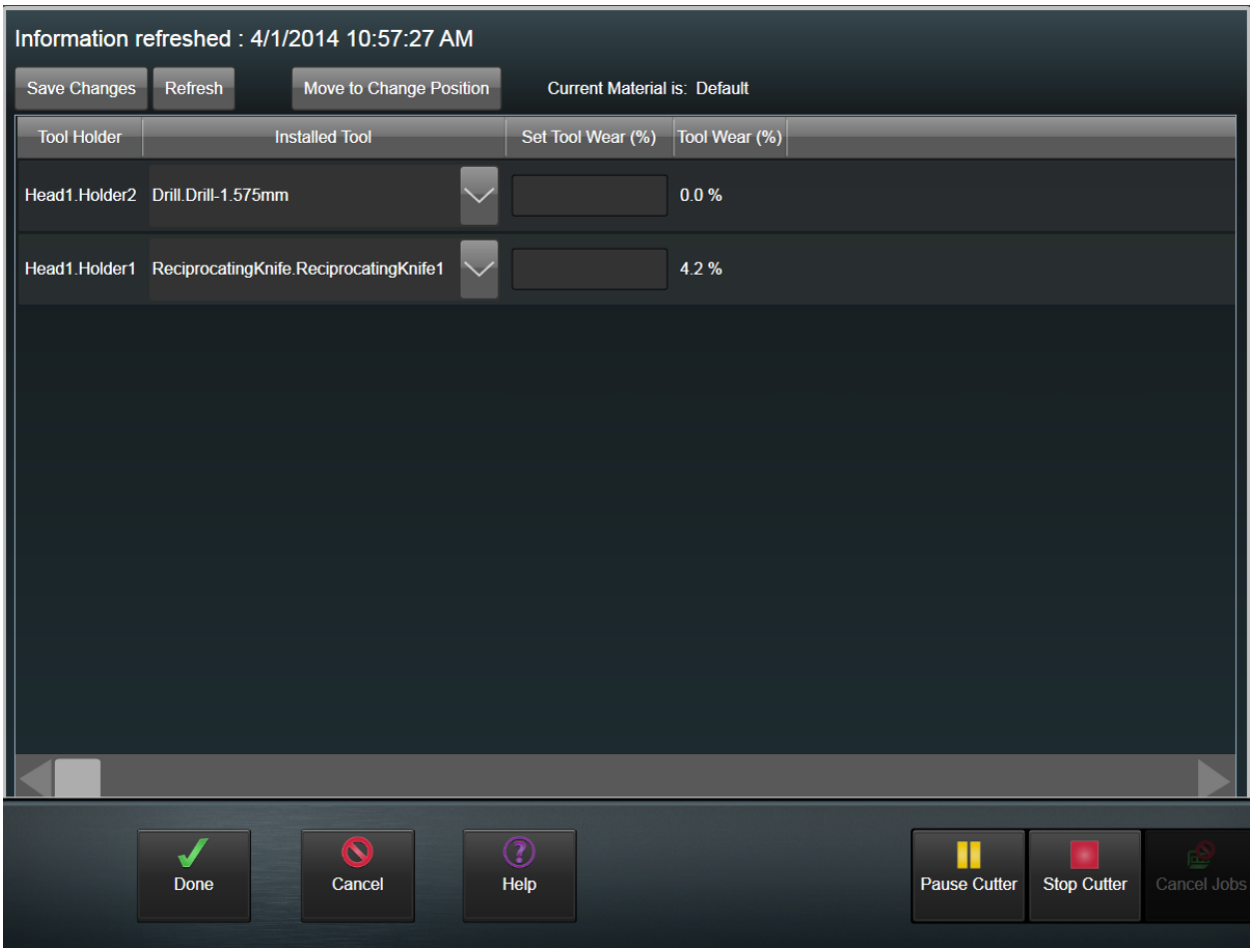


Once pressed, the operator will see the available utilities including “Change Tool” in the Operations column.



Selecting the Change Tool button will access the screen that the operator will use to move the head to the tool change position.

Selecting the desired tool and pressing the Move to Change Position will move the head to the calibrated tool change position and automatically disable power to the servo motors to allow the operator to safely change the desired tool.



Upon completion of changing the tool, (knife blade, or drill bit), the operator will enter the tool wear value to 0 and then press the Save Changes button to reset the tool wear value. This will reset the Status Monitor as well as the value displayed in the Tool Wear % Column.

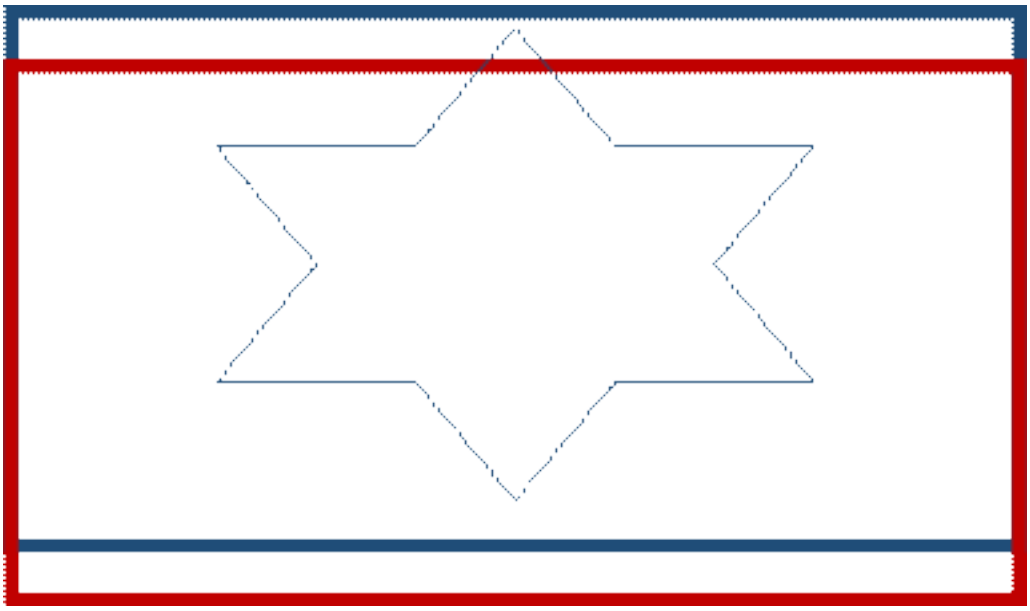
When these steps are completed, the operator will press the Done Button to exit this screen. To continue operating the cutter, servos will require re-enabling.

Tool Work Areas

The available tools are organized into two groups: tools that are permanently installed and tools that must be inserted in a tool holder. Permanently installed tools, such as the laser and the clamp bar, have an associated tool offset and a tool work area. Tools that require a holder, such as a knife or drill, do not have an offset or work area. Instead, the tool takes on the offset and work area of the tool holder that the tool is installed in. The available tool holders can be viewed in the tool change page.

A work area defines the bounding rectangle, in absolute table coordinates, that a tool or tool holder can reach. The software is configured with default work areas for all tools and tool

holders. Calibration of the table size will cause all tool and tool holder work areas to change from their default values to match the calibrated table size.
The offset between tools can cause work areas to have different sizes. For example, on the Paragon LX the knife is offset from the laser in the positive y direction. This allows the knife to reach farther in the plus y direction than the laser can. As a result, the laser work area is smaller in the y direction than the knife work area. The following diagram shows the laser and knife work areas overlaid with a part to be cut:

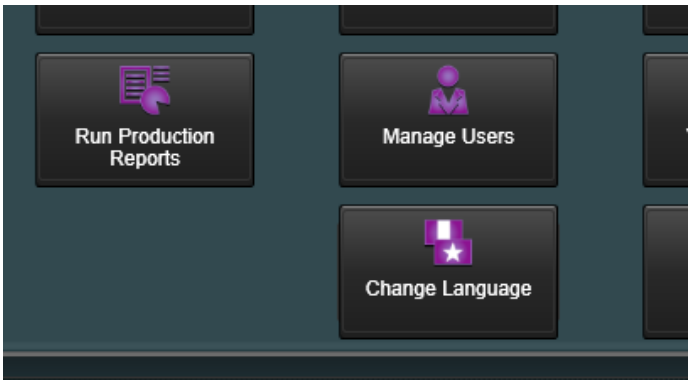


The bottom of the figure is the operator's side of the cutting table: the negative y side. The blue rectangle is the work area for the knife, the red rectangle is the work area for the laser. The star is a part to be cut. One point of the star goes outside the laser's work area which means the laser cannot reach that point. Since the laser cannot reach that point it will not be possible to follow the shape with the laser in dry run mode. However, that point is still inside the work area of the knife and it will be possible to cut the complete shape.

Users and Roles

User and roles are implemented by the GERBERCutter Software to manage operator settings, roles, permissions, and shifts. Each cutter is pre-configured with a default set of users and roles. The default users and roles can be customized to control access to specific system settings and operations.

To access the "Users and Roles" settings, open the "**Utility Drawer**" and press the "**Manage Users**" button, shown below:

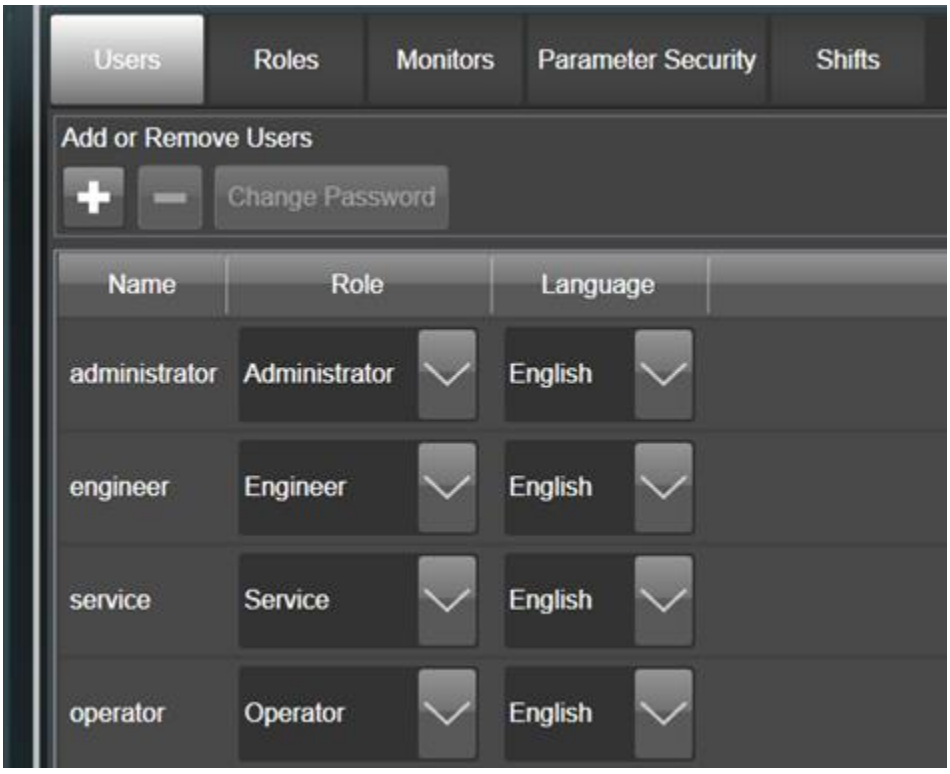


Note: The "Manage User" button is only available to users with the appropriate permissions.

"Manage Users" Dialog

Pressing the "Manage Users" button displays a dialog box which is divided into 5 tabbed sections: "Users", "Roles", "Monitors", "Parameter Security" and "Shifts". Each tabbed section is described below:

(1) Users - *manages users, passwords and permissions*



Add New User

- press the "+" button

Delete a User

- select a user from the list to delete, then press the "-" button

Change Passwords

- select a user from the list, then press "Change Password"

Change a User's Role

- select a user from the list, then select a "Role"

Change a User's Language

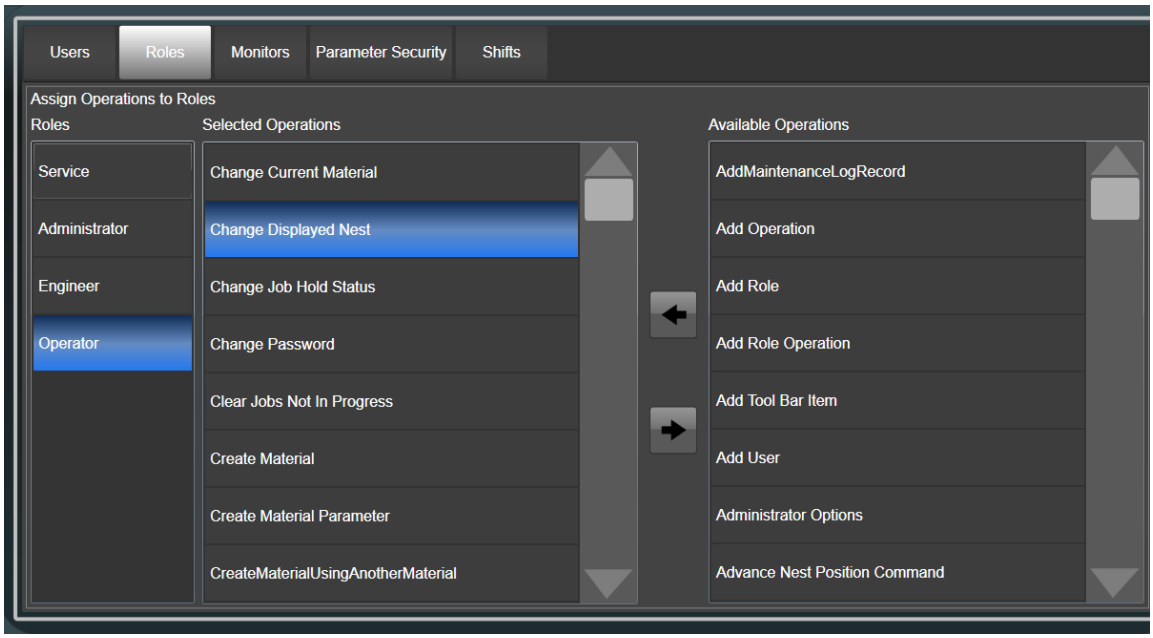
- select a user from the list, then select a "Language"




Important: Do not forget the administrator password, or you will be unable to manage the system. Consider creating a secondary user with administrator permissions to avoid this situation.

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(2) Roles – *manages the operations associated with each Role*



Permissions on the cutter software are controlled through the use of “Roles”. Each cutter user is assigned to a single “Role”. A “Role” defines the set of operations, monitors, and parameters values a user in that “Role” may have access to. For instance, user assigned to the “Service” role might have access to more operations and settings than a user assigned to “Operator” role.

The cutter software is configured with a default set of “Roles” for typical use. However, a user with administrator rights can view and modify the operations defined for each “Role” from this tab as described below:

Viewing Available Operations for each Role

1. Select a “Role” from the first column.
2. The list of “Selected Operations” (left) shows which operations can be performed for the selected role. The list of “Available Operations” (right) shows which operations have not yet been assigned.

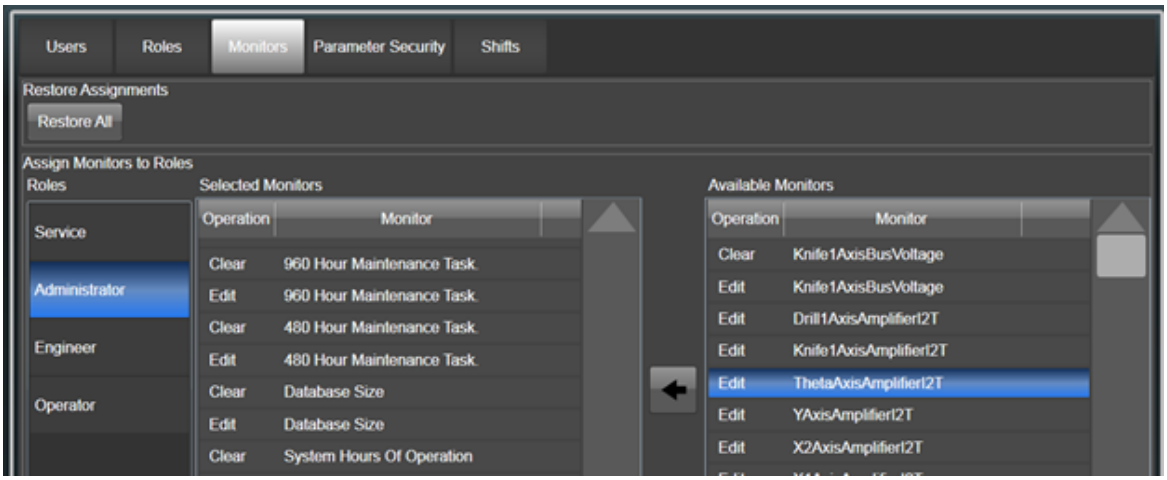
Adding an Operation to a Role

1. Select a “Role” from the first column.
2. Select an “Operation” to add from the “Available Operations” column
3. Press the “left arrow” button to move the selected operation from the list of “Available Operations” to the list of “Selected Operations”

Removing an Operation from a Role

1. Select a “Role” from the first column
2. Select an “Operation” to remove from the “Selected Operations” column
3. Press the “right arrow” button to remove the selected operation from the list of “Selected Operations”

(3) Monitors – *manages permissions on system monitors for each role*

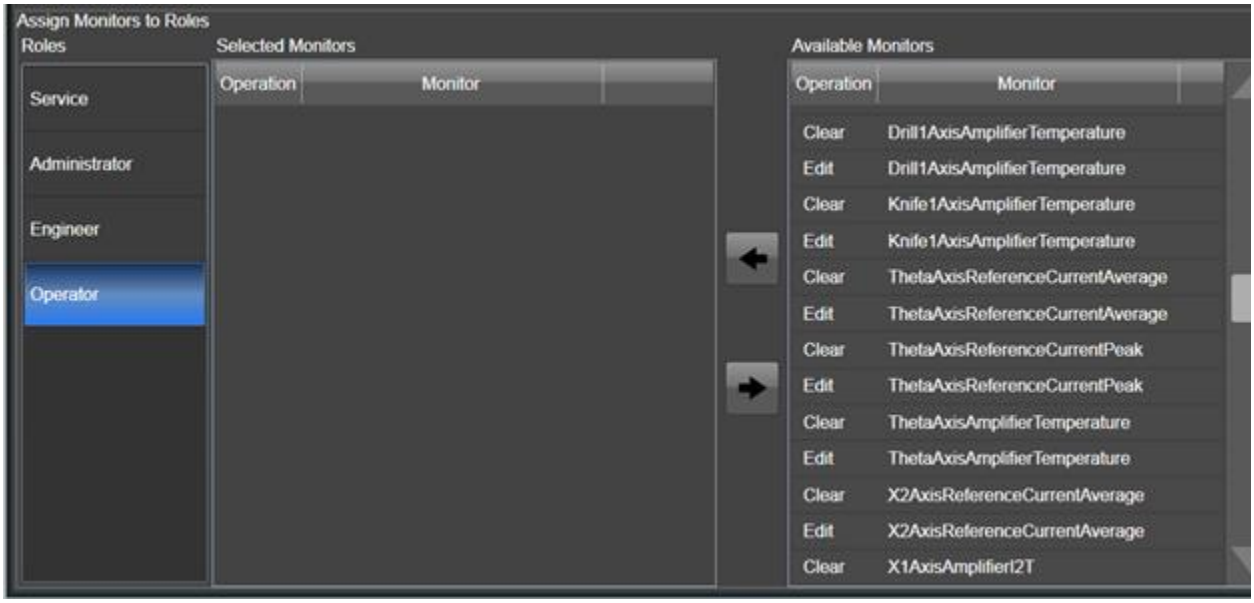


The ***Status Monitor*** sub-system notifies the operator whenever a condition occurs that requires attention. The status of all monitors can be viewed from the “**Utility Drawer**” by clicking “**View System Monitor**”. Each monitor has a color coded “Status” that normally displays in *green* but a status color of *yellow* or *red* indicates the monitor is approaching or has reached a pre-determined threshold value.

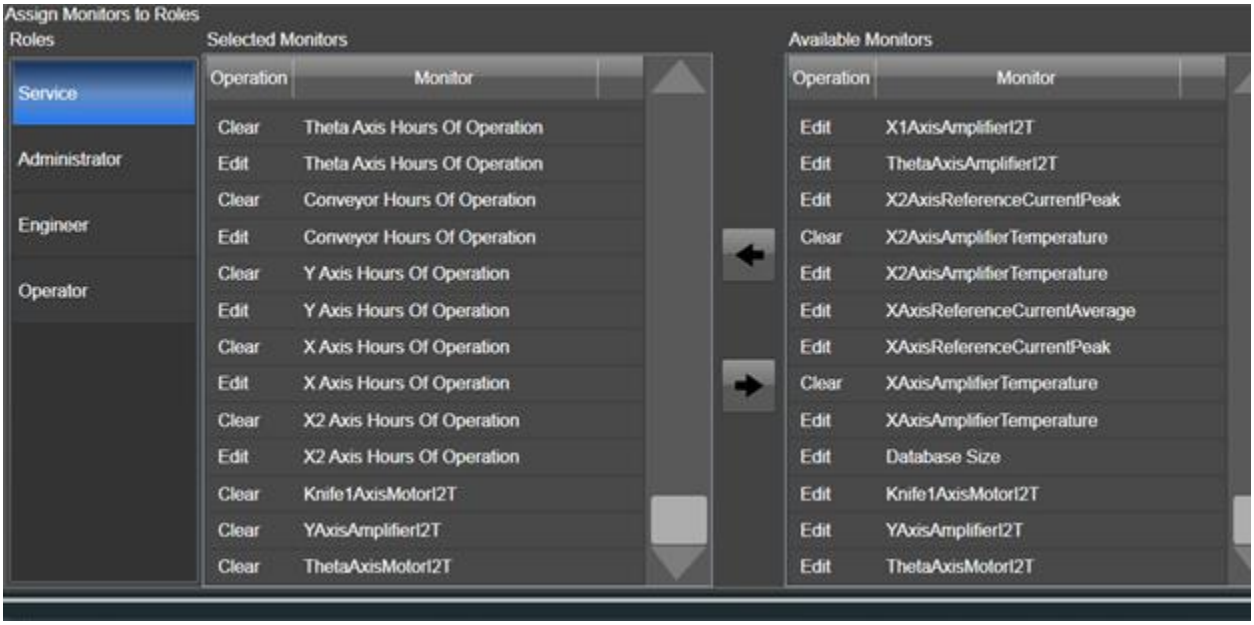
A cutter user/operator can “Clear” or “Edit” a system monitor according to the “Role” they have been assigned to. “Clearing” a monitor dismisses the alert message, while “Editing” it changes the condition that causes it to appear in the first place.

Administrator users can define which users can “Edit” or “Clear” a system monitor by modifying the “Monitors” for each “Role”.

For example, the system can be configured such that users in the “Operator” role cannot clear or edit a monitor, but users in the “Service” role could perform those functions. In this case, the list of “Selected Monitors” for the “Operator” role would be empty:



However, the “Service” Role would have the following list of “Selected Monitors”:



The monitors associated with each user “Role” can be added or removed by an administrator user:

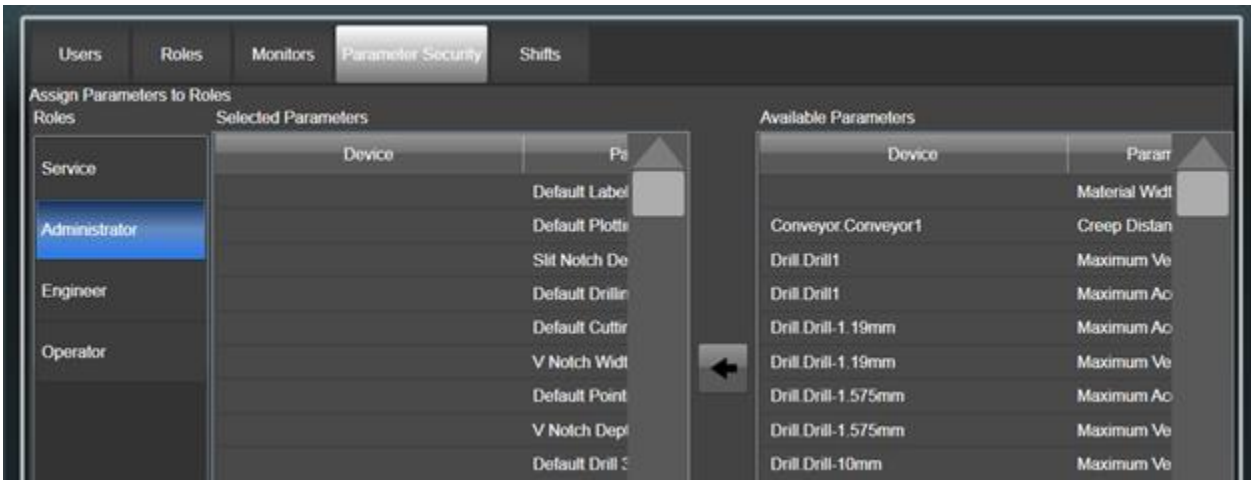
Adding a Monitor to a Role

1) Select a “Role” from the first column.
2) Select the desired “Operation/Monitor” name from the list titled “Available Monitors”.
3) Press the “left arrow” button to add it to the list of “Selected Monitors” which appears on the left.

Removing a Monitor from a Role

1) Select a “Role” from the first column.
2) Select the “Operation/Monitor” to remove from “Selected Monitors” list on the left
3) Press the “right arrow” button to remove the monitor from the selected role.

(4) Parameter Security – *manages access to parameter values*



There are many parameter settings that affect the operation of the cutter. The list of available parameters can be viewed by opening the “Utility Drawer”, then clicking on the “**Change Parameters**” button. Each parameter value can only be modified if the current user has the permission to change them. Theses permissions are assigned on a role-by-role basis by by the administrator user as described below:

Adding a Parameter to a Role

1) Select a “Role” from the first column.
2) Select the desired parameter from the list of “Available Parameters”
3) Press the “left arrow” button to move the parameter to the list of “Selected Parameters”

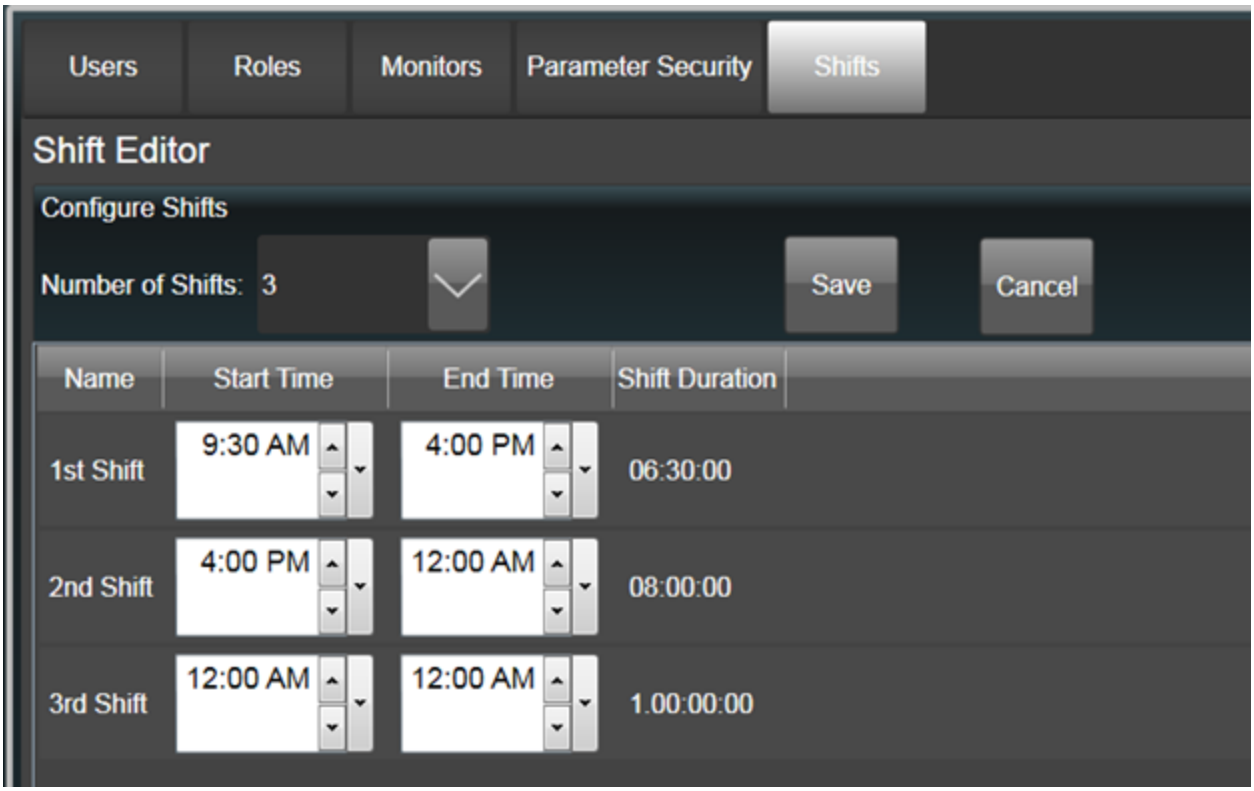
Removing a Parameter from a Role

1) Select a “Role” from the first column.
2) Select the parameter to remove from the “Selected Parameters” list (left)
3) Press the “right arrow” button to remove the parameter from the selected role.

*Note: Access to the “**Change Parameters**” button is currently only available to those users in the “Service”, “Administrator” or “Engineer” Roles. Users assigned to the “Operator” Role cannot change parameter settings even if they have been granted permission to do so through the “**Parameter Security**” tab.*

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(5) Shifts - *defines the number of shifts per day and times for each shift*



The current shift is always displayed at the top right portion of the cutter software, and is also used in production reports. The number of daily shifts can be modified (1-6 shifts are available). The start and end times associated with each shift can also be customized as described below:

Changing the Number of Shifts:

1. Change the drop down list and select the desired number of shifts per day
2. Press “Save” to make your changes permanent, or “Cancel” to revert back to the previous number of shifts.

Adjusting Shift Times

1. Use the “up” and “down” arrows to adjust the shift times, or type a new time in a text box.
2. Press “Save” to make your changes permanent, or “Cancel” to revert back to the previous shift time settings.

Note: The shift times are not allowed to overlap. If you extend the length of a shift into the next shift, the starting time of the next shift will adjust automatically.

Recovery

There are four types of recovery that can be used while operating a Paragon cutter, all of which require different steps. The following will define each recovery mode and list the steps required for the desired result.

E-Stop Recovery

E-stop recovery is the most basic of the recovery modes. This is when the operator presses any of the (6) E-Stop buttons located around the machine.

Pressing an E-Stop button on the Paragon cutter will cut off power to all of the servo motors, thus stopping the cutting operation immediately. In order to continue operation, the user must complete the following steps.

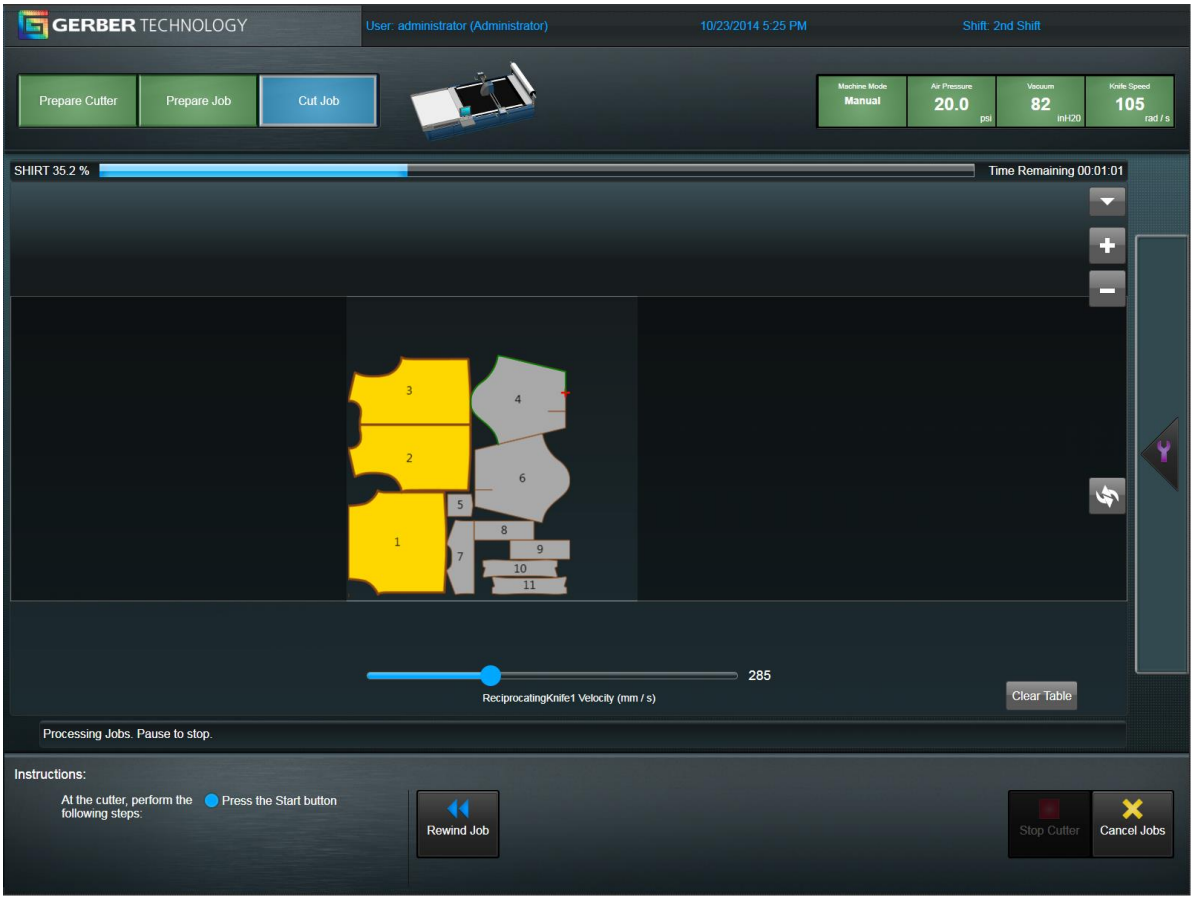
1) Release pressed E-Stop button by twisting the button clockwise.
2) Re-enable the servo motors by pressing the Servo Enable button.
3) Press the Start button on the Beam Control Panel to continue the job that was suspended.

Canceled Job Recovery (Restore)

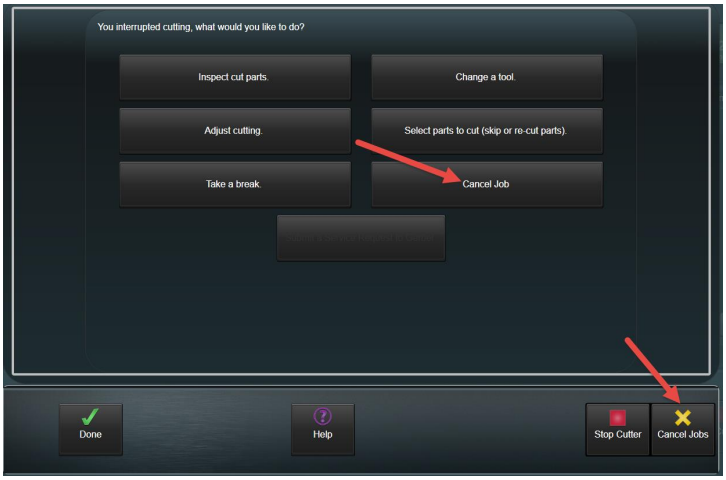
*NOTE: This feature is available in V2.0.2 and later versions of the GERBERcutter software. For earlier versions, you can achieve the same result by press the Stop button to stop the job in progress, logging off, and pressing the Exit button to stop the GERBERcutter software application (do **NOT** cancel the job in progress before you exit.) Then follow the steps in the **Automatic Recovery** section below.*

Restore, is the preferred method of recovering a job if it is intentionally suspended by the operator. The Gerbercutter Software will remember the point at which the job was stopped and will also remember the current state of the cutter, and restore these upon request by the operator. In order to perform this type of recovery, the user will need to complete the following steps.

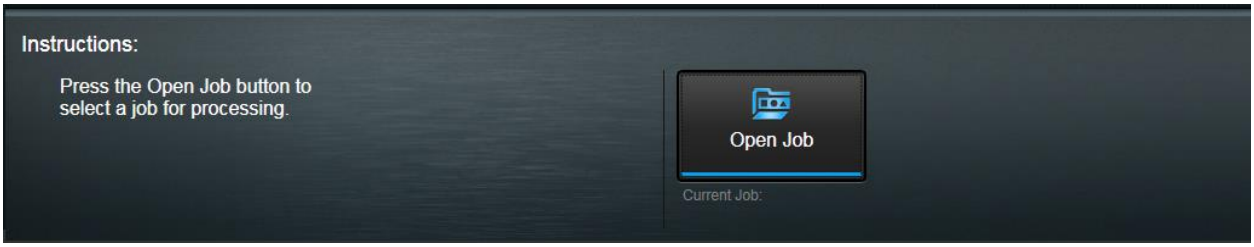
1) Stop the Job in Progress.



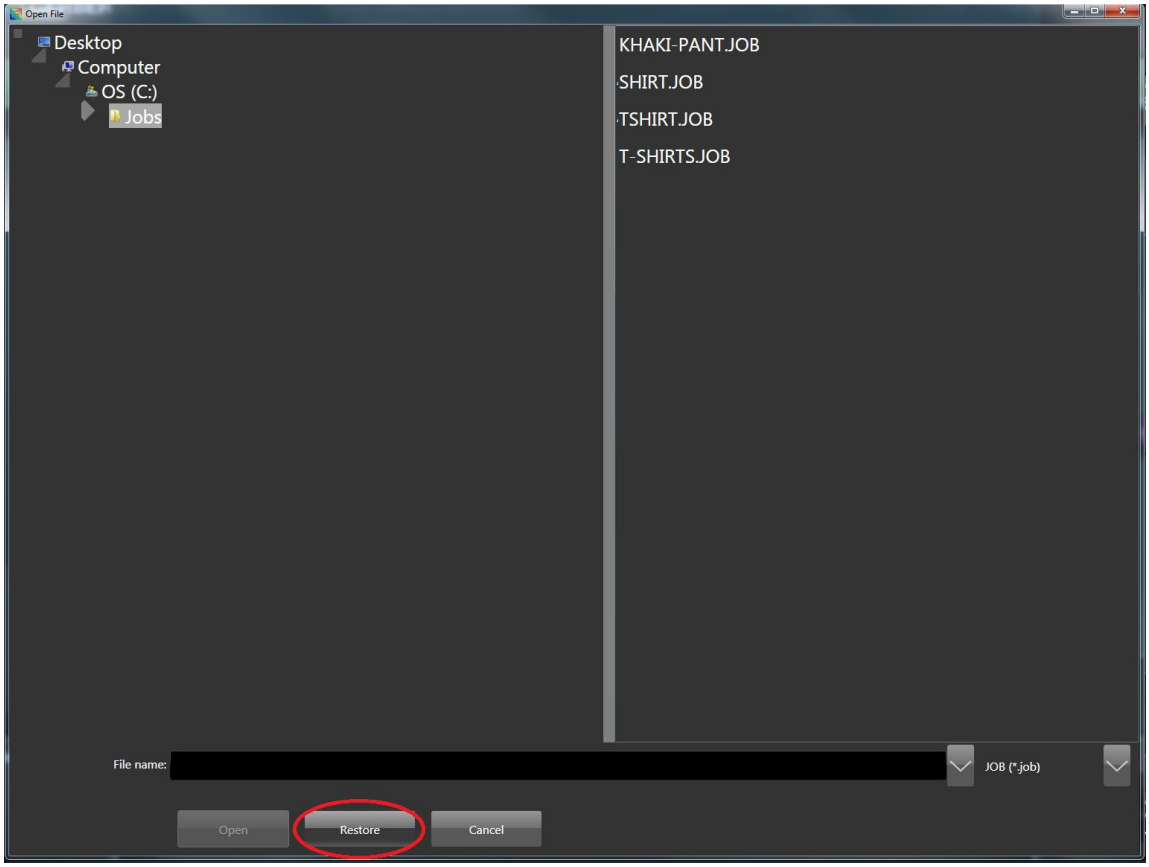
2) Cancel the job using either the “Cancel Job” button in the cut wizard that automatically appears, or by pressing the “Cancel Jobs” button in the lower right of the main screen.



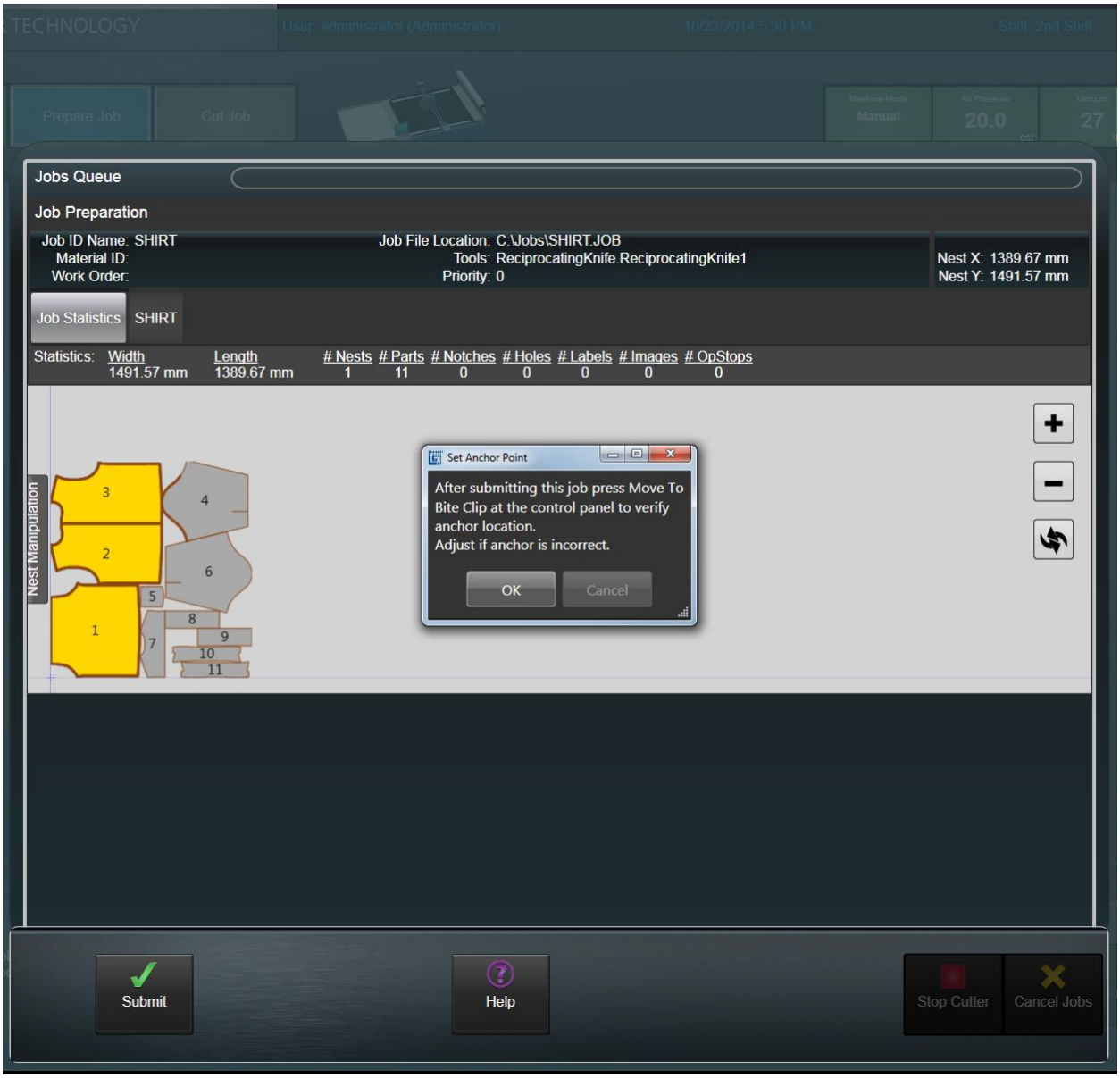
3) To Restore the job that was last canceled, press the Open Job button from the Prepare Job screen.



4) Press the Restore button on the File Open Dialog.

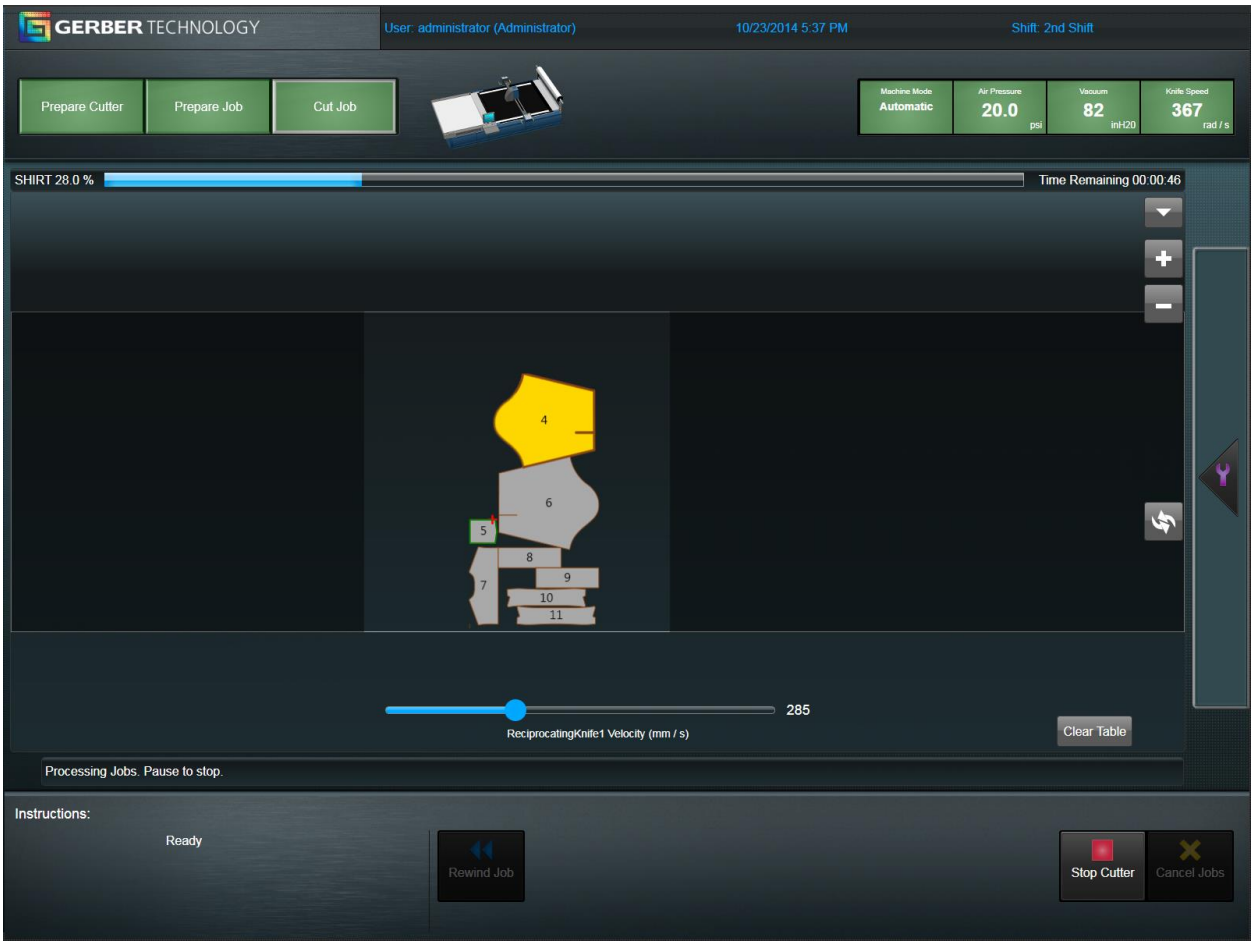


5) The state of the job and the state of the cutter will be restored, and the job appears in the Job Review window for confirmation.



6) Press the Submit button; the job is queued to cut.
7) On the Control Panel, press the Move To Bite Clip (or Move to Anchor) button located on the Material page. The laser light will be positioned on the last bite clip.
8) Adjust the laser light to the actual bite clip mark on the fabric, if necessary.
9) Press the Start button on the control panel.

The cutter will resume cutting the job.



Automatic Recovery

Automatic recovery is the preferred method of recovering a job from an event such as a power loss. The Gerbercutter Software will remember the point at which the job was cutting, and recover to this point. The state of the cutter is also restored.

In order to perform this type of recovery, the user will need to complete the following steps.

1) Power On the cutter and launch the Gerbercutter Software.

2) After starting the Gerbercutter Software, satisfy the Prepare Cutter steps (enabling the servos and homing.) As the cutter transitions to the Prepare Job state, the user will automatically be prompted that there is an unfinished job detected and asked if he/she wishes to recover it.

3) Select YES if recovery is desired.

4) The Gerbercutter software will re-open the job that was suspended, restore the state of the cutter, present the job for confirmation in the Prepare Job Screen and prompt the user to Set or Confirm an Anchor Point.

5) Press OK

6) The software will automatically place an Anchor Point, (indicated by a blue cross-hair), at the last bite clip that was cut on the table.
NOTE: There is no Bite Clip displayed on the screen until the Start button is pressed, however that is where the Anchor Point is automatically placed and displayed by the software.

7) Press the Submit button on the Prepare Job screen.

8) At the Beam Control Panel, jog the laser to the +Y end of the Bite Clip and press the Set Anchor Point button.

9) Follow the workflow prompts and press the Start Button.

Manual Recovery

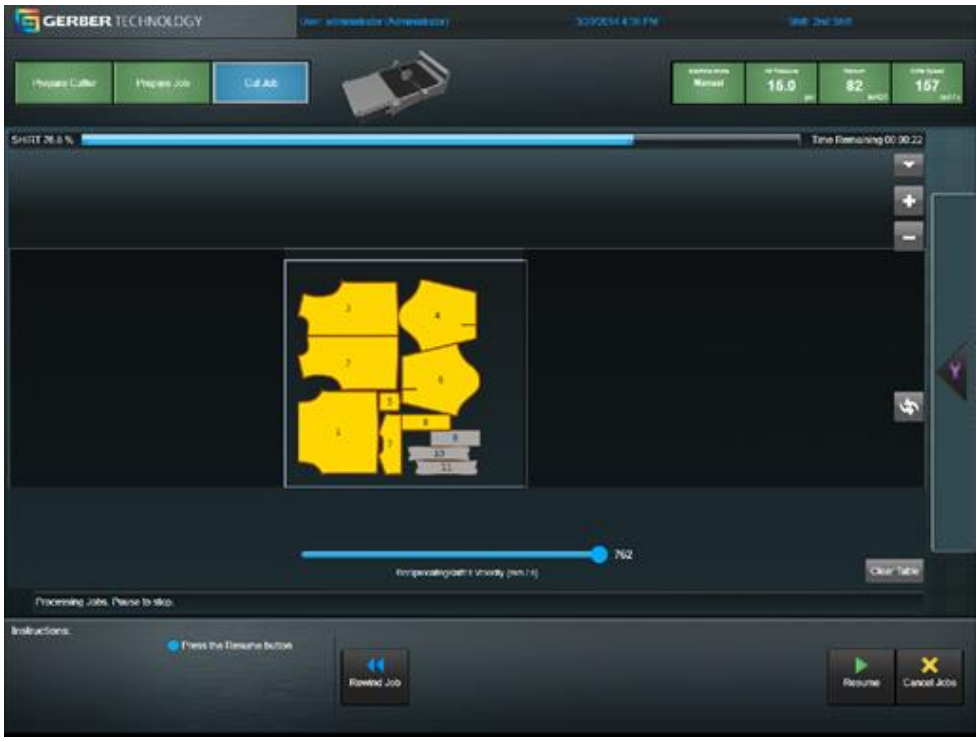
This method of recovery requires the use of Anchor Points to Manually Recover a Partially Cut Job. Manual recovery is used as a last resort, when one of the other recovery mechanisms described above cannot be performed, or the operator accidentally said no when asked whether to automatically recover a job. Neither the state of the job, nor the state of cutter will typically be available in this case; the operator will need to manually restore the job and the cutter state.

In order to perform this type of recovery, the user will need to complete the following steps.

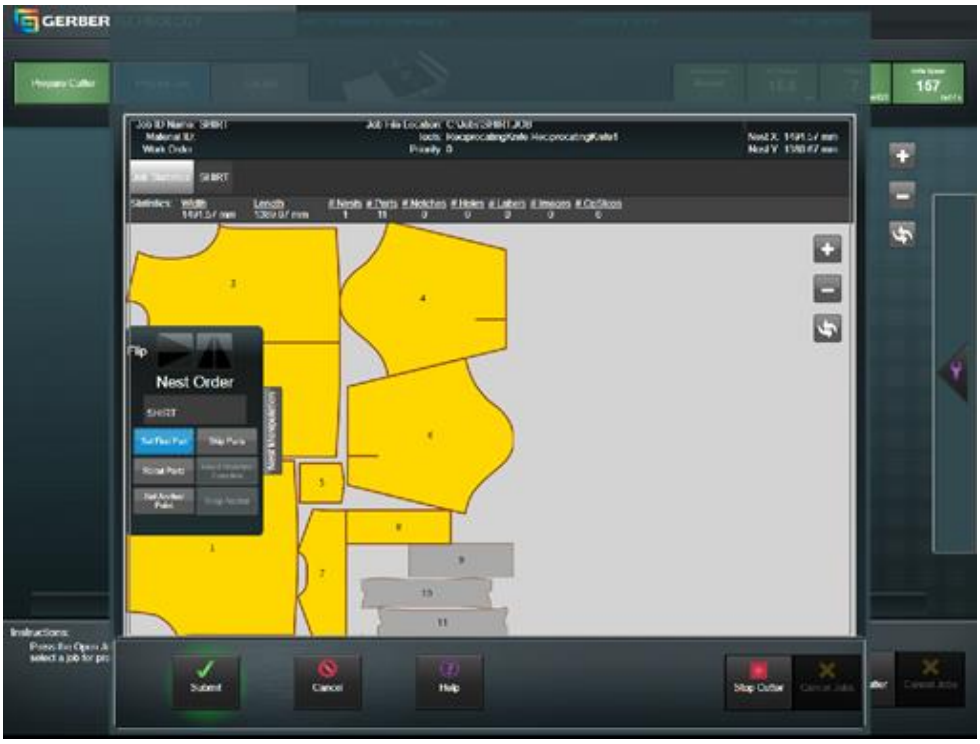
NOTE: The steps below describe a means to manually Restore a job in GERBERcutter Software version 2.0.1 and earlier releases, where the Restore operation described above was not yet available.

NOTE: In version 2.0.2 and later releases, one of the other 3 mechanisms described above should handle almost all of the recovery scenarios that might be encountered. However, there may be a rare case where manual recovery is necessary.

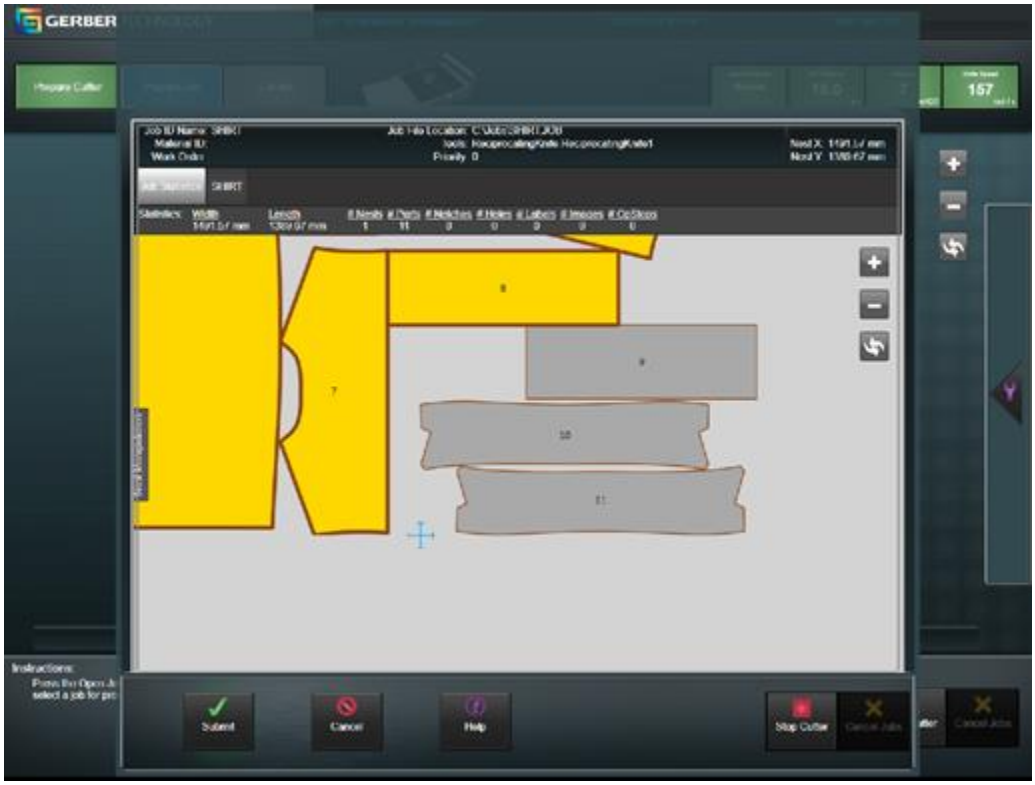
1. In this scenario, the cutter has cut part of the job.

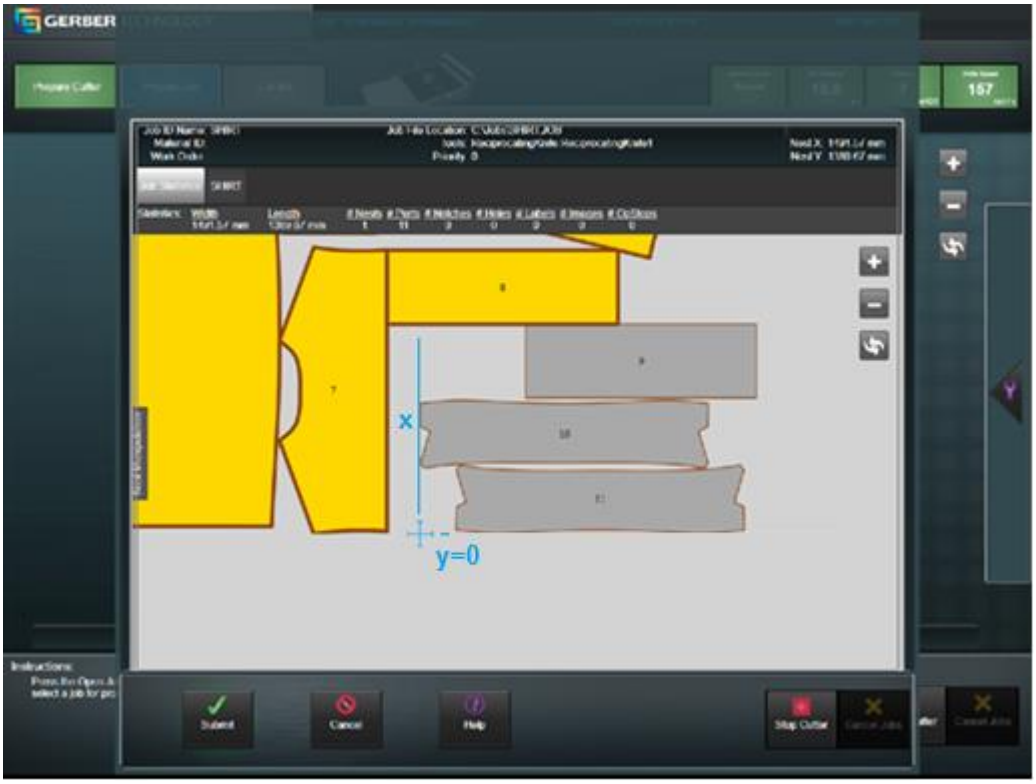


2. Cutting is stopped. Job is canceled.
3. On the Cut Job page, press the “Clear Table” button.
4. Open the same job. Set the first part to begin cutting (piece #9 in this example.)



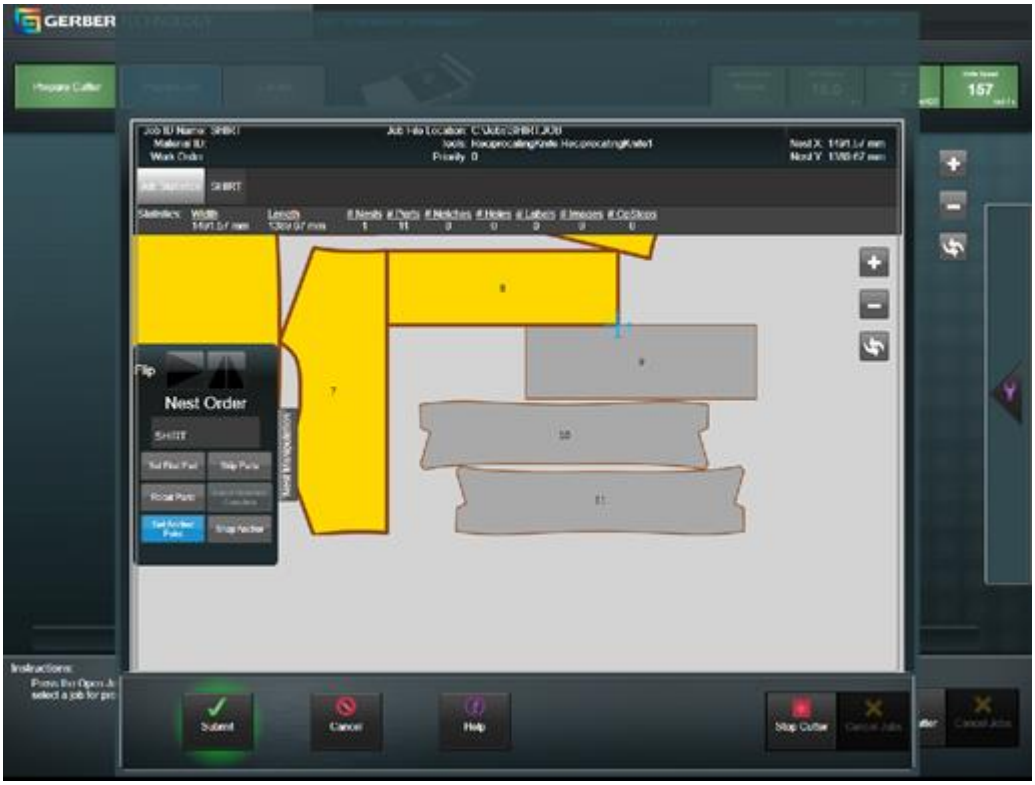
5. By default, an anchor point is set in the job at the X coordinate of the left-most piece to be cut and at the Y coordinate of Y = 0. Here is the view zoomed in. Note the location of the blue anchor point (leftmost X axis point of the uncut parts, and Y axis location of 0.)





Setting this point on the fabric would be difficult, because there is no reference mark on the fabric. Instead, change the anchor point location (see next step).
It is also important to note that the location of the anchor point is NOT at a bite clip.

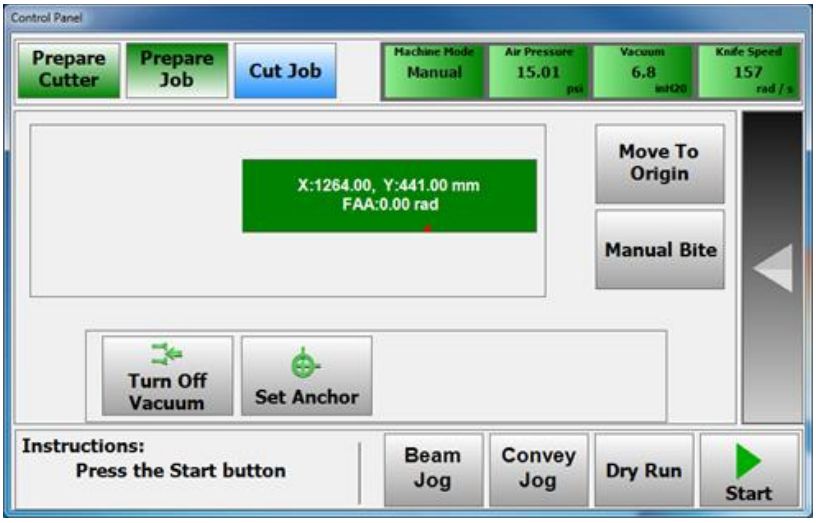
6. Open the “Nest Manipulation” tab and press the “Set Anchor Point” button. Using the Touchscreen, set the anchor point at a corner of piece #8 (this piece has already been cut and can be easily located on the fabric). In this example, we chose the lower right corner of piece #8. [Note that you can use the “Snap Anchor” button to snap the anchor point to the nearest data point. This makes finding a corner easier. Just make sure to press a location INSIDE the piece, and it will snap the anchor point to the closest data point on that piece.]



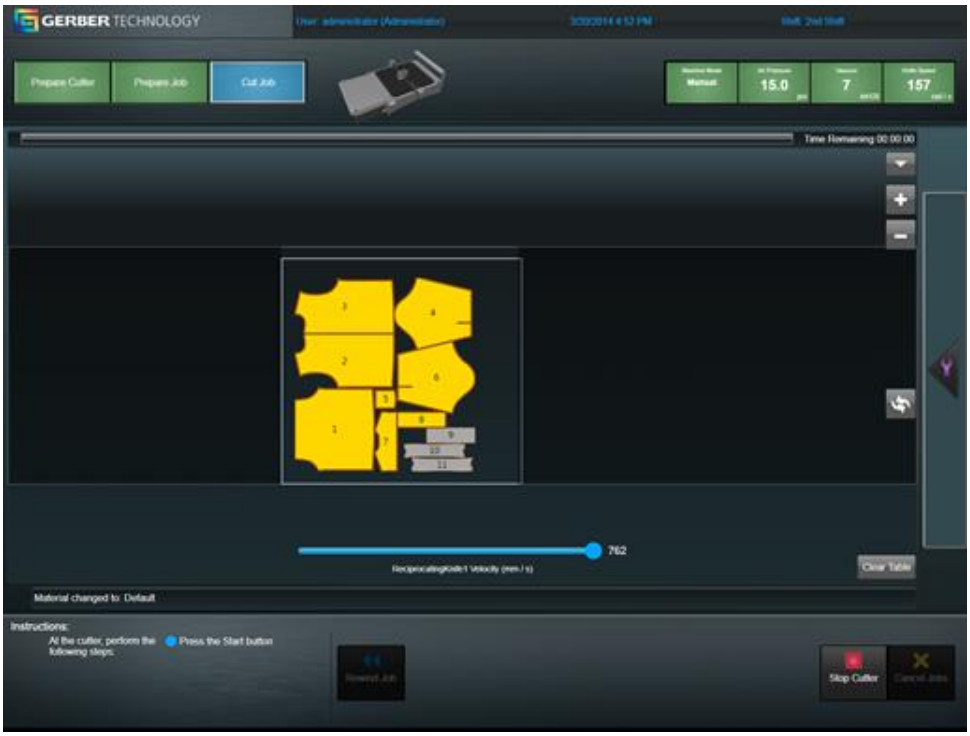
7. Then “Submit” the job. On the Prepare Job Page, the job will be displayed, with pieces colored in according to what parts will be cut. You will also see the blue anchor point at the location that you selected in the prior step.



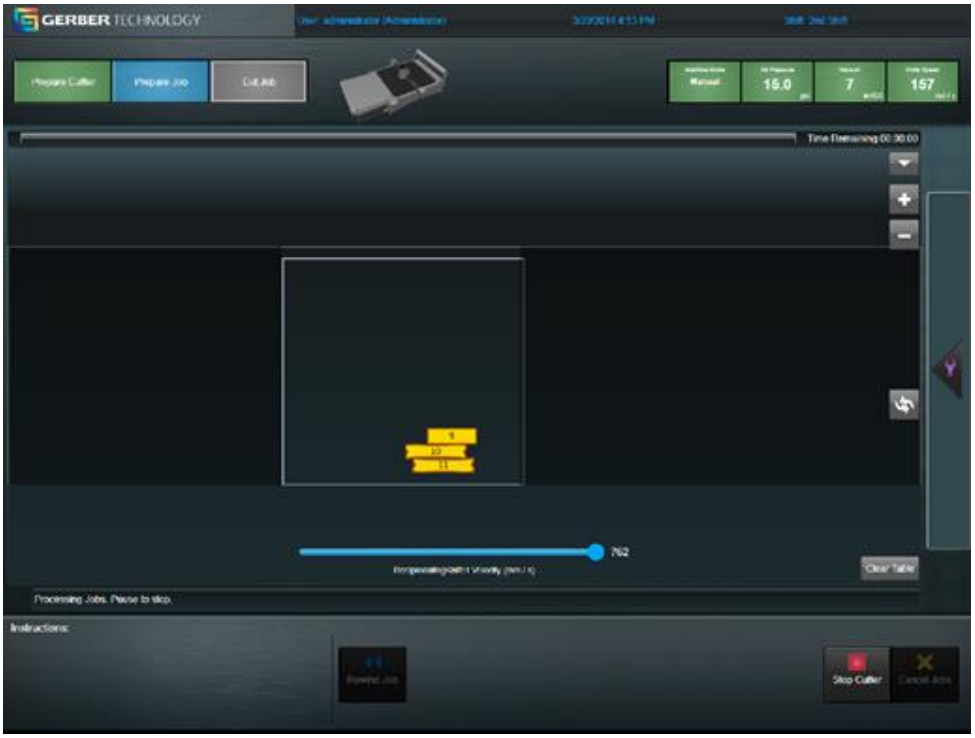
8. Now slew the laser light on the cutter beam to the corner of the piece where the anchor point was defined; the lower right corner of piece #8 in this example. Then press the “Set Anchor Point” button on the Control Panel. This aligns the anchor point from the job to the anchor point on the fabric.



9. The Job will appear on the Cut Job page, including already completed parts and parts yet to be cut.



10. Press the Start button on the Control Panel. The parts that were cut in the previous session will disappear, leaving only the parts to be cut. Cutting will begin. [Note that a bite clip may be made prior to cutting the parts.]



Applications

Biting Modes

Biting Overview

When cutting a nest that exceeds the length of the cutting table, the nest must be divided into sections along its length. Each of these sections is referred to as a “Bite”, and the process of dividing a nest into sections is called “Biting”. A bite is conveyed onto the cutting surface, processed, and then conveyed off the cutting surface, allowing for the next bite to be processed.

C200MT

For decades, the Gerber software that controlled the biting operation for the GTxL, GT1000, GT7250, GT5250 and S91 cutters has been C200MT. In order to learn the biting operation of the Paragon software for the VX and LX cutters, it is important to keep in mind that there are significant differences between the biting operations of C200MT and Paragon.

C200MT Biting

The Origin

With C200MT software, after the spread is positioned on the cutting surface, the operator needs to set an origin with the laser. The origin in this case is a fixed X Y coordinate on the cutting surface that remains the same throughout the cutting of the nest (there might be some movement of the origin due to fabric angle or adjustments from the conveyor move, but these are minor). Because the origin is a fixed point throughout the processing of a nest, the operator tends to first position the spread as far as he can to the left in order to maximize how much material can be cut in each bite. However, C200MT is not able to inform the operator if the spread is positioned correctly until the operator sets the origin. If the nest is not positioned so that it fits within the usable table area, the nest will have to be repositioned and checked again by setting the origin.

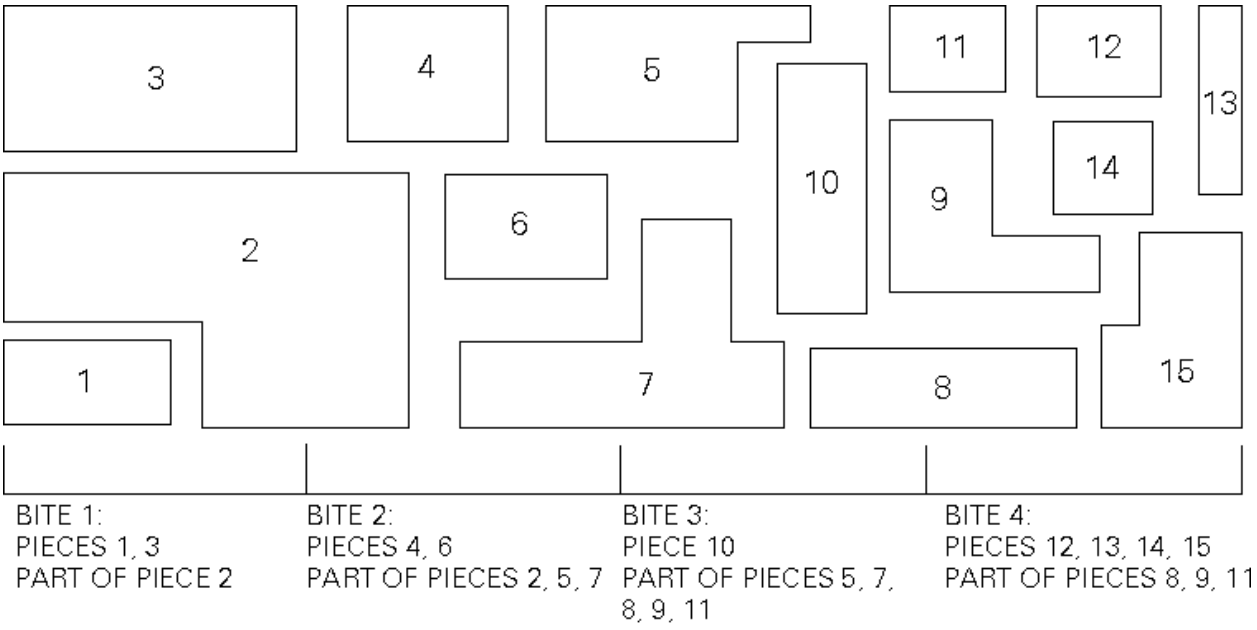
The X and Y coordinates at 0,0 of each bite is positioned at the origin on the table. So for C200MT, when we talk of the origin, we really mean “Bite Origin”.

Usable Table Area

The usable table area is the rectangular region on the cutting table that defines where all the required tools can reach. This, combined with the dimensions of a nest, determines where a valid origin can be placed, if it at all. Because C200MT doesn’t completely process tool and nest information until the Start button is pressed, it is possible for the origin to be invalid when Start is pressed.

Static Length Biting

Static length biting divides the nest into bites of equal lengths. If a piece extends beyond the bite, the cutter “splits” the piece and only cuts the portion of the piece that fits within the bite. When the cutter has finished cutting all pieces or parts of pieces for that bite, the conveyor advances the next bite. The cutter then cuts the second portion of the piece.

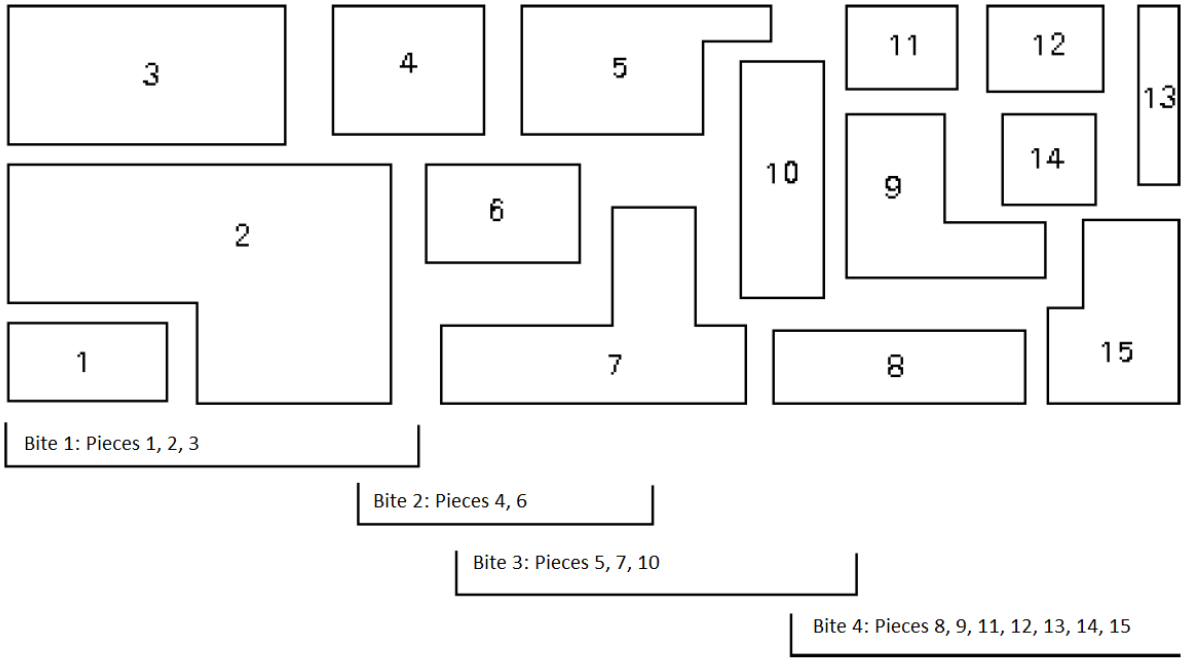


Variable Length Biting

When Variable Length Biting is turned on, the cutter only splits those pieces too large to fit on the cutting table. This feature is useful to:

- Eliminate split pieces in a nest requiring pieces not be split
- Reduce the need for Opstops to match plaids and stripes in split pieces.

Using Variable Length Biting, the cutter cuts all pieces in a given Bite that completely fit on the table. The conveyor then advances to the leftmost uncut piece. It cuts that piece and any other whole pieces on the cutting table. The conveyor again advances to the leftmost uncut piece. This step is repeated until all pieces are cut. Variable length Bites usually are shorter and occur more often than static length Bites. The minimum and maximum lengths of Bites are parameters that can be be changed by the operator, and sometimes have to be in order to make sure certain nests can be fit on the cutters.



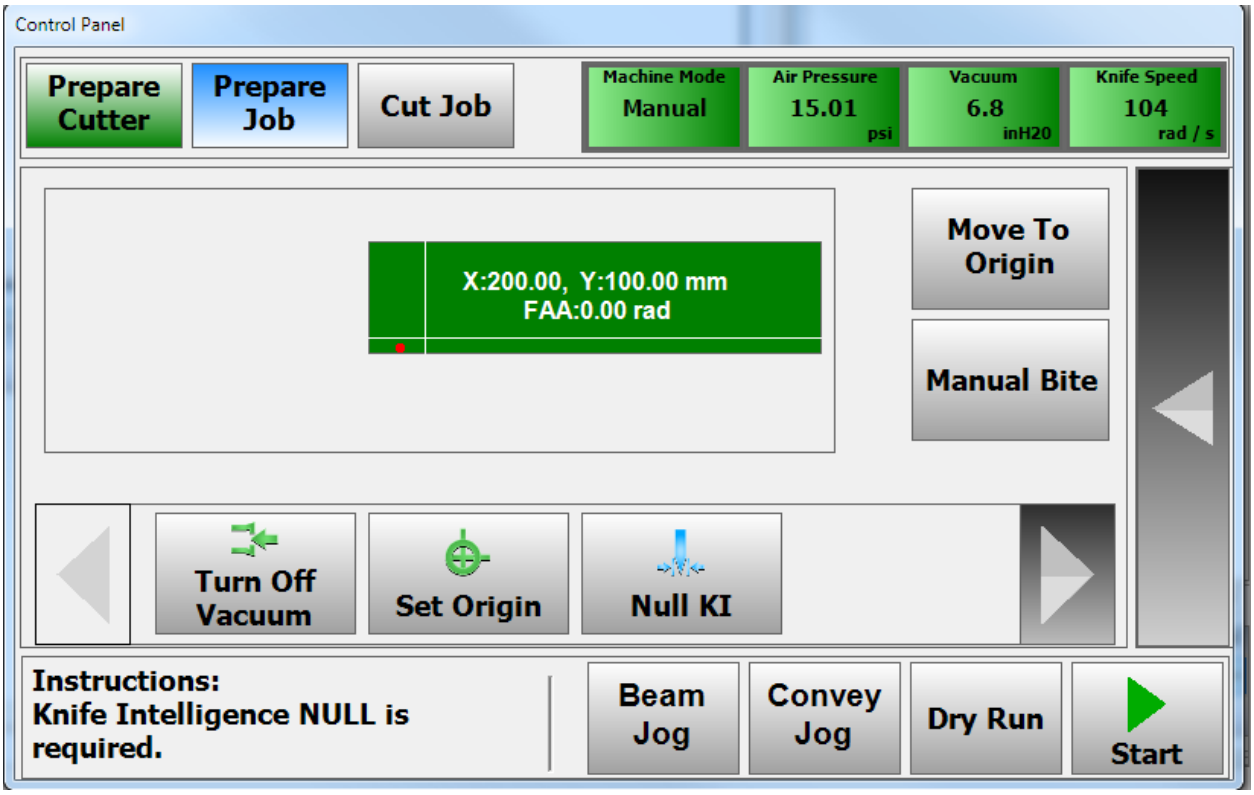
Bite Clips

C200MT has the option of adding Bite Clips to a nest. A bite clip is a small cut that is made just below the nest and is used as a reference point both during and after a conveyor move. Before the convey, the bite clip is made at the far right corner of the current bite. As the spread is conveyed across the table, the laser light maintains a fixed position at the top of the bite clip to provide a visual reference that the spread is not slipping and losing position on the table. If there is no slippage, the bite clip should be positioned at the bite origin. If the operator wants to be assured that the bite clip is positioned at the bite origin, he can pause cutting and press the “Move to Origin” button, which should move the laser light to the position of the last bite clip.

Paragon Biting

The Origin

Unlike the origin in C200MT, the Paragon origin is not a fixed point on the cutting surface. It is the coordinate of the currently loaded nest where X and Y equal 0. As such it is really a “Nest Origin”, not a “Bite Origin”. After the operator loads the nest, the Paragon software will determine the valid origin range and show it relative to the current laser position on the Control Panel. If the Origin Position control is green, the laser is at a valid position. This way the operator knows the origin is valid before setting it.



Once an origin is set and Start is pressed, the Paragon software can move the origin to the left in order to maximize the usable table area. After all of the parts are cut on the table, a conveyor move will position the next set of uncut parts onto the table. This will move the nest origin off of the table. From this point until the end of the nest, there is no longer an origin on the table unless the origin is reset.

Convey as Last Resort

One of the 2 biting strategies selectable by the operator is “Convey as Last Resort”. This strategy will only convey the spread as far as it needs to in order to cut the next piece completely without splitting it. If the piece will not fit entirely within cutting surface, it will convey as far as possible and split the piece. This cutting strategy can lead to many short convey moves, depending on the nest, and is used mostly in single-ply applications.

Convey As Far As Possible

This biting strategy tries to make each conveyor move as great a distance as possible in order to minimize the number of bites. The fewer the bites, the faster the throughput. If a piece cannot fit in a bite even after the greatest possible convey, a split will be added and it will be completed in subsequent bites.

Minimize Part Splitting

When “Convey As Far As Possible” is selected, the operator can also select “Minimize Part Splitting”. If this option is selected, the Paragon software will make sure that all of the elements of a part that are reachable in their entirety in the usable table area will be processed prior to a conveyor move.

Veer Off

Veer Off is an added cut move that is included when splitting a piece that needs to be cut in two or more bites. They are added at the split ends to make sure that there is no uncut material between the two ends.

Left Buffer and Right Buffer

The Left Buffer and the Right Buffer are values that can be used by the biting algorithm to reduce the width of the usable table on the left and/or right side. This reduces the possibility of off-table errors that can occur due to conveyor moves that drift uncut sections beyond the usable table area.

Initial Convey

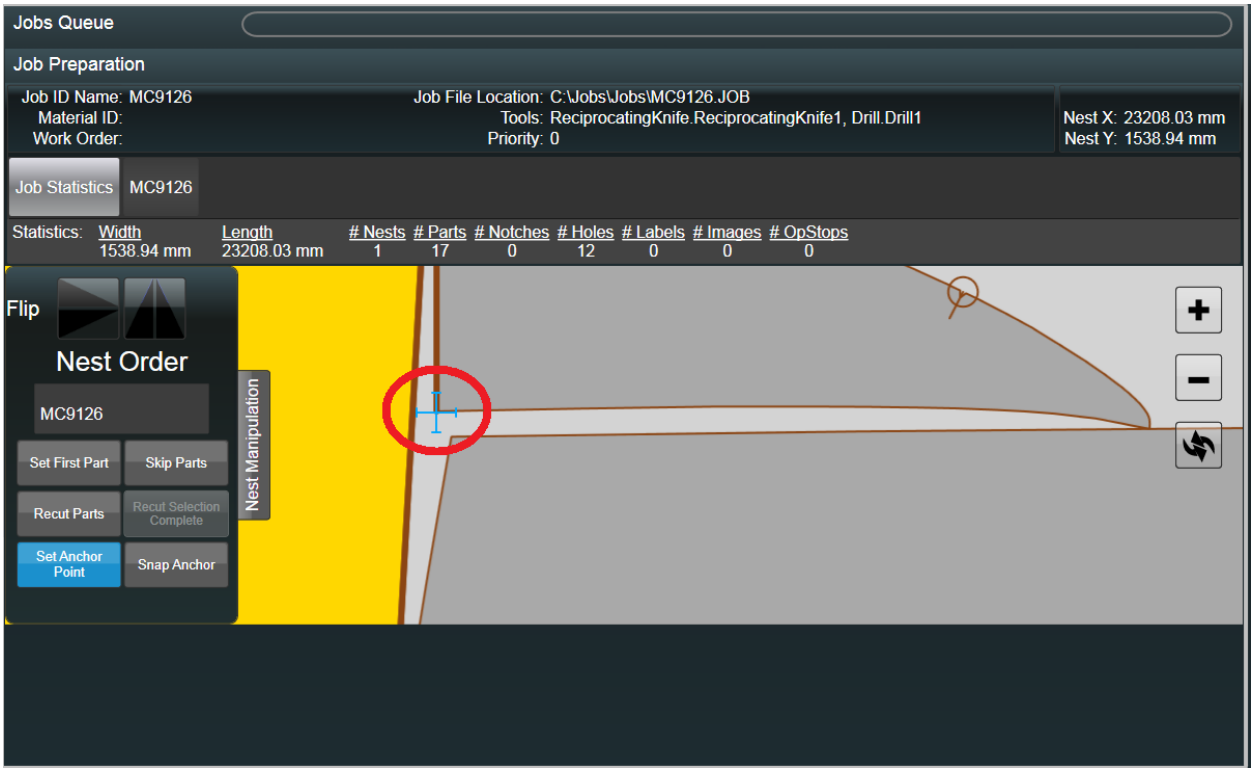
If “Initial Convey” is allowed, then the Paragon software will convey the spread forward from the initial, user set origin to get the maximum usable table area. If it is not allowed, it will proceed to cut the nest prior to the first conveyor move if possible.

Bite Clips

Bite clips are enabled by changing the “Bite Clip Start” value in Processing Settings from 0 to a negative number. “Bite Clip Start” and “Bite Clip End” represent the Y coordinates where a Bite Clip cut will be made. The distance from “Bite Clip Start” to “Bite Clip End” will determine the length of the Bite Clip. After pressing “Start”, a Bite Clip is added to the bottom left-hand corner of the nest. Subsequent Bite Clips are added immediately prior to a conveyor move. At the end of the conveyor move the Bite Clip shall end up at the bottom left-hand corner of the usable table area, unless “Minimize Number of Bite Clips” is active.

Anchor Point

The anchor point is used primarily for recovery. It associates a point in the nest in the Paragon software with a point on the table cutting surface. First, the operator selects a point of the nest in the Job Preview screen using the light blue crosshairs.



Then, when the Set Anchor button is active on the Control Panel, they can position the laser pointer at the associated point in the spread on the table and press that button. This way the software knows where to cut the parts on the table without using an origin.

Minimize Number of Bite Clips

This setting puts the bite clip at the far right end of the usable cutting area and does not add another bite clip until the first is conveyed off-table. It only makes sense to use this setting if the “Convey As Last Resort” biting strategy is being used, since there could be a large number of short bites, and adding a bite clip to each one would adversely affect throughput.

Origin, Bite Clip, and Anchor Point

As was stated above, the origin in the Paragon software is a Nest Origin, not a Bite Origin. Since the origin goes off table after the first or second bite, we need to use the bite clip and anchor point to do what used to be done by the Bite Origin. With bite clips on, the operator can validate the position of the spread by pressing “Move to Bite Clip”. If the laser pointer moves to the bite clip, the operator knows the spread is properly positioned on the table. During a recovery, the operator can set the anchor point to the bite clip to restore the position of the nest.

Resetting the Origin

In order to be able to reset the Nest Origin after pressing start, the operator needs to have “Pause after Bite” on. After each conveyor move the cutter will pause, allowing the operator to verify the nest position by moving to the bite clip. If the position is incorrect, the operator can reset the origin by moving the laser to the correct position and pressing “Set Origin” on the control panel.

Set Fabric Angle

On the first bite of a Nest, the operator has the option of checking and changing the fabric angle. This option is available from the Control Panel. If the Administrator wishes for the fabric angle to be checked and/or modified during the workflow, the buttons shall be visible in the workflow steps in the Prepare Job screen. If not, these buttons shall always be available from the Material Page. If the operator wishes to check and/or modify the Fabric Angle for any bites after the first, he has to have “Pause After Bite” checked and also be using bite clips. Since Paragon doesn’t use Bite Origins, the bite clips are necessary to establish a vertex for the fabric angle

Vacuum Modes

Basic vs. Vacuum Regulation
Ignore vacuum Errors. How the delay value affects it.

Reciprocating Knife Setup

- Tool Wear
    - Tool life (and status monitor)
    - Parameters
- Sharpening
- Knife Intelligence

  Knife Intelligence compensates in real time for side forces acting on the knife blade. These forces push against the knife blade as it cuts through material, causing the knife to bend. Without Knife Intelligence, this deflection would cause variation between top and bottom plies of pattern pieces in high lays of fabric, especially at curves. Knife Intelligence senses such lateral forces and compensates for them, ensuring uniformity of cut patterns. The amount of side force depends on type and quantity of material being cut, speed of the knife, and shape of the cut. A sensor in the presser foot bowl monitors lateral stress on the blade, providing instant feedback to the computer control. Knife Intelligence then turns the knife in the direction of the force until there is a balance of lateral pressure.

  In addition to Hardware Knife Intelligence there also exists Software Knife Intelligence. Software Knife Intelligence, abbreviated SWKI, is a predictive knife intelligence. The software will determine a predicted knife bend based on the curvature of the geometry being cut in real time. This predicated bend is used to generate an offset to apply to theta to compensate for the knife bending.

Hardware and Software knife intelligence can be used in combination to improve cut quality in certain geometries. Both Hardware and Software knife intelligence have gain parameters associated with them to allow the user to apply more or less of each value.

Knife Intelligence becomes a requirement as ply heights increase above 3 cm of compressed material. Generally, as ply height increases » Deflection Angle parameter increases and as material hardness increases » KI Gain decreases.
The normal operating range of the Knife Intelligence parameters are as follows:

KI: Gain 10 to 40
KI: Deflection Angle 4 to 12

To access Knife Intelligence parameters in Axis open the Change Parameters page. The following parameters control Hardware and Software Knife intelligence.

Hardware Ki Enable - Enables the use of Hardware Knife Intelligence
Hardware Ki Gain - Sets the gain value to be used for Hardware Knife Intelligence
KI Maximum Deflection Angle - The maximum angle applied from the KI Sensor

Software Ki Enable - Enables the use of Software Knife Intelligence
Software Ki Gain - Sets the gain value to be used for Software Knife Intelligence

There is no Maximum Deflection Angle for Software Knife Intelligence. It is limited internally by the software to 18 degrees.

Advanced Material Parameters

Parameter Definitions

General Parameters (not associated with a device):

Material Width Width of the material. Constrained by the width of the table. Can be verified with the laser under “Material” in the Control Panel Utility Drawer.
Slit Notch Depth Adjustment The amount to *change* the depth of the slit notches.
V Notch Depth Adjustment The amount to *change* the depth of the V notches.
Default Cutting Tool The cutting tool that shall be used if none is defined.
Default Drilling Tool The drilling tool that shall be used if none is defined.
Default Drill 1 Tool The drill 1 tool that shall be used if none is defined.
Default Drill 2 Tool The drill 2 tool that shall be used if none is defined.
Default Drill 3 Tool The drill 3 tool that shall be used if none is defined.
Default Drill 4 Tool The drill 4 tool that shall be used if none is defined.
Default Labeling Tool The labeling tool that shall be used if none is defined.

Default Labeling Font Name The labeling font that shall be used if none is defined.
Default Plotting Tool The plotting tool that shall be used if none is defined.
Default Pointing Tool The pointing tool that shall be used if none is defined.

Vacuum Parameters

Biting Value that the vacuum is set to during biting.
Continuous Value that the vacuum is set to if the cutter is cutting while conveying.
Cut Value that the vacuum is set to if the cutter is cutting and not conveying.
Idle Value that the vacuum is set to if the cutter is idle.
Biting High Error If the vacuum *exceeds* this value during biting, an alarm will be triggered.
Continuous High Error If the vacuum *exceeds* this value during continuous mode, an alarm will be triggered.
Biting Low Error If the vacuum *drops below* this value during biting, an alarm will be triggered.
Continuous Low Error If the vacuum *drops below* this value during continuous mode, an alarm will be triggered.
Cut Low Error If the vacuum *drops below* this value during cut mode, an alarm will be triggered.
Continuous Low Warning A value above the Low Error value for continuous mode. If the vacuum *drops below* this value during continuous mode, a warning will be triggered, turning the indicator yellow.
Cut Low Warning A value above the Low Error value for cut mode. If the vacuum *drops below* this value during cut mode, a warning will be triggered, turning the indicator yellow.
Error Reset Time A software timeout to prevent false errors.
High Error Latch Time The amount of time the vacuum must be *above* the High Error value to trigger an error.
Low Error Latch Time The amount of time the vacuum must be *below* the High Error value to trigger an error.

Reciprocating Knife Parameters

Cut Length The distance of a new knife from cutting edge to heel.
Knife Speed Checking DO NOT DISABLE. Ensures the knife is on before cutting.
Lift and Plunge Angle Maximum angle knife is allowed to turn while inside the material, before lifting to turn and then plunging back into the fabric to resume.
Lead In The extra distance the knife will cut *before* the *start* of a cut. Used to overlap the start and end of the cut to ensure the part is cut out completely
Lead Out The extra distance the knife will cut *past* the *end* of a cut. Used to overlap the start and end of the cut to ensure the part is cut out completely.
Maximum Blending Angle If the angle of a corner the knife follows is *less* than this value, it will turn the corner into an arc.
Hardware KI Enable For VX. Enables Knife Intelligence based on measured deflection of the knife during cutting.
Hardware KI Gain Sensitivity of the Hardware KI.
Software KI Enable For VX. Enables Knife Intelligence based on the commanded geometry.
Software KI Gain Sensitivity of the Software KI.

Presser Foot Pressure How much pressure the presser bowl will exert on the material.

Reciprocating Knife: Acceleration, Velocity, Speed

Knife Speed Cut Minimum Speed of the knife's reciprocation when it first plunges into the material. As the forward velocity of the knife increases, the reciprocation will increase to the Knife Speed Cut Maximum.
Knife Speed Cut Maximum Maximum speed of the knife's reciprocation while cutting.
Knife Speed Idle Speed of the knife's reciprocation while idling.
Maximum Angular Acceleration Maximum rotation acceleration of the theta axis.
Maximum Angular Velocity Maximum angular velocity of the theta axis.
Maximum Dry Haul Acceleration Maximum acceleration of the cutter head while the knife is moving from piece to piece (i.e. the knife is not in the material).
Maximum Dry Haul Velocity Maximum velocity of the cutter head while the knife is moving from piece to piece (i.e. the knife is not in the material).
Maximum Acceleration The maximum forward acceleration of the knife during cutting.
Maximum Velocity The maximum forward velocity of the knife during cutting.
Minimum Vector Velocity Not implemented.
Velocity Smoothing Increase to smooth cutting data with high number of data points that are not aligned well to reducing jerkiness of cutting. Set to 0 for cut data that follows Gerber's guidelines.

Reciprocating Knife: Sharpening

Knife Speed Sharpen The speed of the knife's reciprocation while it is being sharpened.
Knife Sharpens Limit How many times a knife can be sharpened before the operator is prompted to replace the knife.
Sharpens Until Wear Update After every this number of sharpens, 1 increment of Knife Wear Compensation is applied.
Sharpen Frequency Knife will be sharpened after cutting this distance.
Sharpen Only when Knife is Up Waits until knife is finished with current cut before sharpening. Used to modify behavior of Sharpen Frequency.
Sharpen Every N Pieces Knife will be sharpened after cutting N number of parts. For use when parts are similar in size.
Sharpen Cycles The number of revolutions the sharpener will go about the knife in each direction.

Laser Parameters

Jog Acceleration Maximum acceleration of the cutter head while the laser is in use during jog mode.
Maximum Acceleration Maximum acceleration of the cutter head while the laser is in use during the specified mode.
Maximum Dry Haul Acceleration Maximum acceleration of the cutter head while the laser is in use during dry haul.
Jog Velocity Maximum velocity of the cutter head while the laser is in use during jog mode

Maximum Velocity Maximum velocity of the cutter head while the laser is in use during the specified mode
Maximum Dry Haul Velocity Maximum velocity of the cutter head while the laser is in use during dry haul mode.
Maximum Blending Angle If the angle of a corner the laser follows is *less* than this value, it will turn the corner into an arc.
Velocity Smoothing Increase to smooth cutting data with high number of data points that are not aligned well to reducing jerkiness. Set to 0 for cut data that follows Gerber's guidelines.

Drill Parameters

Drill Speed The RPM speed of the drill.
Maximum Acceleration Maximum acceleration of the cutter head while the drill is in use during the specified mode.
Maximum Dry Haul Acceleration Maximum acceleration of the cutter head while the drill is in use during dry haul.
Maximum Velocity Maximum velocity of the cutter head while the drill is in use during the specified mode.
Maximum Dry Haul Velocity Maximum velocity of the cutter head while the drill is in use during dry haul.

Conveyor Parameters

Creep Distance The distance over which the conveyor slows to a stop.
Maximum Acceleration Maximum acceleration of the conveyor.
Minimum Velocity Commanded speed of the conveyor to overcome the dampening force of the weight of material to make sure the conveyor reaches the correct position at the end of the creep distance.
Maximum Velocity Fastest speed of the conveyor during movement.

When Changed Parameters Take Effect

Name	No Job Loaded	Job is Loaded	Job is Paused	Job is Running
Alternate LeadIn	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Alternate LeadOut	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Biting	Immediate.	Immediate.	Immediate	Immediate.
Biting High Error	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Biting Low Error	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Bowl Up Delay	Immediate.	Immediate.	Immediate	Immediate.
Continuous	Immediate.	Immediate.	Immediate	Immediate.
Continuous High Error	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Continuous Low Error	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Continuous Low Warning	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Corner Threshold	When Job loads.	When Start pressed.	Immediate	Immediate.
Creep Distance	Immediate.	Immediate.	Immediate	Immediate.
Cut	Immediate.	Immediate.	Immediate	Immediate.
Cut Length	When Job loads.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Cut Low Error	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Cut Low Warning	When Start pressed.	When Start pressed.	When Start pressed.	Immediate.
Default Cutting Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Drill 1 Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Drill 2 Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Drill 3 Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Drill 4 Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Drilling	When Job loads.	Immediate.	When next Job	When next Job

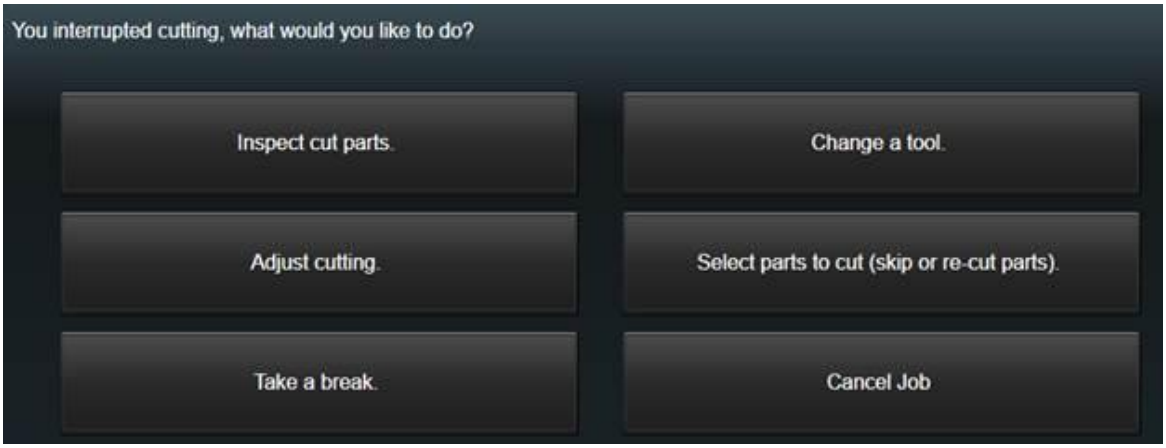
Tool			loads.	loads.
Default Labeling Font Name	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Labeling Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Plotting Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Default Pointing Tool	When Job loads.	Immediate.	When next Job loads.	When next Job loads.
Drill Speed	Immediate.	Immediate.	Immediate	Immediate.
Error Reset Time	Immediate.	Immediate.	Immediate	Immediate.
Hardware KI Enable	Immediate.	Immediate.	Immediate	Immediate.
Hardware KI Gain	Immediate.	Immediate.	Immediate	Immediate.
High Error Latch Time	Immediate.	Immediate.	Immediate	Immediate.
Idle	Immediate.	Immediate.	Immediate	Immediate.
Jog Acceleration	When the Application starts.	When the Application starts.	When the Application starts.	When the Application starts.
Jog Velocity	When the Application starts.	When the Application starts.	When the Application starts.	When the Application starts.
KI Maximum Deflection Angle	Immediate.	Immediate.	Immediate	Immediate.
Knife Sharpens Limit	Immediate.	Immediate.	Immediate	Immediate.
Knife Speed Checking	On Error.	On Error.	On Error.	On Error.
Knife Speed Cut Maximum	Immediate.	Immediate.	Immediate	Immediate.
Knife Speed Cut Minimum	Immediate.	Immediate.	Immediate	Immediate.
Knife Speed Idle	Immediate.	Immediate.	Immediate	Immediate.
Knife Speed Sharpen	Immediate.	Immediate.	Immediate	Immediate.
Lead Distance	When the Application starts.	When the Application starts.	When the Application starts.	When the Application starts.
LeadIn	When Job loads.	When Start pressed.	When Start pressed.	Next time Start is pressed.
LeadOut	When Job loads.	When Start	When Start	Next time Start is

		pressed.	pressed.	pressed.
LeadOut Distance	When the Application starts.	When the Application starts.	When the Application starts.	When the Application starts.
Lift And Plunge Angle	When Job loads.	When Start pressed.	When the next Job loads.	When the next Job loads.
Low Error Latch Time	Immediate.	Immediate.	Immediate	Immediate.
Material Width	When Job loads.	When the next Job loads.	When the next Job loads.	When the next Job loads.
Maximum Acceleration	Immediate.	Immediate.	Immediate	Immediate.
Maximum Angular Acceleration	Immediate.	Immediate.	Immediate	Immediate.
Maximum Angular Velocity	Immediate.	Immediate.	Immediate	Immediate.
Maximum Blending Angle	Immediate.	Immediate.	Immediate	Immediate.
Maximum Dry Haul Acceleration	Immediate.	Immediate.	Immediate	Immediate.
Maximum DryHaulVelocity	Immediate.	Immediate.	Immediate	Immediate.
Maximum Velocity	Immediate.	Immediate.	Immediate	Immediate.
Minimum Vector Velocity	NA	NA	NA	NA
Minimum Velocity	Immediate.	Immediate.	Immediate	Immediate.
Notch Trailer	Immediate.	Immediate.	When the next Job loads.	When the next Job loads.
Number Of Hits	Immediate.	Immediate.	When the next Job loads.	When the next Job loads.
Output Scale Factor	Immediate.	Immediate.	Immediate	Immediate.
Presser Foot Pressure	Immediate.	Immediate.	Immediate	Immediate.
Pressure	Immediate.	Immediate.	Immediate	Immediate.
Punch Rotation	Immediate.	Immediate.	When the next Job loads.	When the next Job loads.
Purge Enabled	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Sharpen Cycles	Immediate.	Immediate.	Immediate	Immediate.
Sharpener Rotation Speed	Immediate.	Immediate.	Immediate	Immediate.

Sharpen Every n Pieces	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Sharpen Frequency	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Sharpen Only When Knife Up	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Sharpens Until Wear Update	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Slit Notch Depth Adjustment	When Job loads.	When Start pressed.	When the next Job loads.	Next time Start is pressed.
Software KI Enable	Immediate.	Immediate.	Immediate	Immediate.
Software KI Gain	Immediate.	Immediate.	Immediate	Immediate.
Tool Life Distance	Immediate.	Immediate.	Immediate	Immediate.
Trigger Delay	NA	NA	NA	NA
Use Clamp Bar	When Start pressed.	When Start pressed.	When Start pressed.	Next time Start is pressed.
Use Direction Bit	Immediate.	Immediate.	Immediate	Immediate.
Velocity Smoothing	Immediate.	Immediate.	Immediate	Immediate.
V Notch Depth Adjustment	When Job loads.	When Start pressed.	When the next Job loads.	When the next Job loads.
V Notch Width Adjustment	When Job loads.	When Start pressed.	When the next Job loads.	When the next Job loads.

Wizards

There are many reasons an operator would interrupt a job in progress. Sometimes this is due to an issue that must be resolved before continuing with cutting. The system displays a wizard any time the operator interrupts a job to assist with correcting several typical issues. Following is the initial wizard screen:



The operator should select the button that best describes the reason for interrupting the job.

Inspect cut parts.

Inspection of parts requests the operator to indicate if the parts are acceptable or not. If the parts are acceptable no action is needed. If the parts are not acceptable the operator is shown the adjust cutting wizard.

Change a tool.

This shows the tool change screen. Refer to the tool change section.

Adjust cutting.



The adjust cutting wizard is entered when the operator determines the cutting quality is not acceptable. The operator should select the button which most closely matches the quality issue observed.

- Adjust notches allows the operator to reduce the depth of slit or V notches. It is also possible to increase/decrease the width of V notches. This wizard may result in temporary changes to the following parameters: V Notch Depth Adjustment, V Notch Width Adjustment, Slit Notch Depth Adjustment.
- Adjust part picking deals with issues that prevent parts from being completely cut out. The first attempt to resolve this issue is to sharpen the knife, automatically performed by the wizard when cutting is resumed. If the operator continues to have problems picking parts the operator will invoke this wizard again resulting in the automatic increasing of the lead in and lead out parameters (temporary parameter changes are made to Lead In and Lead Out for the cutting tool). If this does not solve the problem a third invocation of the wizard will suggest that the operator try increasing the vacuum or reducing cutting speed.
- Eliminate material fusing deals with the knife getting hot enough to melt the material being cut. The first attempt to resolve this issue is to sharpen the knife, automatically performed by the wizard when cutting is resumed, and to reduce the knife speed (revolutions per minute). A temporary change is made to the Knife Speed Cut Maximum and Knife Speed Cut

Minimum parameters. If this does not solve the issue then the operator is given the following suggestions: reduce the knife speed, increase the cutting speed, use the Vortec cooling system.

- Eliminate material shifting deals with the knife pushing material. The first attempt to resolve this issue is to sharpen the knife and reduce the maximum cutting speed, automatically performed by the wizard. A temporary change is made to the Maximum Velocity parameter for the cutting tool. If this does not work the wizard suggests calling Gerber service.
- Adjust part size provides details on what affects part sizes and recommends visual inspection of the knife.

Select parts to cut (skip or re-cut parts).

Provides description of the rewind feature for re-cutting parts that are on the table for a job currently in progress. For any other situation the operator is directed to select the parts to cut when opening a job.

Take a break.

Pressed if the operator needs to take a break or leave the machine unattended.

Cancel job.

The operator decides that the current job does not need to be completed.

Reporting

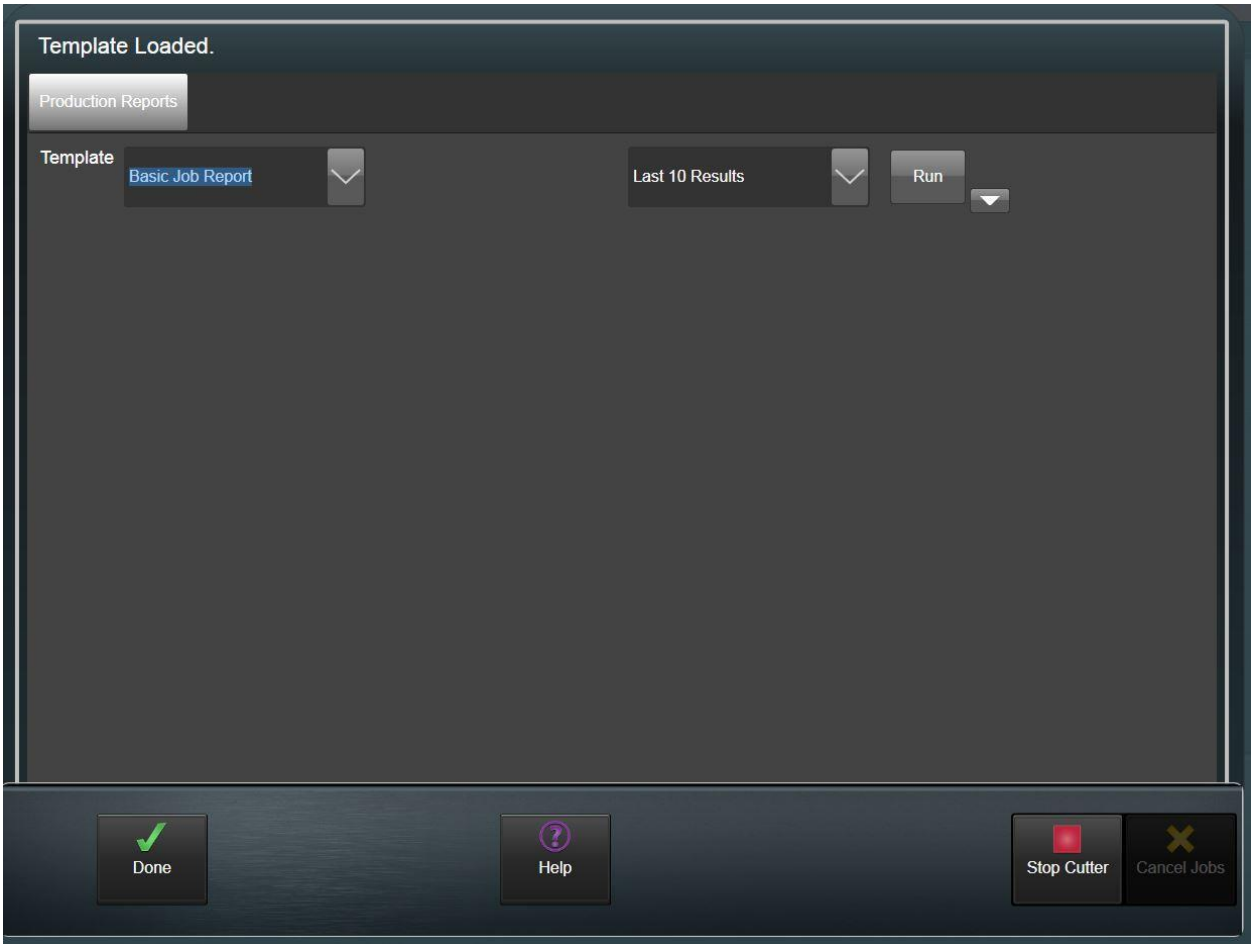
Running reports

There are two kinds of reports you can run on the Paragon cutter. The simplest is the Job Results. Pull out the Utility drawer and click the Job Results button. The following screen appears.

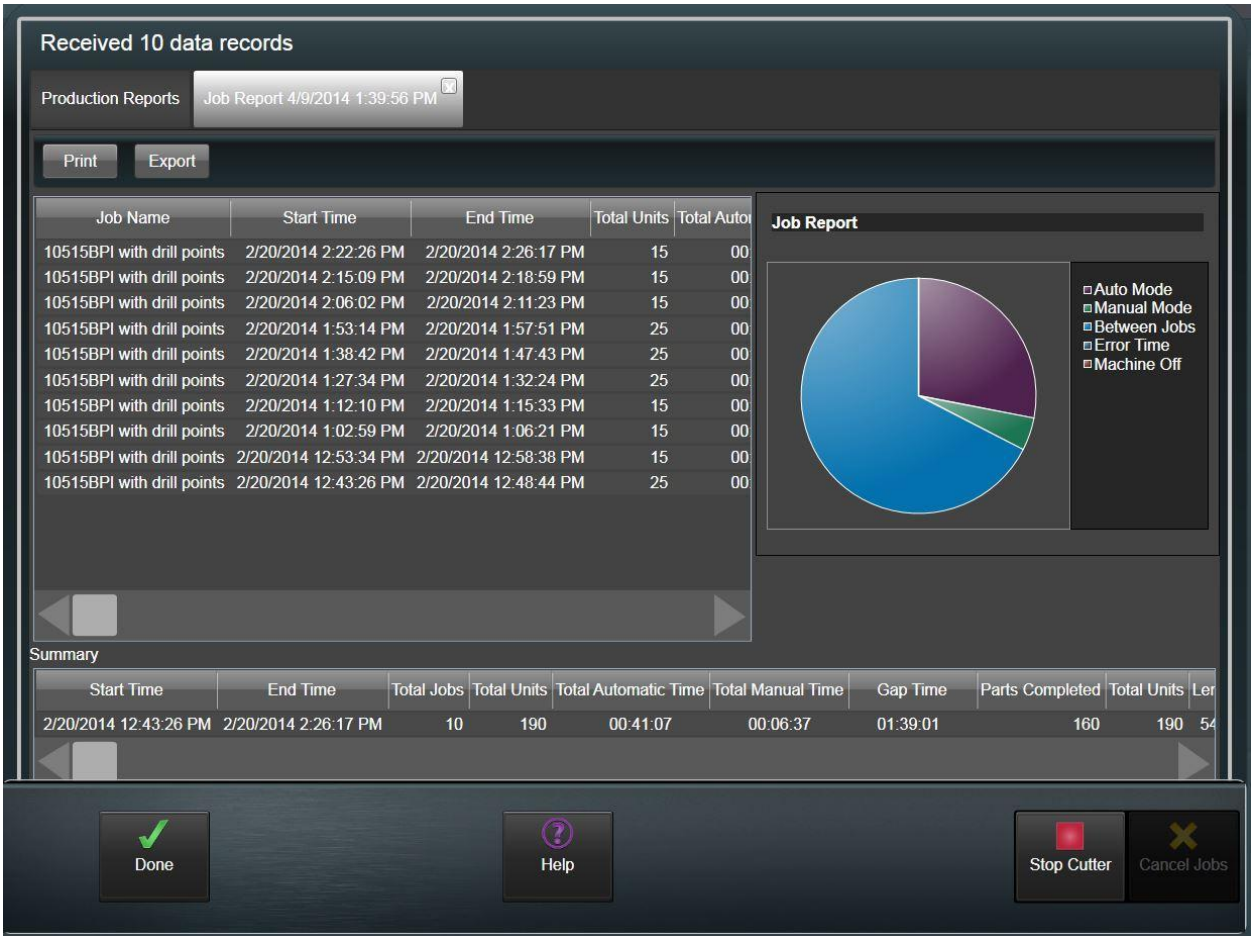


- To see more than the last 10 results, Select a different amount from the pull down list.
- To see the details of any one job, highlight the job in the top list, and touch the small arrow on the right of the screen. The details will appear in the lower pane.
- Touch “Done” when you are finished.

The second kind of report is the Production Report. It can be triggered by touching the “Run Production Reports” button in the Utility drawer.

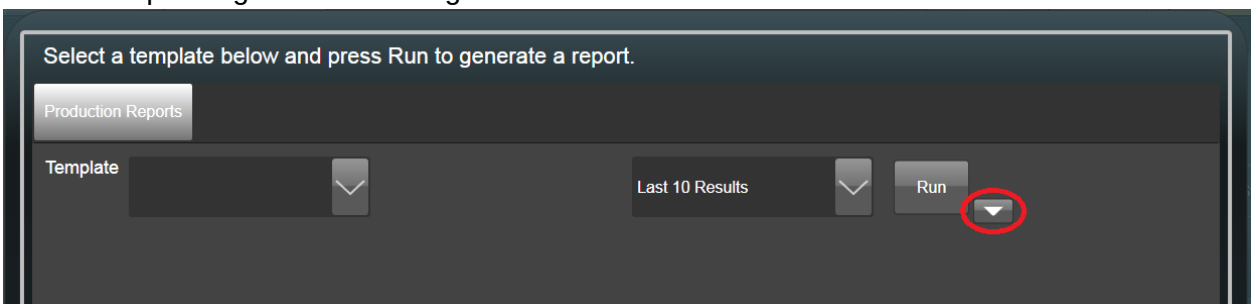


- Select a report template from the drop down box on the left.
- Select the number of jobs to report from the drop down box on the right.
- Touch “Run”. The report will be in a new tab at the top of the screen.
- You can run other reports without closing the first one. Just select a different template and touch “Run” again. Your new report appears in another tab.
- The right side of some reports will display a pie chart which displays the machine modes at a glance.
    - Auto Mode is the time spent cutting automatically.
    - Between Jobs is the time the machine was waiting for the next job.
    - Manual Mode is any time the machine was interrupted while cutting a job.
    - Machine Off is, time that the machine was turned off. This usually won’t appear unless you have defined a definite start and end time for your report.



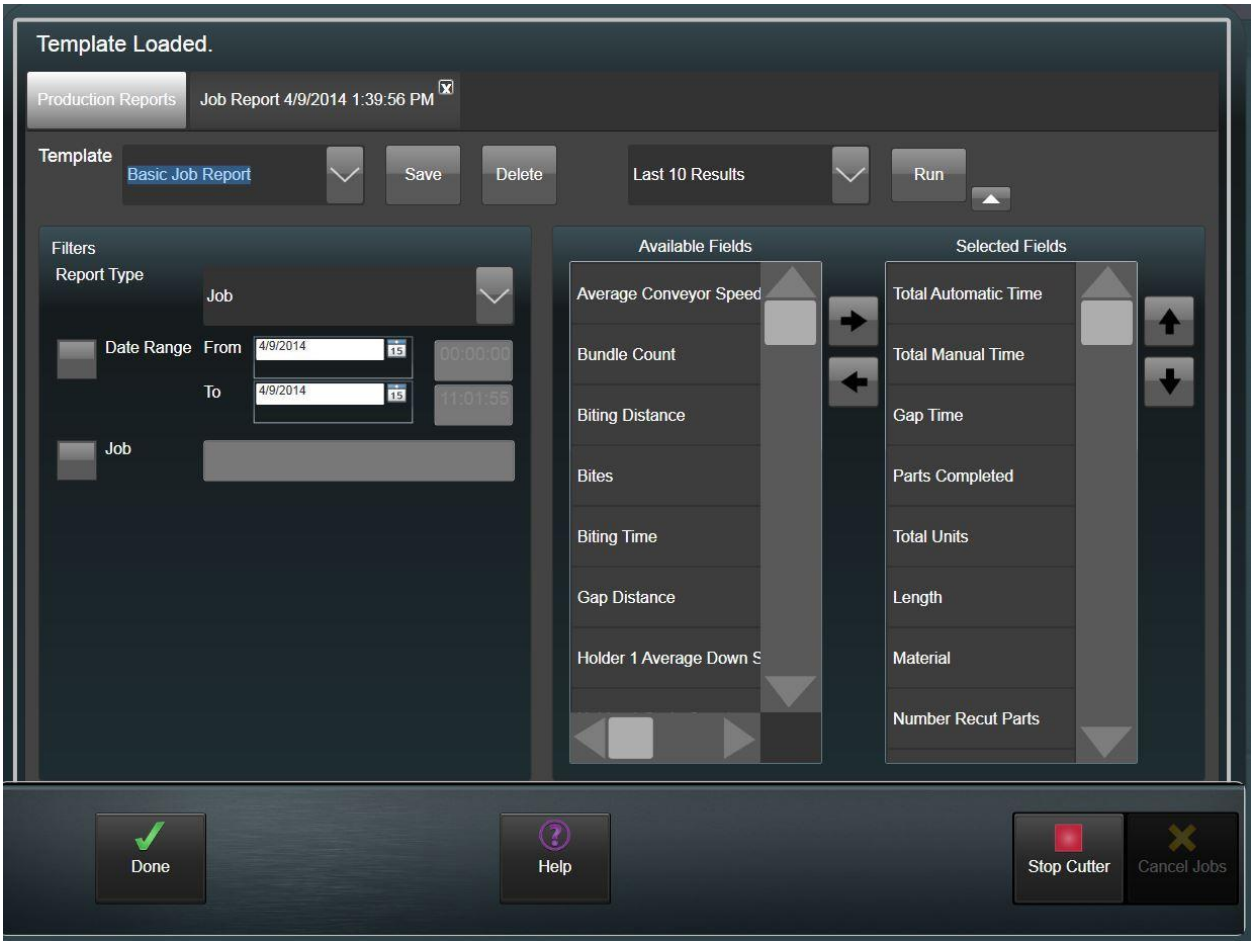
Customizing reports

Reports can be customized by selecting the Production Reports tab, and touching the downward-pointing arrow on the right.



- Select a report type, and optionally, a start time and date.
    - Depending upon the report type selected, different filters will appear below the date range selector. Leaving that filter blank will select all of the particular type you are reporting. For example, a Shift report will display all shifts, unless filtered in the area.
- Populate the “Selected Fields” box on the right with whatever available fields you choose.

- You can run the report, or save this configuration as a Report template by typing a name into the Template box, and touching “Save”. Note: Date/Time filters do not get saved in templates.



Excel export

Individual report results can be exported to a CSV file by touching the “Export” button at the top of each report. The file format is .csv, which can easily be opened by any spreadsheet software.

Calibrations

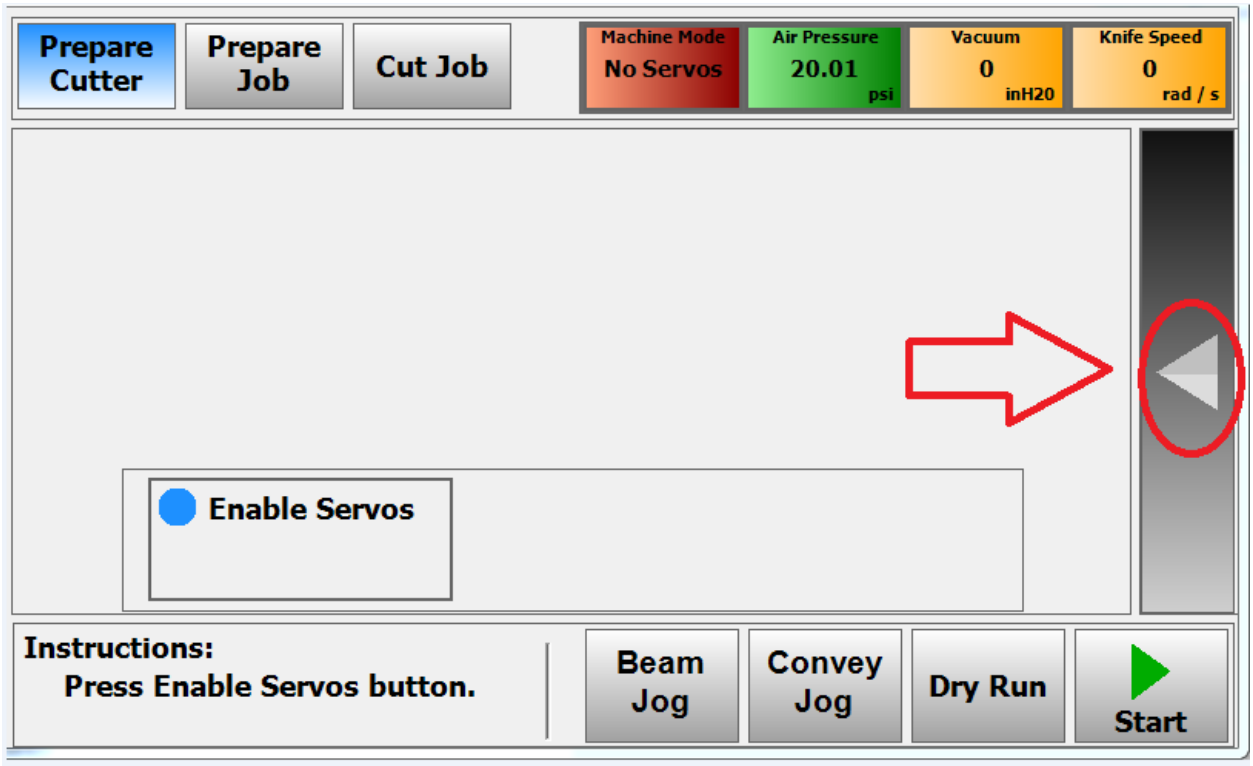
Calibrations on the Paragon cutter are performed at the Beam Control Panel. This section will cover all of the aspects of performing and modifying system calibrations including:
What do Calibrations do?
How are they done?
Where are the calibrations seen?
Where are they stored?
What parameters are affected? How are they important?
Delete a bad calibration.
Check boxes, order of operation. Checking / unchecking. Redoing.

What do Calibrations do?

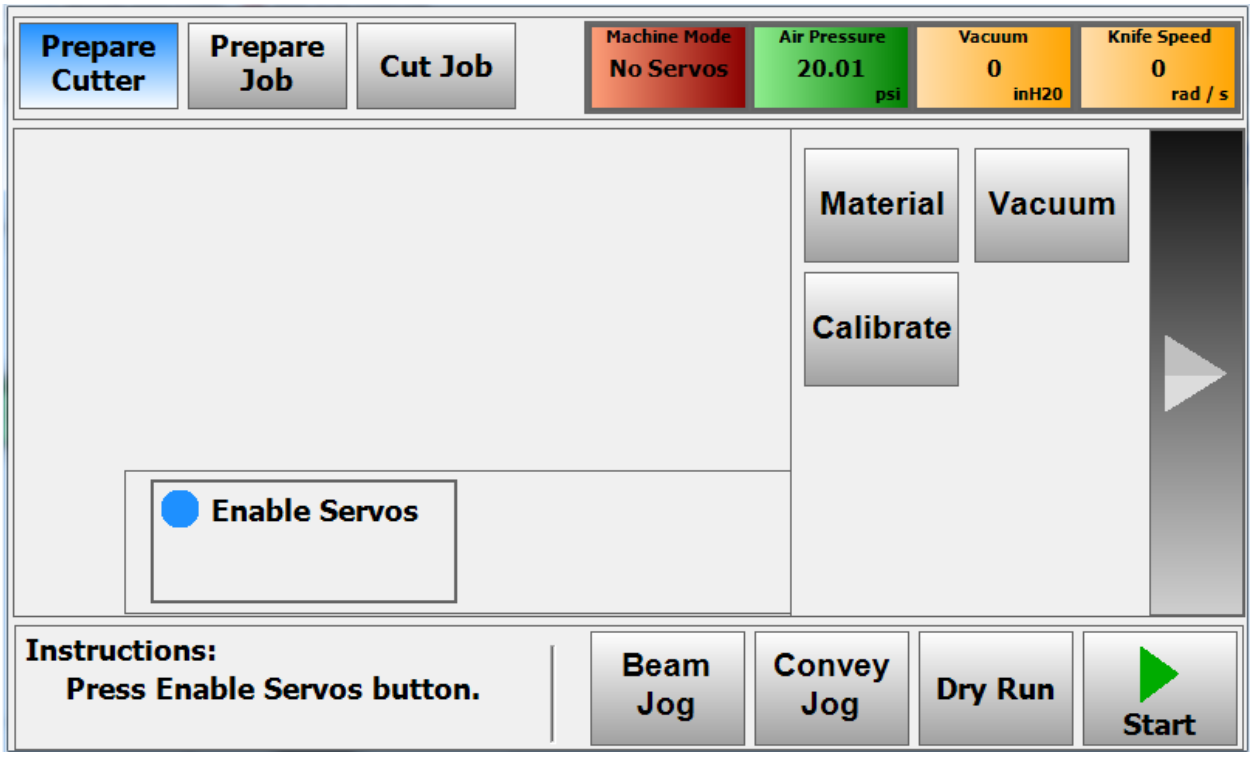
Calibrations are designed to provide a mechanical baseline for the Paragon cutter. When performed, they will tune the system to within established tolerances in order to achieve optimum functionality.

How are they done?

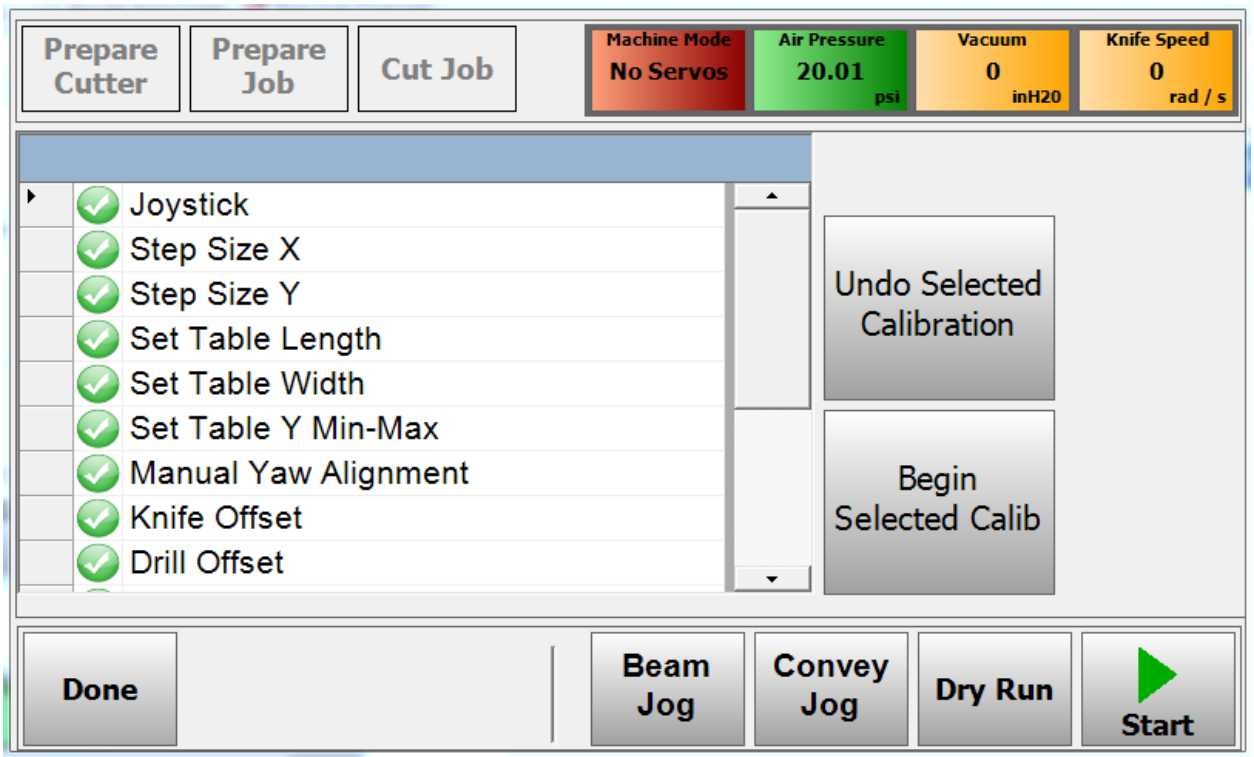
Each Paragon cutter is pre-calibrated and tested during the manufacturing process, but it may be necessary to refine the calibrations upon installation. To access the calibration page, open the Utility Drawer on the right side of the Beam Control Panel.



Opening this will display:



Pressing the Calibrate Button will display:



Warning: **Pressing the "Undo Selected Calibration" button will undo all of the subsequent calibrations and will require that they be redone. It is very important to be aware of this and to avoid using this function inadvertently.**

The order in which the calibrations are listed and performed has been determined to ensure that the most important are done first.

Beam Square is listed last because it is ***undone*** prior to shipping the system and requires re-calibration upon installation. This is directly related to the fact that "Undoing" a calibration undoes all of the calibrations that follow and is why it is last on the list.

Since the system is calibrated during manufacturing, it should not be necessary to repeat all of them prior to the Beam Square cal. Any of the calibrations can be validated by performing them again, but using the Undo Selected Calibration should be avoided.

There are (5) calibrations which allow for resetting to the Default values within the individual calibration page. These include:

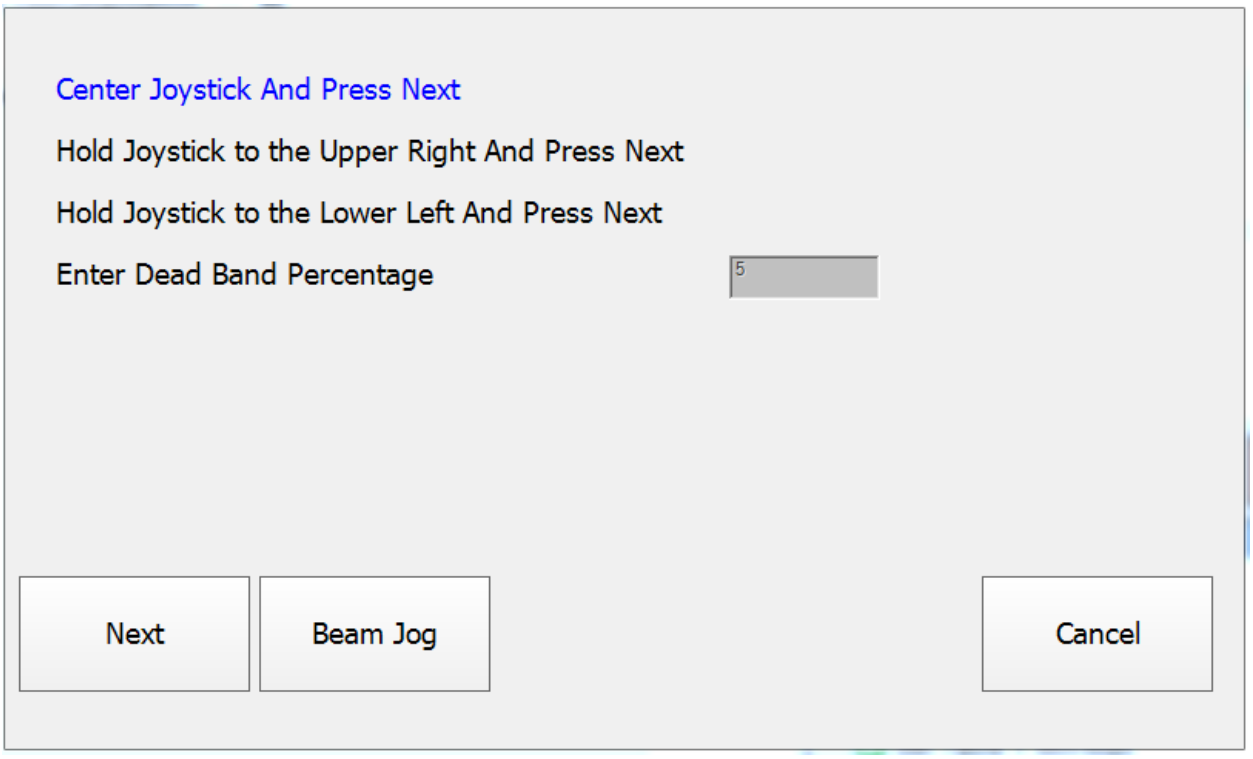
- Step Size X
- Step Size Y
- Manual Yaw Alignment
- Conveyor Aux Encoder Step
- Beam Square

When in each of these calibrations, there is a Reset button that can be used if the existing calibrated values do not produce the desired result.

If it is required to reset these in order to redo the calibration, this can be done within the calibration page for each. It is recommended that this reset function be used as opposed to using the "Undo Selected Calibration" feature.

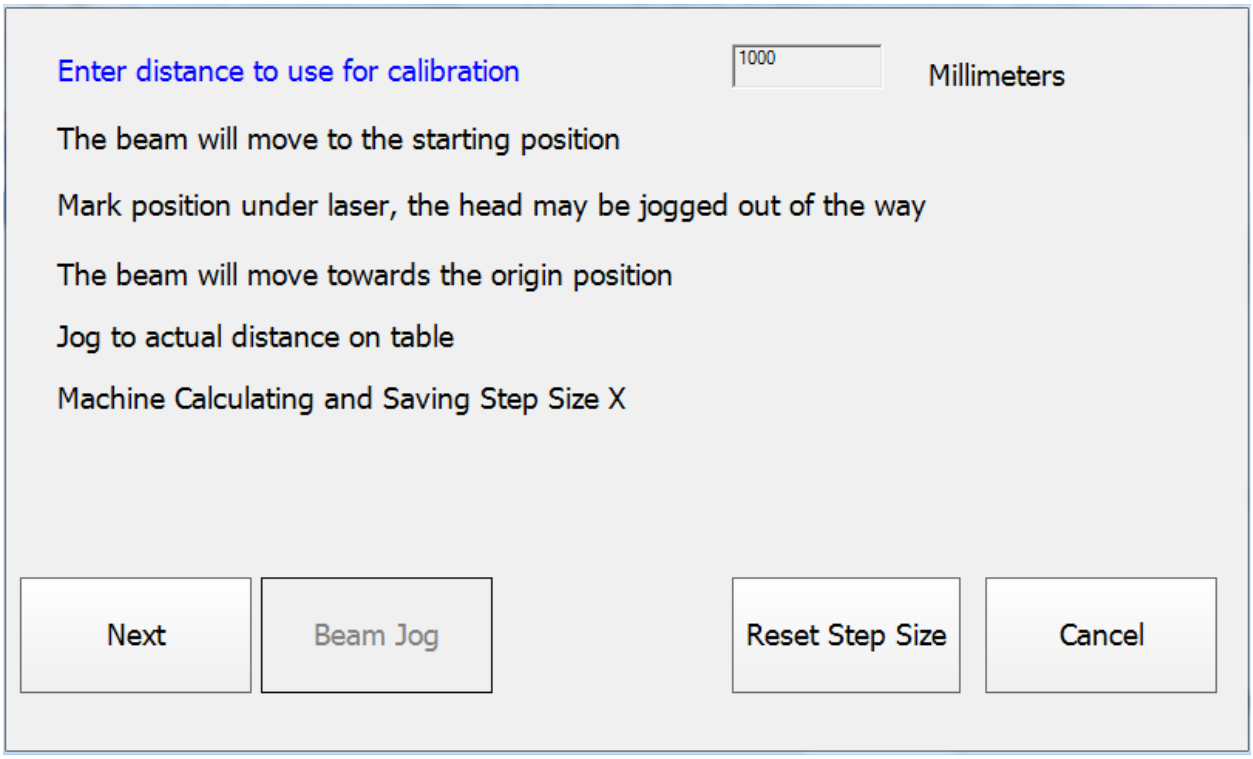
To perform the calibrations, select the individual calibration desired and press the Begin Selected Calibration button. The following images display the individual screens for each of the calibrations. Follow the steps in order to complete each one. Calibrations can be repeated multiple times in order to refine the results if required.

Joystick Calibration:



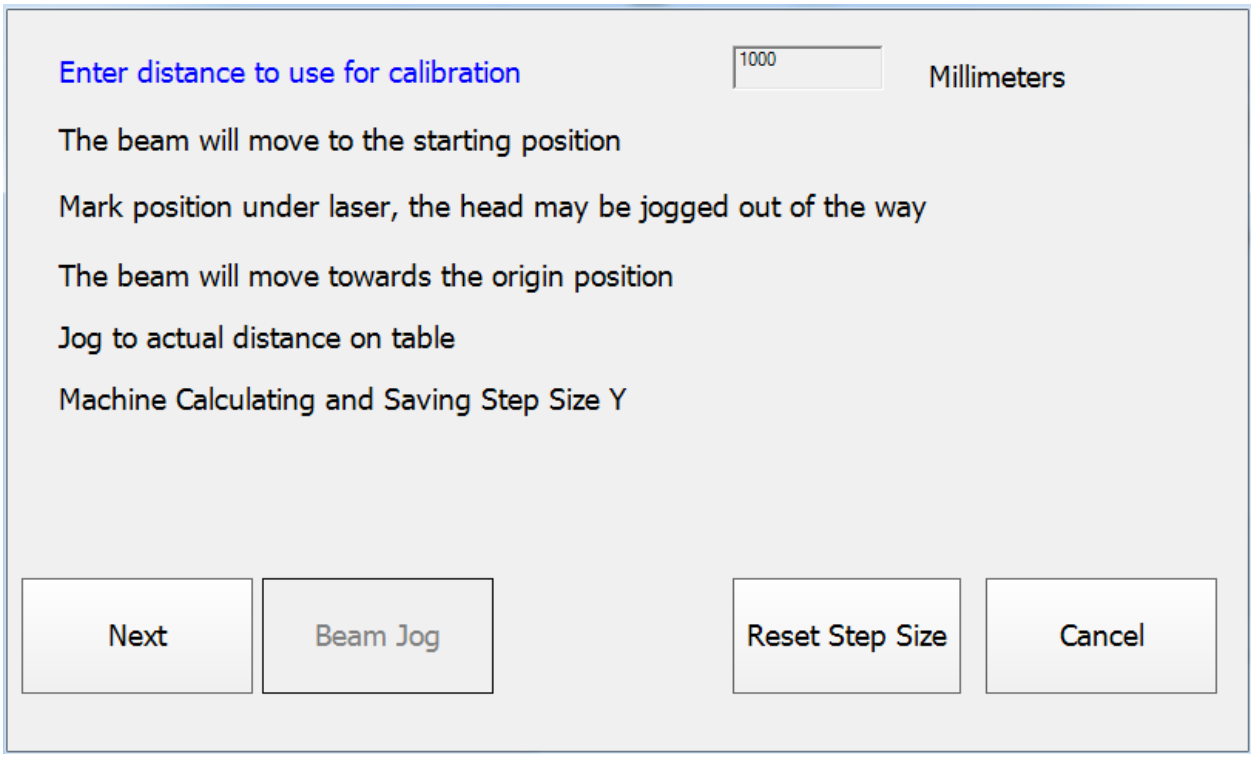
Step Size X:

Note: System Home is required upon completion.



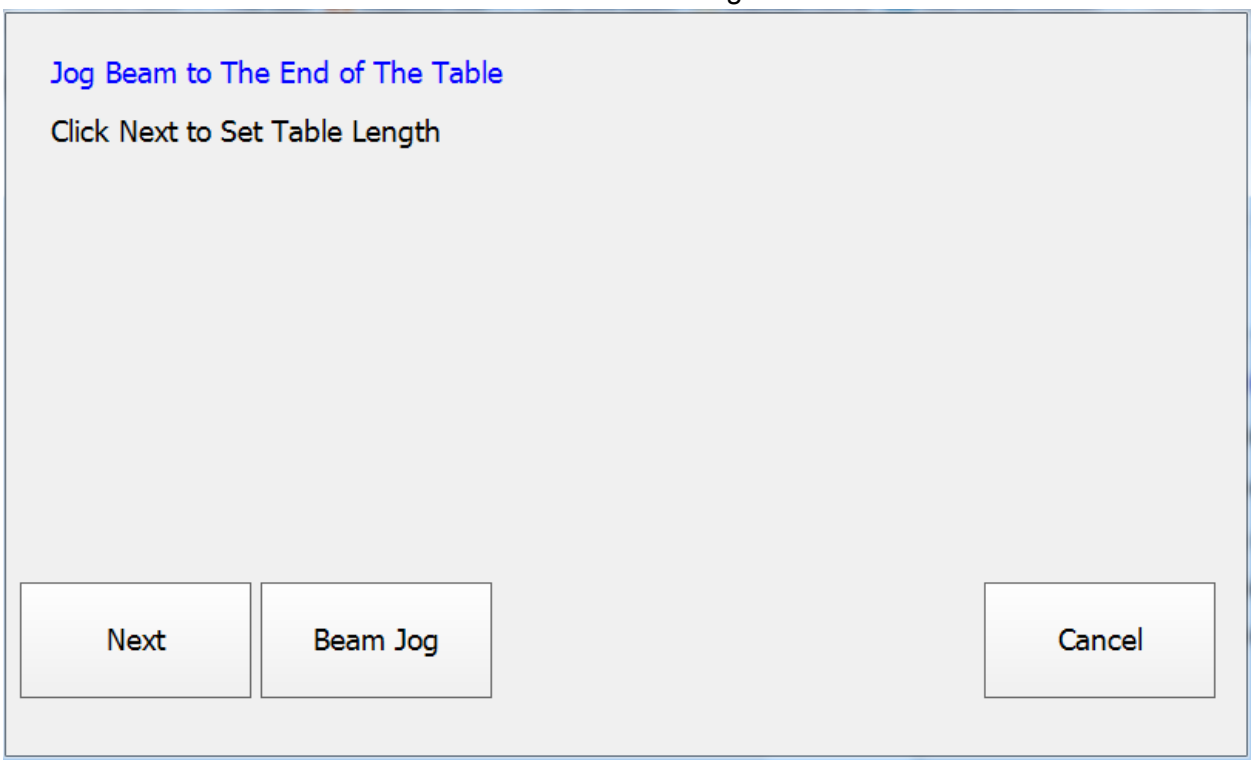
Step Size Y:

Note: System Home is required upon completion.



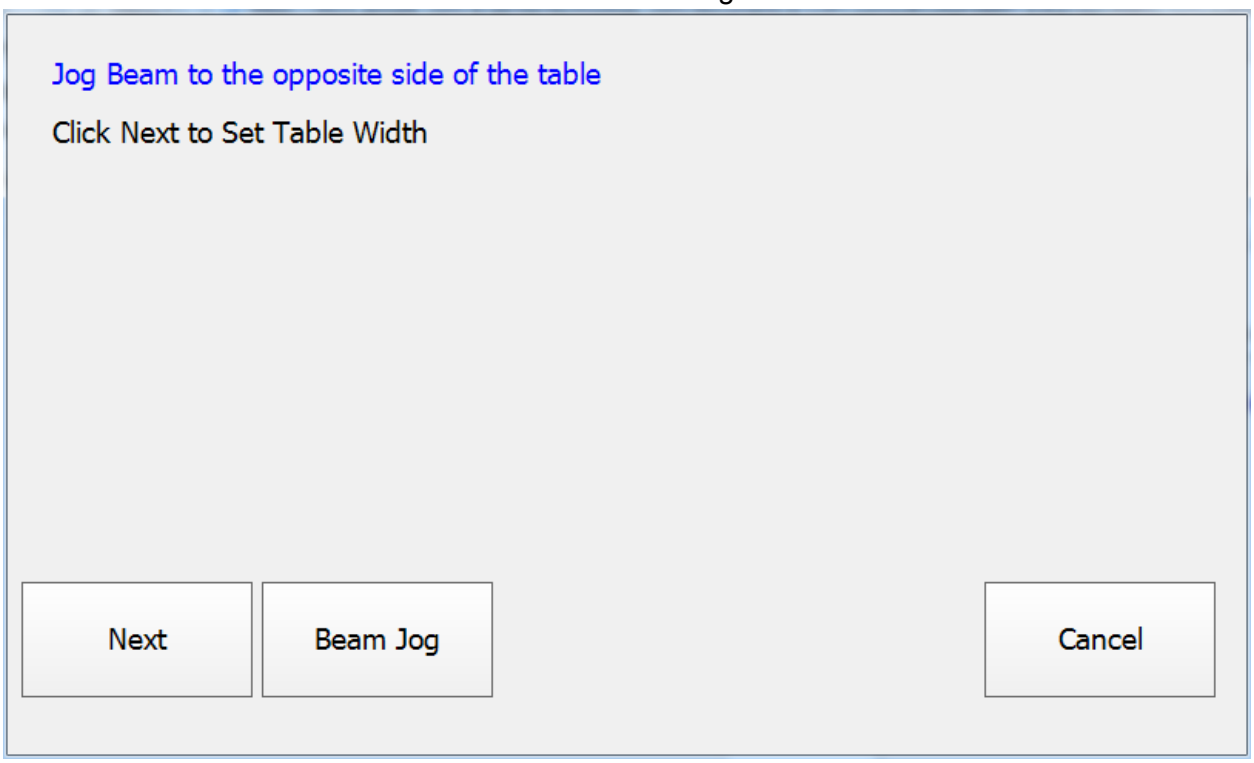
Set Table length:

Note: Move beam back off of limit switch before selecting “Next”.

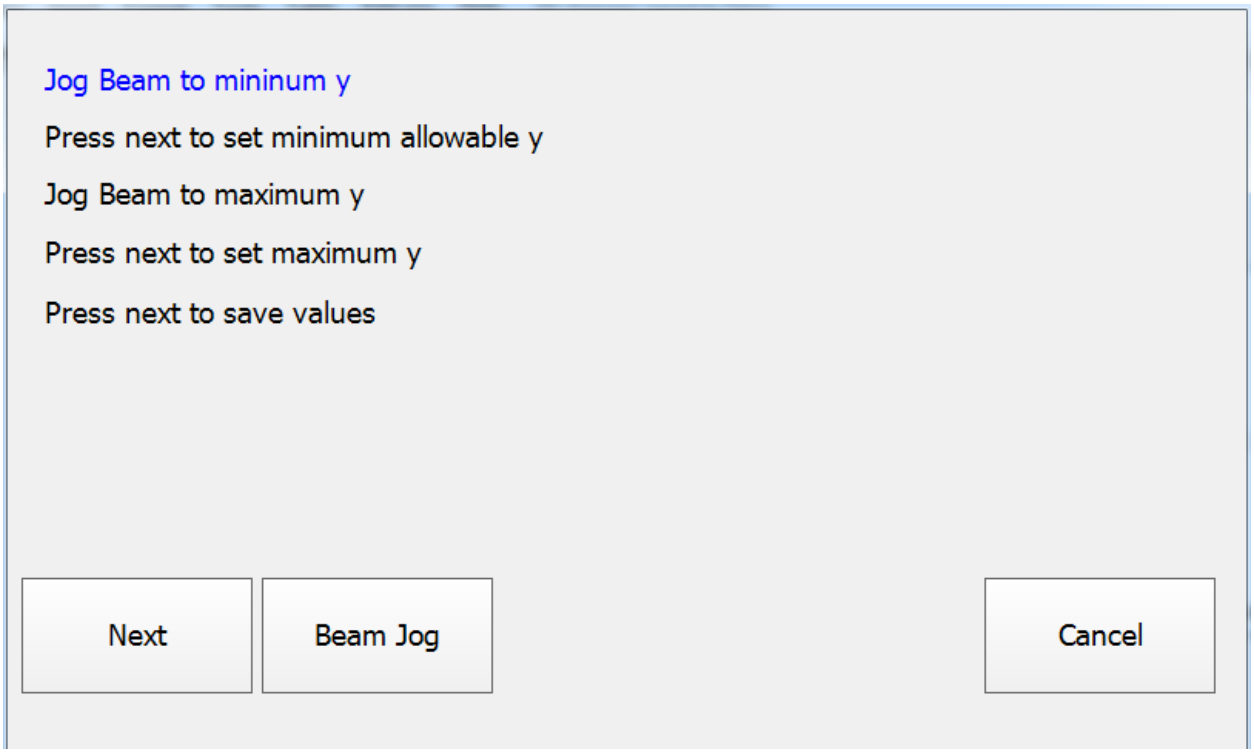


Set Table Width:

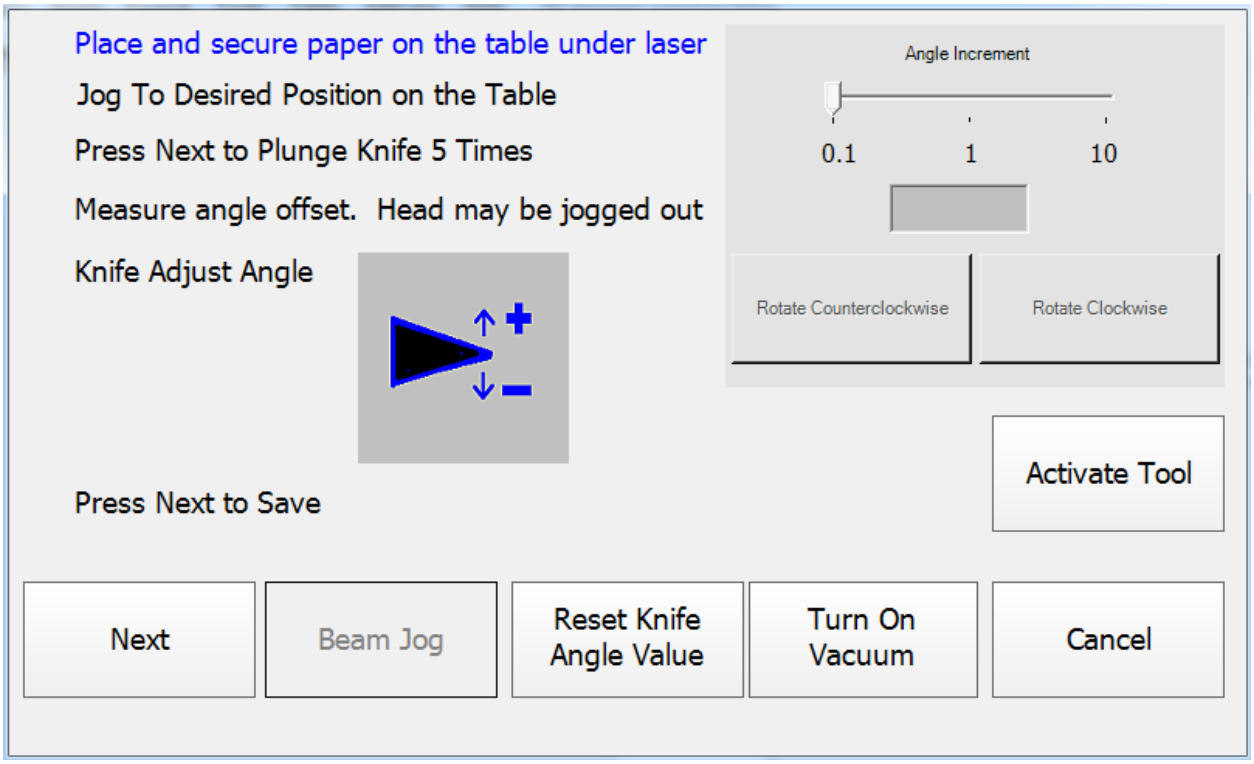
Note: Move head back off of limit switch before selecting “Next”.



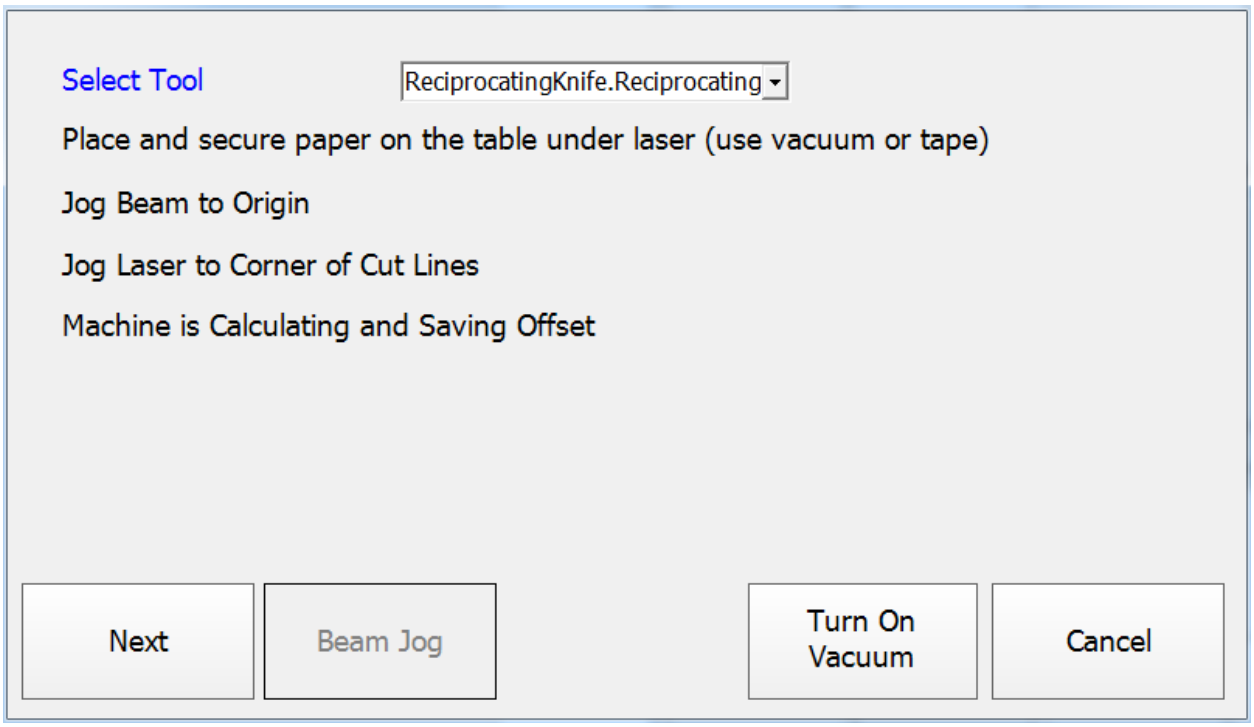
Set Table Y Min Max (Variable with use of side seals).



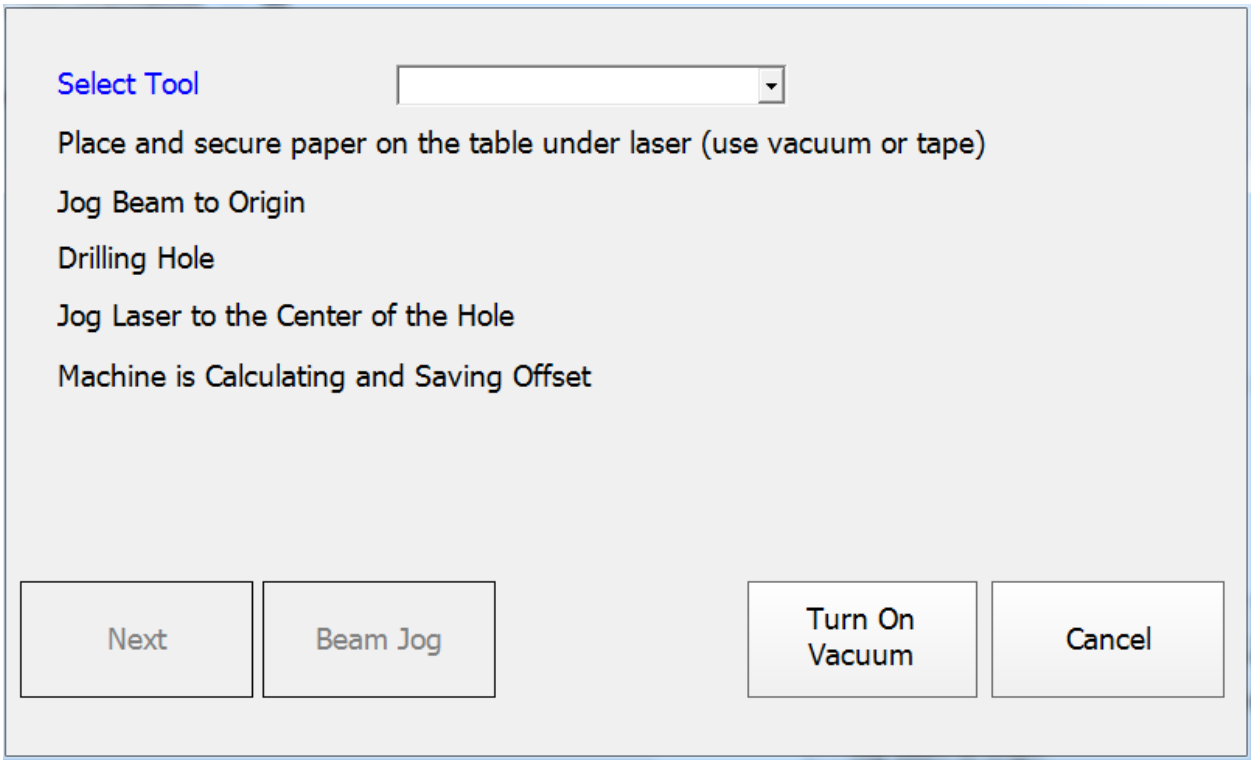
Manual Yaw Alignment: (Same as C home to System Zero).



Knife Offset: (Knife offset to laser pointer)

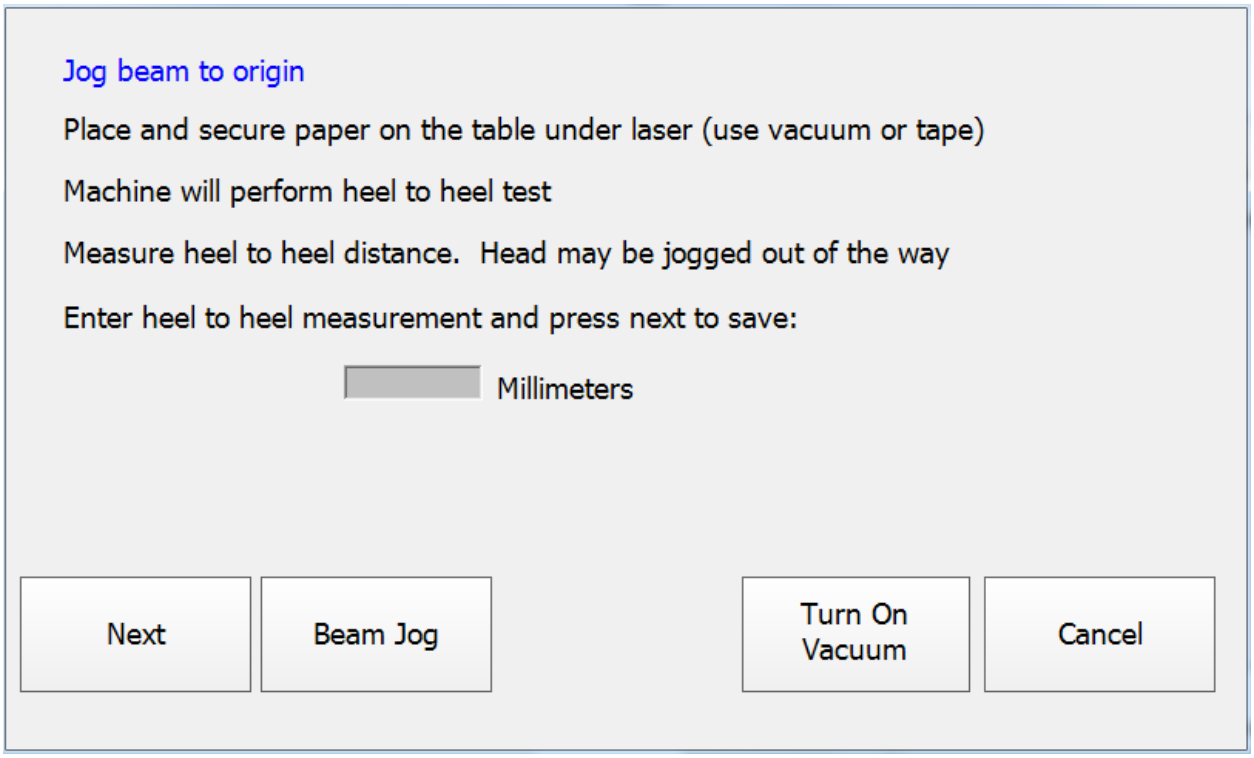


Drill Offset: (Drill offset to laser pointer used if one or two drills are installed).

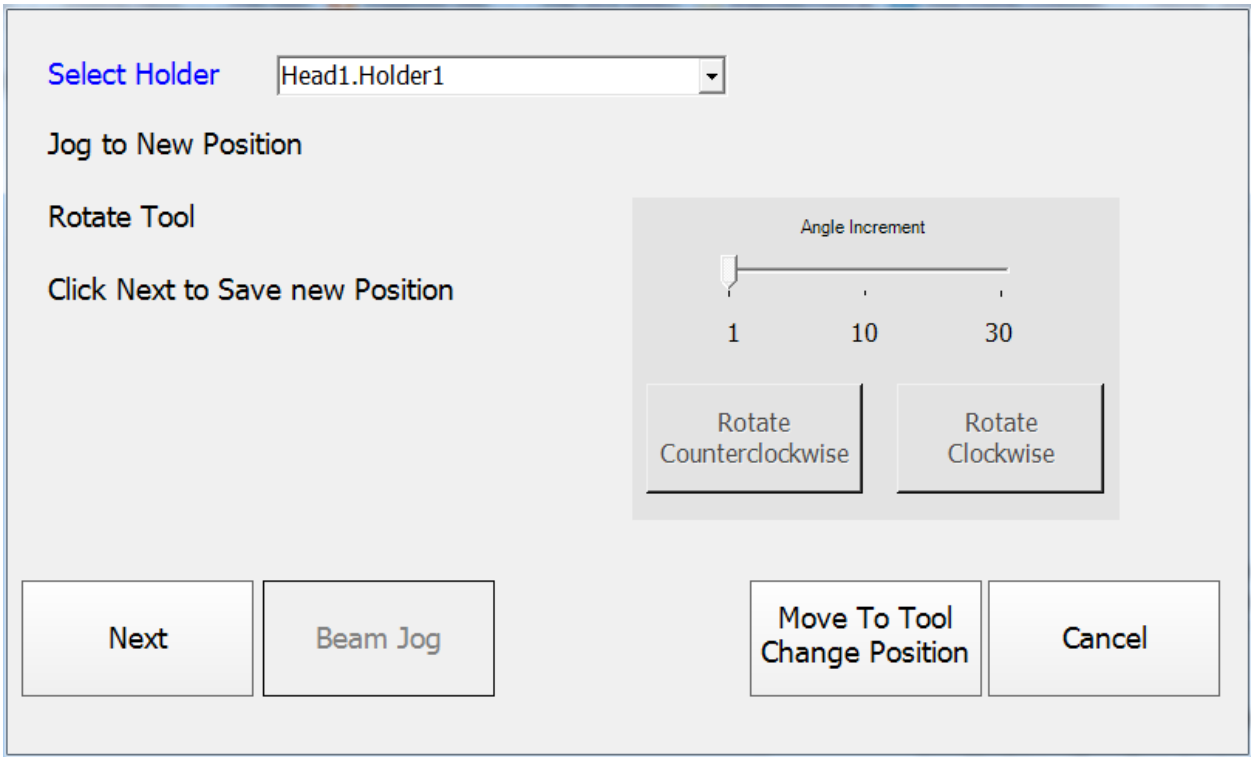


Heel to Heel:

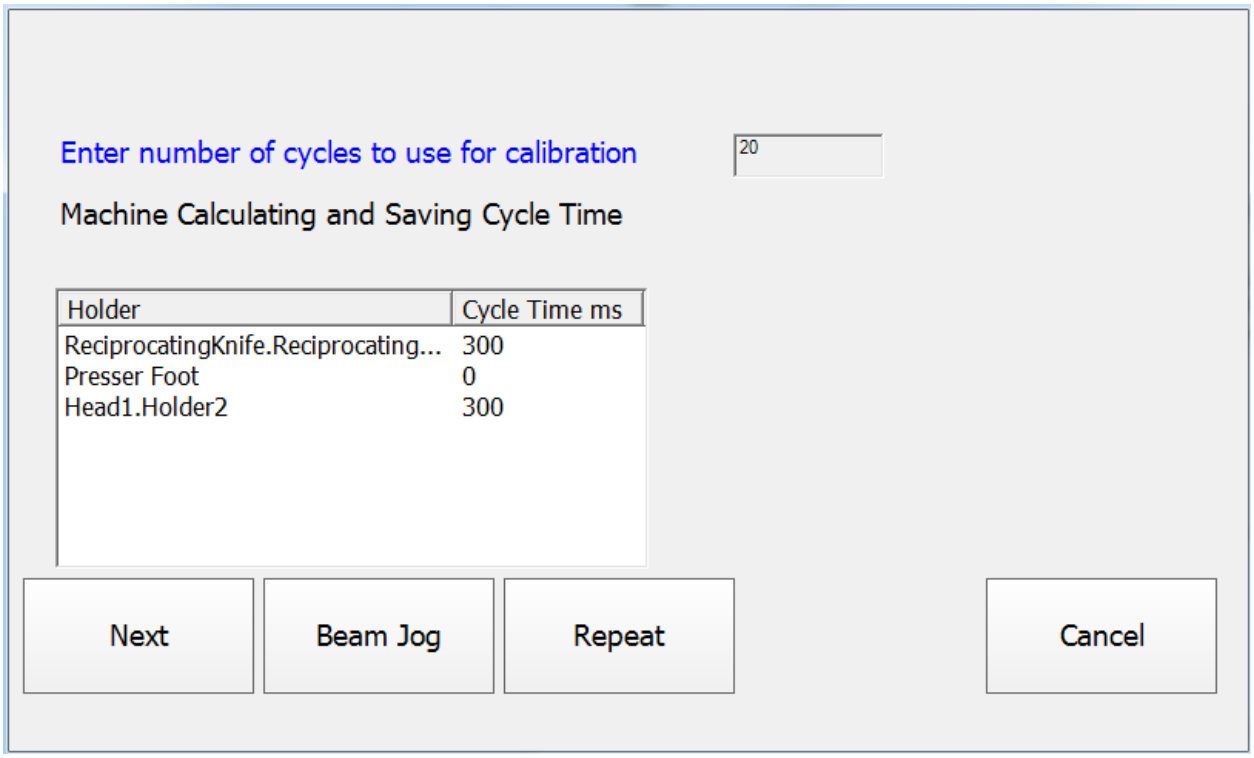
Note: Knife position is fixed on LX cutter, on VX, this is used to see knife alignment and heel to heel length. Accurately measure with caliper and enter value).



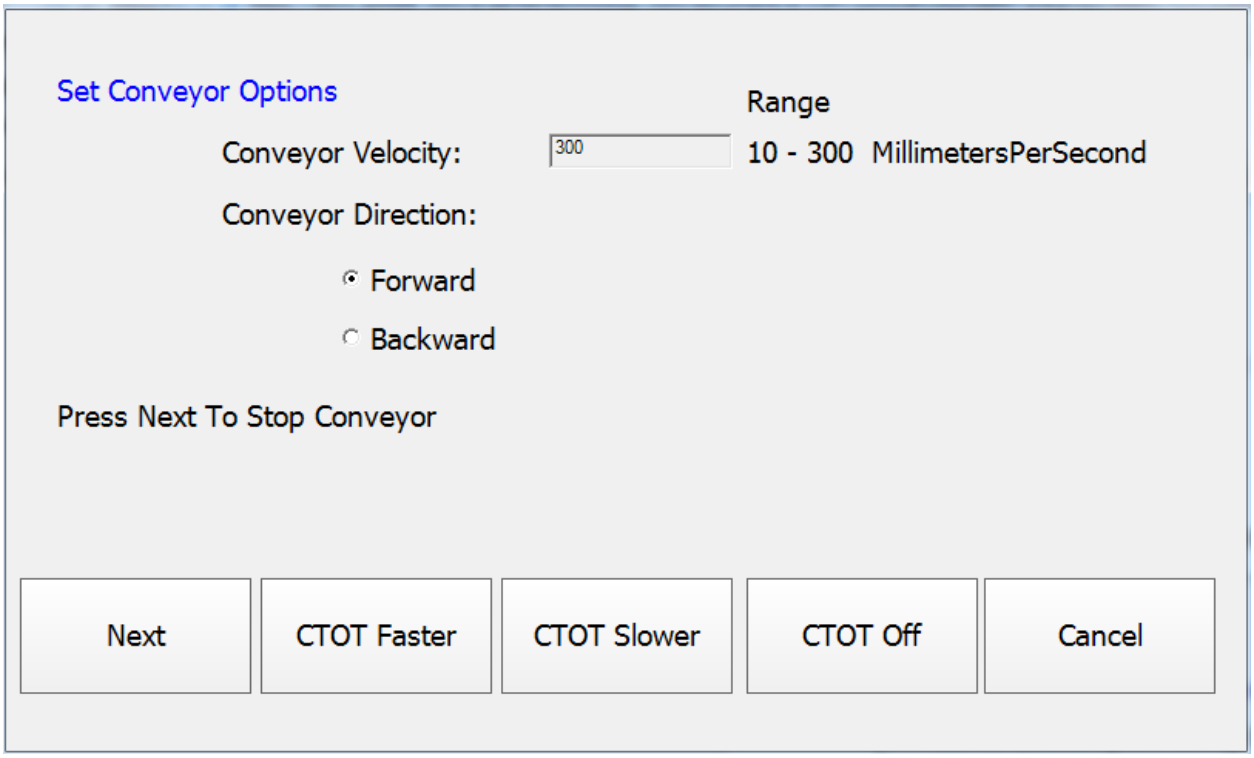
Tool Change Position: (Position head moves to for changing tools).



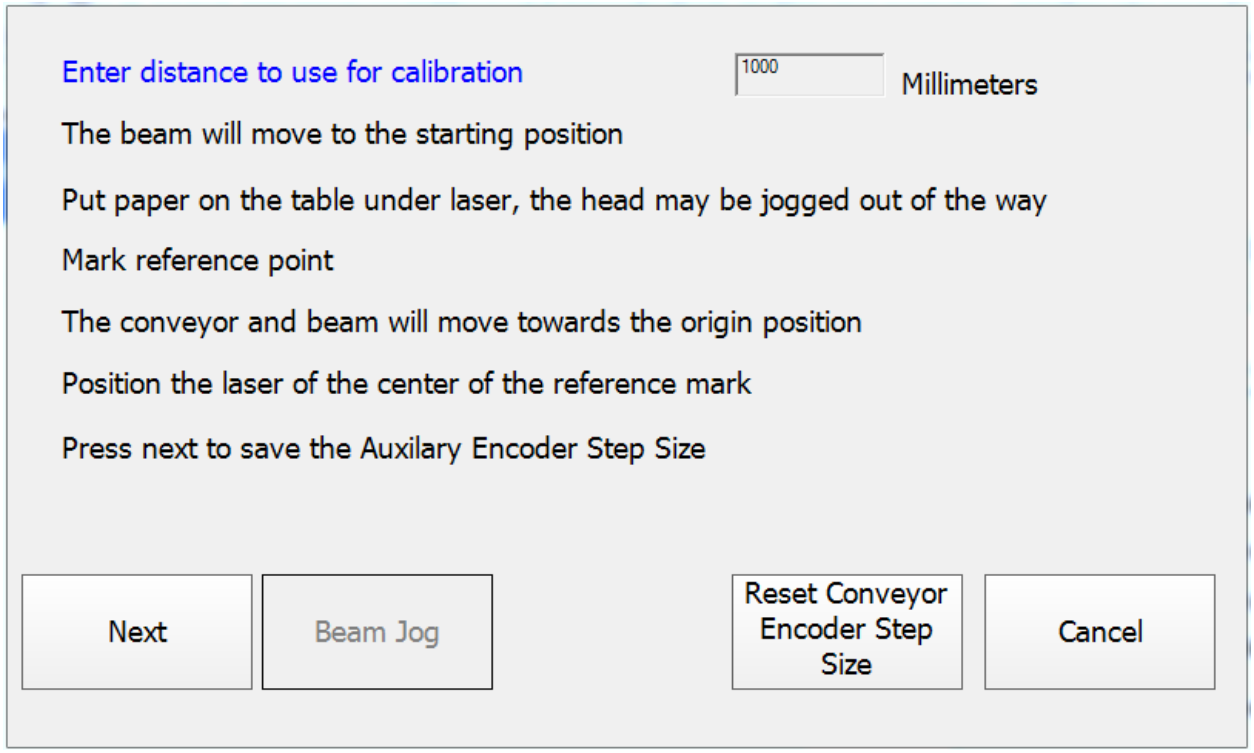
Tool Cycle Time: (Used in calculating total job time remaining).



Conveyor Tracking: (Used to synchronize table and CTOT speed).

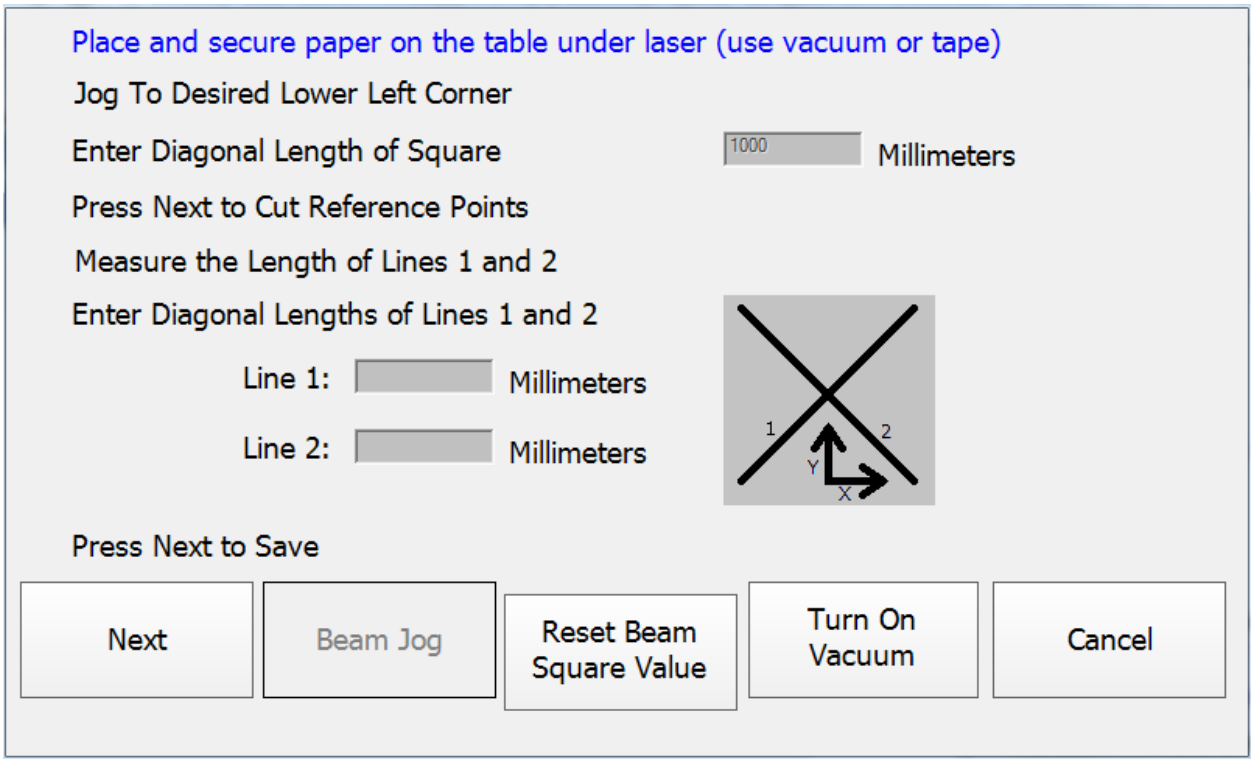


Conveyor Aux Encoder: (This synchronizes the table encoder to the X step size).



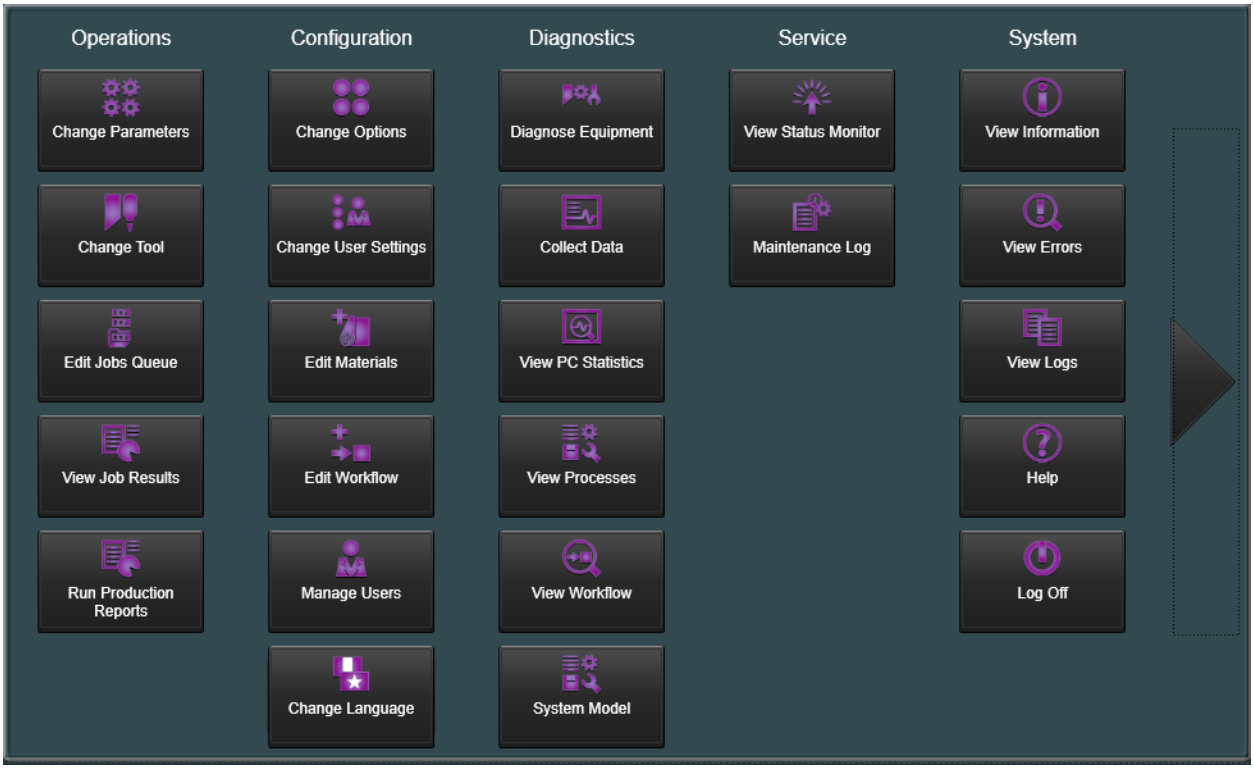
Beam Square:

Note: System Home is required upon completion.

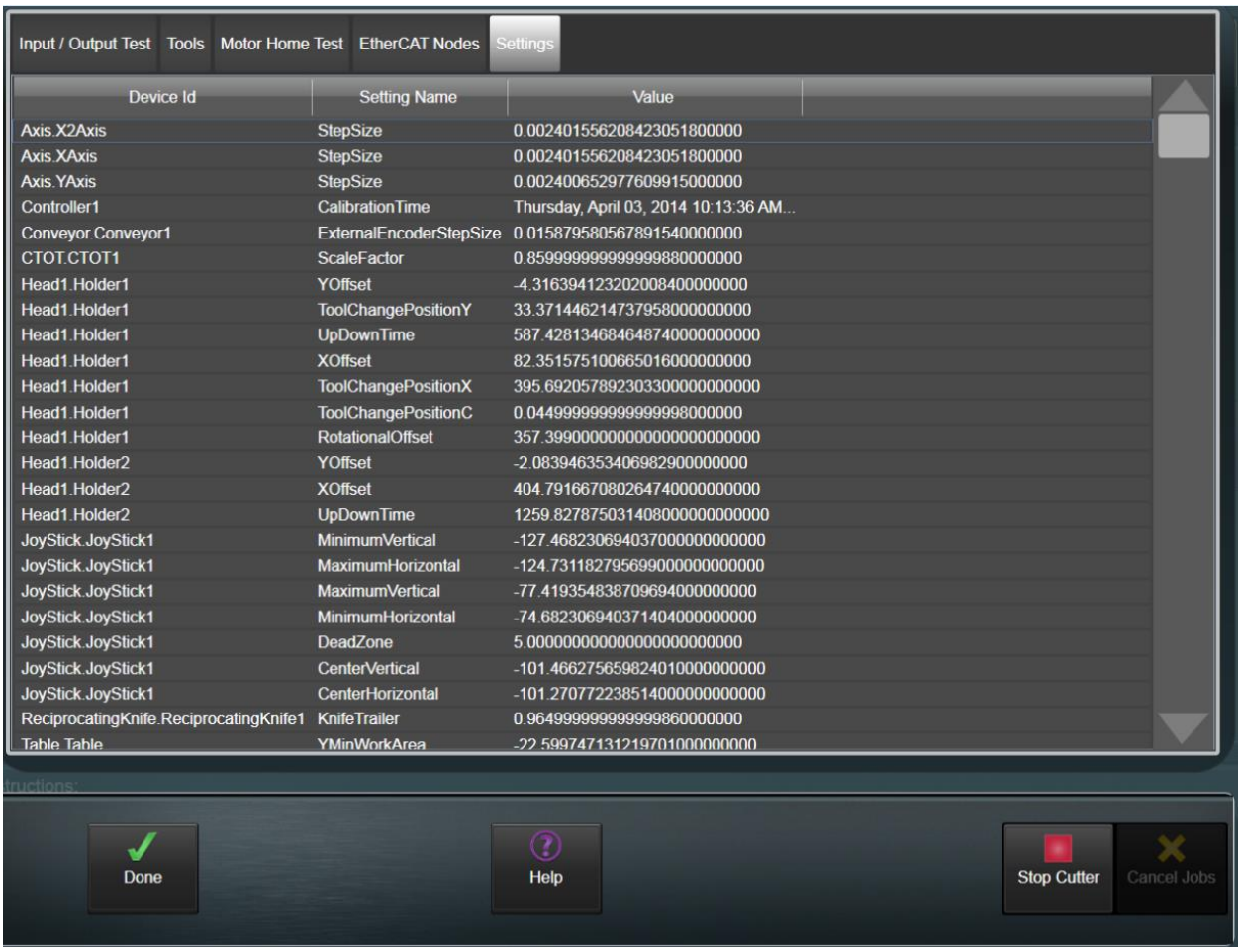


Where are the Calibrations seen?

The calibration values can be seen by accessing the settings through the Gerbercutter user interface. From the main screen, open the Utility Drawer.



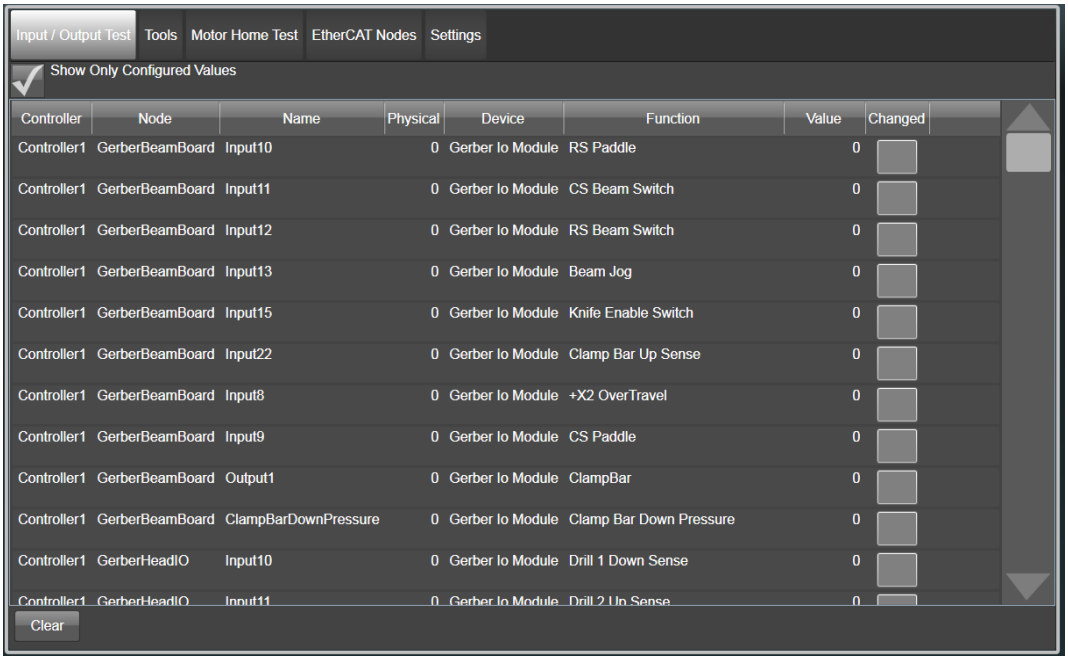
Select Diagnose Equipment from the Diagnostics column, and then press the Settings tab. This page is for reference only. The values cannot be edited here, but will be changed if a calibration is adjusted.


Input / Output Test
Tools
Motor Home Test
EtherCAT Nodes
Settings
Device Id
Setting Name
Value
Axis.X2Axis StepSize 0.00240155620842305180000
Axis.XAxis StepSize 0.00240155620842305180000
Axis.YAxis StepSize 0.00240065297760991500000
Controller1 CalibrationTime Thursday, April 03, 2014 10:13:36 AM...
Conveyor.Conveyor1 ExternalEncoderStepSize 0.015879580567891540000000
CTOT.CTOT1 ScaleFactor 0.859999999999999880000000
Head1.Holder1 YOffset -4.316394123202008400000000
Head1.Holder1 ToolChangePositionY 33.371446214737958000000000
Head1.Holder1 UpDownTime 587.428134684648740000000000
Head1.Holder1 XOffset 82.351575100665016000000000
Head1.Holder1 ToolChangePositionX 395.692057892303300000000000
Head1.Holder1 ToolChangePositionC 0.044999999999999998000000
Head1.Holder1 RotationalOffset 357.399000000000000000000000
Head1.Holder2 YOffset -2.083946353406982900000000
Head1.Holder2 XOffset 404.791667080264740000000000
Head1.Holder2 UpDownTime 1259.827875031408000000000000
JoyStick.JoyStick1 MinimumVertical -127.468230694037000000000000
JoyStick.JoyStick1 MaximumHorizontal -124.731182795699000000000000
JoyStick.JoyStick1 MaximumVertical -77.419354838709694000000000
JoyStick.JoyStick1 MinimumHorizontal -74.682306940371404000000000
JoyStick.JoyStick1 DeadZone 5.000000000000000000000000
JoyStick.JoyStick1 CenterVertical -101.466275659824010000000000
JoyStick.JoyStick1 CenterHorizontal -101.270772238514000000000000
ReciprocatingKnife.ReciprocatingKnife1 KnifeTrailer 0.964999999999999860000000
Table.Table YMinWorkArea -22.599747131219701000000000
Done
Help
Stop Cutter
Cancel Jobs

Diagnostics

Diagnose Equipment

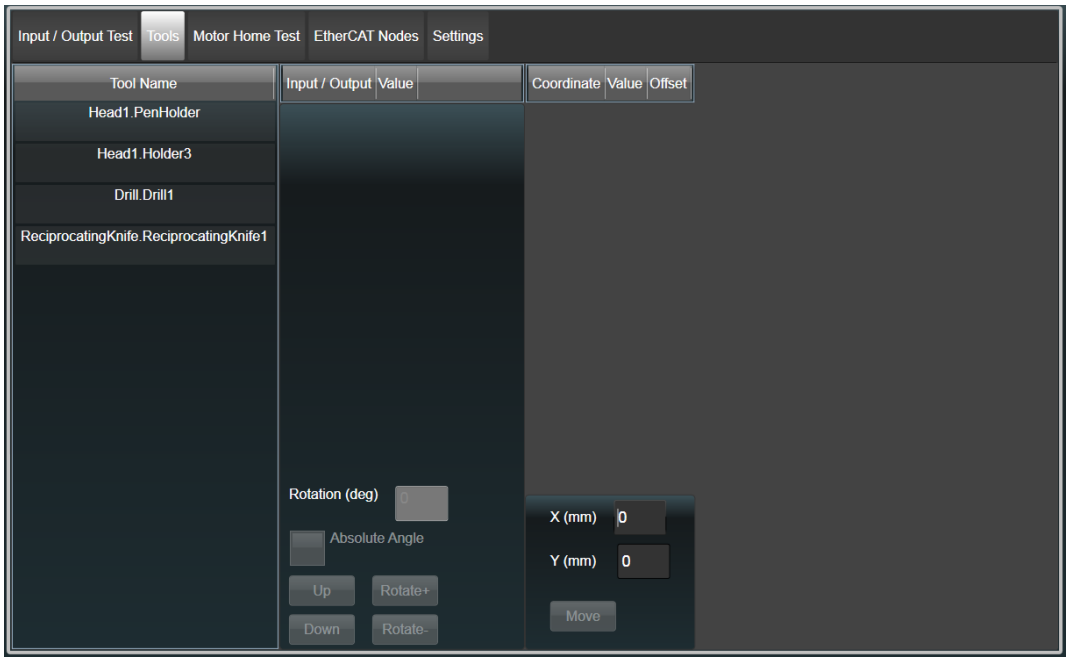
- Input / Output Test



The screen will show when there are changes to the value of each component listed. It allows you to clear the screen to see the changes over again, but will not allow the value to be changed manually. The '**Changed**' column just will turn blue for a component when it's value has changed.'

- Tools

This tab will let you activate certain physical movements of the tools to see how they are functioning. Example of the activations are Up, Down, Rotate, etc.



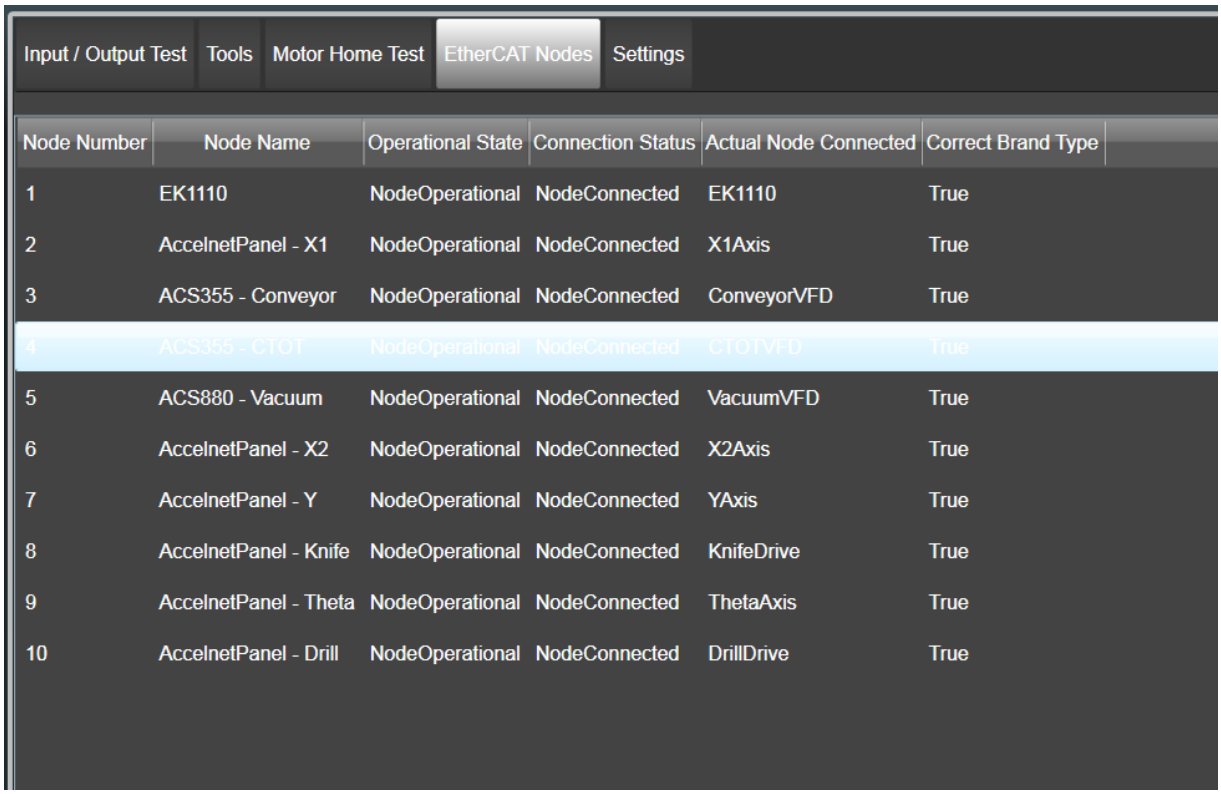
- EtherCAT Nodes

  <u>The EtherCat connections order is:</u>

  1. EK1110
  2. AccelnetPanel - X1
  3. ACS355 - Conveyor
  4. ACS355 - CTOT
  5. ACS880 - Vacuum(VX) / ACS355 - Vacuum(LX)
  6. AccelnetPanel - X2
  7. AccelnetPanel - Y
  8. AccelnetPanel - Knife
  9. AccelnetPanel - Theta
  10. AccelnetPanel - Drill

<u>Troubleshooting the EtherCat Nodes (*feature available in V2.0.2 and beyond*):</u>

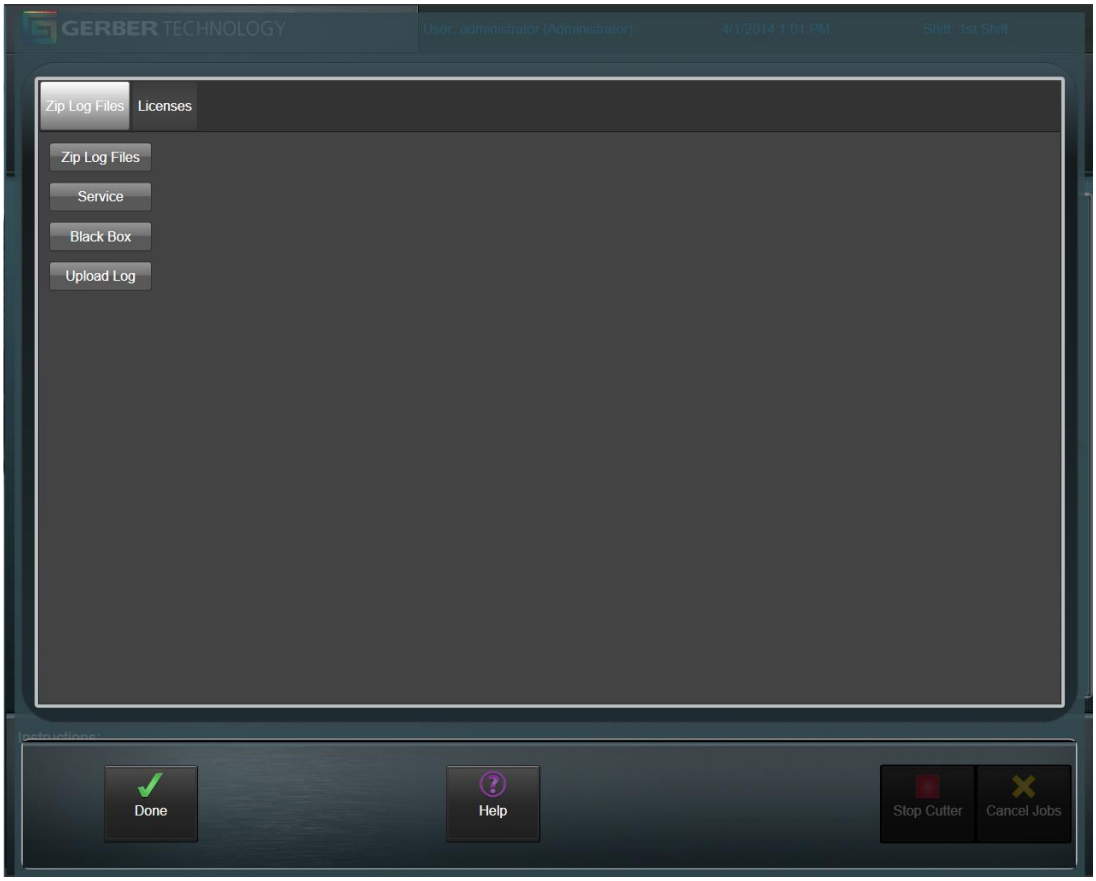
1. This will help identify if the EtherCAT devices are not connected in the proper order. The last two columns of this window will let you know when you have a device that is connected in the wrong location in the chain of devices. That particular device's row will turn red in this window.



- Settings

  This tab shows the devices calibration values from when the machine was last calibrated.

Collect Data



This screen will let you export valuable information from the computer running the software, and the actual controller machine on the cutter.

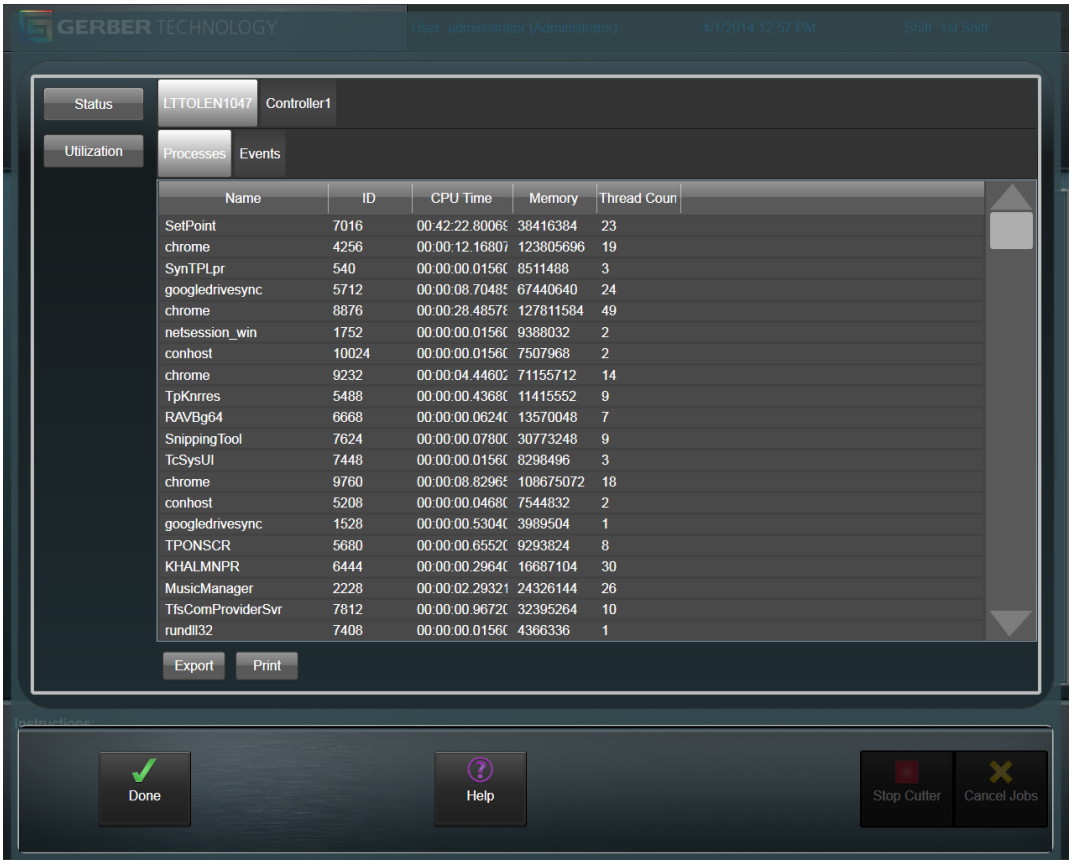
4 Types of Log Exporting

1. Zip Log Files
    a. The root of the zip file contains log files that have a long history to see what happened on a machine from several days ago.
    b. Contains DataLog, MachineOptions, SettingsOverride config files for the process manager.
    c. Contains Options and JobQueueGui config files for the GUI.
2. Service
    a. Contains logs that give general information about the controller computer. It will also contain a Maintenance.csv file with maintenance records from the programs database that have been performed on the cutter.
3. Black Box
4. Upload Log

a. This will export a zip file containing a DataLog and ServoDataLog file.

View PC Statistics

This screen will give you general and specific information about the computer running the Paragon software, and the the controller. The screen can show you what processes and events are occurring on both computers under the 'Status' (1) Button. The 'Utilization' button will show the status of the system resources for either computer. The information for both screens can be exported to a csv file or printed out.



View Processes

Shows the required processes for the software to be running, which will be in green if everything is fine. They will turn to a different color when there is a problem with that process.

System Model

Shows detail information for the components running, both hardware and software parts. This information is shown in real time. The hardware components on this screen have more detailed properties. Example of the properties would be voltage, current, temperature, pressures, etc.

Common Errors and diagnosis / corrective action.
Tool position uncertain
Position errors vs following errors (terminology)

Service Tools / Standalone utilities

Utilities Installed With Cutter Software

These utilities are available from the Start->All Programs->GERBERcutter Software->GERBERcutter Utilities folder.

1. Cutter Image Backup and Restore
   This is the utility to use when attempting to transfer parameters and settings from one machine to another or for reporting the state of a machine for diagnostics purposes. There are checkboxes to specify which items are to be included in the backup or restore operation. The following items can be backed up/restored:
   - Axis UI Settings
     This saves user changeable options for the Axis UI which is currently used only on the Z1 cutters. This includes colors and units to display.
   - GERBERcutter UI Settings
     This saves user changeable options for the GERBERcutter UI which is currently used only on the Paragon cutters. This include colors and units to display.
   - Machine Options
     This saves the Queue Settings, Processing Settings, General Settings, and the Administrator Options.
   - Controller Calibrations
     This saves the calibrations that were performed from the Control Panel.

- Controller Configurations
  This saves the controller configuration from the most recent software installation.
- Cutter Operational Hours History
  This save the amount of time the cutter has been operational.
- Lightning Database
  This saves the cutter database. The database contains job recovery information, material definitions, currently installed tools, tool wear, user roles, operations permitted for each role, list of users, shift definitions, threshold monitor and maintenance status, and cutting results used for generating reports.
- CutWorks Settings and Wizards
  This saves the cei.ini which contains settings such as material definitions, wizard settings, available import file types, cutter type.

2. Database Backup and Restore
   This is the utility to use when attempting to get information about the cutter database version, backing up and restoring the database, or for deleting a specified range of cutting results.

3. ZLink
   This is the utility to use transferring cutter software from the PC to the controller and control panel. When cutter software is installed, the software needed for the controller and control panel is first stored on the hard drive of the PC. The files are then transferred, over the network, to the controller and control panel by the ZLink utility. If the controller or control panel are not available during cutter software installation this utility can be run at a later date when they are available.

Utilities On The Service Disk

1. A utility for performing the first time configuration of the control panel is provided in the CPConfig folder of the installation disk. Copy the contents of the CPConfig folder to a USB flash drive. Insert the flash drive into the control panel and run CPConfig.exe from the control panel touchscreen. This will configure the control panel so that it can communicate with the controller and PC. Once this is done ZLink will be able to download software to the control panel.
2. A utility for setting all controller calibrations back to defaults ir provided in the CalibrationDelete folder. This may be usefull if the calibrations have been corrupted preventing the machine from functioning.

3. A utility, called FlashConfig.exe, for setting up a flash card for the controller may be installed by running setup.exe from the service disk. Follow the directions in the release notes for proper usage.

Known problems and limitations